

January 14, 2025

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

RE: CZMA Federal Consistency Review Submission Arundel Yacht Club Kennebunkport, Maine 04046

To Whom it May Concern,

On behalf of the Arundel Yacht Club (AYC, 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 AYC's 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	Submitted 9/6/2024
Individual Standard Permit	USACE	Submitted 10/3/2024
Natural Resources Protection Act Individual Permit	Maine DEP	Submitted 10/3/2024
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 Kennebunkport	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 September 6, and October 3, 2024, respectively, and the Maine DEP Natural Resources Protection Act (NRPA) Individual Permit application that was submitted on October 3, 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. Toberg

cc. AYC – Costas Balomenos USACE – Heather Stukas Maine DEP – Alison Sirois

Enc. Federal Consistency Submission Form

AYC USACE Section 408 Permit Application (Submitted on September 6, 2024) AYC USACE Individual Standard Permit Application (Submitted on October 3, 2024) AYC Maine DEP NRPA Individual Permit Application (Submitted on October 3, 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:

Arundel Yacht Club Dredging		
Contact Name:	Authorized Agent (if applicable):	
Costas Balomenos (on behalf of the Arundel Yacht Club, Applicant)	Walsh Engineering Associate	es, Inc. (c/o - Leyna Tobey)
Federal Agency:		
N/A		
Address:		
51 Ocean Avenue		
City:	State:	Zip Code:
Kennebunkport	Maine	04046
Email:	Phone Number:	
leyna@walsh-eng.com (Authorized Agent)	207-553-9898 (Authorized A	gent)
II. Federal Consistency Category: ☐ Federal Agency Activity (15 CFR Part 930, subpart C) ☐ Federal License or Permit Activity (15 CFR Part 930, subpart D) ☐ Outer Continental Shelf Activity (15 CFR Part 930, subpart E) ☐ Federal Financial Assistance Activity to State/Local Government (15 CFR Part 930, subpart F)		
The project includes dredging of the Kenr marina to provide adequate depth for nav		Arundel Yacht Club's

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

VII. Statement of Determination/Certification	and Signature. Check one and sign below:
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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:	Lugna L. Tobery	Digitally signed by Leyna Tobey, PE Date: 2025.01.14 13:29:58-05'00'	
Printed Name: Leyna Tobey	9.319	Date: 1/14/2025	

AYC USACE Section 408 Permit Application (Submitted on September 6, 2024)

Army Corp of Engineers Section 408

For

Arundel Yacht Club 51 Ocean Ave Kennebunkport, ME 04046

September 6, 2024

Applicant

Arundel Yacht Club P.O. Box 328 Kennebunkport, ME 04046

Prepared By:



One Karen Drive, Suite 2A Westbrook, Maine 207.553.9898



September 6, 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
Arundel Yacht Club Dredging
51 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 (the Arundel Yacht Club, 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 Arundel Yacht Club (AYC) is located at 51 Ocean Avenue in Kennebunkport, Maine with 161 feet of frontage on the Kennebunk River. The Town of Kennebunkport Assessor's Office identifies the parcel as Map 10, Lot 1, Block 5. The facility is an 0.42-acre parcel of land with an 18,100 square foot 1.5-story shingled historical building known as the "Thomas Goodwin Rope Walk," which is now used as the yacht club. The property maintains associated parking areas and 50 boat slips (see Figure 1 – Section 408 Plan attached to this letter).

The shoaling that is occurring in the AYC's 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 = 8,031 cubic yards of silt and sand
- Area of dredge = 180-foot x 290-foot area (48,620 square feet)
- 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 AYC, 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 yet to be approved. Please refer to Figure 2 – Plan View and Figure 3 – Section Views, 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 General 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 AYC 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 AYC site has an extensive history of dredging dating back to the 1970s, with the most recent USACE permit issued for a maintenance dredge in August 2015 (Permit #NAE-2006-26), and the most recent Maine DEP Permit by Rule (PBR) issued in January 2017 (Permit #L-22701-4E-A-N). Any dredging that takes place is only a temporary measure until the AYC 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 is our determination that the project is not likely to adversely affect threatened or endangered species.



Cultural Resources

The Maine Historic Preservation Commission (MHPC) has been consulted and determined that there will be no historic properties affected by the proposed undertaking as defined by Section 106 of the National Historic Preservation Act. The Passamaquoddy Tribe and the Mi'kmaq Nation Tribal Historic Preservation Office (THPO) have both determined that the project will have no impact on cultural and historical concern. Project correspondence regarding cultural resources is attached to this letter.

Essential Fish Habitat Assessment

The project may have a temporary adverse effect on Essential Fish Habitat (EFH). The project site is located within areas designated as EFH for Atlantic Salmon Rearing Habitat. 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 following the approval of 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.

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. AYC

Enc. Section 408 Project Plans

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

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

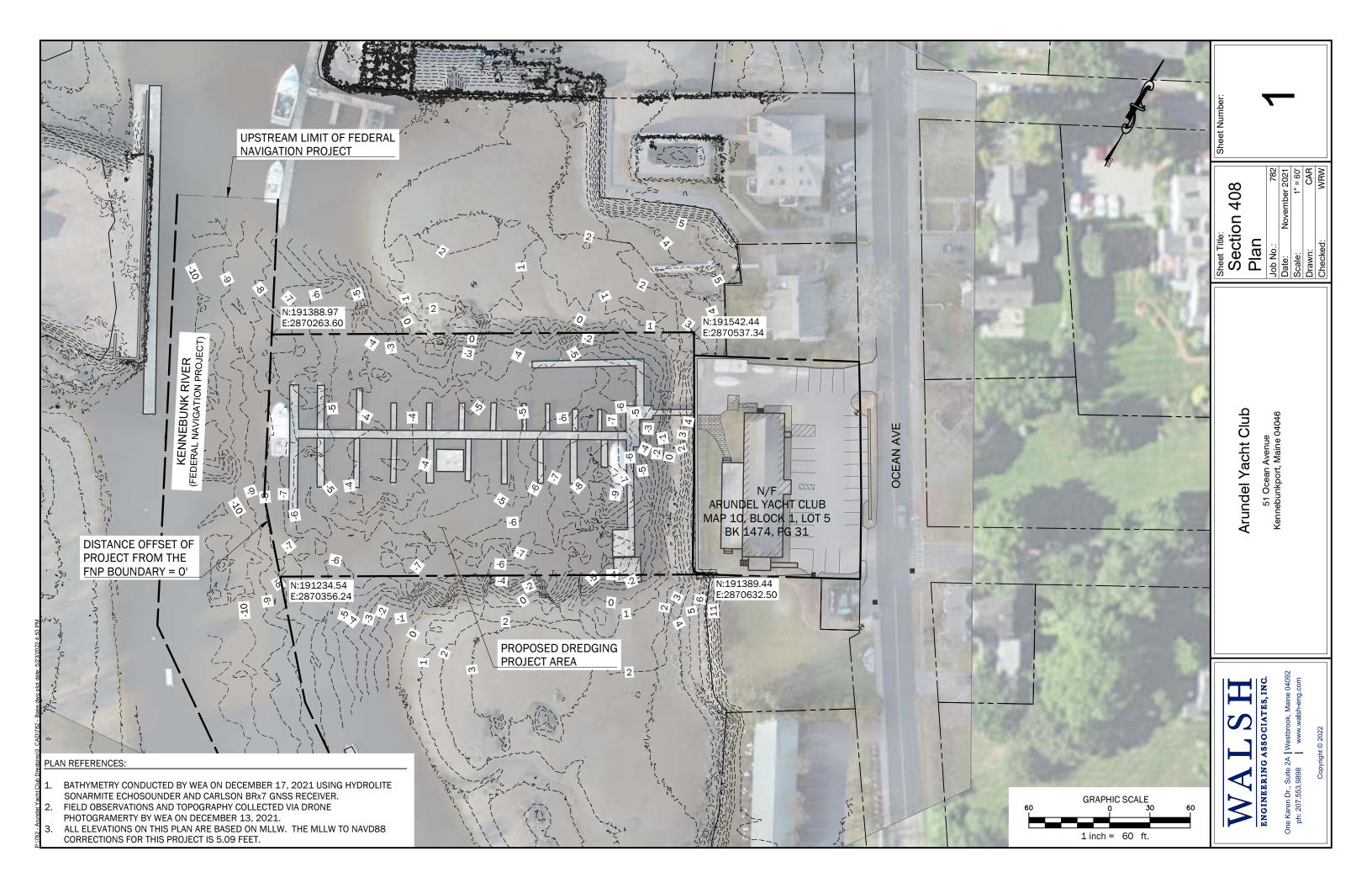
Town of Kennebunkport Letter dated August 30, 2024

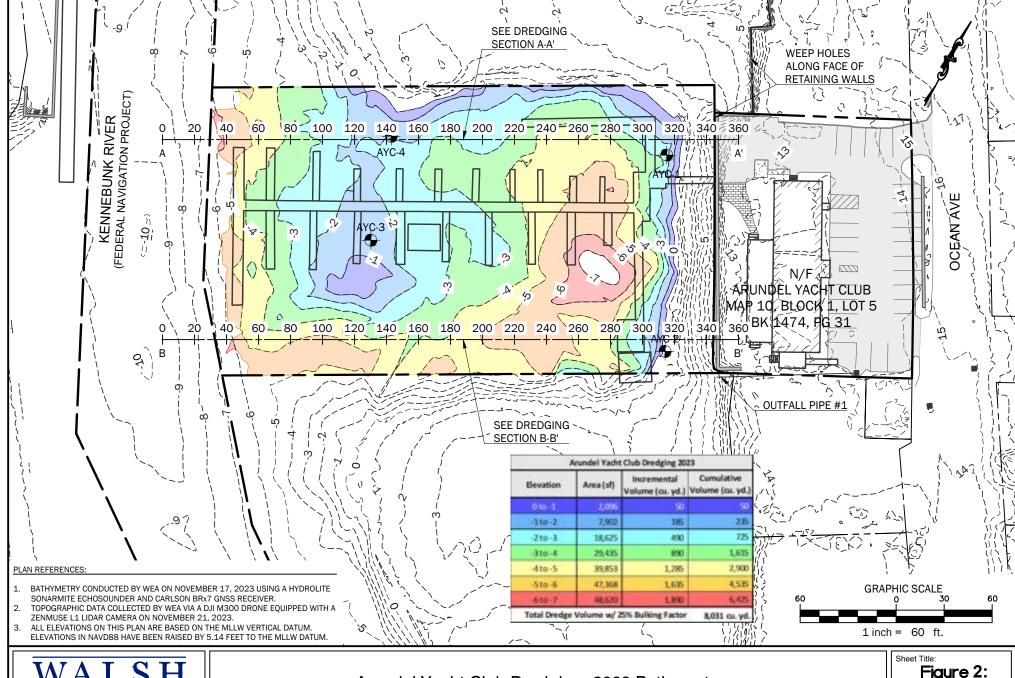
Cultural Resources Correspondence

MHPC Conclusion Statement dated March 9, 2022

THPO Notification dated February 24, 2022

THPO Responses dated March 2, 2022, March 3, 2022, and June 15, 2022





$\frac{WALSH}{\text{engineering associates, inc.}}$

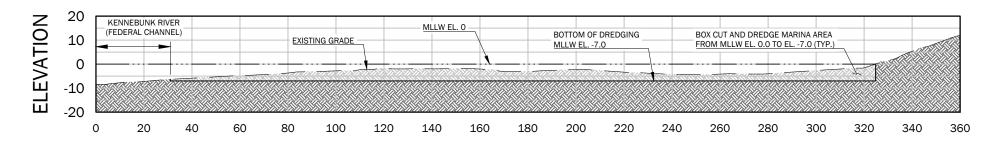
One Karen Dr., Suite 2A | Westbrook, Maine 04092 ph: 207.553.9898 | www.walsh-eng.com

Arundel Yacht Club Dredging: 2023 Bathymetry

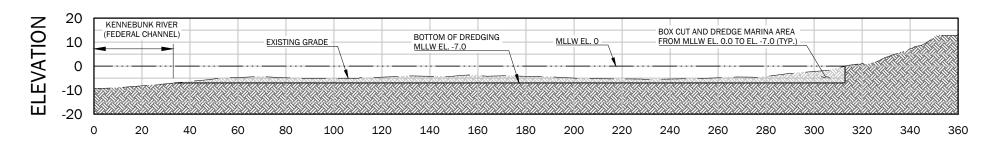
Arundel Yacht Club 51 Ocean Ave Kennebunkport, Maine 04046

Fig.	gure 2:	
Ple	ın View	
	_	

Job No.:	782
Date:	December 2023
Scale:	1" = 60'
Drawn:	CAR
Checked:	WRW

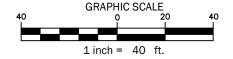


STATION Dredging Section A-A'



STATION

Dredging Section B-B'





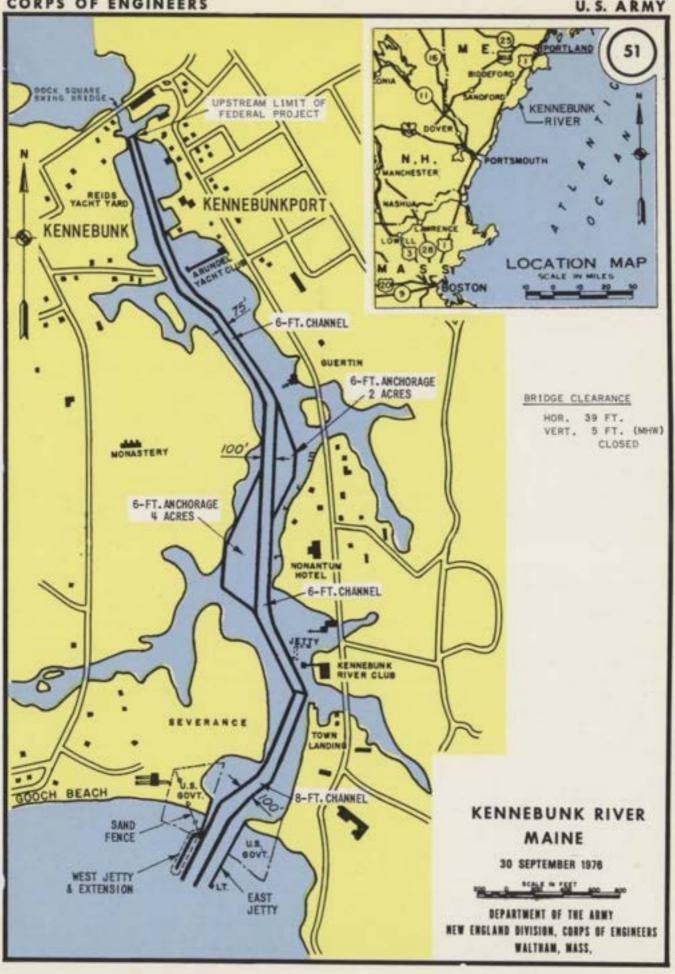
Copyright © 2023

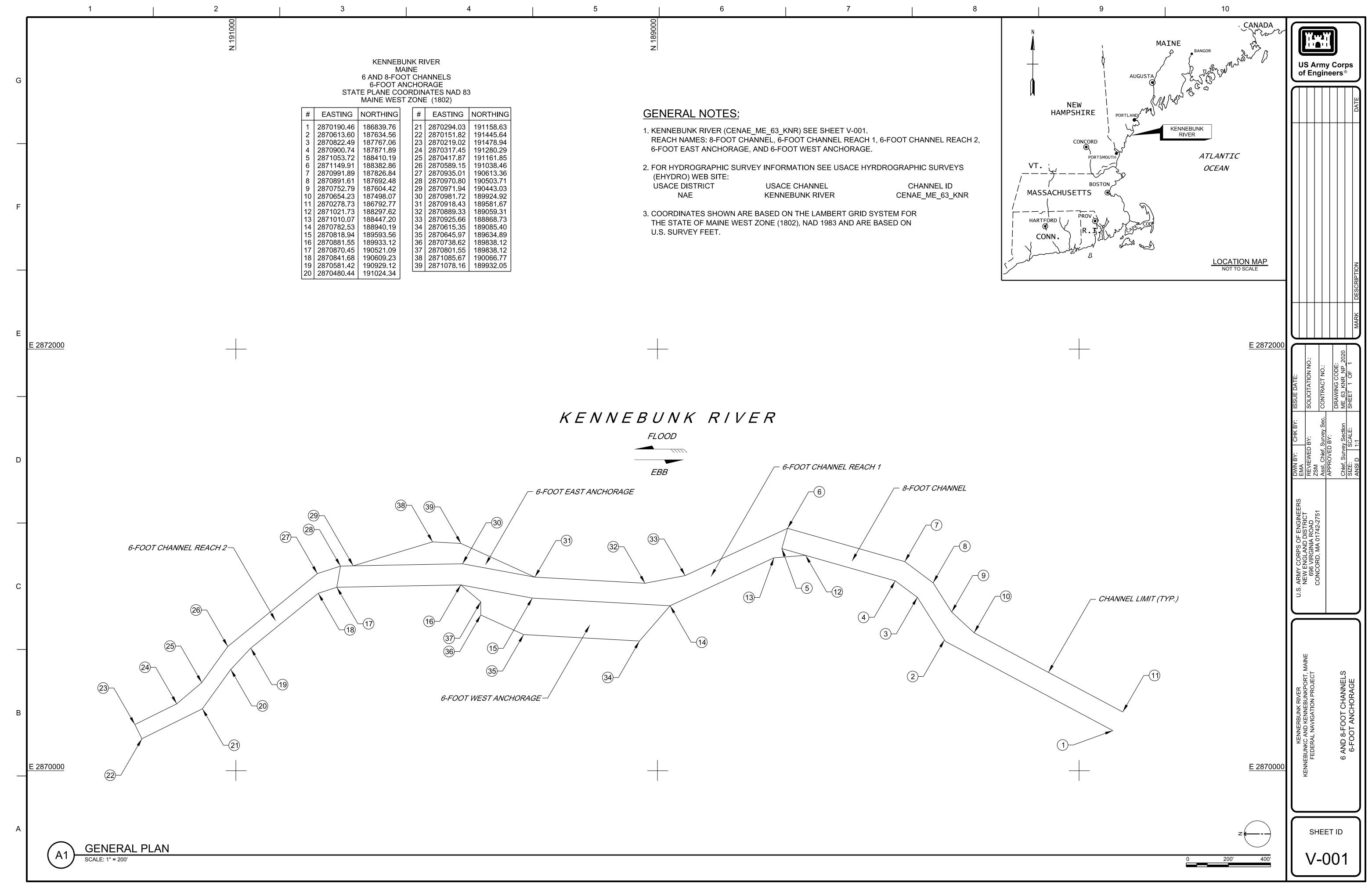
Arundel Yacht Club Dredging: 2023 Bathymetry

Arundel Yacht Club 51 Ocean Ave Kennebunkport, Maine 04046

Section Views		
Job No.:	782	
Date:	December 2023	
Scale:	1" = 40'	
Drawn:	CAR	
Checked:	WRW	

Figure 3:







TOWNOFKENNEBUNKPORT, MAINE

- INCORPORATED 1653 -

August 30, 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 Arundel Yacht Club, 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 Arundel Yacht Club (AYC) is seeking to mechanically dredge the shoaled areas of the Kennebunk River within the AYC 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 AYC's 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 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.

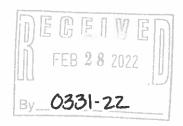
Sincerely,

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





February 24, 2022

Mr. Kirk F. Mohney, Director Maine Historic Preservation Commission 55 Capitol Street 65 State House Station Augusta, Maine 04333-0065

RE: Arundel Yacht Club Historic Review

51 Ocean Ave, Kennebunkport ME

Map 10, Lot 1, Block 5

Dear Mr. Mohney,

Please take note that the Arundel Yacht Club intends to file permit applications with the Maine DEP for dredging activities located in the Kennebunk River offshore of 51 Ocean Ave in Kennebunkport, Maine. Walsh Engineering Associates is requesting that the MHPC review the area for any known historic and/or archaeological resources. A site plan 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 randee@walsh-eng.com. Thank you in advance for your timely comments.

Respectfully,

Randee McDonald Project Coordinator

Walsh Engineering Associates

Enc: Location Plan

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



February 24, 2022

THPO

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

THPO

Passamaquoddy Tribe of Indians Pleasant Point Reservation PO Box 343 Perry, Maine 04667 soctomah@gmail.com

THPO

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

VIA email as noted above

RE: Arundel Yacht Club Historic Review 51 Ocean Ave, Kennebunkport ME Map 10, Lot 1, Block 5 THPO
Mi'kmaq Nation
7 Northern Road Presque Isle, Maine 04769
kreis@micmac-nsn.gov

THPO

Cultural and Historic Preservation Dept.12 Wabanaki Way Indian Island, Maine 04468 chris.sockalexis@penobscotnation.org

Please take note that the Arundel Yacht Club intends to file permit applications with the Maine DEP for dredging activities located in the Kennebunk River offshore of 51 Ocean Ave in Kennebunkport, Maine. Walsh Engineering Associates is requesting that the THPO review the area for any known historic and/or archaeological resources. A site plan 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 randee@walsh-eng.com. Thank you in advance for your timely comments.

Respectfully,

Randee McDonald Project Coordinator

Walsh Engineering Associates

Enc: Location Plan

Tribal Historic Preservation Office Passamaquoddy Tribe

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

March 2, 2022

Randee McDonald Project Coordinator One Karen Drive, Suite 2A Westbrook, ME 04092

• Re: Kennebunkport – 51 Ocean Ave

Dear Randee;

The Passamaquoddy THPO has reviewed the following applications 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 Projects listed above will not have any impact on cultural and historical concerns of the Passamaquoddy Tribe. Should buried artifacts, human remains, cultural sites or ground features be unexpectedly unearthed during ground disturbing activities, all construction should immediately cease and the resources be examined by a professional archaeologist. Additionally, all appropriate authorities-including all pertinent tribal entities should be notified.

Sincerely;

Donald Soctomah Soctomah@gmail.com THPO Passamaquoddy Tribe **Tribal Historic Preservation Office**

Mi'kmaq Nation (Formerly known as the Aroostook Band of Micmac)

Kendyl Reis

Tribal Historic Preservation Officer

7 Northern Road

Presque Isle, ME 04769

Phone: (207)764-1972 ext. 161

Fax: (207)764-7667 Email: kreis@micmac-nsn.gov Arundel Yacht Club Project

51 Ocean Ave, Kennebunkport, Maine March 3rd, 2022

Thank you for the opportunity to review the above-referenced project for compliance with National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA), or other, requirements.

Based on the project description, we do not have knowledge of any specific sites or cultural features that exist at the proposed project location.

However, this geographic area does constitute traditional areas that were historically utilized by members of the Mi'kmaq Nation and the other Wabanaki Tribes. Therefore, we respectfully request that if during the course of excavation/construction activities, human remains, artifacts, or any other evidence of Native American presence is discovered, that site activities in the vicinity of the discovery immediately cease, pending notification to us.

In addition, if this project results in wetland disturbances requiring mitigation, we are requesting that you utilize the black ash (<u>Fraginus nigra</u>) as the principal wetland species for wetland restoration activities. The black ash tree has special significance in the culture of the northeastern Tribes and is used extensively for weaving baskets and other Native American crafts. The black ash tree also provides valuable food and habitat for migratory waterfowl and other wildlife. Unfortunately, however, this species has been selected against by foresters and landowners who favor other tree species. As a result of this, and other environmental factors, the black ash tree is in serious decline in Maine. The Mi'kmaq Nation has completed several black ash wetland restoration projects and have a dependable source for highly-quality seedlings, and the experience and expertise to assist you with black ash wetland restoration projects.

On the subject of human remains, artifacts, or any other evidence of Native American presence is discovered. The human remains will be reburied with the appropriate respect for the remains that is required at a distinctive and respectable site. The artifacts and other evidence of Native American discovery will be documented with appropriate detail. The items will be analyzed for the precise period of the items' distinctive period and will be documented by the Tribal Historic Preservation Officer for the Mi'kmaq Nation.

If you have any questions or comments, please feel free to contact me.

Sincerely,

Kendyl Reis Tribal Historic Preservation Officer





PENOBSCOT NATION CULTURAL & HISTORIC PRESERVATION 12 WABANAKI WAY, INDIAN ISLAND, ME 04468

CHRIS SOCKALEXIS – TRIBAL HISTORIC PRESERVATION OFFICER E-MAIL: chris.sockalexis@penobscotnation.org

NAME	Randee McDonald
ADDRESS	Walsh Engineering Associates
	One Karen Drive, Suite 2A
	Westbrook, ME 04092
OWNER'S NAME	Arundel Yacht Club
TELEPHONE	(207) 553-9898
EMAIL	Randee@Walsh-eng.com
PROJECT NAME	Maintenance Dredging
PROJECT SITE	Kennebunkport, ME
DATE OF REQUEST	February 24, 2022
DATE REVIEWED	June 15, 2022

Thank you for the opportunity to comment on the above referenced project. This project appears to have no impact on a structure or site of historic, architectural or archaeological significance to the Penobscot Nation as defined by the National Historic Preservation Act of 1966, as amended.

If there is an inadvertent discovery of Native American cultural materials during the course of the project, please contact my office at (207) 817-7471. Thank you for consulting with the Penobscot Nation Tribal Historic Preservation Office with this project.

Chris Sockalexis, THPO Penobscot Nation AYC USACE Individual Standard Permit Application (Submitted on October 3, 2024)

New England District of the U.S. Army Corps of Engineers General Permit Application/Pre-Construction Notification

For

Arundel Yacht Club 51 Ocean Ave Kennebunkport, Maine

October 3, 2024

Applicant

Arundel Yacht Club 51 Ocean Ave Kennebunkport, Maine

Prepared By:



One Karen Drive, Suite 2A Westbrook, Maine 207.553.9898



October 3, 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 General Permit Application Pre-Construction Notification Arundel Yacht Club Kennebunkport, Maine 04046

Dear Heather,

On behalf of the Arundel Yacht Club (AYC, Applicant), Walsh Engineering Associates, Inc. (WEA), is pleased to submit the enclosed General Permit Application/Pre-Construction Notification 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 AYC.

The AYC is located at 51 Ocean Ave in Kennebunkport, Maine, with 161 feet of frontage along the Kennebunk River. The Town of Kennebunkport Assessor's Office identifies the parcel as Map 10, Block 5, Lot 1. The facility is a 0.42-acre parcel of land with an 18,100 square foot 1.5-story shingled historical building known as the "Thomas Goodwin Rope Walk," which is now used as the AYC. The property maintains associated parking areas and fifty boat slips. The proposed dredge area is coincidental with the area that was previously permitted under Maine Department of Environmental Protection (DEP) Permit #L-22701-4E-A-N in 2006. Since that time, it has been dredged in August 2015 under Maine DEP's Permit by Rule (PBR) process and USACE Permit #NAE-2006-26, and once more in January 2017 under another PBR.

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 on September 6, 2024. In addition, this Pre-Construction Notification 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. AYC

Enc. Pre-Construction Notification & Supporting Documents

One Karen Drive, Suite 2A | Westbrook, ME 04092 | 207.553.9898 | Walsh-Eng.com

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Arundel Yacht Club Kennebunkport, ME 04046

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Section VII: Content of a Pre-Construction Notification

In addition to the following required information, the applicant must provide additional information as the Corps deems essential to make a public interest determination including, where applicable, a determination of compliance with the Section 404(b)(1) guidelines or ocean dumping criteria. Such additional information may include environmental data and information on alternate methods and sites as may be necessary for the preparation of the required environmental documentation. For a more comprehensive checklist, go to www.nae.usace.army.mil/missions/regulatory >> Forms >> Application and Plan Guideline Checklist. Please check with the Corps for project-specific requirements.

Information required for all projects:

- DIGITAL SUBMISSIONS ARE ENCOURAGED (email PCN to cenae-r-me@usace.armv.mil)
- Completed Corps application form (ENG Form 4345 attached below or found electronically at www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/Obtain-a-Permit) or appropriate state application form. Forms may need to be supplemented to include the information noted below.
- Proof of notification to MHPC and all five federally-recognized tribes (see Section VIII for contact info).
- Official Species List for any federally-listed endangered or threatened species and email address of the person who generated the list.
- Drawings, sketches, or plans (detailed engineering plans and specifications are not required) that are legible, reproducible (color is encouraged, but features must be distinguishable in black and white), no larger than 8.5"x11", with bar scale (plans overlaid on aerial photos are discouraged). Wetland area impact sheets shall have the highest resolution possible to show work within Corps jurisdiction (do not just reduce project overview or cut large-scale plan into quadrant sheets). Provide locus map and a plan overview of the entire property with a key index to the individual impact sheets. A locus map be on a section of color USGS topographic map.
- ✓ Include:
 - All direct, secondary, permanent and temporary effects the project would cause, including the anticipated amount of impacts to waters of the U.S. expected to result from the activity, in acres, linear feet, or other appropriate unit of measure.
 - □ Any historic permanent fill associated with each single and complete project. N/A
 - □ Cross-section views of all wetland and waterway fill areas and wetland replication areas. N/A
 - Document on project plans wetlands, other special aquatic sites (SAS) including vegetated shallows (or submerged aquatic vegetation, SAV) and mudflats, natural rocky habitat, shellfish areas, vernal pools, and other waters, such as lakes and ponds, and perennial, and intermittent streams on the project site (GC1). N/A
 - MLW line, MHW mark, and HTL elevations in tidal waters. Show OHWM elevation in lakes and non-tidal streams.
 - → Existing and proposed conditions.
- Volume, type, and source of fill material to be discharged into waters and wetlands, including the area(s) (in square feet or acres) of fill in wetlands, below OHWM in inland waters and below the HTL in coastal waters.
- ☐ If applicable, a restoration plan showing how all temporary fills and structures will be removed and the area restored to pre-project conditions (see GC 21). N/A

Information that may be required:

- Photographs of wetland/waterway to be impacted. Photos at low tide are preferred for work in tidal waters.
- ▼ For drawings, sketches, or plans:
 - The vertical datum for all coastal projects and projects in towns bordering coastal waters shall be in U.S. survey feet and referenced to MLLW and include current tidal epoch, with a reference chart showing conversion factor to the North American Vertical Datum of 1988. Do not use local datum. See www.nae.usace.army.mil/missions/regulatory Forms and Publications >> Vertical Datum FEMA(Jul .2007);
 - The horizontal state plane coordinates shall be shown on plan and elevation views and shall be in the North American Datum of 1983 (NAD83) State Plane Coordinate System in U.S. survey feet.
- □ For the construction of a filled area or pile or float-supported platform, the use of, and specific structures to be erected on, the fill or platform. N/A
- For the discharge of dredged or fill material into waters of the U.S. or the transportation of dredged material for the purpose of disposing of it in ocean waters, the source of the material; the purpose of the discharge, a description of the type, composition and quantity of the material; the method of transportation and disposal of the material; and the location of the disposal site.
- For the discharge of dredged or fill material into waters of the U.S., include a statement describing how impacts to waters of the U.S. are to be avoided and minimized. Include either a statement describing how impacts to waters of the U.S. are to be compensated for or a statement explaining why compensatory mitigation should not be required for the proposed impacts.
- ✓ Purpose and need for the proposed activity;
- Limits and coordinates of any Federal Navigation Project in the vicinity of the project area.
- □ Limits and coordinates of any proposed mooring field, reconfiguration zone or aquaculture activity. Provide , coordinates for all corners; N/A
- Schedule of construction/activity;
- ✓ Names and addresses of adjoining property owners;
- □ Location and dimensions of adjacent structures; N/A
- ✓ Alternatives analysis;
- □ Wetland delineation data sheets; N/A
- List of authorizations required by other federal, interstate, state, or local agencies for the work, including all approvals received or denials already made.
- Identification and description of potential impacts to Essential Fish Habitat (see GC 17).
- Identification of potential discharges of pollutants to waters, including potential impacts to impaired waters, in the project area.
- □ Invasive Species Control Plan (see GC 22). For sample control plans, see www.nae.usace.army.mil/Missions/Regulatory/Invasive-Species N/A
- □ Wildlife Action Plan (WAP) maps. Contact the Maine Department of Inland Fisheries & Wildlife (Section VIII) or online at www.maine.gov/ifw/wildlife/conservation/action plan.html N/A

Information for dredging projects that may be required:

- Sediment testing, including physical (e.g., grain-size analysis), chemical and biological testing. For projects proposing open water disposal, applicants must contact the Corps as early as possible regarding sampling and testing protocols. Sampling and testing of sediments without such contact should not occur and if done, would be at the applicant's risk.
- The area in square feet and volume of material to be dredged below mean high water.
- □ , Existing and proposed water depths. N/A
- Type of dredging equipment to be used.
- Nature of material (e.g., silty sand).
- Any existing sediment grain size and bulk sediment chemistry data for the proposed or any nearby projects.
- □ Information on the location and nature of municipal or industrial discharges and occurrence of any contaminant spills in or near the project area. N/A
- □ , Shellfish survey. N/A
- Location of the disposal site (include locus sheet).
- Identification and description of any potential impacts to Essential Fish Habitat.
- □ Delineation of submerged aquatic vegetation (e.g., eelgrass beds). N/A

Information for tidal crossing projects that may be re	eauired: N/A
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	A graphic longitudinal elevation profile plot of the tidal stream channel thalweg, both up and downstream of the proposed project site. Thalweg elevations shall extend from the crossing to beyond the zone of scour, channel widening, or other channel alteration resulting from the present or pre-existing crossings. The profile plot should include labeled elevations for the: □ crossing invert and top of the inlet and outlet
	□ roadbed crown
	□ lowest and highest recorded tides at the site
	□ reference datums, such as MLLW, MHHW, and astronomical high tide
	□ hydraulic controls and nearest crossings that could influence or be influenced by the proposed crossing
	A graphic plot of continuous tidal water levels recorded up and downstream, simultaneously, of the proposed crossing for an entire lunar cycle. The water level plot should include labeled elevations for the: — crossing invert and crossing top at the inlet and outlet
	□ roadbed crown
	□ reference datums, such as MLLW, MHHW, and astronomical high tide
	A map showing projected extents of maximum flooding within the area influenced by the crossing under current conditions and as a result of sea level rise. The present minimum sea level rise scenario suggested for planning purposes by the Maine Climate Council Scientific and Technical Subcommittee is the Intermediate Scenario, which projects an increase of 3.0-4.6 feet by 2100.
In	formation for aquaculture projects that may be required: N/A
	Maine Aquaculture guidelines and joint Corps/Maine DMR applications may be found at: www.maine.gov/dmr/aquaculture/index.htm
	In addition to the information required above, applications should also include: □ Results of coordination with Harbor Master and U.S. Coast Guard □ Whether canopy predator nets are being used.



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 www.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. 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: http://dpcld.defense.gov/Privacy/SORNsIndex/DOD-wide-SORN-Article-View/Article/570115/a1145b-ce.aspx										
(ITEMS 1 THRU 4 TO BE 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 - Matthew Middle - Last - Tuller	First - Leyna Middle - L. Last - Tobey									
Company - Arundel Yacht Club	Company - Walsh Engineering Associates, Inc.									
E-mail Address - matt@atlanticcomfort.com	E-mail Address - leyna@walsh-eng.com									
6. APPLICANT'S ADDRESS:	9. AGENT'S ADDRESS:									
Address- P.O. Box 328	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	a. Residence b. Business c. Fax 207-553-9898									
STATEMENT OF	AUTHORIZATION									
11. I hereby authorize, Walsh Engineering Associates, Inc. to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.										
*See Attached A	gent Authorization									
SIGNATURE OF APPLIC	ANT DATE									
NAME, LOCATION, AND DESCRI	PTION OF PROJECT OR ACTIVITY									
12. PROJECT NAME OR TITLE (see instructions) Arundel Yacht Club Dredging										
13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)									
Kennebunk River	Address 51 Ocean Ave									
15. LOCATION OF PROJECT	Vonashvalvasit ov. Mains - 04046									
Latitude: •N 43°21'29.77" Longitude: •W 70°28'31.64"	City - Kennebunkport State- Maine Zip- 04046									
16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)										
State Tax Parcel ID 3428 Municipality Kennebunkport										
Section - Township -	Range -									

	Exit 32, Route ME-111, then onto Precourt Stre ME-9; then 2nd left onto Ocean Ave.	et; turn right onto US-1 South, then left onto Log Cabin Road
 Proposed dredged volume = 8,0 Area of dredge = 180 foot x 250 Proposed dredge depth = elevat The dredged material would be t 	echanically dredge the following: 31± cubic yards of silt and sand) foot area (45,356 square feet) ion -6.0 plus a one foot overdig ransported by barge to the Isle of Shoals North ((IOSN) open water disposal site. Please refer to Figure 1 -
Plan View and Figure 2 - Section	n Views for detailed information.	
The applicant is proposing to me in and around the boat slips, to p		yards of sediment from the area in front of the AYC, includin ng. Silt, sand, and other natural deposits have impacted the ally during periods of low tide.
l	JSE BLOCKS 20-23 IF DREDGED AND/OR FILL MA	TERIAL IS TO BE DISCHARGED
		disposal and beneficial use of dredged materials are infeasible by barge to the Isle of Shoals North (IOSN) open water disposa
21. Type(s) of Material Being Discha	rged and the Amount of Each Type in Cubic Yards:	
Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards

8,031 CY - silt and sand

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

Acres 45,356 SF; 1.04 acres

or

Linear Feet

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

Walsh Engineering Associates will be working closely with the Arundel Yacht Club 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 Work Already Complete? Yes X No IF YES, DESCRIBE THE COMPLETED WORK								
				e than can be entered here, please at	ach a supplemental list).			
a. Address- See att	cached 150-to	ot abutters list	-					
City -		State -		Zip -				
b. Address-								
City -		State -		Zip -				
c. Address-								
City -		State -		Zip -				
d. Address-								
City -		State -		Zip -				
e. Address-								
City -		State -		Zip -				
26. List of Other Certificat	es or Approvals/Denials rec	eived from other Federal, St	ate, 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	*See Attached Lis	st of Authorization	ons Required for F	roject			
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	g, and flood plain permits						
27. Application is hereby and accurate. I further cer	made for permit or permits tr tify that I possess the autho	o authorize the work describ rity to undertake the work de	ed in this application. I c escribed herein or am act	certify that this information in ting as the duly authorized at Digitally signed by Leyna Tobey, F Contact Info: leyna@walsh-eng.co Date: 2024.10.03 11:51:15-04'00'	gent of the applicant.			
SIGNATURE	OF APPLICANT	DATE	1.79	JRE OF AGENT	DATE			
		rho desires to undertake t s been filled out and signo		applicant) or it may be sig	ned by a duly			
			- '	partment or agency of the al fact or makes any false				

ENG FORM 4345, SEP 2022 Page 3 of 3

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.





To Whom It May Concern,

By this letter, the undersigned, a representative of the Arundel Yacht Club authorizes Walsh Engineering Associates, Inc. to act as the agent for the undersigned in the preparation and submission of all Federal, State, and Local City permit applications and relevant documents and correspondence for all necessary permits for the dredging of the AYC Marina located at 51 Ocean Ave, 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.

Sincerely,

Signature

Anita O. Carroll AYC VICE Commodore

1 27 2022

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 Arundel Yacht Club (AYC) is located at 51 Ocean Avenue in Kennebunkport, Maine, with 161 feet of frontage along the Kennebunk River. The Town of Kennebunkport's Assessor's Office identifies the parcel as Map 10, Block 5 Lot 1. The facility is a 0.42-acre parcel of land with an 18,100 square foot 1.5-story shingled historical building known as the "Thomas Goodwin Rope Walk," which is now used as the yacht club. The property maintains associated parking areas and 50 boat slips.

Existing Conditions

The AYC 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 AYC's dredging activities date back to the 1970s, with the most recent permits issued for maintenance dredging in 2017. Silt, sand, and other natural deposits have impacted the marina of the AYC and have limited boat navigation and berthing depths, especially during periods of low tide.

Proposed Project

The applicant is proposing to mechanically dredge approximately $8,031\pm$ cubic yards of sediment from the area in front of the AYC, including in and around the boat slips, to provide adequate depth for navigation and berthing.

The area of the dredge will be an approximately 180-foot by 250-foot area (~45,356 square feet). 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. A site location plan of the dredge location, a photo log of the existing site, and a locus map of the IOSN disposal site are attached to this Activities Description.

The proposed AYC dredge area is coincidental with the area that was previously permitted under Maine Department of Environmental Protection (DEP) Permit #L-22701-4E-A-N in 2006. Since that time, it has been dredged in August 2015 under Maine DEP's Permit by Rule (PBR) and U.S. Army Corps of Engineers (USACE) Permit #NAE-2006-26, and in January 2017 under Maine DEP's PBR.

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.

Work Adjacent to a Federal Navigation Project

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), a USACE Federally Authorized Civil Work Project under 33 USC 408 (Section 408). A Section 408 Permit Application was submitted to the USACE for this project on September 6, 2024.

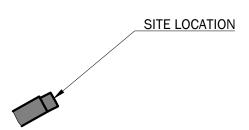
WEA will be working closely with the AYC and the designated dredging company to ensure the alteration of the FNP by dredging will be in the manner and amount that has been designated and approved. The dredge will only temporarily occupy the FNP for the amount of time needed to dredge the area (anticipated to be two days). The proposed dredging actions are not anticipated to be injurious to the public interest or impair the usefulness of the USACE project.

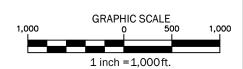
A 1976 USACE map showing the original limits of the Kennebunk River FNP is attached to this Activities Description, as well as an updated map from 2020 showing revised coordinates for the upstream limits of the FNP.

Adjacent Dredging Projects

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









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Arundel Yacht Club Dredging

Arundel Yacht Club 51 Ocean Avenue Kennebunkport, Maine 04046

	Sheet Title: Figure 1: Overview Plan
l	Overview Plan



PHOTO LOG

Arundel Yacht Club Dredge

Kennebunkport, ME

Photo No. 1

Date: 1/28/2022

Site Location:

Arundel Yacht Club

Description:

View of the Arundel Yacht Club.



Photo No. 2

Date: 11/15/2021

Site Location:

Arundel Yacht Club

Description:

View of the adjacent Kennebunk River and approximate dredge location.



Photo No. 3

Date: 11/15/2021

Site Location:

Arundel Yacht Club

Description:

Additional view of approximate dredge location.



Photo No. 4

Date:

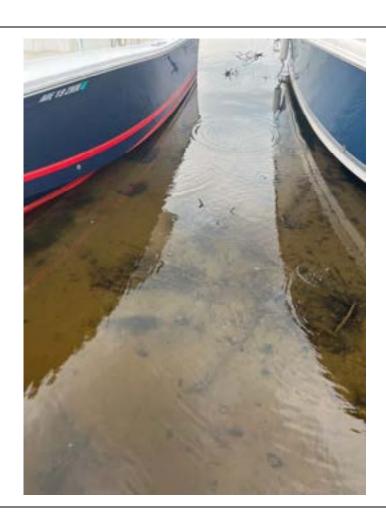
8/4/2023

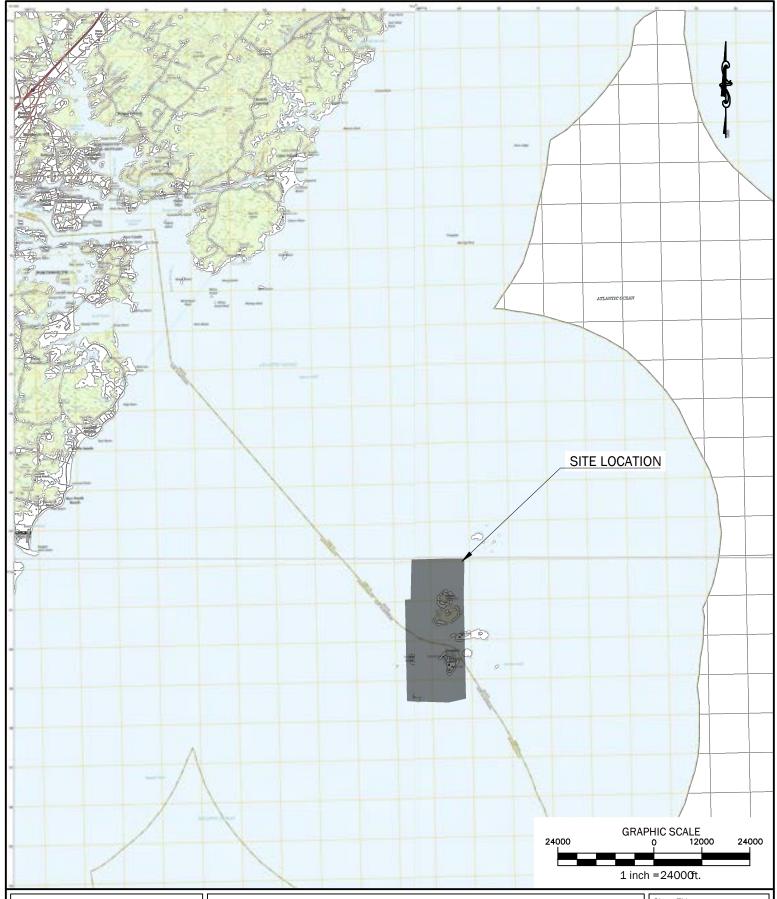
Site Location:

Arundel Yacht Club

Description:

Boat slips in the marina.







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Arundel Yacht Club Dredging

Arundel Yacht Club 51 Ocean Avenue Kennebunkport, Maine 04046

Sheet Title: Dredge Disposal Site Location

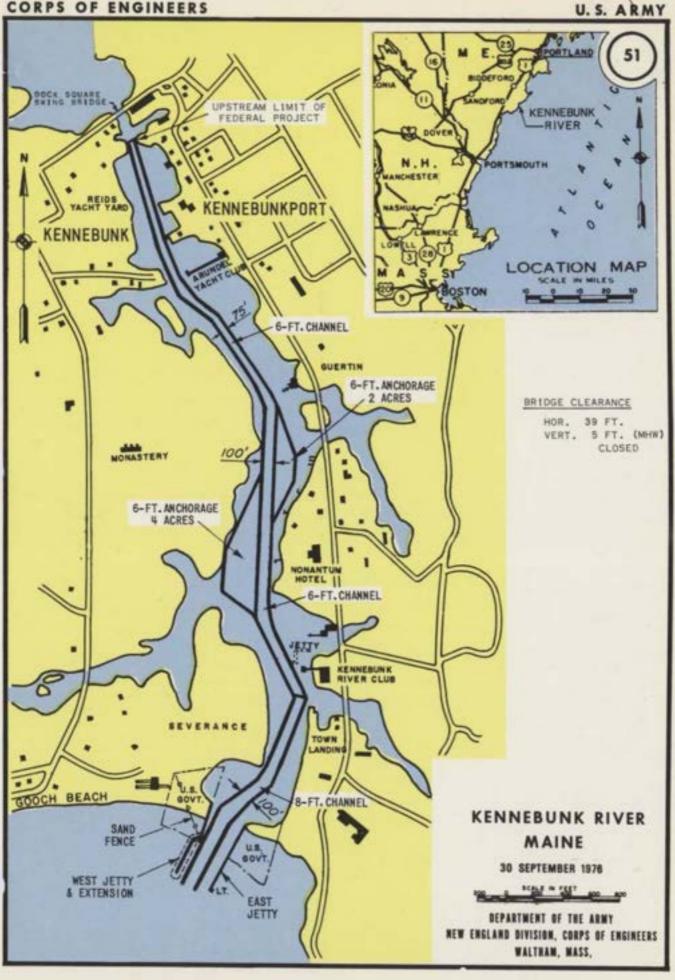
 Job No.:
 782

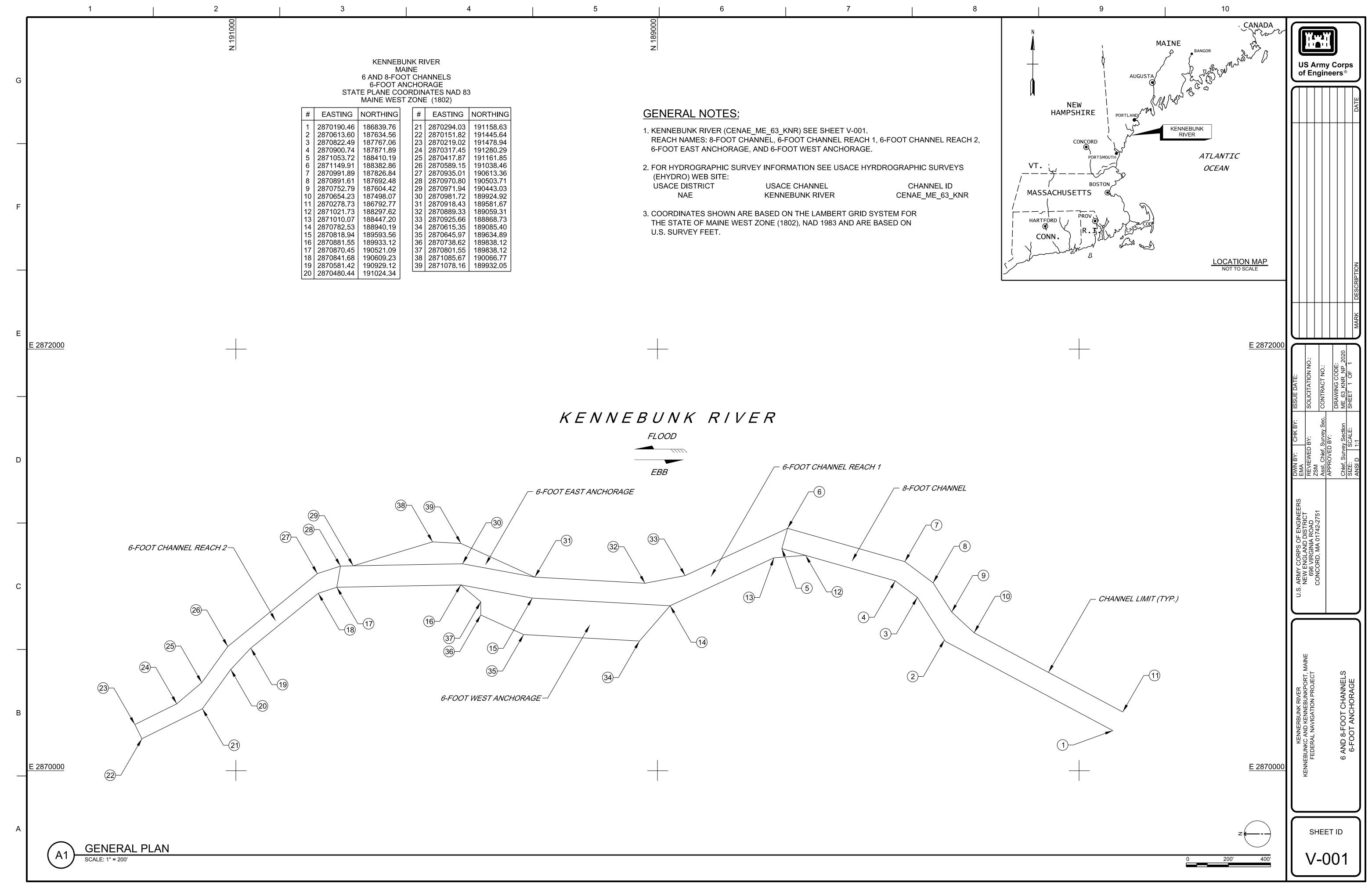
 Date:
 January 2022

 Scale:
 1" = 24,000'

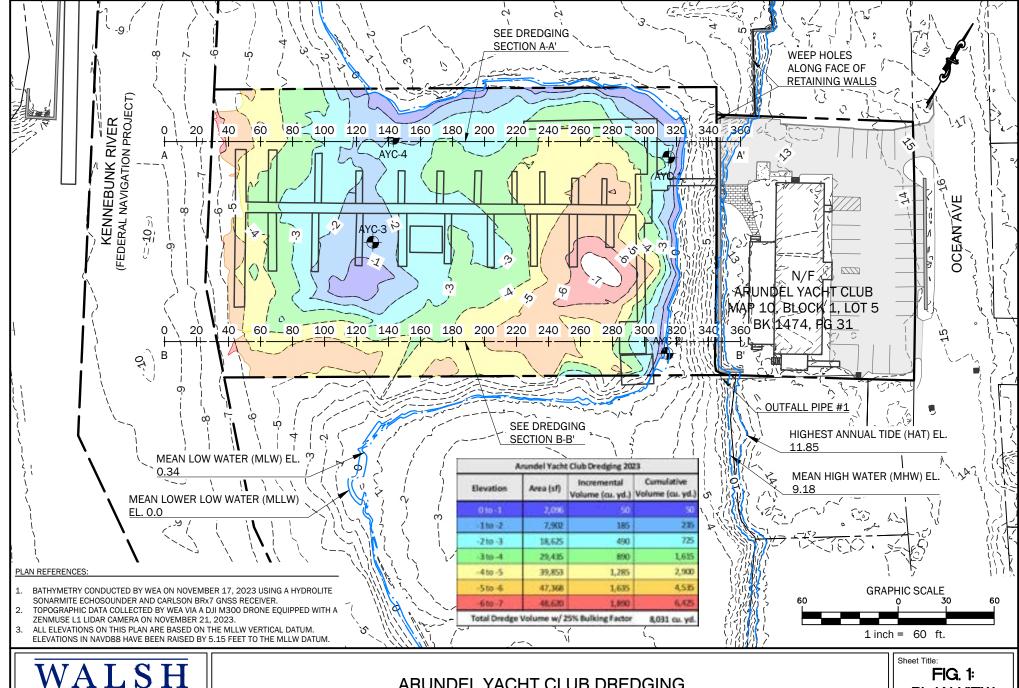
 Drawn:
 KEW

 Checked:
 WRW











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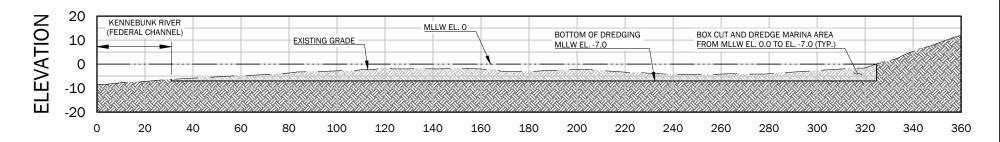
ph: 207.553.9898 www.walsh-eng.com

ARUNDEL YACHT CLUB DREDGING

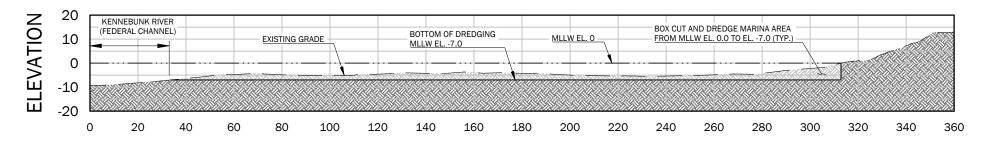
ARUNDEL YACHT CLUB 51 OCEAN AVE KENNEBUNKPORT, ME 04046

Sheet Title:					
FIG. 1:					
PLAN VIEW					
Joh No ·	782				

OCT. 23, 2024 Scale: AS SHOWN CAR/MNW Drawn: WRW



STATION Dredging Section A-A'



STATION

Dredging Section B-B'





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ARUNDEL YACHT CLUB DREDGING

ARUNDEL YACHT CLUB 51 OCEAN AVE KENNEBUNKPORT, ME 04046

FIG 2:					
SECTION VIEWS					
Job No.:	782				
Date:	OCT. 23, 2024				
Scale:	AS SHOWN				
Drawn:	CAR/MNW				
Checked:	WRW				



Alternatives Analysis

Revision 1A – October 25, 2024

*Note: Sections of this Alternatives Analysis that have been updated/added in Revision 1A are in red text.

Dredging Alternatives Analysis

WEA studied several alternatives for the Arundel Yacht Club (AYC) 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 AYC with safe navigation and anchoring conditions for watercraft.

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

Existing Conditions

The AYC (site) encompasses approximately 0.42 acres of land. The Arundel Wharf, Ocean Avenue and a residence border the site to the north; residences and Ocean Avenue border the site to the east; the Yachtsman Hotel & Marina Club are 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 AYC. 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 AYC 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 8,031 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 8,031 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 May 24, 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 AYC and the nearby Yachtsman Marina, 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 General 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 AYC

WEA investigated the option of onshore disposal of the 8,031 cubic yards of dredged materials from the AYC. The AYC encompasses approximately 0.42 acres of land, as shown in the aerial site map attached to this Alternatives Analysis as Figure 1. Due to the small size of the AYC 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 23-foot by 23-foot grassed area east of the AYC building. If a 4-foot walkway is kept clear around the stockpile, the allowable diameter of the stockpile would be 15 feet (therefore the allowable radius would be 7.5 feet). Using the following standard soil stockpile volume equation, the required height of a 8,031 cubic yard (216,837 cubic feet) stockpile would need to be 3,681 feet tall, which is infeasible.
 - $Volume = \frac{1}{3} \times \pi \times Radius^2 \times Height \rightarrow$

 - Height = Volume × 3 × $\frac{1}{\pi}$ × $\frac{1}{Radius^2}$ →

 Height = 216,837 ft³ × 3 × $\frac{1}{\pi}$ × $\frac{1}{(7.5ft)^2}$ = 3,681 ft

- O In addition, this step is infeasible due to the layout of the AYC's dock/boat slips; the closest a dredge barge could get to the "open space" located to the east of the AYC building is at least 90 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 402 or 201 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 AYC 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 to this Alternatives Analysis for reference.

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

The proposed dredge volume for the Arundel Yacht Club is 8,031 cubic yards, or 216,837 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 216,837 cubic feet, the diameter of the stockpile needed to store the dredged material would be approximately 200 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 240 feet. Figure 2, included with this Alternatives Analysis, shows what a 240-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 AYC does not have control or interest in any of the nearby facilities along the Kennebunk River shown in Figure 2.

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 251 dumpsters to store 8,031 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 251 roll-off dumpsters would be approximately 84,715 square feet. Figure 3, included with this Alternatives Analysis, shows what an 84,715 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 AYC does not have control or interest in any of the nearby facilities along the Kennebunk River shown in Figure 3.

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 AYC 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 \$600,000 to \$800,000 for disposal of 8,031 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

- 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

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 \$5.6M for the incineration of 8,031 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 AYC are in Illinois or Arkansas.

• Spread of material over open ground

- o This alternative is also infeasible because the AYC does not have access to a land area appropriate for spreading the material over open ground. Spreading 216,837 cubic feet of soil across a land area would consist of: 1 foot of sediment spread across a 216,837 square foot (∼5 acre) land area; or 6 inches of sediment spread across a 433,674 square foot (∼10 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 AYC 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 AYC 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 AYC and the nearby Yachtsman Marina, 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

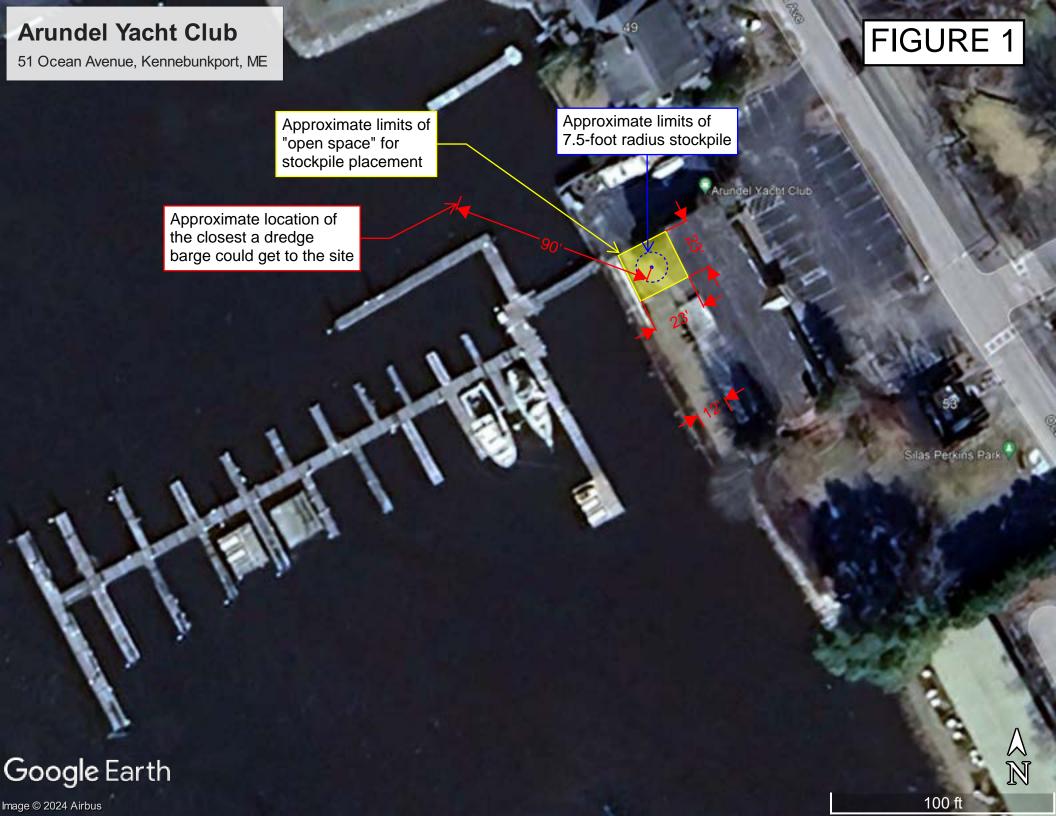
Due to the infeasibility of disposing of dredged material onshore and there being no beneficial use sites suitable for disposal, Alternative C, open water placement at IOSN, was selected as the most appropriate alternative for the project.

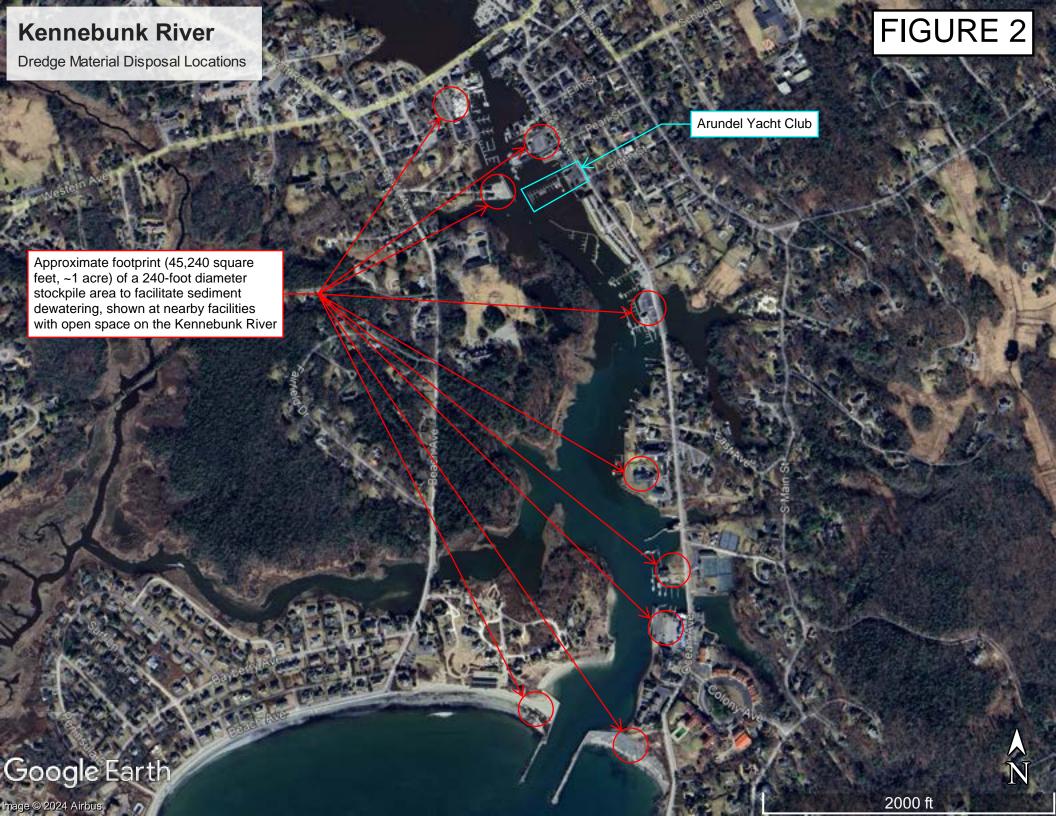
Figures

Figure 1: AYC Site Aerial Map

Figure 2: Kennebunk River – Stockpile Locations

Figure 3: Kennebunk River – Roll-Off Dumpster Locations





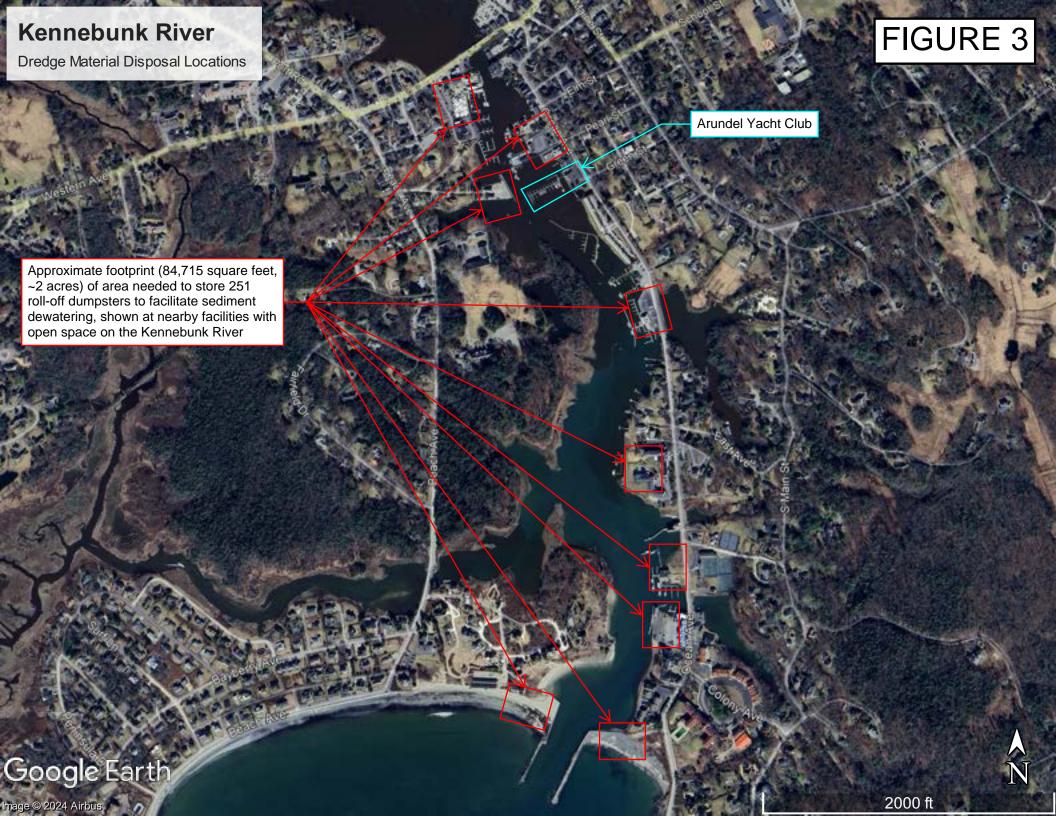




Table 1: Dredge Material Disposal Beneficial Use Alternatives – Arundel Yacht Club

<u>Table 1</u> <u>Dredge Material Disposal Beneficial Use Alternatives - Arundel Yacht Club</u> Summary Table & References

Project Name ¹	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. 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. ^{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. ^{4,5}
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. ^{4,5}
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. ^{4,5}
Piscataqua Salt Marsh Priority Area ²	Salt Marsh Priority Area	Rye, NH		USFWS	No	Piscataqua Salt Marsh is not a potential dredge disposal site. ⁷
Ogunquit Salt Marsh Priority Area/Rachel Carson National Wildlife Refuge ³	Salt Marsh Priority Area	Ogunquit/Wells, ME		USFWS	No	Maine state permitting does not allow the use of dredged materials on salt marshes. ⁸

<u>Table 1</u> <u>Dredge Material Disposal Beneficial Use Alternatives - Arundel Yacht Club</u> Summary Table & References

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

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



One Karen Drive, Suite 2A Westbrook, ME 04092 P: (207) 553-9898, Ext 101 www.walsh-eng.com







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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



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







This transmission is intended only for the individual or entity to which it is addressed, and may contain information that is privileged, confidential and exempt from disclosure under applicable law. If the reader of this communication is not the intended recipient, or an employee or agent responsible for delivering the communication to the intended recipient, you are notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error please contact the sender at 207-553-9898.

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 AYC within the Kennebunk River, which is located approximately 0.75 miles from the mouth of the Kennebunk River.

The shoreline area southeast of the AYC consists of large riprap placed to prevent bank erosion. The yacht club and its neighbor to the northeast have vertical concrete retaining walls. 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.

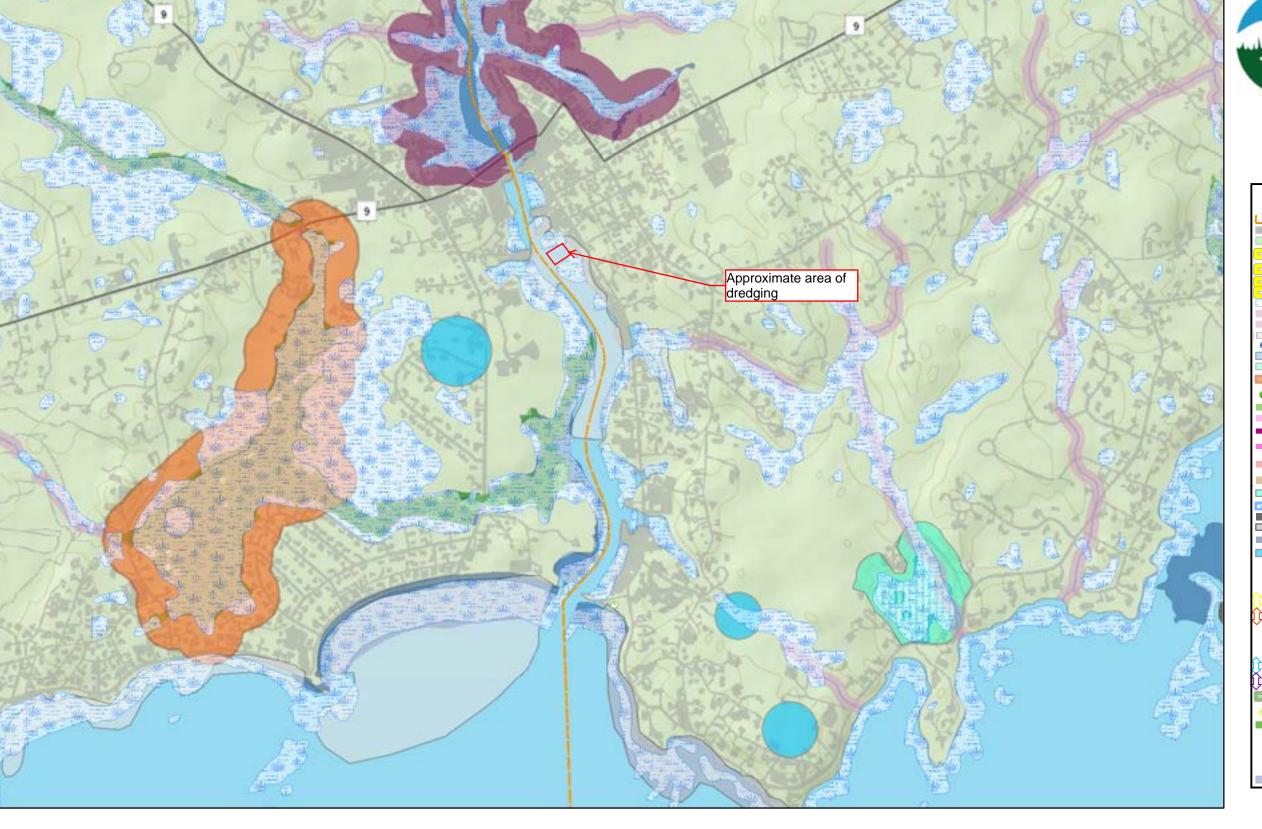
According to the U.S. Department of Fish & Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) website (https://ipac.ecosphere.fws.gov/), the following are listed species that may occur in the area of the property: the Northern Long-eared Bat and the Monarch Butterfly. It is our determination that the project is not likely to adversely affect threatened or endangered species.

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 AYC 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.

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.





Legend



















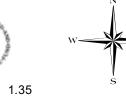
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Supported in part by Maine Outdoor Heritage Fund lottery ticket sales

Map Prepared by Maine

Department of Inland

Fisheries & Wildlife

March 2022







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: June 15, 2022

Project Code: 2022-0013708

Project Name: AYC

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 ECOS-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 ECOS-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.

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:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.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/birds/policies-and-regulations.php.

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/birds/bird-enthusiasts/threats-to-birds.php.

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 Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

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.

06/15/2022

Attachment	(~)	١.
Attachment	S	١.

Official Species List

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: 2022-0013708

Event Code: None Project Name: AYC

Project Type: Disposal Dredge Material

Project Description: This project consists of dredging an area in front of the Arundel Yacht

Club.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@43.358029450000004,-70.47593825153226,14z



Counties: York County, Maine

Endangered Species Act Species

There is a total of 2 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 Fisheries¹, 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

Threatened

No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045

Insects

NAME STATUS

Monarch Butterfly *Danaus plexippus*

Candidate

No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743

Critical habitats

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

IPaC User Contact Information

Agency: Walsh Engineering Associates, Inc.

Name: Randee McDonald

Address: One Karen Drive, Suite 2A

City: Westbrook

State: ME Zip: 04092

Email randee@walsh-eng.com

Phone: 2075539898

8/27/24, 4:13 PM EFH Report

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.

<u>Greater Atlantic Regional Office</u>
<u>Atlantic Highly Migratory Species Management Division</u>

Query Results

Degrees, Minutes, Seconds: Latitude = 43° 21′ 30″ N, Longitude = 71° 31′ 27″ W

Decimal Degrees: Latitude = 43.358, Longitude = -70.476

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>	(2)	Acadian Redfish	Larvae	New England	Amendment 14 to the Northeast Multispecies FMP
<u>"</u>	•	Haddock	Juvenile	New England	Amendment 14 to the Northeast Multispecies FMP
<u>"</u>	•	Little Skate	Adult	New England	Amendment 2 to the Northeast Skate Complex FMP
<u>"</u>	•	Monkfish	Adult, Eggs/Larvae, Juvenile	New England	Amendment 4 to the Monkfish FMP
<u>"</u>	•	Silver Hake	Adult, Eggs/Larvae	New England	Amendment 14 to the Northeast Multispecies FMP
P	•	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.

8/27/24, 4:13 PM EFH Report

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

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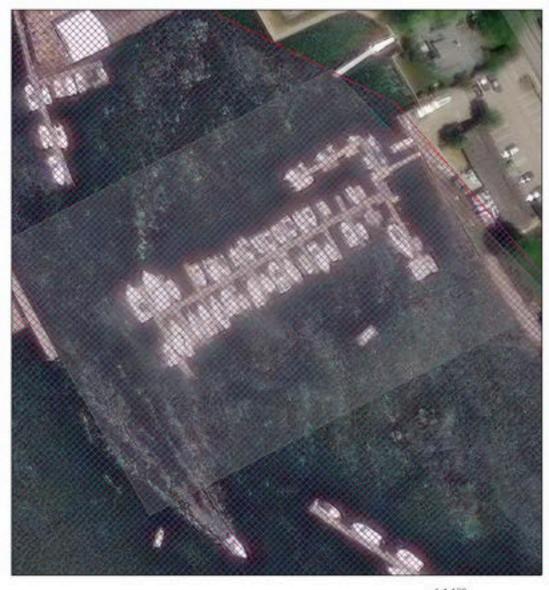


Drawn Action Area & Overlapping S7 Consultation Areas

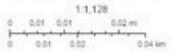
Area of Interest (AOI) Information

Area: 2.79 acres

Aug 27 2024 14:26:21 Eastern Daylight Time







Naus, Micrael, Bar Community Maja Community, & Openinteethis Microsof, Birl, Tonffon, Gamon, SafeDrain, Geoffelmologies, Ins., NET NASA, USGO, 874, MFS, US Centus Bureau, USGA, USFIRIS

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Summary

Name	Count	Area(acres)	Length(mi)
Atlantic Sturgeon	2	5.59	N/A
Shortnose Sturgeon	1	2.79	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
1	ANS_C50_ADU_MAF	Atlantic sturgeon	Adult	Migrating & Foraging	N/A
2	ANS_C50_SUB_MAF	Atlantic sturgeon	Subadult	Migrating & Foraging	N/A

	#	From	Until	From (2)	Until (2)	Area(acres)
	1	01/01	12/31	N/A	N/A	2.79
ſ	2	01/01	12/31	N/A	N/A	2.79

Shortnose Sturgeon

#	Feature ID Species		Life Stage	Behavior	Zone	
1	SNS_C50_ADU_MAF			Migrating & Foraging	N/A	

#	From	Until	From (2)	Until (2)	Area(acres)	
1	04/01	11/30	N/A	N/A	2.79	

about:blank 2/2

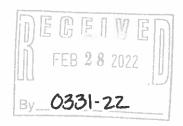
Attachment 5 – Historic Sites

- 5.1 MHPC Response
- 5.2 THPO Notification
- 5.3 THPO Responses

5.0 Historic Sites

As	required	by	the	Army	Corps	of	Engineers	(ACOE),	the	Maine	Historic	Preservation
Coı	nmission	(MF	HPC)	and th	e Triba	l Hi	storic Prese	rvation Of	ficer	s (THP	O) of Mai	ne have been
con	sulted reg	ardi	ng th	nis proje	ect. A	opy	of these co	ommunicat	ions	are incl	uded with	this section.





February 24, 2022

Mr. Kirk F. Mohney, Director Maine Historic Preservation Commission 55 Capitol Street 65 State House Station Augusta, Maine 04333-0065

RE: Arundel Yacht Club Historic Review

51 Ocean Ave, Kennebunkport ME

Map 10, Lot 1, Block 5

Dear Mr. Mohney,

Please take note that the Arundel Yacht Club intends to file permit applications with the Maine DEP for dredging activities located in the Kennebunk River offshore of 51 Ocean Ave in Kennebunkport, Maine. Walsh Engineering Associates is requesting that the MHPC review the area for any known historic and/or archaeological resources. A site plan 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 randee@walsh-eng.com. Thank you in advance for your timely comments.

Respectfully,

Randee McDonald Project Coordinator

Walsh Engineering Associates

Enc: Location Plan

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



February 24, 2022

THPO

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

THPO

Passamaquoddy Tribe of Indians Pleasant Point Reservation PO Box 343 Perry, Maine 04667 soctomah@gmail.com

THPO

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

VIA email as noted above

RE: Arundel Yacht Club Historic Review 51 Ocean Ave, Kennebunkport ME Map 10, Lot 1, Block 5 THPO
Mi'kmaq Nation
7 Northern Road Presque Isle, Maine 04769
kreis@micmac-nsn.gov

THPO

Cultural and Historic Preservation Dept.12 Wabanaki Way Indian Island, Maine 04468 chris.sockalexis@penobscotnation.org

Please take note that the Arundel Yacht Club intends to file permit applications with the Maine DEP for dredging activities located in the Kennebunk River offshore of 51 Ocean Ave in Kennebunkport, Maine. Walsh Engineering Associates is requesting that the THPO review the area for any known historic and/or archaeological resources. A site plan 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 randee@walsh-eng.com. Thank you in advance for your timely comments.

Respectfully,

Randee McDonald Project Coordinator

Walsh Engineering Associates

Enc: Location Plan

Tribal Historic Preservation Office Passamaquoddy Tribe

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

March 2, 2022

Randee McDonald Project Coordinator One Karen Drive, Suite 2A Westbrook, ME 04092

• Re: Kennebunkport – 51 Ocean Ave

Dear Randee;

The Passamaquoddy THPO has reviewed the following applications 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 Projects listed above will not have any impact on cultural and historical concerns of the Passamaquoddy Tribe. Should buried artifacts, human remains, cultural sites or ground features be unexpectedly unearthed during ground disturbing activities, all construction should immediately cease and the resources be examined by a professional archaeologist. Additionally, all appropriate authorities-including all pertinent tribal entities should be notified.

Sincerely;

Donald Soctomah Soctomah@gmail.com THPO Passamaquoddy Tribe **Tribal Historic Preservation Office**

Mi'kmaq Nation (Formerly known as the Aroostook Band of Micmac)

Kendyl Reis

Tribal Historic Preservation Officer

7 Northern Road

Presque Isle, ME 04769

Phone: (207)764-1972 ext. 161

Fax: (207)764-7667 Email: kreis@micmac-nsn.gov Arundel Yacht Club Project

51 Ocean Ave, Kennebunkport, Maine March 3rd, 2022

Thank you for the opportunity to review the above-referenced project for compliance with National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA), or other, requirements.

Based on the project description, we do not have knowledge of any specific sites or cultural features that exist at the proposed project location.

However, this geographic area does constitute traditional areas that were historically utilized by members of the Mi'kmaq Nation and the other Wabanaki Tribes. Therefore, we respectfully request that if during the course of excavation/construction activities, human remains, artifacts, or any other evidence of Native American presence is discovered, that site activities in the vicinity of the discovery immediately cease, pending notification to us.

In addition, if this project results in wetland disturbances requiring mitigation, we are requesting that you utilize the black ash (<u>Fraginus nigra</u>) as the principal wetland species for wetland restoration activities. The black ash tree has special significance in the culture of the northeastern Tribes and is used extensively for weaving baskets and other Native American crafts. The black ash tree also provides valuable food and habitat for migratory waterfowl and other wildlife. Unfortunately, however, this species has been selected against by foresters and landowners who favor other tree species. As a result of this, and other environmental factors, the black ash tree is in serious decline in Maine. The Mi'kmaq Nation has completed several black ash wetland restoration projects and have a dependable source for highly-quality seedlings, and the experience and expertise to assist you with black ash wetland restoration projects.

On the subject of human remains, artifacts, or any other evidence of Native American presence is discovered. The human remains will be reburied with the appropriate respect for the remains that is required at a distinctive and respectable site. The artifacts and other evidence of Native American discovery will be documented with appropriate detail. The items will be analyzed for the precise period of the items' distinctive period and will be documented by the Tribal Historic Preservation Officer for the Mi'kmaq Nation.

If you have any questions or comments, please feel free to contact me.

Sincerely,

Kendyl Reis Tribal Historic Preservation Officer





PENOBSCOT NATION CULTURAL & HISTORIC PRESERVATION 12 WABANAKI WAY, INDIAN ISLAND, ME 04468

CHRIS SOCKALEXIS – TRIBAL HISTORIC PRESERVATION OFFICER E-MAIL: chris.sockalexis@penobscotnation.org

NAME	Randee McDonald
ADDRESS	Walsh Engineering Associates
	One Karen Drive, Suite 2A
	Westbrook, ME 04092
OWNER'S NAME	Arundel Yacht Club
TELEPHONE	(207) 553-9898
EMAIL	Randee@Walsh-eng.com
PROJECT NAME	Maintenance Dredging
PROJECT SITE	Kennebunkport, ME
DATE OF REQUEST	February 24, 2022
DATE REVIEWED	June 15, 2022

Thank you for the opportunity to comment on the above referenced project. This project appears to have no impact on a structure or site of historic, architectural or archaeological significance to the Penobscot Nation as defined by the National Historic Preservation Act of 1966, as amended.

If there is an inadvertent discovery of Native American cultural materials during the course of the project, please contact my office at (207) 817-7471. Thank you for consulting with the Penobscot Nation Tribal Historic Preservation Office with this project.

Chris Sockalexis, THPO Penobscot Nation





150 feet Abutters List Report

Kennebunkport, ME October 01, 2024

Subject Property:

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

Vision ID: 3428

Property Address: 51 OCEAN AVENUE

Mailing Address: ARUNDEL YACHT CLUB

PO BOX 328

Mailing Address: KENNEBUNKPORT, TOWN OF

PO BOX 566

KENNEBUNKPORT, ME 04046-0328

KENNEBUNKPORT, ME 04046

Abutters:

10/1/2024

Parcel Number: 10-1-15

CAMA Number: 10-1-15

Vision ID: 3441

Property Address: 53 OCEAN AVENUE

Parcel Number: 10-1-3 Mailing Address: YACHTSMAN HOSPITALITY, LLC

 CAMA Number:
 10-1-3
 2 LIVEWELL DRIVE, #203

 Vision ID:
 3427
 KENNEBUNK, ME 04043

Property Address: 57 OCEAN AVENUE

Parcel Number: 10-1-4 Mailing Address: KENNEBUNKPORT, TOWN OF

 CAMA Number:
 10-1-4
 PO BOX 566

 Vision ID:
 525
 KENNEBUNKPORT, ME 04046

Property Address: OCEAN AVENUE

Parcel Number: 10-1-6 Mailing Address: EDITH HG MCCONNELL REVOCABLE

 CAMA Number:
 10-1-6
 TRUST

 Vision ID:
 527
 PO BOX 1813

Property Address: 49 OCEAN AVENUE KENNEBUNKPORT, ME 04046

,

Parcel Number: 10-1-7 Mailing Address: BARTLETT, HUGH J & JUDITH

CAMA Number: 10-1-7 PO BOX 293

Vision ID: 105722 KENNEBUNKPORT, ME 04046
Property Address: 47 OCEAN AVENUE #5

Parcel Number: 10-1-7 Mailing Address: FANTON, ROMA F

CAMA Number: 10-1-7A 39 MEETINGHOUSE LANE Vision ID: FAIRFIELD, CT 06430

Property Address: 47 OCEAN AVENUE #7

Parcel Number: 10-1-7 Mailing Address: NOWAK, LORI

CAMA Number: 10-1-7B 4940 N HACIENDA DEL SOL ROAD

Vision ID: 105722 TUCSON, AZ 85718
Property Address: 47 OCEAN AVENUE #8

Parcel Number: 10-1-7 Mailing Address: NOWAK, LORI

CAMA Number: 10-1-7C 4940 N HACIENDA DEL SOL ROAD

Vision ID: 105722 TUCSON, AZ 85718

Property Address: 47 OCEAN AVENUE #6



150 feet Abutters List Report

Kennebunkport, ME October 01, 2024

Parcel Number: 10-1-7

CAMA Number: 10-1-7D Vision ID: 105722

Property Address: 47 OCEAN AVENUE #4

Parcel Number:

CAMA Number:

10-1-7 10-1-7E

Vision ID:

105722

Property Address: 47 OCEAN AVENUE #2

Parcel Number: CAMA Number: 10-1-7 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

Parcel Number:

10-1-7 CAMA Number: 10-1-7Z 105722

Vision ID:

Property Address: 47 OCEAN AVENUE #MAIN

Parcel Number:

10-2-1 CAMA Number: 10-2-1

Vision ID:

3442

Property Address: 46 OCEAN AVENUE

Parcel Number:

10-2-2 CAMA Number: 10-2-2 546

Vision ID: Property Address: OCEAN AVENUE

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

Vision ID:

Property Address: 52 OCEAN AVENUE

10/1/2024

Parcel Number: 10-5-11 CAMA Number: 10-5-11

Vision ID: 588

Property Address: 5 GREENE STREET

PO BOX 2675

KENNEBUNKPORT, ME 04046

Mailing Address: MULBERGER, VIRGINIA A

Mailing Address: MCFB, LLC

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

Mailing Address: RIVERBANK CONDO

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: MAHONEY FAMILY REVOCABLE TRUST

52 OCEAN AVENUE

KENNEBUNKPORT, ME 04046

Mailing Address: STOHLMAN, SUZANNE

PO BOX 127

KENNEBUNKPORT, ME 04046



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 an approximately 180-foot by 250-foot area (~45,356 square feet). 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, including the Yachtsman Marina, 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 May 24, 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 AYC and the nearby Yachtsman Marina, 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.

CENAE-PDE 24 May 2022

FINAL Sampling and Analysis Plan for Arundel Yacht Club, Kennebunkport, ME, File Number NAE-2022-00288

1. **Project Description:** The applicant is proposing to mechanically dredge approximately 3,775 cubic yards (CY) of material from shoaled areas totaling just over one acre 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 Arundel Yacht Club located along the Kennebunk River in Kennebunkport, ME. The yacht club building was originally constructed in 1806 and was used as a rope making business until 1816. Sanborn maps from 1911 show that the property was used for a boat house, carriage house, and wagon shed. It has served as the Arundel Yacht Club since 1957 and provides dockage for up to fifty recreational boats and the launching of small sailboats. There is no boat or engine repair that takes place at the property. Land use in the surrounding area includes a mix of residential properties, many with docks, and marina facilities. The Yachtsman Hotel and

Marina Club, which provides dockage for recreational watercraft, is directly adjacent to the south of the property. The nearby Kennebunkport Marina is approximately 800 feet south of the project area and offers boat slips, full mechanical services, and repairs as well as a boat ramp. Chicks Marina, which has a fuel dock, is adjacent to the southern property boundary of the Kennebunkport Marina, approximately 1,200 feet south of the project area. Downtown Kennebunkport, an area with several restaurants, retail shops, and marine services, is approximately 1,000 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 stormwater discharge pipes within the Arundel Yacht Club and the other marina properties along the river (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 (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 project area was last dredged in 2017 when approximately 1,800 CY of material were removed to a depth of -6 feet 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. Chemistry data, also from 2003, revealed elevated levels of metals (cadmium, copper, and mercury) at the project site. A review of biological testing data from 2014 found sediment from the project area not likely to be acutely toxic to benthic organisms. A suitability determination from 2015 concluded that project sediments were suitable for open water placement at CADS.

The adjacent 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 the 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 (https://www.maine.gov/dep/spills/index.html), NAE determined that there have been several small diesel, gasoline, and oil spills within the surrounding area of the project site since 2011.

<u>Risk Ranking</u>: 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.

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

Table 1: Project Risk Ranking

Sample Collection: In the first phase of testing the applicant shall collect 3. sediment cores from four 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. In addition, a field duplicate sample should be collected for bulk chemistry and grain size analysis and an equipment blank should be collected for chemical analysis off any non-dedicated equipment used in the sampling process.

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 ±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: http://www.nae.usace.army.mil/Missions/Regulatory/Dredged-Material-Program/.

Grain Size and Bulk Sediment Chemistry: All samples from the proposed dredge

footprint shall be individually analyzed for grain size and 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 (WOC). 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 shall immediately notify the applicant, who may wish to seek guidance from NAE on project-specific procedures for preparation of additional elutriate samples requiring 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 the applicant wishes to use alternate species listed in the RIM, then NAE must be contacted prior to sampling to coordinate the need for reference area sample collection and analysis.

- <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 (http://www.nae.usace.army.mil/Missions/Disposal-Area-Monitoring-System-DAMOS/Electronic-Data-Deliverables.aspx). 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: Gabriella.J.Saloio@usace.army.mil)

Gabriella Saloio

Biologist

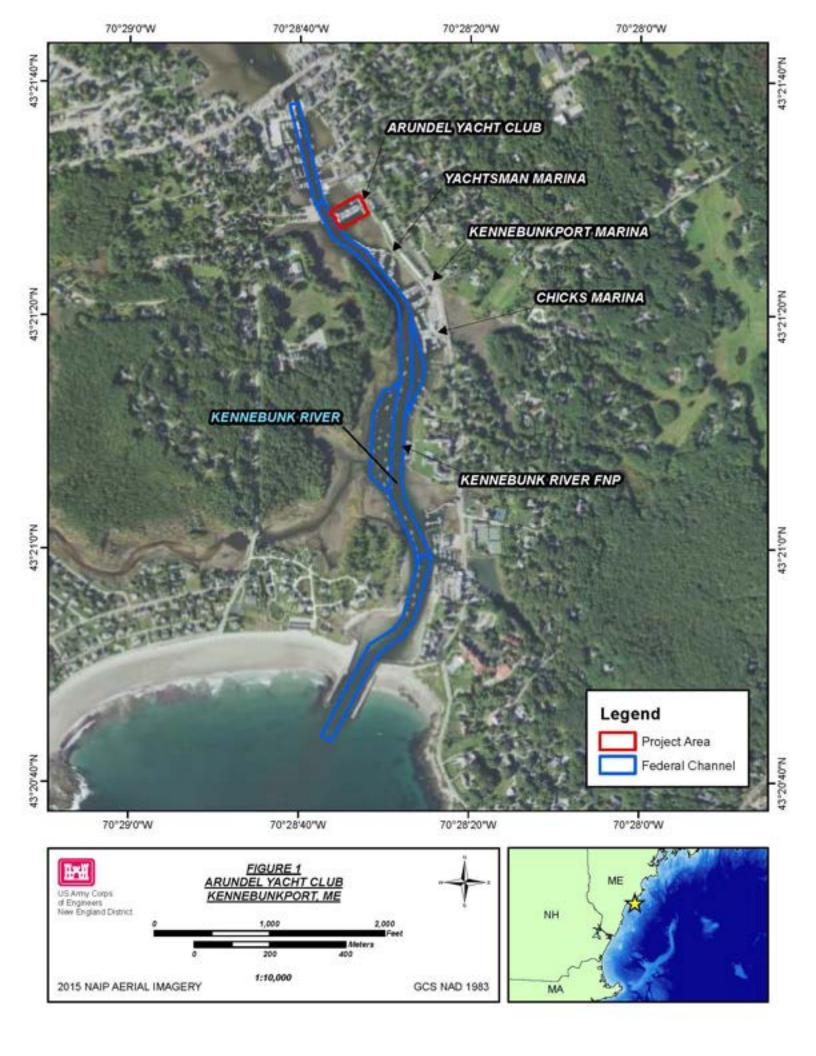
New England District

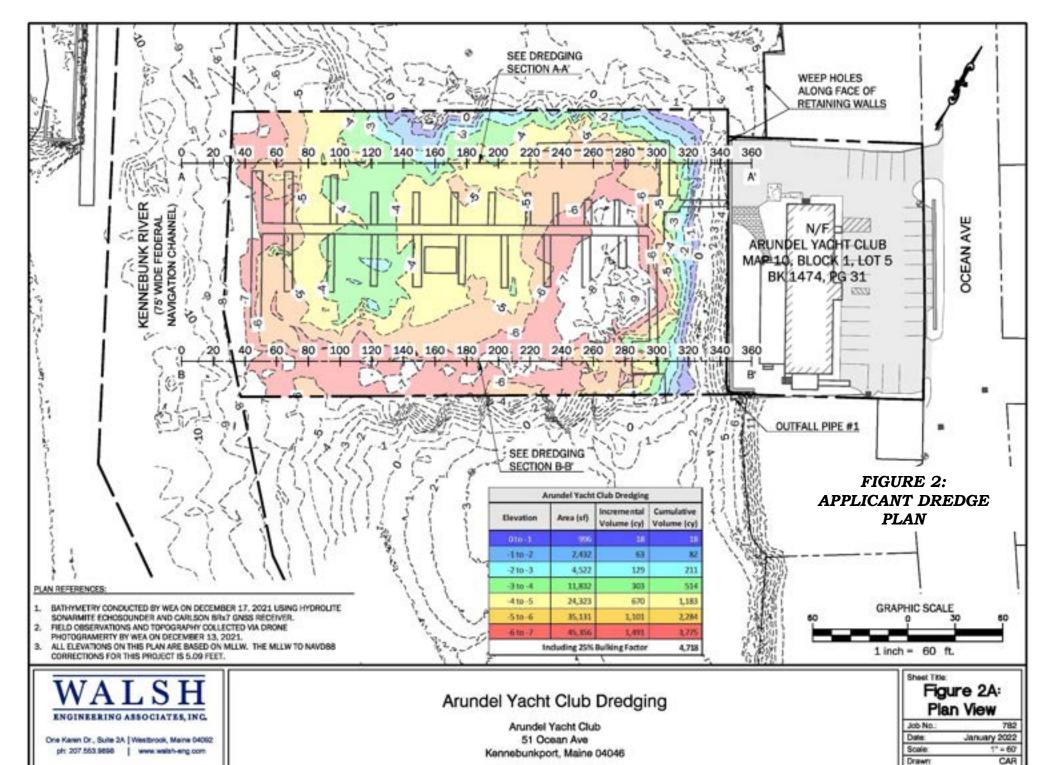
U.S. Army Corps of Engineers

Gabriella Saloio

Table 2: Arundel Yacht Club Sample Locations

Station	Latitude (NAD 83)	Longitude (NAD 83)	Survey Depth (Feet MLLW)	Project Depth (Feet MLLW)	Overdepth (Feet)	Estimated Core length (Feet)
AYC-1	-70.475810	43.358305	-3.9	-6.0	1.0	3.1
AYC-2	-70.475589	43.358010	-1.7	-6.0	1.0	5.3
AYC-3	-70.476321	43.357931	-3.0	-6.0	1.0	4.0
AYC-4	-70.476397	43.358105	-3.0	-6.0	1.0	4.0





Checked

WRW

Copyright © 2022

OE2 - Annel Park Clab Decignos CADOE2 - Russ dag plot date: 1080002 5 50 PM

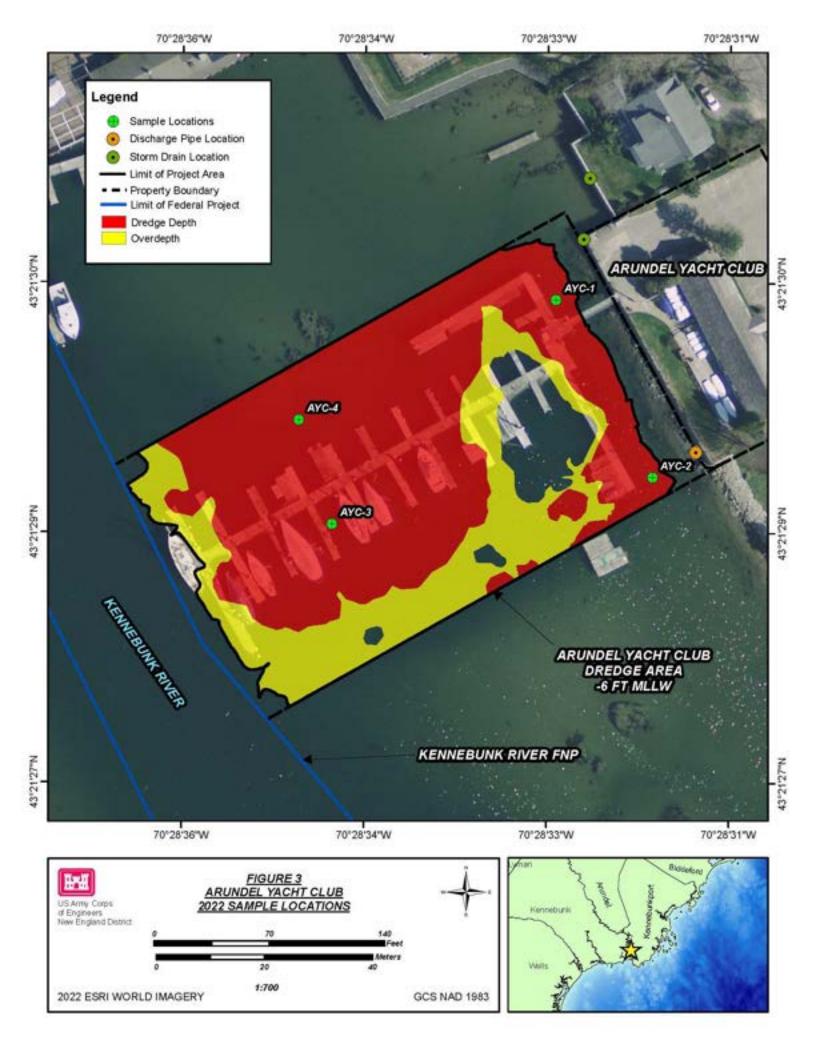


TABLE 3: RECOMMENDED PROCEDURES FOR SAMPLE COLLECTION, PRESERVATION, AND STORAGE

<u>Analyses</u>	Collection <u>Method</u>	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 ^c	Refrigerate. Dry ice ^b or freezer storage is recommended for extended holding times.	≤ 4° Cc	Hg - 28 days Others - 6 Months ^d
Organic Compounds	Grab/corer	475 mL	Solvent-rinsed glass jar with Teflon lid ^c	Refrigerate. Dry ice ^b or freezer storage is recommended for extended holding times.	≤ 4° C/dark ^d	14 days ^e
Particle Size	Grab/corer	75 mL	Whirl-pac bag ^b	Refrigerate	≤ 4° C	Undetermined
Total Organic Carbon	Grab/corer	3 L	Heat treated glass vial with Teflon lined lid ^c	Refrigerate. Dry ice ^c 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
Biological Tests						
Dredged Material	Grab/corer	12-15 L per sample	Plastic bag or container ^e	Completely fill and Refrigerate; sieve	≤ 4° C/dark/airtight	14 days ^{i f}
Reference Sediment	Grab/corer	45-50 L per test	Plastic bag or container ^e	Completely fill and Refrigerate; sieve	≤ 4° C/dark/airtight	14 days ^{i f}
Control Sediment	Grab/corer	21-25 L per test	Plastic bag or container ^e	Completely fill and Refrigerate; sieve	≤ 4° C/dark/airtight	14 days ^{i f}
Water and Elutria	te					
Chemical/Physica	l Analyses					
Metals		Discrete sampler or pump	1 L	Acid-rinsed polyethylene or glass jar	pH <2 with HNO ₃ 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 ^d
Trawl/ Teflon coated grab	30 g	Double Ziploc ^c	Handle with non-metallic forceps; plastic gloves; dry icec	≤ -20° C°	Hg - 14 days Others - 6 months ⁱ
Trawl/ Teflon coated grab	100 g	Hexane-rinsed double aluminum foil and double Ziploc ^c	Handle with hexane-rinsed stainless steel forceps; dry icec	≤ -20° C°	10 days ^{i e}
Trawl/ Teflon coated grab	50 g	Heat cleaned aluminum foil and watertight plastic bag ⁱ	Covered ice chest ^d	≤ -20° Ci	10 days ^{i e}
Trawl/ Teflon coated grab	50 g	Hexane-rinsed double aluminum foil and double Ziploc ^c	Handle with hexane-rinsed stainless steel forceps; dry icec	≤ -20° Ci	10 days ^{i e}
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

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

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).

^h Plumb (1981).

i Tetra Tech (1986b)

FINAL Sampling and Analysis Plan for Arundel Yacht Club, Kennebunkport, ME, File Number NAE-2022-00288

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
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)	

FINAL Sampling and Analysis Plan for Arundel Yacht Club, Kennebunkport, ME, File Number NAE-2022-00288

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

^{*} 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 Arundel Yacht Club, Kennebunkport, ME, File Number NAE-2022-00288

TABLE 5: ELUTRIATE TESTING PARAMETERS

<u>Parameter</u>	Recommended Analytical <u>Method</u>	Reporting <u>Limit (µg/L)</u>
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	1.0 1.0 1.0 0.6 1.0 0.4 1.0 1.0 0.5
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	NAE-2007-2704	-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 (https://www.maine.gov/dep/spills/index.html) 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						
	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		%Fines							
Sample ID	76Gravei	Coarse	Medium	Fine	%Filles					
	Arun	del Yacht C	lub							
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					
Yachtsman Marina										
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

								Ken	nebunkpo	rt M	'arina			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	ט	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.

								Arun	acht Club				
				IOSI	V	AYC-1		AYC-2		AYC-	3	AYC-4	ļ
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 7440439 7440473 7440508 7439976 7440020 7440666 SUMLPAH SUMHPAH 72548 72559 50293 SUMDDX 60571 SUMCHLOR	Number Units 14762744 % 7440382 mg/kg 7440439 mg/kg 7440473 mg/kg 7440508 mg/kg 7439921 mg/kg 7440660 mg/kg 7440666 mg/kg SUMLPAH ug/kg SUMLPAH ug/kg SUMLPAH ug/kg 172548 ug/kg 172559 ug/kg 50293 ug/kg SUMDDX ug/kg SUMCHLOR ug/kg	Number Units ERL 14762744	Number Units ERL ERM 14762744 % 7440382 mg/kg 8.2 70 7440473 mg/kg 1.2 9.6 74404508 mg/kg 81 370 7440508 mg/kg 34 270 7439971 mg/kg 46.7 218 7439976 mg/kg 0.150 0.710 7440020 mg/kg 20.9 51.6 7440666 mg/kg 150 410 SUMLPAH ug/kg 552 3,160 SUMLPAH ug/kg 552 3,160 SUMLPAH ug/kg 1,700 9,600 72548 ug/kg 1,700 9,600 72559 ug/kg 2.2 27 50293 ug/kg 1 7 SUMDDX ug/kg 1.58 46.1 60571 ug/kg 0.02 8 SUMCHLOR ug/kg 0.5 6	CAS Number Units ERL ERM Value 14762744 % 1.28 7440382 mg/kg 7440439 mg/kg 1.2 9.6 0.072 7440473 mg/kg 8.1 370 31.5 7440508 mg/kg 4.2 70 10.9 7439921 mg/kg 46.7 218 18.1 7439926 mg/kg 0.150 0.710 0.032 7440020 mg/kg 1.50 410 60.6 SUMLPAH ug/kg 1,700 1,600 260 72548 ug/kg 1,700 1,600 2,600 72559 ug/kg 1,700 1,600 2,000 72559 ug/kg 1,700 1,600 2,000 1,600	Number Units ERL ERM Value Q 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 7439976 mg/kg 0.150 0.710 0.032 7440020 mg/kg 20.9 51.6 20.8 7440666 mg/kg 150 410 60.6 SUMLPAH ug/kg 552 3,160 48.2 SUMLPAH ug/kg 1,700 9,600 260 72548 ug/kg 2 20 0.020 U 72559 ug/kg 2.2 27 0.066 50293 ug/kg 1 7 0.026 U SUMDDX ug/kg 1.58 46.1 0.112 60571 ug/kg 0.02 8 0.040 U SUMCHOR Ug/kg 0.02 8 0.040 U SUMCHOR Ug/kg 0.05 6 0.300 U	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 1,700 9,600 260 1482 \$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 0.05 6 0.300 U 1.72	CAS Number Units ERL ERM Value Q Result Q 14762744	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 7439921 mg/kg 0.150 0.710 0.032 0.064 0.086 7440020 mg/kg 0.150 0.710 0.032 0.064 0.086 7440666 mg/kg 150 410 60.6 101 58.1 SUMLPAH ug/kg 552 3,160 48.2 189 654 SUMLPAH ug/kg 1,700 9,600 260 1482 3341 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 Q Result Q Result 14762744 % 1.28 1.14 1.15 8.46 14762744 % 1.28 1.14 1.15 8.46 7440382 mg/kg 8.2 70 9.66 9.75 6.72 7.78 7440473 mg/kg 81 370 31.5 41.6 26.2 25.6 7440508 mg/kg 34 270 10.9 29.4 15.7 25.6 7439921 mg/kg 46.7 218 18.1 30.9 26.1 21.4 7439976 mg/kg 0.150 0.710 0.032 0.064 0.086 0.059 744020 mg/kg 20.9 51.6 20.8 25.4 13.0 15.0 7440666 mg/kg 150 410 60.6 101 58.1 68.6 SUMLPAH ug/kg 552 3,160 48.2 189 654 90.9 SUMLPAH ug/kg 1,700 9,600 260 1482 3341 411 72548 ug/kg 2 20 0.020 U 3.87 J 4.34 J 0.274 72559 ug/kg 1.28 16.0 0.112 13.0 12.7 0.801 SUMDDX ug/kg 1.58 46.1 0.112 13.0 12.7 0.801 60571 ug/kg 0.02 8 0.040 U 0.23 U 0.15 U 0.550 SUMCHLOR ug/kg 0.5 6 0.300 U 1.72 U 1.111 U 4.2	CAS Number Units ERL ERM Value Q Result	CAS Number Units ERL ERM Value Q Result Q

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

CAS Number Physical 14762744 Metals Arsenic 7440382 Cadmium 7440439 Chromium 7440473 Chromium 7440473 Chromium 7440508 Lead 7439921 Mercury 7439976 Nickel 7440666 PAHs Total LPAH SUMLPAH Total HPAH SUMLPAH Pesticides	Units % 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	70 9.6 370 270 218 0.710 51.6 410	IOSI Value 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	Q Q	KBRC- Result 4.98 0.433 26.0 13.8 17.8 0.054	Q	Result - 3.52 0.300 20.0 9.34 12.2	0 0	3.30 0.350 20.5 9.52 13.3	Q	Result	E Q	Result - 3.34 0.277 18.0 8.28	Q Q	Result	Q	Fesult - 5.12 0.451 24.8 13.6	Q Q	Result 1.58 0.119 11.0 5.32
Parameter Number Physical 14762744 Total organic carbon 14762744 Metals 7440382 Arsenic 7440382 Cadmium 7440473 Chromium 7440473 Copper 7440508 Lead 7439921 Mercury 7439976 Nickel 7440020 Zinc 7440666 PAHs SUMLPAH Total LPAH SUMLPAH Total HPAH SUMLPAH	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	70 9.6 370 270 218 0.710 51.6	1.28 9.66 0.072 31.5 10.9 18.1 0.032 20.8	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	Q	3.52 0.300 20.0 9.34 12.2	Q	3.30 0.350 20.5 9.52	Q	2.47 0.229 15.6 18.6	Q	3.34 0.277 18.0 8.28	Q	2.82 0.237 16.5	Q	5.12 0.451 24.8	Q	1.58 0.119 11.0
Physical 14762744 Total organic carbon 14762744 Metals Arsenic Arsenic 7440382 Cadmium 7440439 Chromium 7440473 Copper 7440508 Lead 7439921 Mercury 7439976 Nickel 744020 Zinc 7440666 PAHs SUMLPAH Total LPAH SUMLPAH Total HPAH SUMLPAH	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	9.66 0.072 31.5 10.9 18.1 0.032 20.8		5.34 0.463 27.5 13.7 18.8 0.062 15.9		4.98 0.433 26.0 13.8 17.8		3.52 0.300 20.0 9.34 12.2		3.30 0.350 20.5 9.52		2.47 0.229 15.6 18.6		3.34 0.277 18.0 8.28		0.237 16.5		5.12 0.451 24.8		0.119 11.0
Total organic carbon 14762744 Metals 7440382 Arsenic 7440382 Cadmium 7440439 Chromium 7440473 Copper 7440508 Lead 7439921 Mercury 7439976 Nickel 744020 Zinc 7440666 PAHs SUMLPAH Total LPAH SUMLPAH Total HPAH SUMLPAH	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	9.66 0.072 31.5 10.9 18.1 0.032 20.8		5.34 0.463 27.5 13.7 18.8 0.062 15.9		4.98 0.433 26.0 13.8 17.8		3.52 0.300 20.0 9.34 12.2		3.30 0.350 20.5 9.52		2.47 0.229 15.6 18.6		3.34 0.277 18.0 8.28		0.237 16.5		5.12 0.451 24.8		0.119 11.0
Metals 7440382 Arsenic 7440382 Cadmium 7440439 Chromium 7440473 Copper 7440508 Lead 7439921 Mercury 7439976 Nickel 7440020 Zinc 7440666 PAHs SUMLPAH Total LPAH SUMLPAH Total HPAH SUMLPAH	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	9.66 0.072 31.5 10.9 18.1 0.032 20.8		0.463 27.5 13.7 18.8 0.062 15.9		0.433 26.0 13.8 17.8		0.300 20.0 9.34 12.2		0.350 20.5 9.52		0.229 15.6 18.6		0.277 18.0 8.28		0.237 16.5		0.451 24.8		0.119 11.0
Cadmium 7440439 Chromium 7440473 Copper 7440508 Lead 7439921 Mercury 7439976 Nickel 744020 Zinc 7440666 PAHs SUMLPAH Total LPAH SUMLPAH Total HPAH SUMLPAH	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	0.072 31.5 10.9 18.1 0.032 20.8		0.463 27.5 13.7 18.8 0.062 15.9		0.433 26.0 13.8 17.8		0.300 20.0 9.34 12.2		0.350 20.5 9.52		0.229 15.6 18.6		0.277 18.0 8.28		0.237 16.5		0.451 24.8		0.119 11.0
Chromium 7440473 Copper 7440508 Lead 7439921 Mercury 7439976 Nickel 744020 Zinc 7440666 PAHS SUMLPAH Total LPAH SUMLPAH Total HPAH SUMLPAH	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	31.5 10.9 18.1 0.032 20.8		27.5 13.7 18.8 0.062 15.9		26.0 13.8 17.8		20.0 9.34 12.2		20.5 9.52		15.6 18.6		18.0 8.28		16.5		24.8		11.0
Copper 7440508 Lead 7439921 Mercury 7439976 Nickel 7440020 Zinc 7440666 PAHs SUMLPAH Total LPAH SUMLPAH Total HPAH SUMLPAH	mg/kg mg/kg mg/kg mg/kg mg/kg	34 46.7 0.150 20.9 150	270 218 0.710 51.6	10.9 18.1 0.032 20.8		13.7 18.8 0.062 15.9		13.8 17.8		9.34 12.2		9.52		18.6		8.28						
Lead 7439921 Mercury 7439976 Nickel 7440020 Zinc 7440666 PAHs SUMLPAH Total LPAH SUMLPAH Total HPAH SUMLPAH	mg/kg mg/kg mg/kg mg/kg ug/kg	46.7 0.150 20.9 150	218 0.710 51.6	18.1 0.032 20.8		18.8 0.062 15.9		17.8		12.2								7.16		13.6		5.32
Lead 7439921 Mercury 7439976 Nickel 7440020 Zinc 7440666 PAHs SUMLPAH Total LPAH SUMLPAH Total HPAH SUMLPAH	mg/kg mg/kg mg/kg mg/kg ug/kg	0.150 20.9 150	0.710 51.6	0.032 20.8		0.062 15.9						13.3		0.67								
Nickel 7440020 Zine 7440666 PAHs Total LPAH SUMLPAH SUMLPAH Total HPAH SUMLPAH	mg/kg mg/kg ug/kg	20.9 150	51.6	20.8		15.9		0.054						0.07		11.5		9.29		17.7		4.81
Zinc 7440666 PAHs	mg/kg ug/kg	150								0.052		0.053		0.032		0.067		0.046		0.056		0.023
PAHS Total LPAH SUMLPAH Total HPAH SUMHPAH	ug/kg		410	60.6				14.5		11.4		11.3		8.57		9.92		8.67		13.4		6.12
Total LPAH SUMLPAH Total HPAH SUMHPAH		550				68.9		67.7		48.3		50.9		37.2		50.5		39.9		78.2		28.9
Total HPAH SUMHPAH		EEO																				
		332	3,160	48.2		316		321		208		106		114		101		127		217		104
Pesticides	ug/kg	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 SUMCHLOR	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 SumNOAA18	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 ERL Red indicates an exceedance of the ERM																						
U= Compound was analyzed for but was no	t detected	(non-dete	ect)																			
J= Indicates an estimated value	. actorica	(mon dec	000,																			
Non-detects reported as half the MDL																						
Reference site data from DAMOS monitoring	g surveys (2019 IOS	SN)																			
Total PCBs were calculated using the NOA	18 metho	d																				
Total Chlordane is a sum of alpha and gam	ma chlorda	ane, cis a	nd trans	nonachlo	or, an	d oxychloro	lane	; IOSN valu	e is	a sum of on	ily a	lpha and ga	ımm	a chlordan	е							

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 10⁻⁴), 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 (LC₅₀) 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: LC₅₀ Values in Suspended Phase Toxicity Test

Composite	A. bahia	M. beryllina	M. edulis
	LC ₅₀ (%)	LC ₅₀ (%)	LC ₅₀ (%)
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

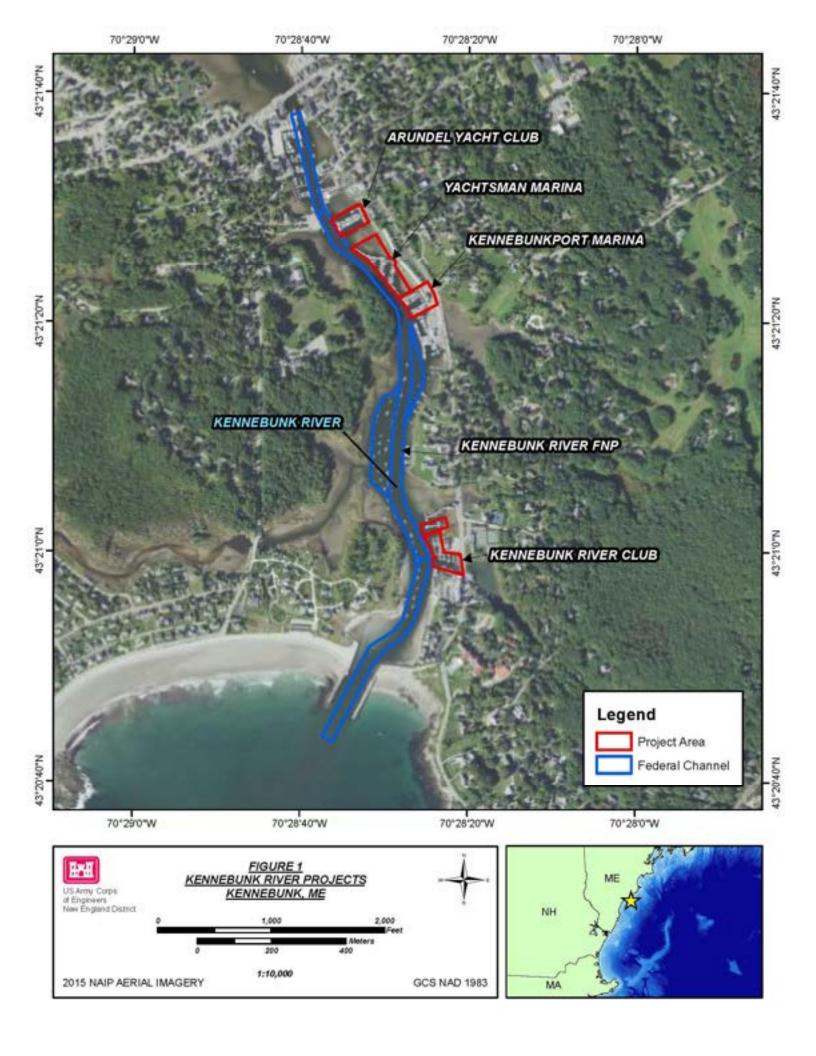
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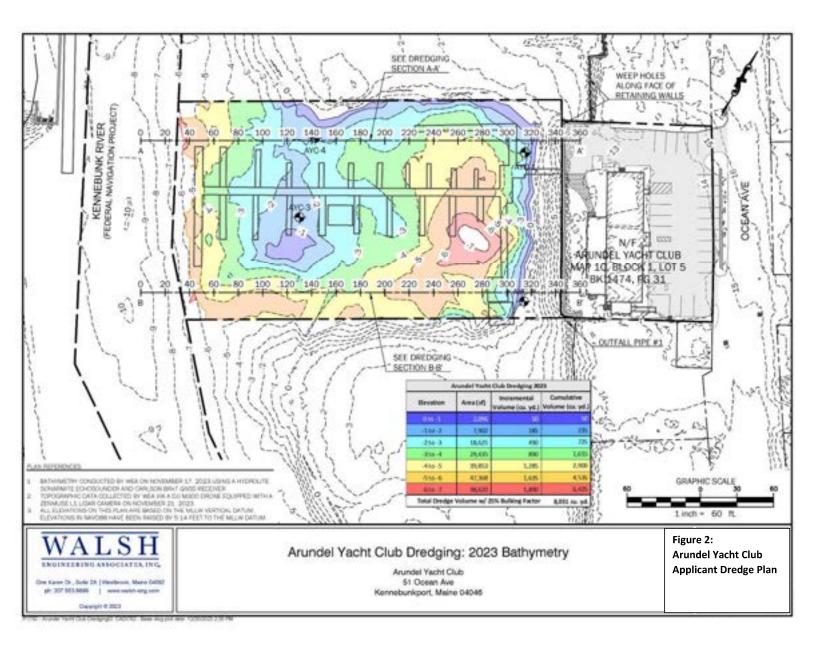
Richard B. Loyd Chief Environmental Resources and Marine Programs Section USACE-New England District

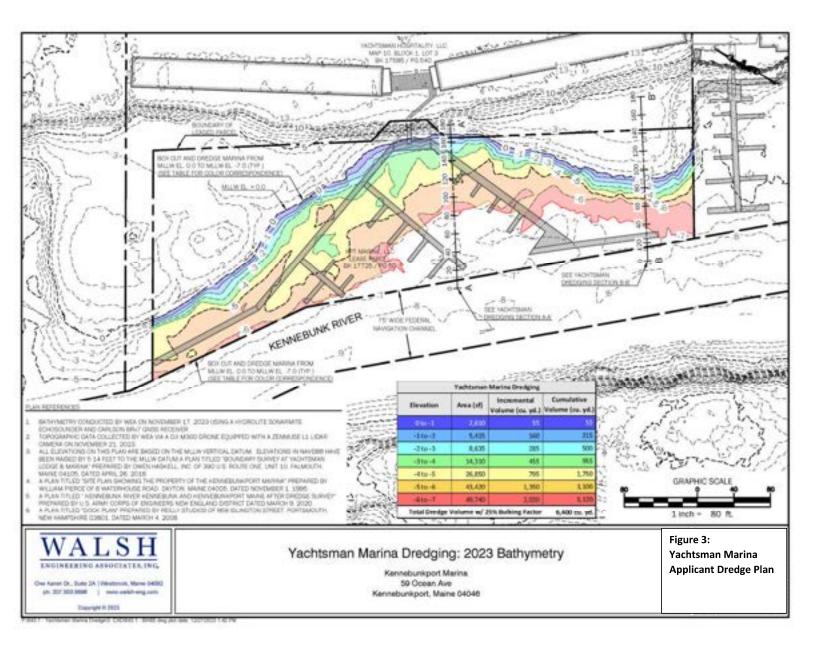
5. References:

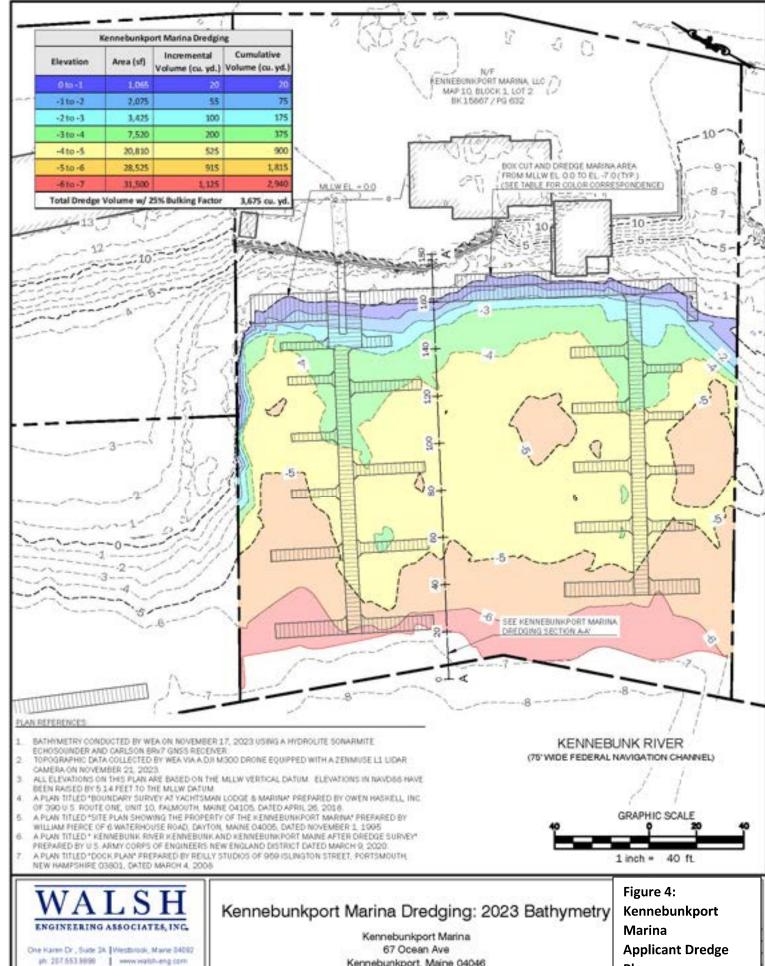
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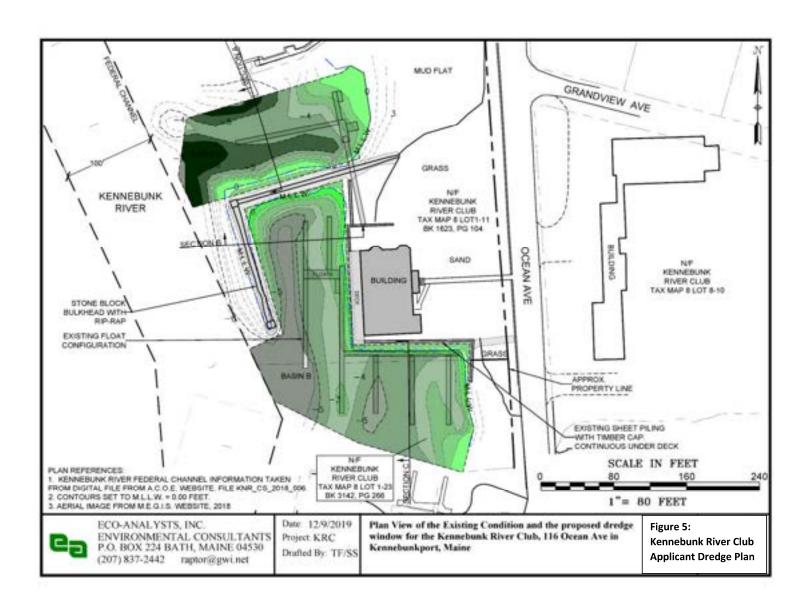


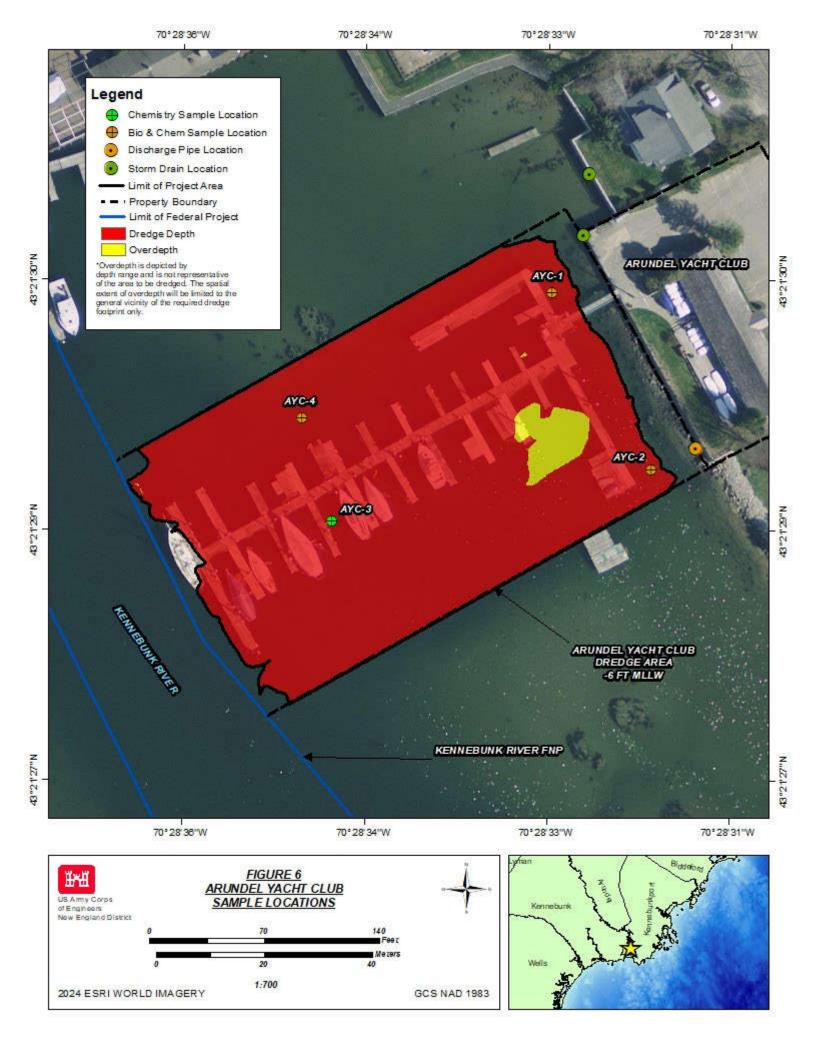


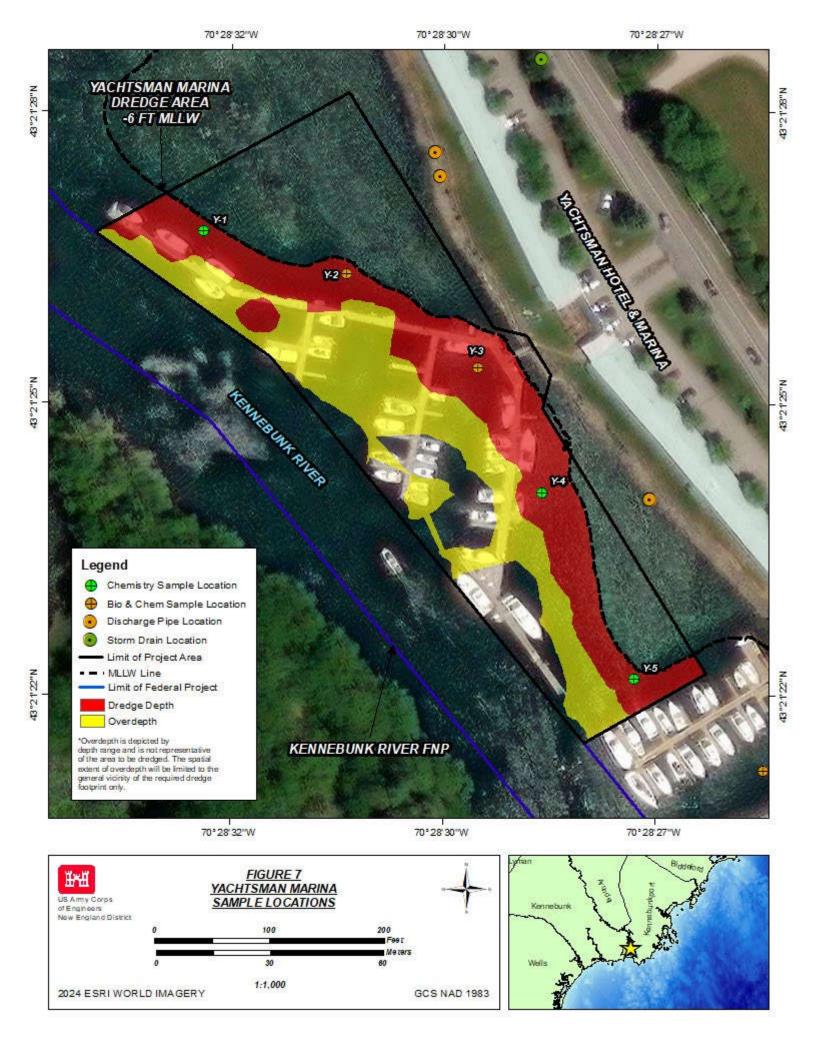
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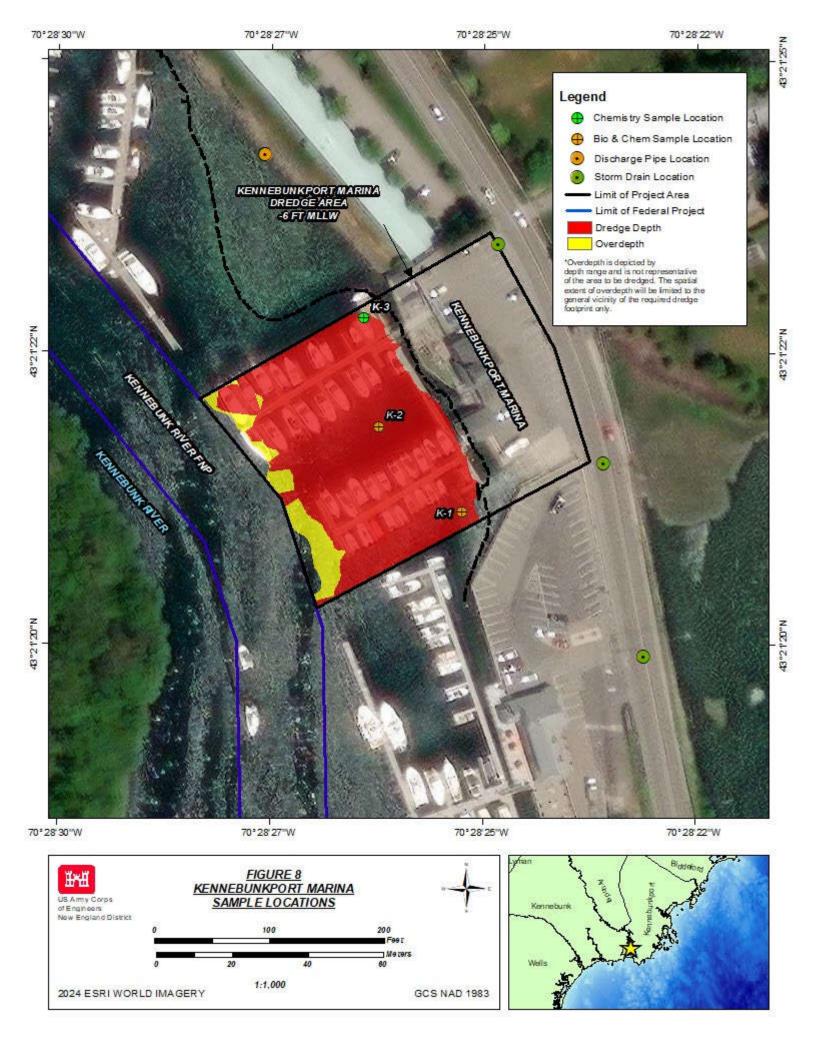
Kennebunkport, Maine 04046

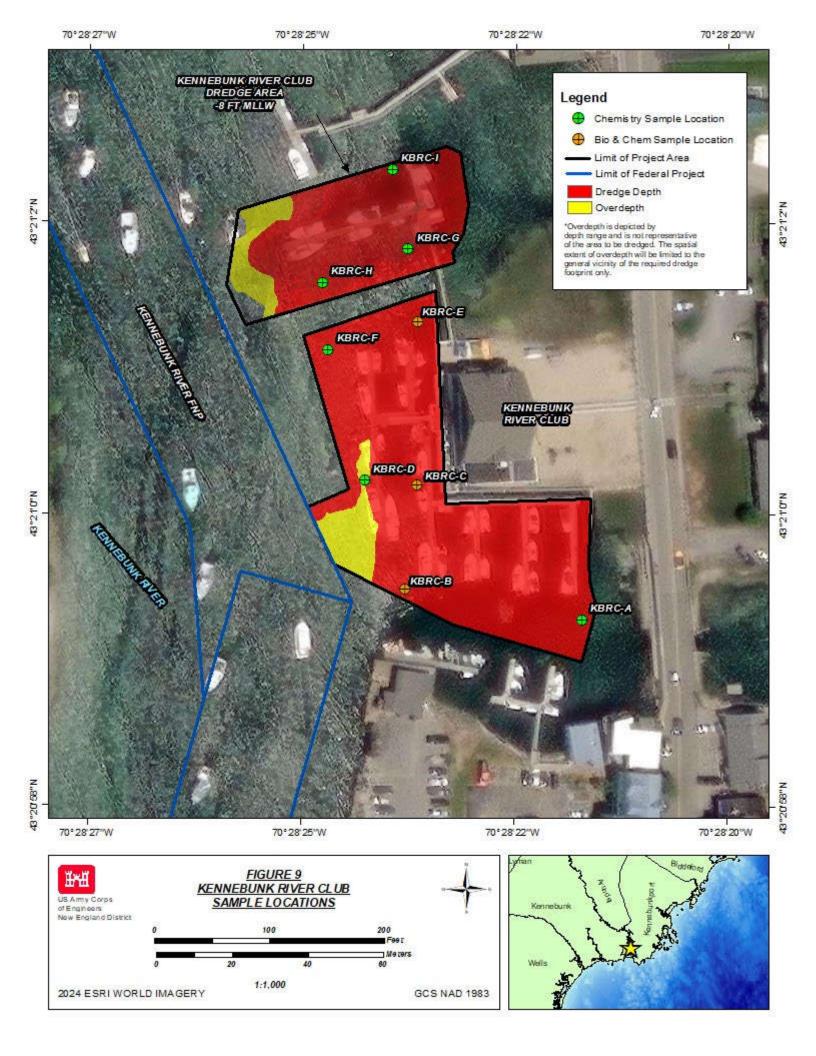
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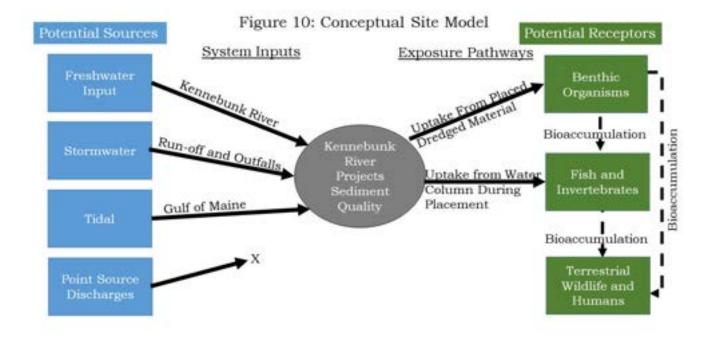












Appendix A Core Logs and Photographs

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>		Longitude: - 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.	



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

Core Photo

made refusal was reached after 2.4' penetration.



Project: <u>Arundel Yacht Cl</u>	<u>ub</u>	Date : <u>7/26/2022</u>	
Sampling Personnel:Dustin J]	Kach		
Weather: Light Winds, Clea	ar Skies		
Location Method:DGPS: 1	meter accuracy		
Sample ID: <u>AYC-3</u>		Time: 12:55 pm	
Sampler Type: VibraCor	e Sampler		
Depth:3.2' MLLW			
Coordinates: <u>Latitude: 43.357</u>	793	Longitude: -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.



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.



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	Longitude: -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>	Longitude: -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.

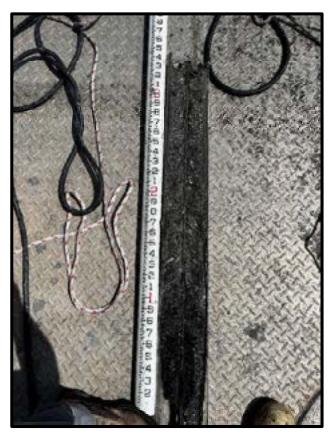


Project:	Kennebunkport Marina	<u>1 </u>		Date:	
Sampling Per	sonnel: <u>Dustin J Kach</u>				
Weather:	Light Winds, Clear Ski	ies			
Location Met	hod: DGPS: 1 meter	r accuracy			
Sample ID: _	K-3			Time: 10:05 am	
Sampler Type	e: <u>VibraCore San</u>	npler			
Depth:	-1.7' MLLW				
Coordinates:	Latitude: 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



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-1	Time: 11:29 am
Sampler Type: VibraCore Sampler	
Depth:1.5' MLLW	
Coordinates: <u>Latitude</u> : 43.35735	Longitude: - 70.47578
Penetration: 3.5' Recovery:	3.5' No. Attempts: <u>8</u>

Material Description: <u>0-3.5</u>' composited. Compact sand with shell debris. Multiple attempts were made refusal was reached after 3.5' penetration.



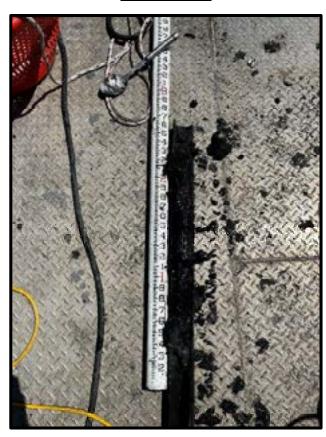
Project:	Yachtsman Marina			Date: <u>7/26/2022</u>	
Sampling Pers	sonnel: <u>Dustin J Kach</u>				
Weather:	Light Winds, Clear Sk	ies			
Location Metl	hod: DGPS: 1 mete	er accuracy			
Sample ID:	Y-2			Time: _11:15 am	
Sampler Type	e:VibraCore Sar	npler			
Depth:	-1.2' MLLW				
Coordinates:	Latitude: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



Project: Yachtsman Marina	Date : <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	Longitude: - 70.47488
Penetration: 2.7' Reco	overy: 2.7' No. Attempts: 5

Core Photo

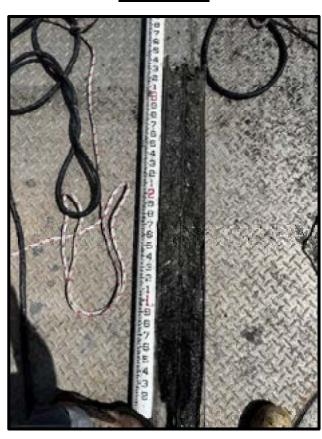
Material Description: <u>0-2.7</u>' composited. Dark silt with hard packed sand at bottom of core.



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	Longitude: - 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>	Longitude: - 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

Hysical Total organic carbon Metals Arsensie Cadmium Chromium Copper Lead Lead Wickel Zinc PAHs Accnaphthene	7440382 7440439 7440439 7440439 7440508 7439921 7439976 7440020 7440666	Units % mg/kg mg/kg mg/kg mg/kg mg/kg	8.2 1.2 81 34	70 9.6	108 Value 1.28 9.66	Q.	K-1 Result	(NAE-2001 K-1 Q Result	5-00280 2		V-1		(N	chtsman Ma AE-2004-00						l Yacht Clu 2022-0028		AVC-4	KBRC-A				Ke	ennebunk R (NAE-2007-	2704)			H KBRC-	I KBRC-F
Hysical Total organic carbon Metals Arsensie Cadmium Chromium Copper Lead Lead Wickel Zinc PAHs Accnaphthene	7440382 7440439 7440473 7440508 7439921 7439976 7440020	mg/kg mg/kg	8.2 1.2 81	70 9.6	Value 1.28 9.66	Q				K-3													MDDO I									17 1755	I WDDG D
Hysical Total organic carbon Metals Arsensie Cadmium Chromium Copper Lead Lead Wickel Zinc PAlls Accnaphthene	7440382 7440439 7440473 7440508 7439921 7439976 7440020	mg/kg mg/kg	8.2 1.2 81	70 9.6	1.28 9.66	Q	Result	Q Result					Y-2	Y-3	Y-4	Y-5	AY	C-1	AYC-2	AYC	-3			KBRC-	B KBF	C-C	KBRC-D	KBRC-	E KE	3RC-G	KBRC		
Total organic carbon Metals Arsenic Cadmium Chronium Chronium Chroper Leacu Wiktel Zinc FAHS Acenaphthene	7440382 7440439 7440473 7440508 7439921 7439976 7440020	mg/kg mg/kg	1.2		9.66	Н			QI	Result Q	Result	Q R	esult Q	Result Q	Result 0	Result	Q Resul	lt Q	Result 0	Q Result	Q I	Result Q	Result	Q Result	Q Resui	lt Q	Result C	2 Result	Q Res	ult Q	Result	Q Result	Q Result Q
Metals Arrenic Cadmium Chromium Chromium Copper Lead Mercury Nickel Zinc FAHs Accnaphthene	7440382 7440439 7440473 7440508 7439921 7439976 7440020	mg/kg mg/kg	1.2		9.66																												
Arsenie Cadmium Chromium Copper Lead Mercury Nickel Zinc PAHs Accenaphthene	7440439 7440473 7440508 7439921 7439976 7440020	mg/kg mg/kg	1.2		9.66		0.37	3.04		2.32	0.93	_	1.72	1.90	1.19	0.20	1.14	\perp	1.15	8.46		2.64		-	_	\perp	_	-	_			-	
Cadmium Chromium Choper Lead Mercury Nickel Zinc PAH8 Acenaphthene	7440439 7440473 7440508 7439921 7439976 7440020	mg/kg mg/kg	1.2		9.66	_																											
Chromium Copper Lead Mercury Nickel Zinc PAHa Acenaphthene	7440473 7440508 7439921 7439976 7440020	mg/kg mg/kg	81			_	2.85	6.68		6.34	6.65		3.20	7.96	4.54 0.430	0.984	9.75		6.72	7.78 0.453		0.613	5.34 0.463	4.98 0.433	3.52		3.30 0.350	2.47	3.3		2.82	5.12 0.451	1.58
Copper Lead Mercury Nickel Zinc PAHs Accnaphthene	7440508 7439921 7439976 7440020	mg/kg mg/kg		370	31.5	-	21.9	27.1		26.4	0.225		.235	33.6	23.1	6.71	41.6		26.2	25.6		38.1	27.5	26.0	20.0		20.5	0.229	0.2		0.237	24.8	0.119
Lead Mercury Nickel Zinc PAHs Acenaphthene	7439921 7439976 7440020	mg/kg		370	10.0	+	14.2	16.7		15.4	12.5		3.64	18.3	9.82	1.59	29.4		15.7	25.6		24.3	13.7	13.8	9.34		9.52	18.6	8.2		7.16	13.6	5.32
Nickel Zinc PAHs Acenaphthene	7440020			218	18.1	-	134	21.9		17.1	12.4		12.9	20.2	7.79	1.81	30.9		26.1	21.4		33.7	18.8	17.8	12.2		13.3	8.67	11		0.70	17.7	4.81
Zine PAHs Acenaphthene			0.150		0.032	1	0.051	0.063		0.047	0.045		.051	0.052	0.011	1 0.005	J 0.064		0.086	0.059	J.	0.108	0.062	0.054	0.050		0.053	0.032	0.0		0.046	0.056	0.023
PAHs Acenaphthene	7440666	mg/kg	20.9	51.6	20.8	-	9.17	15.6		15.4	11.3		3.37	21.4	15.1	3.81	25.4		13.0	15.0		22.7	15.9	14.5	11.4	-	11.3	8.57	9.5		8.67	13.4	6.12
Acenaphthene		mg/kg	150			T	56.6	67.4		57.2	42.2	3	37.6	71.2	45.2	10.2	101		58.1	68.6		98.0	68.9	67.7	48.3	$\neg \neg$	50.9	37.2	50.	.5	39.9	78.2	28.9 J
	83329	ug/kg	16				3.96	J 20.4		15.1	5.30		3.46 J	2.97 J	1.75	J 1.32	J 11.3		23.4	1.40		4.94 J	21.7	18.2	1.35		1.35 t	1.35	U 1.3		1.35	U 1.35	U 1.35 U
Acenaphthylene	208968	ug/kg	44		7.06	\perp	30.1	20.6		12.6	9.97		17.0	12.6	0.241	J 0.884	J 23.8		71.1	7.60		15.3	10.0	1.25	U 1.25		1.25 L	1.25	U 1.2		1.25	U 11.9	1.25
Anthracene Fluorene	120127 86737	ug/kg	85.3 19	540	2.40	-	32.5 8.08	34.5		40.4 17.1	26.3 6.97		9.01	18.1 5.98	0.692 .	J 0.640 J 0.186	J 25.0 U 12.9		119	7.96		18.6 4.86 J	90.3	143.0	46.3 15.9		19.6 1.45 U	26.2 J 1.45	U 1.4		25.2	29.1 14.2	15.4 U
Nanhthalene	91203	ug/kg ug/kg				+	8.30	10.2		11.6	5.13		3.99	9.39	2.35 1	J 0.186	U.I 14.5		21.8	29.7		7.95 J	1.15	30.6 II 1.15	11 1.15		1.45 U	1.45	U 1.4		1.15	U 1.15	U 1.15 U
Phenanthrene	85018	ug/kg	240	1500	26.9	+	102	10.2		128	134		120	69.4	2.62	J 2.26	J 101		381	40,7		52.2	1.15	127	142		81.5 U	82.9	J 76		87.1	159	82.9
Total LPAH	SUMERAN	ug/kg				+	185	225		225	188		191	118	7.87	8.67	189		654	90.9		104	316	321	208		106	114	10		127	217	104
Benzo[a]anthracene	56553	ug/kg	261	1,600	21.3	o	115	157		133	127		128	74.0	2.98	J 3.97	136		326	31.0		77.3	311	522	257	+	92	97.2	78		67.0	136	55.8
Benzo(a)pyrene	50328	ug/kg	430	1,600	23.4		129	160		130	132	J :	130	85.3	3.12	J 4.60	140		328	35.7		90.0		J 226	J 146		80 J		71		58	J 129	J 51.8 J
Benzo[b)fluoranthene	205992	ug/kg			36.4		126	180		137	116		141	95.8	3.61	J 5.28	163		320	42.7		93.5	282	J 303	J 210		109 J	87.2	86		86.2	J 201	J 63.6 J
Benzojg,h,ilperylene	191242	ug/kg			23.1	П	88.0	112		90.4	87.6		33.3	63.9	2.36	J 3.32	J 101		206	28.2		61.9		J 82.4	J 60.7		38.2 J	39.7	31.		23.7	J 50	J 26.8 J
Benzo[kjfluoranthene	207089	ug/kg			18.5	₩	91	131		117	106		14.6	61.4	2.23	3.38	J 120		231	31.1		75.7	174	J 251	J 139		77.7 J	67.3	78		52.5	J 110	J 40.5 J
Chrysene Dibenyla blanthracene	218019 53703	ug/kg ug/kg	384	2,800	21.7	+	132	164 24.4		138 20.4	136		140	88.9 15.2	0.253	J 4.68 J 0.723	J 25.3		362	42.9 8.33		94.7	321	455 J 15.5	.I 10.0		9.9 11	95.7 J 10.2	86. 10.		79.0	169	58.6 UJ 9.90 U.
Dibenz(a,h)anthracene Fluoranthene	53703 206440		63.4		4.41	+	239	24.4 364		474	19.6		21.2	15.2	7.05	0.723	J 25.3 291		702	92.7		233	619	1130	0 10.0	L UJ	9.9 U	J 10.2	J 13		10.2	UJ 10.1 209	123 U.J. 9.90 U.J.
Indenol1.2.3-edipyrene	193395	ug/kg	000	5,100	23.6	$\boldsymbol{+}$	83.5	108		94.6	90.1		36.5	67.2	2.39	1 3.20	J 102		215	27.4		64.2	71.2	J 87.5	J 60.5	-	39.5	43.8	33		27.2	J 51.0	J 28.1 J
Pyrene	129000	ug/kg	665	2.600	45.2	-	215	297		330	225		244	144	5.99	12.6	256		594	71.2		181	611	1140	665	- V	166	158	14		122	236	109
	SUMHPAH	ug/kg	1,700	9,600	260	-	1238	1697		1664	1336		338	863	33,3	48.3	1482		3341	411		986	2644	4212	2028		866	838	75		653	1301	567
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	2.86 J	0.093 U	J 0.016 U	J 0.013	UJ 3.87	J	4.34	J 0.274	UJ	1.99 J		1.90	2.10		1.30	1.00	1.2		0.880	1.70	0.680
4,4'-DDE	72559	ug/kg	2.2	27	0.066		2.23	4.53		0.068 U	2.50	J	2.78	0.057 U	0.010 1	0.008	U 7.51	J	5,74	0.167	U	4.37 J	1.90	1.30	1.40		1.30	0.790	1.4		1.30	2.00	0.400
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 1	J 0.017	U 1.62	J	2.60	0.360	U	1.51 J	0.850	1.50	4.00		0.750	0.620	0.9	00	0.530	2.20	0.028 U
Total DDX Aldrin	309002	ug/kg	1.58	46.1	0.112	٠	0.051	11 0.063		0.328 U 0.374 U	0.063		.051 U	0.272 U	0.045 1	J 0.038	U 0.378		0.243	0.801 U 0.915	U	0.374 11	0.008	4.70 II 0.008	7.50		0.008 t	2.41	U 0.0	0	0.008	5.90	U 0.200 U.
		ug/kg ug/kg			0.066		0.051			0.374 U		U 0		0.311 U		0.044	U 0.378			0.915			0.008		11 0.000		0.008 U		U 0.0			U 0.008	
cis-Nonachlor	5103719	ug/kg	_	_	0.019		0.015	U 0.019		0.109 U	0.133		.015 U	0.090 U	0.015	J 0.013	U 0.110		0.071	U 0.265		0.109 U	0.010	U 0.007	U 0.00		0.010 C	0.010	U 0.0		0.007	U 0.007	U 0.007 U
Dieldrin	60571	ug/kg	0.02	8	0.040		0.013	U 0.038		0.226 11	0.038			0.090	0.031	0.026	11 0.23			0.550		0.225 11	0.460	0.850	0.02		1.00	1.20	0.0		0.026	U 0.610	0.026
Endosulfan I	959988	ug/kg		_	0.036	Ü	0.028	U 0.035	Ü	0.206 U	0.035	0 0	.029 U	0.171 U	0.028	0.024	U 0.208	3 U	0.134	U 0.500	U ·	0.206 U	0.009	U 0.009	U 0.009) U	0.009 L	0.009	U 0.0	09 U	0.009	U 0.009	U 0.009 U
Endosulfan II	33213659	ug/kg			0.019	U	0.015	U 0.018	U	0.106 U	0.018	U 0	.015 U	0.088 U	0.015	J 0.013	U 0.107	7 U	0.069 U	U 0.260	U ·	0.106 U	0.019	U 0.019	U 0.019	U	1.20	0.019	U 0.0	19 U	0.019	U 0.740	0.019 U
Endrin	72208	ug/kg			0.022	U	0.017	U 0.021	U	0.123 U	0.021	U 0	.017 U	0.102 U	0.017	0.014	U 0.124		0.080 U	U 0.300	U ·	0.123 U	0.027	U 0.027	U 0.430		0.760	0.027	U 0.0		0.770	1.90	0.027 U
Gamma-Chlordane (trans)	5103742	ug/kg			0.040		0.031	U 0.039		0.228 U	0.038			0.189 U		J 0.027	U 0.23		0.15 U	U 0.555	U	0.228 U	0.710	0.910	0.220		1.8	0.009	U 0.0		1.50	0.720	0.830 J
Heptachlor	76448	ug/kg			0.041		0.032	U 0.040		0.235 U 0.482 U	0.039		.032 U	0.195 U	0.032 1	J 0.027	U 0.237		0.152 0.312 0.312	U 0.570		0.234 U 0.482 U	0.470	0.300 U 0.009	U 0.005		0.230	0.220	0.0 U 0.0		0.009	U 0.820 U 0.009	0.009 U
Heptachlor epoxide Hexachlorobenzene	1024573	ug/kg			0.085		0.066	U 0.082		0.482 U	0.081	0	.066 U	0.400 U	0.066	J 0.056	U 2.035		1.305	U 1.18		2.02 U	0.009	U 0.009	0.009		0.009 U	0.009	U 0.0		0.009	U 0.009	U 0.200 U. U 0.009 U
Lindane	58899	ug/kg ug/kg	_	_	0.334	- 11	0.274	U 0.341	- 11	2.013 U	0.337		.047 U	0.281 U	0.274	1 0.039	U 0.342		0.219	U 0.825	17 .	D 222 11	0.009	U 0.430	0.010		0.010 C	0.010	U 0.0		0.010	U 0.010	U 0.400 J
Methorsychlor	72435	ug/kg			0.039	11	0.073	11 0.090	II.	0.530 11	0.037			0.442	0.073 1	0.052	11 0.540		0.219	U 1.30	II .	0.530 11	0.015	U 0.125	U 0.12		0.015 U	0.013	U 0.1		0.125	U 0.013	U 0.125 U
Oxychlordane	27304138	ug/kg			0.082	Ŭ	0.063	U 0.079	Ü	0.464 U	0.078	UO	.064 U	0.385 U	0.063	0.054	U 0.469	U	0.301	U 1.13	U ·	0.464 U	0.710	0.010	U 1.60		0.010 t	0.010	U 0.2		0.010	U 0.290	0.200 U.
	8001352	ug/kg			1.71		1.33	U 1.65		9.70 U	1.63		1.34 U	8.10 U	1.33	J 1.13	U 9.80		6.30 t	U 23.8		9.70 U		U 0.019	U 0.019		0.019 t	0.019	U 0.0		0.019	U 0.019	U 0.019 U
trans-Nonachlor	39765805	ug/kg			0.018	U	0.014	U 0.017		0.100 U	0.017		.014 U	0.083 U	0.014	J 0.012	U 0.101		0.065 1	U 0.244		0.100 U	0.009	U 0.010	U 0.010	U (0.010 L	0.010	U 0.0		0.010	U 0.010	U 0.200 U.
	SUMCHLOR	ug/kg	0.5	- 6	0.300	U	0.233	U 0.289	U	1.710 U	0.285	UO	.234 U	1.42 U	0.233	0.198	U 1.72	U	1.11 U	U 4.2	U	1.7 U	1.4	0.95	1.8		1.8	0.044	U 0.2	65	1.54	1.04	1.25
PCBs	04000405				0.16	12	0.044	11 0.071		0.000	0.050		041 22	0.049	0.041		11 0.000		0.000	0.000	111	0.06	0.015	11 0.01	11 0000		0.015	0.015	77 0.0		0.017	11 0.01	11 0015
	34883437	ug/kg	_	-	0.104		0.041	U 0.050	- 0	0.059 U 0.043 U	0.050		.041 U	0.049 U	0.041 1	J 0.035 I 0.025	U 0.060		0.039	U 0.145		0.06 U	0.015	U 0.015	U 0.01		0.015 U	0.015	U 0.0		0.015	U 0.015	U 0.015 U
PCB 018 PCB 028	7012375	ug/kg ug/kg	_	_	0.076	11	0.030	U 0.037	11	0.043 U	0.036	0 0	050 1	0.030 L	0.030	0.025	U 0.044	1 11	0.028	0.105	II .	0.043 U	0.017	U 0.017	U 0.01	U U	0.017	0.017	U 0.0	15 U	0.017	U 0.017	U 0.017 U
	41464395	ug/kg			0.129	0	0.056	U 0.062	111	0.074 U	0.062	11 0	.056 U	0.061 U	0.056	0.043	11 0.083	3 11	0.048 (0.200	TI I	0.073 0	0.015	U 0.013	11 0.001	3 11	0.015 0	0.015	U 0.0	08 II	0.008	U 0.013	U 0.015 U
	41464408	ug/kg		_	0.140	Ŭ	0.055	U 0.068	Ü	0.080 U	0.067		.055 U	0.067 U	0.055	1 0.047	U 0.081	Ŭ	0.052	U 0.195	ŭ,	0.080 U	0.008	U 0.009	U 0.000		0.009 U	0.009	U 0.0	09 U	0.008	U 0.009	U 0.009 U
	35693993	ug/kg			0.080	Ü	0.308	J 0.248	Ĵ	0.046 U	0.038		.031 U	0.038 U	0.031	J 0.027	U 0.046	5 U	0.506	0.111	U ·	0.046 U		U 0.010	U 0.010		0.010 U	0.010	U 0.0	10 U	0.010	U 0.010	U 0.010 U
PCB 066	32598100	ug/kg			0.075	Ü	0.029	U 0.036	U	0.043 U	0.036	UO	.030 U	0.036 U	0.029 1	J 0.025	U 0.043	3 U	0.028	U 0.105	U	0.043 U	0.007	U 0.007	U 0.00	7 U	0.007 U	0.007	U 0.0	07 U	0.007	U 0.007	U 0.007 U
	38380028	ug/kg			0.061		0.302	J 0.030	U	0.035 U	0.029		.024 U	0.029 U	0.024 1	J 0.020	U 0.035		0.023 t	U 0.085		0.035 U	0.007	U 0.007	U 0.00		0.007 U	0.007	U 0.0		0.007	U 0.007	U 0.007 U
	37680732	ug/kg			0.123		0.819	0.059		0.070 U	0.059		.048 U	0.270 J		J 0.041	U 0.357		0.747	0.170		0.070 U	0.006	U 0.006	U 0.004		0.006 U	0.006	U 0.0		0.006	U 0.006	U 0.006 U
	32598144	ug/kg			0.110		0.043	U 0.053		0.063 U			.043 U	0.052 U		J 0.037	U 0.063		0.041 0	U 0.153		0.063 U		U 0.010	U 0.010		0.010 t		U 0.0		0.010	U 0.010	U 0.200
	31508006	ug/kg			0.116	U	0.571	0.056	U	U 880.0	0.056	UO	.046 U	0.055 U	0.045	0.039	U 0.067	U	0.590	0.162	U ·	0.056 U	0.011	U 0.250	0.01		0.011 t	0.011	U 0.0	11 U	0.011		U 0.011 U
PCB 128 PCB 138	38380073	ug/kg ug/kg	_	-	0.137	U	0.053	U 0.066	U	0.078 U	0.066	U 0	.054 U	0.065 U	0.053 1	J 0.046	U 0.079	, ,	0.051 U	0.191	U I	0.078 U	0.005	U 0.005	U 0.003		0.005 L	0.005	U 0.0	usi U	0.005	U 0.005	U 0.005 U
	35065282	ug/kg	_	_	0.088	11	0.922	0.625		0.290 J 0.104 II	0.092		.278 J	0.453 J	0.034	0.029	U 0.389		0.657	0.122		0.050 U	0.280	0.360	0.230		0.220	0.008	U 0.0		0.260	U 0.290	0,008 U
	35065271	ug/kg		_	0.183	U	0.026	U 0.033		0.039 11	0.087		.027 II	0.292 U	0.071	1 0.022	U 0.039		0.025	0.254		0.039 U	0.260	U.310	11 0.01		0.006 C	0.006	U 0.0		0.006	U 0.220	U 0.006 U
PCB 170	35065293	ug/kg		_	0.069	U	0.026	J 0.033		0.039 U	0.032		.027 U	0.032 U	0.020	1 0.023	U 0.040		0.025	U 0.096		0.039 U	0.007	U 0.007	U 0.00		0.007 1	0.007	U 0.0		0.007	U 0.007	U 0.007 U
	52663691	ug/kg			0.037	Ü	0.015	U 0.018		0.021 U				0.018 U		J 0.012	U 0.022		0.014	U 0.052		0.021 U		U 0.006	U 0.00		0.006 U		U 0.0		0.006	U 0.006	U 0.006 U
(PCB 184)	74472483	ug/kg			0.076	U	0.030	U 0.037	U	0.043 U	0.036	UO	.030 U	0.036 U	0.030 1	J 0.025	U 0.044	Ü	0.028 U	U 0.105	U	0.043 U	0.012	U 0.012	U 0.013	U S	0.012 U	0.012	U 0.0	12 U	0.012	U 0.012	U 0.012 U
PCB 187	52663680	ug/kg			0.099	U	0.213	J 0.048	U	0.056 U	0.047	U 0	.039 U	0.047 U	0.039 1	J 0.033	U 0.057	7 U	0.037	U 0.138	U	0.056 U	0.008	U 0.008	U 0.001	3 U	0.008 U	0.008	U 0.0	08 U	0.008	U 0.008	U 0.008 U
	52663782	ug/kg			0.129	U	0.050	U 0.062	U	0.074 U	0.062	UO	.051 U	0.061 U	0.050 1	J 0.043	U 0.075	U	0.048	U 0.180		0.074 U	0.009	U 0.009	U 0.009		0.009 U	0.009	U 0.0	09 U	0.009	U 0.009	U 0.009 U
	40186729	ug/kg			0.132	U	0.051	U 0.064	U	0.075 U	0.063	UO	.052 U	0.063 U	0.051 1	J 0.044	U 0.07€	5 U	0.049 (U 0.184		0.075 U	0.011	U 0.011	U 0.01		0.011 t	0.011	U 0.0	11 U	0.011	U 0.011	U 0.011 U
		ug/kg					0.059			0.086 U				0.072 U			U 0.087						0.005		U 0.003			0.005				U 0.005	
Total PCBs	Sun/IOAA18	ug/kg	22.7	180	4.02	C	8.34	3.98		2.77	1.92	- 2	2.33	3.56	1.56	1.33	U 3.95		8.87	5.59	ď	2.29 U	1.4	2.1	1.2		0.751	0.326	U 0.3	26 U	0.831	1.3	0.705

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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 ^d Mean Qual	IOSN 2019 Mean Qual	Composite Mean Qual
Trace Metals		7.104.11	1110111 Quiti	
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 b	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	μg/Kg	0.381 a	0.286 a	4.22 aNS
Anthracene	μg/Kg	0.903 ab	0.310 a 0.581 a	0.610 abS
Benzo(a)anthracene Benzo(a)pyrene	μg/Kg	0.775 a 0.813 a	0.581 a 0.610 a	0.766 ac 0.805 ac
Benzo(a)pyrene Benzo(b)fluoranthene	μg/Kg μg/Kg	0.813 a 1.08 a	0.807 a	2.43 aS
Benzo(k)fluoranthene	μg/Kg μg/Kg	0.493 a	0.371 a	6.45 aS
Benzo(g,h,i)perylene	μg/Kg 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	μg/Kg	0.0638 a	0.0480 a	0.0632 ac
PCB 018	μg/Kg	0.0465 a	0.0349 a	0.0460 ac
PCB 028	μg/Kg	0.0790 a	0.0593 a	0.0784 ac
PCB 044	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 PCB 128	μg/Kg	0.0713 a 0.0842 a	0.0534 a 0.0632 a	0.0706 ac 0.0834 ac
PCB 128 PCB 138	μg/Kg μg/Kg	0.0642 a 0.305 ab	0.0632 a 0.331 ab	0.462 aNS
PCB 153	μg/Kg μg/Kg	0.628 b	0.763	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	μg/Kg	0.0928 a	0.0697 a	0.0920 ac
Total PCBs	μg/Kg	4.39	3.79	6.42
Pesticides				
Aldrin	$\mu g/Kg$	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 Total Chlordanes	μg/Kg	0.0501 a 0.184	0.0752 a 0.277	0.0495 ac 0.182
4,4'-DDT	μg/Kg μg/Kg	0.0159 a	0.0238 a	0.0158 ac
4,4'-DDD	μg/Kg 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	0.688
Dieldrin	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	$\mu g/Kg$	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.

^d Pre-test tissue represents the mean of three replicates, whereas the reference and site composites represent a mean of 5 replicates.

^e 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 ^d 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 ^c
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 α =0.05. S = Significant - mean tissue body burden was statistically different, greater than the associated reference site mean body burden. Statistical significance accepted at α =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.

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

^e 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 Fillet				
	Test	6.01E-6	3.72E-2			
	Reference	1.66E-6	1.74E-2			
		Nereis 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	n Fillet		
	Test	5.09E-6	8.9E-2		
	Reference	1.63E-6	3.72E-2		
		Nereis 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	Lobster 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	Х
4,4'-DDD	X
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	X
Fluorene	×
Naphthalene	×
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	X			
Pyrene	X			
Total DDT	X			
Total PCBs	X			
Cadmium	X			
Chromium	Х			
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>	,,,	22	Ū	1111		2772	
Pentachlorophenol	87865	ug/L	13	0.290	U	0.224	U	0.222	U
Pesticides	3,300	45/1	10	0.250		0.221	Ĭ	0.222	Ĭ
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	0.00008	U	0.00008	U
Alpha-Chlordane (cis)	5103719	ug/L ug/L	1.5	0.00023	U	0.00018	U	0.00018	U
Dieldrin	60571		0.71	0.00011	U	0.00008	U	0.00008	U
	2921882	ug/L	0.71	0.00008	U	0.00004	U	0.00004	U
Chlorpyrifos		ug/L			_				
Endosulfan I	959988	ug/L	0.034	0.00011	U	0.00008	U	0.00008	U
Endosulfan II	33213659	ug/L	0.034	0.00010	U	0.00007	U	0.00007	U
Endrin	72208	ug/L	0.037	0.00012	U	0.00008	U	0.00008	U
Gamma-Chlordane (trans)	5103742	ug/L		0.00005	U	0.00004	U	0.00004	U
Heptachlor	76448	ug/L	0.053	0.00008	U	0.00006	U	0.00006	U
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									
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	Ū	0.00009	Ū	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		01					<u> </u>		

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

^{*} indicates average includes detects and non-detects



9.0 List of Authorizations Required for Project

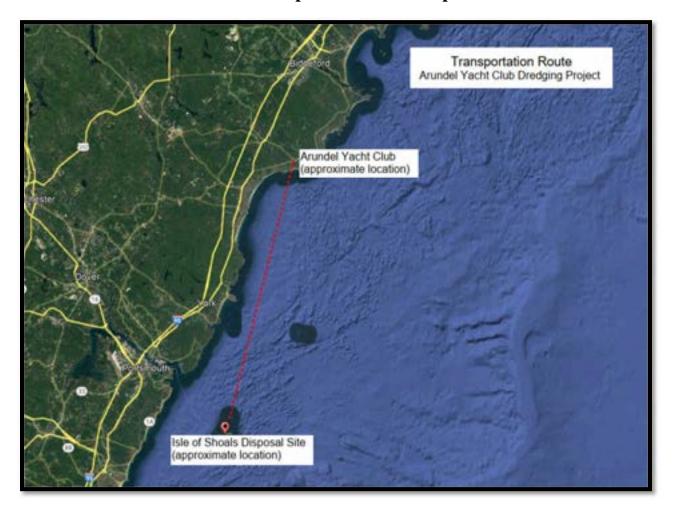
The following authorizations are required by federal, state, and local agencies to conduct the proposed dredging work at the AYC:

Authorization	Regulatory Entity	Status	
Section 408	U.S. Army Corps of Engineers	Submitted on 9/6/2024	
Pre-Construction Notification	U.S. Army Corps of Engineers	Application included herein	
Individual NRPA Permit	Maine Department of Environmental Protection	Submitted concurrently with this Pre-Construction Notification	
Kennebunk River	Town of	To be submitted in late	
Committee Approval	Kennebunkport/Kennebunk	winter/early spring 2025	
Kennebunk River Harbor	Town of	To be submitted in late	
Master Approval	Kennebunkport/Kennebunk	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.

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 Arundel Yacht Club (AYC), 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 AYC 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 AYC is 8,031 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 14 to 17 trips to the IOSN Disposal Site.

AYC Maine DEP NRPA Individual Permit Application (Submitted on October 3, 2024)

Maine DEP Natural Resources Protection Act (NRPA) Permit Application

For

Arundel Yacht Club 51 Ocean Ave Kennebunkport, Maine

October 3, 2024

Applicant

Arundel Yacht Club 51 Ocean Ave Kennebunkport, Maine

Prepared By:



One Karen Drive, Suite 2A Westbrook, Maine 207.553.9898

*THIS IS A RESUBMISSION OF THE NRPA PERMIT APPLICATION PACKAGE ORIGINALLY SUBMITTED TO THE DEP ON OCTOBER 3, 2024. THIS PACKAGE HAS BEEN UPDATED TO INCLUDE NOTICE TO ABUTTERS WITHIN 1,000 FEET, INSTEAD OF 150 FEET. PLEASE SEE THE ATTACHED EMAIL CORRESPONDENCE WITH DEP ABOUT THE RESUBMISSION AND WAIVED REVIEW FEE.

DEP EMAIL CORRESPONDENCE REGARDING THE RESUBMISSION AND WAIVED REVIEW FEE

Leyna Tobey

From: Sirois, Alison <Alison.Sirois@maine.gov>
Sent: Friday, November 8, 2024 10:06 AM

To: Leyna Tobey

Subject: RE: L-19091-4E-B-N, ATS#93178 Kennebunkport - Arundel Yacht Club - NRPA Individual

Permit Application

I can let our admin staff know you are withdrawing the application.

Once you have sent the notice to the additional abutters, repackage and resubmit via the online portal noting that the application is a resubmittal and the fee is being waived. You can include this email with the application.

From: Leyna Tobey <leyna@Walsh-eng.com> **Sent:** Friday, November 08, 2024 8:36 AM **To:** Sirois, Alison <Alison.Sirois@maine.gov>

Subject: RE: L-19091-4E-B-N, ATS#93178 Kennebunkport - Arundel Yacht Club - NRPA Individual Permit Application

EXTERNAL: This email originated from outside of the State of Maine Mail System. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hey Alison,

Thanks so much for the explanation and guidance on this! I will let the rest of the Walsh office know about the Chapter 2 rule changes as well, so we get this right moving forward.

To withdraw the application: Do I just reply to my original submission email and say that I am withdrawing the application and will resubmit with updated abutter notice documentation under a separate email? I just want to make sure I get the process right.

Thanks!

Leyna

From: Sirois, Alison <<u>Alison.Sirois@maine.gov</u>>
Sent: Friday, November 8, 2024 8:30 AM
To: Leyna Tobey <<u>leyna@Walsh-eng.com</u>>

Subject: RE: L-19091-4E-B-N, ATS#93178 Kennebunkport - Arundel Yacht Club - NRPA Individual Permit Application

Hi Leyna,

We are updating the website and removing this element from the NRPA handbook but some applications came in during this transition period. We apologize for that.

The best path forward is for you to withdraw and resubmit this application. If you do that then you only must notice the additional abutters and then submit those newly noticed with the other list of abutters you already noticed for the initial submittal. We can waive the fee for the resubmittal (obviously). We also can honor the original submittal date toward the statutory deadline. Another change you should be aware of is the fact that you do not have to notice abutters with certificate of mailing or certified mailings any longer. We just need a list of abutters notices, evidence of the date of mailing and a map and list with all abutters notified within 1000 feet.

Let me know if you have questions. I am including the new Chapter 2 rules below.

- A. Recipients and Publication. Notice must be mailed to the following:
 - (1) abutters and all persons owning land within 1,000 feet of the proposed project. Use of local tax records or other reliable means is acceptable for purposes of identifying property owners requiring notice;
 - (2) the municipal office(s) where the proposed project is located; and
 - (3) the county commissioner(s) where the proposed project is located, if the proposed project is located in an unorganized or deorganized area of the State.

Notwithstanding section 13(C) of this rule, notice must also be published once in a newspaper with a general circulation in the vicinity of or as close as possible to the area where the project is located, in accordance with 1 M.R.S. § 601.

Copies of the published notice and a list of persons to whom notice was provided must be submitted with the application. Failure to submit documentation that notice was provided as required may result in a determination that the application is incomplete and not acceptable for processing.



Alison Sirois (she/her)
Regional Manager, Bureau of Land Resources
Maine Department of Environmental Protection
Phone (207)699-7028 Office (207)822-6300
www.maine.gov/dep

From: Leyna Tobey < leyna@Walsh-eng.com>
Sent: Friday, November 08, 2024 8:01 AM
To: Sirois, Alison < Alison. Sirois@maine.gov>

Subject: RE: L-19091-4E-B-N, ATS#93178 Kennebunkport - Arundel Yacht Club - NRPA Individual Permit Application

EXTERNAL: This email originated from outside of the State of Maine Mail System. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hey Alison,

I only sent notices to the direct abutters to the property following the instructions in the NRPA application information booklet (screenshotted below). I didn't notice that the Chapter 2 rules were updated, but can get the additional abutters notices sent out today. Should I wait to submit proof of notification to the Department until the project is assigned a Manager?

Thanks!

08/2024

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.

- 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.
- 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.
- Municipal Office: You must send a copy of the Notice of Intent to File and a duplicate of the entire
 application to the Municipal Office.

ATTACH a list of the names and addresses of the owners of abutting property.

From: Sirois, Alison < Alison.Sirois@maine.gov > Sent: Thursday, November 7, 2024 3:30 PM
To: Leyna Tobey < leyna@Walsh-eng.com >

Subject: RE: L-19091-4E-B-N, ATS#93178 Kennebunkport - Arundel Yacht Club - NRPA Individual Permit Application

Hi Leyna,

Did you notice all abutters within 1000 feet of the project site pursuant to the Chapter 2 rules for this application? This change went into effect on September 15th, 2024.



Alison Sirois (she/her)
Regional Manager, Bureau of Land Resources
Maine Department of Environmental Protection
Phone (207)699-7028 Office (207)822-6300
www.maine.gov/dep

From: Leyna Tobey < leyna@Walsh-eng.com>
Sent: Thursday, October 03, 2024 11:41 AM

To: DEP, Land Application < DEP.LandApplication@maine.gov>

Cc: Bill Walsh <bill@Walsh-eng.com>; Werner Gilliam <werner@Walsh-eng.com>; Matt Tuller

<matt@atlanticcomfort.com>; Costas Balomenos <fredandoakie@gmail.com>

Subject: L-19091-4E-B-N, ATS#93178 Kennebunkport - Arundel Yacht Club - NRPA Individual Permit Application

EXTERNAL: This email originated from outside of the State of Maine Mail System. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good morning,

On behalf of the Arundel Yacht Club (AYC), Walsh Engineering Associates, Inc. is submitting the attached NRPA Individual Permit Application for proposed dredging activities at the AYC's property at 51 Ocean Avenue in Kennebunkport, ME.

The attached PDF includes the NRPA Application form, proof of processing/licensing payment on the DEP's Payment Portal, and Attachments 1 through 13. Due to file size, Attachments 14 through 16 and Appendices A through D were not included in this email. Our team will await correspondence from the assigned DEP project manager to submit the remainder of the application.

Please let us know if you have any questions. Thanks in advance for your time!

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



This transmission is intended only for the individual or entity to which it is addressed, and may contain information that is privileged, confidential and exempt from disclosure under applicable law. If the reader of this communication is not the intended recipient, or an employee or agent responsible for delivering the communication to the intended recipient, you are notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error please contact the sender at 207-553-9898.



October 3, 2024

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

RE: Individual NRPA Permit Application Arundel Yacht Club Kennebunkport, Maine 04046

To Whom it May Concern,

On behalf of the Arundel Yacht Club (AYC, 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 AYC.

The AYC is located at 51 Ocean Ave in Kennebunkport, Maine, with 161 feet of frontage along the Kennebunk River. The Town of Kennebunkport Assessor's Office identifies the parcel as Map 10, Block 5, Lot 1 The facility is a 0.42-acre parcel of land with an 18,100 square foot 1.5-story shingled historical building known as the "Thomas Goodwin Rope Walk," which is now used as the AYC. The property maintains associated parking areas and fifty boat slips. The proposed dredge area is coincidental with the area that was previously permitted under Maine DEP Permit #L-22701-4E-A-N in 2006. Since that time, it has been dredged in August 2015 under Maine DEP's Permit by Rule (PBR) process and U.S. Army Corps of Engineers (USACE) Permit #NAE-2006-26, and once more in January 2017 under another PBR.

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. Tobery

cc. AYC

Enc. NRPA Application & Supporting Documents

Table of Contents Maine DEP – NRPA Application

Arundel Yacht Club Kennebunkport, ME 04046

NRPA Permit Application Proof of Payment Agent Authorization Certificate of Good Standing Deed/Right/Title/Interest

Activities Description	Attachment 1
Alternatives Analysis	Attachment 2
Site Location Map	
Photo Log	Attachment 4
Site Plan	
Additional Plan (Section Views)	Attachment 6
Construction Plan	Attachment 7
Erosion and Sedimentation Control Plan	
Site Conditions Report	Attachment 9
Notice of Intent to File	Attachment 10
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	• •

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

FOR DEP USE		
ATS #		
-= <u></u>		
Гotal Fees:		
Date: Received		

APPLICATION FOR A NATURAL RESOURCES PROTECTION ACT PERMIT → PLEASE TYPE OR PRINT IN BLACK INK ONLY

1. Name of Applicant:	Arundel Yacht Club c/o Matthew Tuller			5.Name of Agent: Walsh Engineering Associate			ates, LLC				
2. Applicant's Mailing Address:	PO Box 328 Kennebunkport, Maine 04046						One Karen Drive, Suite 2A Westbrook, Maine 04092				
3. Applicant's Daytime Phone #:					7. Agent's Daytime Phone #:		20	7.553	.9898		
4. Applicant's Email A (Required from either or agent):		matt@at	lanticco	omfort.com	8. Agent's Email Addres		ddress:	Leyna@walsh-eng.com			g.com
9. Location of Activity (Nearest Road, Street,		Ocean	Ave		10. Town:	Kennek	ounkpoi	11. C	ounty:	′ork	
12. Type of Resource: (Check all that apply)	☐ River, st☐ Great Po☐ Coastal	ond	ook	ook		of Resou		Kenne	ebunk F	Rive	er
		iter Wetland Special Sig		nce		ınt of Impa .Ft.)	act:	Fill:			
		int Wildlife				- Sq Ft (D	redge Ar	``	ging/Veg Re cy dredging (includ		
15. Type of Wetland:	☐ Forested	d		<i>T</i> .		OR FRES		R WETI		m.	2
(Check all that apply)	☐ Scrub S			Tier	1		Tier 2			Tier .	3
	□ Wet Mea□ Peatland■ Open W□ Other	d	Į	□ 0 - 4,999 □ 5,000-9,9 □ 10,000-1	999 sq ft	q ft		0 sq. ft.	t. □ > 43,560 sq. ft. or □ smaller than 43,560 sq. ft., not eligible for Tier 1		
16. Brief Activity Description:	Dredging	of the rive	er at th	ne Arundel	Yacht Cl	ub to pro	vide ade	equate o	depth for r	navig	gation
17. Size of Lot or Parc	el 🖂	square f	eet or	☑ 0.42	acres UTI	M Northine	1· 4801636.	13 m N j	TM Fasting	· 19 T	380382.60 m E
& UTM Locations: 18. Title, Right or Inter				—	30.00		j		Tivi Edourig	_	
To: Title, Right of Intel	■ ov		□ lea		chase option		ritten agr		.,	l	
19. Deed Reference No		Book#: ₂₃₂₄	۱ ۲	Page: ₃₂₆		p and Lot		Map 10		Lot #	
21. DEP Staff Previous Contacted:	sly	Alison Sirois Alex Groblews	ski		22. Part of project:	of a larger	Ye			⊒ Ye ■ No	-
23. Resubmission	■ Yes→	If yes, pro	evious	1 2270)1-4E- <i>[</i>	N NI Pro	evious p		Alison		
of Application?:	□ No	applicatio			/	1-1V m	anager:	25 D			
24. Written Notice of Violation?:	☐ Yes → No	If yes, na enforceme		ff involved:					vious Wetla eration:	ana	☐ Yes ☐ No
26. Detailed Directions to the Project Site:	From Portland, take I-95 South; Exit 32, Route ME-111, then onto Precourt Street; turn right onto US-1										
27. TIER					TIER	2/3 AND I	INDIVIDU	AL PERI	MITS		
☐ Title, right or interes:☐ Topographic Map											
☐ Narrative Project De											
☐ Plan or Drawing (8 1☐ Photos of Area	/2" x 11") Information Meeting Documentation ☐ Compensation Plan (Attachment 4), if required										
☐ Statement of Avoida	(Attachment 1) that contains the Appendix A and others, if required										
☐ Statement/Copy of c			Information listed under Site Conditions ■ Alternatives Analysis (Attachment 2) including description of how wetland impacts were Avoided/Minimized ■ Statement/Copy of cover letter to MHPC □ Description of Previously Mined Peatland, if required								
28. FEES Amount End	closed:	Proof of Paym		P's Online Payment							
CEF	RTIFICA	TIONS	AN	CERTIFICATIONS AND SIGNATURES LOCATED ON PAGE 2							

<u>IMPORTANT</u>: 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)."

gned by Leyna Tobey, PE fo: leyna@walsh-eng.com 4.10.03 10:01:39-04'00'

SIGNATURE OF AGENTAPPLICANT

Inc. Leyna@walsh-eng.com 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		\$651.00	Arundel Yacht Club Dredging NRPA Individual Permit Code: 4E - other activity on a Coastal Wetland Processing Fee: \$521; Licensing Fee: \$130;

Receipt ID: 7520

Transaction Date: 10/3/2024 10:22:55 AM

Transaction Summary					
Payment	\$651.00				
Service Fee	\$2.00				
Total	\$653.00				

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,

By this letter, the undersigned, a representative of the Arundel Yacht Club authorizes Walsh Engineering Associates, Inc. to act as the agent for the undersigned in the preparation and submission of all Federal, State, and Local City permit applications and relevant documents and correspondence for all necessary permits for the dredging of the AYC Marina located at 51 Ocean Ave, 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.

Sincerely,

Signature

Anita O. Carroll AYC VICE Commodore

1 27 2022

Date



Corporate Name Search

Information Summary

Subscriber activity report

This record contains information from the CEC database and is accurate as of: Thu Feb 24 2022 12:58:37. Please print or save for your records.

Legal Name	Charter Number	Filing Type	Status	
ARUNDEL YACHT CLUB	19570017ND	NONPROFIT CORPORATION (T13- B)	GOOD STANDING	
Filing Date	Expiration Date	Jurisdiction		
05/23/1957	N/A	MAINE		
Other Names		(A=Assumed ; F=Former)		

NONE

Clerk/Registered Agent

DURWARD W. PARKINSON C/O BERGEN & PARKINSON, LLC 62 PORTLAND ROAD, SUITE 25 KENNEBUNK, ME 04043

Know All Men by These Presents, that

The, ARUNDEL YACHT CLUB OF KENNEBUNKPORT, Maine, a Maine Corporation duly organized by law and having its established place of business in the Town of Kennebunkport, County of York and State of Maine,

in consideration of ***SIXTY-EIGHT THOUSAND (\$68,000.00)*** dollars, paid by The Ocean National Bank of Kennebunk, a national banking association and corporation established under the laws of The United States at Kennebunk, in the County of York, and State of Maine, the receipt whereof is hereby acknowledged, do hereby give, grant, bargain, sell and convey unto the said The Ocean National Bank of Kennebunk, its successors and assigns forever a certain lot or parcel of land with all buildings or other structures thereon now owned by the Grantor and commonly known as the "Ropewalk", situated in Kennebunkport, County of York and State of Maine, on the westerly side of Ocean Avenue (formerly known as Water Street and formerly known as River Road), bounded and described as follows:

BEGINNING at a point marked by a one (1) inch iron pipe driven in the ground on the southwesterly side of said Ocean Avenue, said iron pipe being located thirty-six and forty-nine hundredths (36.49) feet southwesterly from the center of a hydrant located near the northeasterly sideline of said Ocean Avenue, said iron pipe also being located seventy-five and twenty-five hundredths (75.25) feet northerly from the center of a U.S. Army Corps of Engineers "flagpole", situated on land of George W. Day, et al, said iron pipe also being one hundred sixty-five and fifty hundredths (165.50) feet southeasterly, as measured along said Ocean Avenue from another one (1) inch iron pipe driven in the ground on the southwesterly side of said Avenue at the northerly corner of the premises herein described; thence South 61° 33' 29" West by said Day land to the channel of the Kennebunk River; thence North bounding westerly by the channel of said River to land now or formerly of Marian B. Cox; thence North 59° 18' 49" East by said Cox land to said Ocean Avenue, which point is marked by a one (1) inch iron pipe driven into the ground, said iron pipe being located sixty-eight and five hundredths (68.05) feet southeasterly from the norhterly corner of the main building standing on said Cox land and also being thirty-five and twelve hundredths (35.12) feet easterly from the easterly corner of said building standing on said Cox land and also being sixty-eight and sixty-three hundredths (68.33) feet easterly from the southerly corner of said building standing on said Cox land; thence southeasterly by said Ocean Avenue, one hundred sixty five and fifty hundredths (165.50) feet to the point of beginning.

Together with all its right, title and interest in and to the land under said Ocean Avenue to the center line thereof, and also together with all its right, title and interest in and to that portion of the bed of Kennebunk River between high and low water mark covered by the above description, subject to all rights of navigation and other rights of the public in riparian lands on tide water, as now owned by the Grantor.

The above described premises are conveyed subject to any existing easements for the maintenance of drainage of other pipe lines crossing the same and any other easements or servitudes of record insofar as any of the same may now be in force and effect.

Reference may be had to a plan entitled "Plan Showing Land of the Arundel Yacht Club of Kennebunkport, Maine" drawn by Thomas J. Ober, Surveyor, November 2, 1964 and duly recorded in the York County Registry of Deeds, Plan Book 40, Page 5, said plan gives the bearing of the southwesterly side of said Ocean Avenue as North 30° 41' 11" West, true meridian and the courses herein given are calculated from it. the above described premises are conveyed subject to such additional agreements as were set forth in a certain exchange of quit-claim deeds by and between the within Grantor and Marian B. Cox both dated December 14, 1964 and duly recorded in said York Registry of Deeds, Book 1633, Pages 10 and 73.

Further reference may also be had to another exchange of quit-claim deeds by and between the within Grantor and George W. Day, et al duly recorded in said York Registry, Book 1633, Pages 248 and 251.

The within Grantor traces title to the above described premises under deed from Julia B. Fuller dated February 28, 1962 and recorded in said York Registry, Book 1484, Page 32.

The above described premises are conveyed subject to the conditions, covenants and restrictions set forth in said deed from Julia B. Fuller to the within Grantor as aforesaid.

The Hanr and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said The Ocean National Bank of Kennebunk, its successors and assigns forever, to its and their use and behoof forever. And it for itself and heirs, executors, administrators, successors and assigns do covenant with the said Grantee, its successors and assigns, that it is lawfully seized in fee of the granted premises; that they are free from all incumbrances; that it hashave good right to sell and convey the same to said Grantee to hold as aforesaid; and that it and its heirs, successors and assigns shall and will Marrant and Orfern the same to the said Grantee, its successors and assigns forever, against the lawful claims and demands of all persons.

Together with all heating furnaces and boilers, oil burners and attachments thereto, heaters, water tanks, mantels, gas and electric light fixtures, screens, storm doors and windows, screen doors, window shades, awnings, and all other fixtures of whatever kind or nature at present contained in said buildings and hereinafter placed therein prior to the full payment and discharge of this mortgage, which are hereby agreed to be a part of the mortgaged real estate.

will not suffer or commit And itdoes covenant and agree with the Grantee herein that it any strip or waste of the above granted premises.

heirs, executors or administra-Pruvided Nevertheless. That if the said Grantor, its tors, successors and assigns shall pay to the said Grantee, its successors or assigns, the sum of

SIXTY-EIGHT THOUSAND per centum per annum, from the date hereof, with interest on said sum at the rate of 98 until said note mentioned herein, is fully paid, and shall pay all taxes and other assessments laid upon said property, promptly when due, and shall at all times keep said buildings insured, payable to said Grantee, to the extent of the claim hereby secured, and shall repay to said Grantee its successors or assigns, all sums it or they may pay for taxes, water and sewer charges, discharge of liens, assessments, insurance, including insurance under the Provisions of the Flood Disaster Protection Act of 1973, reasonable repairs and improvements upon said premises, and all expenses, if any are incurred, of foreclosure of this mortgage, with interest on said sums as aforesaid, then certain promissory note bearing this deed, as also even date with these presents, given by the said Grantor to the said Grantee, to pay the said sum and interest at the time aforesaid, shall both be void, otherwise shall remain of \$ 68,000.00 in full force.

Provided, further, that it is an additional covenant of the Grantor herein for breach of which foreclosure may be claimed and for breach of which all indebtedness secured hereby may be declared due and payable at once, that title to the within described mortgaged premises shall not pass from Grantor or from any subsequent title holders, either voluntarily or involuntarily. This covenant shall continue until all indebtedness and obligations secured hereby are satisfied, or permission given, or election not to foreclose or accelerate said indebtedness by Grantee, its successors or assigns. Failure of Grantee to make such election as to any one such transfer, shall not constitute a waiver of any rights of Grantee, its successors or assigns, as to any subsequent such transfer of title as to which this covenant shall remain in full force and effect. The term title as used herein shall mean the estate of the Grantor subject to the lien of this mortgage.

Provided, further, that if the Grantor herein is a corporation, the Grantee, its successors and assigns, shall have the Statutory Power of Sale in addition to any other remedies for breach of any covenant, condition or agreement herein contained.

In Milness Mherrof. it, the said Arundel Yacht Club of Kennebunkport, Maine, has caused this instrument to be sealed with its corporate seal and signed in its corporate name by David C. Richardson, Commodore, THE THE TENENT AND Stephen I. Harriman, Treasurer, thereunto duly authorized,

in its description Grant to a	forskessmodensing	aforcanial techn		ximescassand into by
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HOSEON XXIII DE HEREKE	/ baloui anni xoak		twentieth	day of
March /, in t	he year of our Lord or			seventy-eight.
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March 20. YORK, SS. Personally appeared the above named David, C. Richardson, Commodore and Stephen Treasurer and acknowledged the above browns, instrument to be their free act and deed, in their said emacitites and the free let and deed of otary Public 📝 said corporation.

**PERCENTAGE CONTRACT** 

# 3 EU 5 TO 7 18 Becrived 12 0 1978 end recorded from the original

Attachment 1:

**Activities Description** 

#### 1.0 Activities Description

The Arundel Yacht Club (AYC) is located at 51 Ocean Avenue in Kennebunkport, Maine, with 161 feet of frontage along the Kennebunk River. The Town of Kennebunkport's Assessor's Office identifies the parcel as Map 10, Block 5 Lot 1. The facility is a 0.42-acre parcel of land with an 18,100 square foot 1.5-story shingled historical building known as the "Thomas Goodwin Rope Walk," which is now used as the yacht club. The property maintains associated parking areas and 50 boat slips.

#### **Existing Conditions**

The AYC 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 AYC's dredging activities date back to the 1970s, with the most recent permits issued for maintenance dredging in 2017. Silt, sand, and other natural deposits have impacted the marina of the AYC and have limited boat navigation and berthing depths, especially during periods of low tide.

#### **Proposed Project**

The applicant is proposing to mechanically dredge approximately  $8,031\pm$  cubic yards of sediment from the area in front of the AYC, including in and around the boat slips, to provide adequate depth for navigation and berthing.

The area of the dredge will be an approximately 180-foot by 250-foot area (~45,356 square feet). 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 AYC dredge area is coincidental with the area that was previously permitted under Maine Department of Environmental Protection (DEP) Permit #L-22701-4E-A-N in 2006. Since that time, it has been dredged in August 2015 under Maine DEP's Permit by Rule (PBR) and U.S. Army Corps of Engineers (USACE) Permit #NAE-2006-26, and in January 2017 under Maine DEP's PBR.

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

**Attachment 2:** 

**Alternative Analysis** 

#### 2.0 Alternatives Analysis

#### **Dredging Alternatives Analysis**

WEA studied several alternatives for the Arundel Yacht Club (AYC) 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 AYC with safe navigation and anchoring conditions for watercraft.

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

#### **Existing Conditions**

The AYC (site) encompasses approximately 0.42 acres of land. The Arundel Wharf, Ocean Avenue and a residence border the site to the north; residences and Ocean Avenue border the site to the east; the Yachtsman Hotel & Marina Club are 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 AYC. 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 AYC 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 8,031 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 8,031 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 May 24, 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 AYC and the nearby Yachtsman Marina, 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 General 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 AYC

WEA investigated the option of onshore disposal of the 8,031 cubic yards of dredged materials from the AYC. The AYC encompasses approximately 0.42 acres of land, as shown in the aerial site map attached to this Alternatives Analysis as Figure 1. Due to the small size of the AYC 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 23-foot by 23-foot grassed area east of the AYC building. If a 4-foot walkway is kept clear around the stockpile, the allowable diameter of the stockpile would be 15 feet (therefore the allowable radius would be 7.5 feet). Using the following standard soil stockpile volume equation, the required height of a 8,031 cubic yard (216,837 cubic feet) stockpile would need to be 3,681 feet tall, which is infeasible.
    - $Volume = \frac{1}{3} \times \pi \times Radius^2 \times Height \rightarrow$

    - Height = Volume × 3 ×  $\frac{1}{\pi}$  ×  $\frac{1}{Radius^2}$  →

      Height = 216,837 ft³ × 3 ×  $\frac{1}{\pi}$  ×  $\frac{1}{(7.5ft)^2}$  = 3,681 ft
  - In addition, this step is infeasible due to the layout of the AYC's dock/boat slips; the closest a dredge barge could get to the "open space" located to the east of the AYC building is at least 90 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 402 or 201 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 AYC 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 to this Alternatives Analysis for reference.

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

The proposed dredge volume for the Arundel Yacht Club is 8,031 cubic yards, or 216,837 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 216,837 cubic feet, the diameter of the stockpile needed to store the dredged material would be approximately 200 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 240 feet. Figure 2, included with this Alternatives Analysis, shows what a 240-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 AYC does not have control or interest in any of the nearby facilities along the Kennebunk River shown in Figure 2.

#### 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 251 dumpsters to store 8,031 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 251 roll-off dumpsters would be approximately 84,715 square feet. Figure 3, included with this Alternatives Analysis, shows what an 84,715 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 AYC does not have control or interest in any of the nearby facilities along the Kennebunk River shown in Figure 3.

#### 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 AYC 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 \$600,000 to \$800,000 for disposal of 8,031 cubic yards of material.
- O 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

- 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.
- 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 \$5.6M for the incineration of 8,031 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 AYC are in Illinois or Arkansas.

#### • Spread of material over open ground

- o This alternative is also infeasible because the AYC does not have access to a land area appropriate for spreading the material over open ground. Spreading 216,837 cubic feet of soil across a land area would consist of: 1 foot of sediment spread across a 216,837 square foot (∼5 acre) land area; or 6 inches of sediment spread across a 433,674 square foot (∼10 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 AYC 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 AYC 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 AYC and the nearby Yachtsman Marina, 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

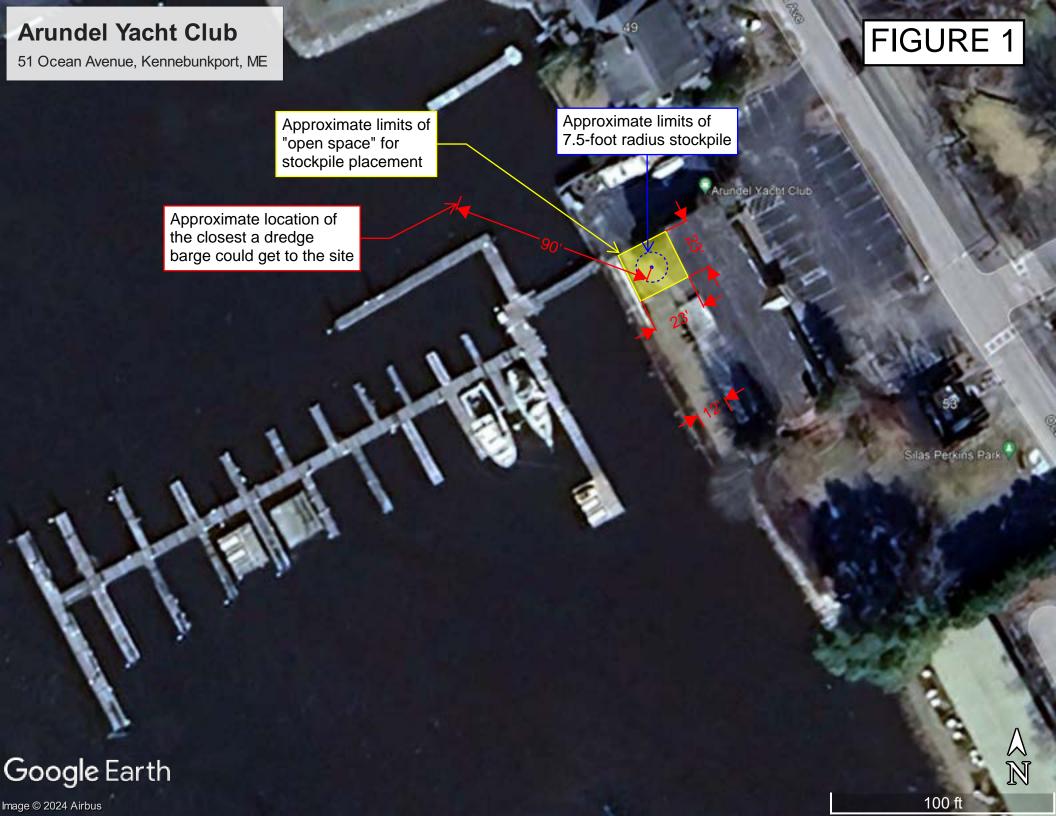
Due to the infeasibility of disposing of dredged material onshore and there being no beneficial use sites suitable for disposal, Alternative C, open water placement at IOSN, was selected as the most appropriate alternative for the project.

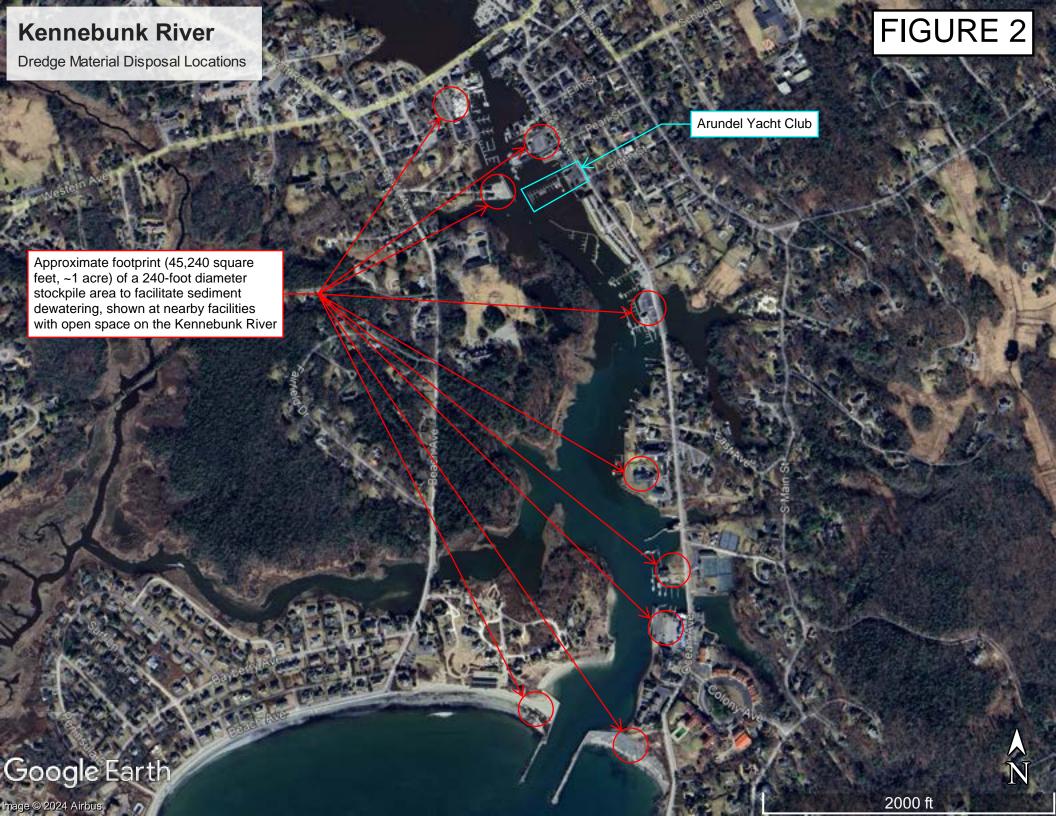
### **Figures**

Figure 1: AYC Site Aerial Map

Figure 2: Kennebunk River – Stockpile Locations

Figure 3: Kennebunk River – Roll-Off Dumpster Locations





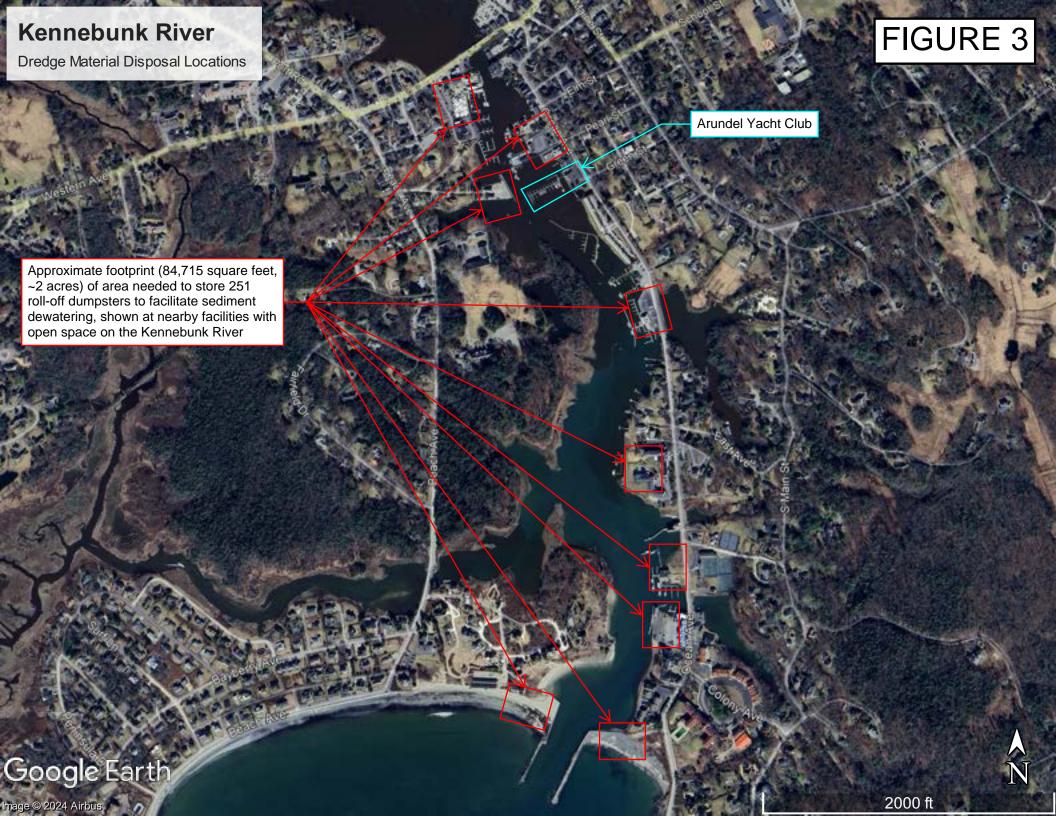




Table 1: Dredge Material Disposal Beneficial Use Alternatives – Arundel Yacht Club

# <u>Table 1</u> <u>Dredge Material Disposal Beneficial Use Alternatives - Arundel Yacht Club</u> Summary Table & References

Project Name ¹	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. 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. ^{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. ^{4,5}
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. ^{4,5}
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. ^{4,5}
Piscataqua Salt Marsh Priority Area ²	Salt Marsh Priority Area	Rye, NH		USFWS	No	Piscataqua Salt Marsh is not a potential dredge disposal site. ⁷
Ogunquit Salt Marsh Priority Area/Rachel Carson National Wildlife Refuge ³	Salt Marsh Priority Area	Ogunquit/Wells, ME		USFWS	No	Maine state permitting does not allow the use of dredged materials on salt marshes. ⁸

# <u>Table 1</u> <u>Dredge Material Disposal Beneficial Use Alternatives - Arundel Yacht Club</u> Summary Table & References

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

#### 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 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



One Karen Drive, Suite 2A Westbrook, ME 04092 P: (207) 553-9898, Ext 101 www.walsh-eng.com







This transmission is intended only for the individual or entity to which it is addressed, and may contain information that is privileged, confidential and exempt from disclosure under applicable law. If the reader of this communication is not the intended recipient, or an employee or agent responsible for delivering the communication to the intended recipient, you are notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error please contact the sender at 207-553-9898.

#### **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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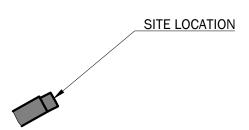


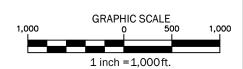
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**Attachment 3:** 

**Site Location Map** 









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# Arundel Yacht Club Dredging

Arundel Yacht Club 51 Ocean Avenue Kennebunkport, Maine 04046

	Sheet Title: Figure 1: Overview Plan
l	Overview Plan

 **Attachment 4:** 

Photo Log



# Attachment 4.0 PHOTO LOG

### **Arundel Yacht Club Dredge**

Kennebunkport, ME

Photo No. 1

**Date:** 1/28/2022

Site Location:

Arundel Yacht Club

**Description:** 

View of the Arundel Yacht Club.



Photo No. 2

**Date:** 11/15/2021

Site Location:

Arundel Yacht Club

Description:

View of the adjacent Kennebunk River and approximate dredge location.



## Photo No. 3

**Date:** 11/15/2021

# Site Location:

Arundel Yacht Club

## Description:

Additional view of approximate dredge location.



## Photo No. 4

#### Date:

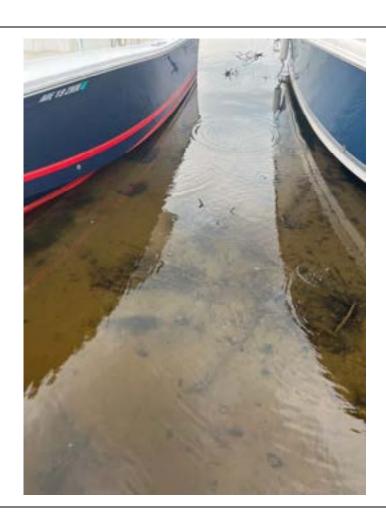
8/4/2023

# Site Location:

Arundel Yacht Club

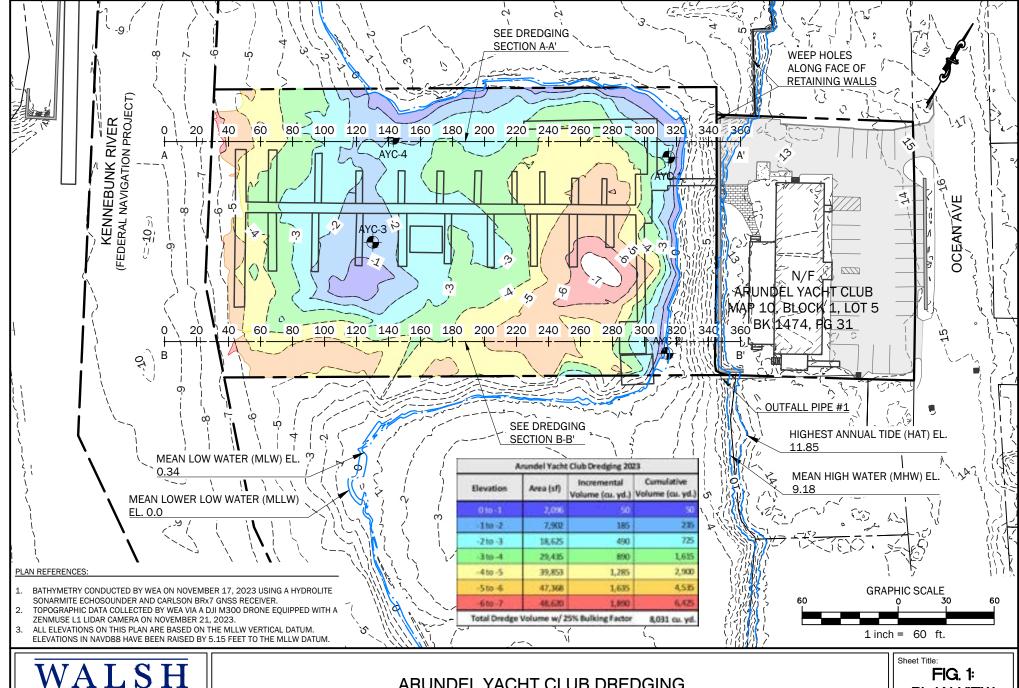
# Description:

Boat slips in the marina.



**Attachment 5:** 

**Site Plan** 





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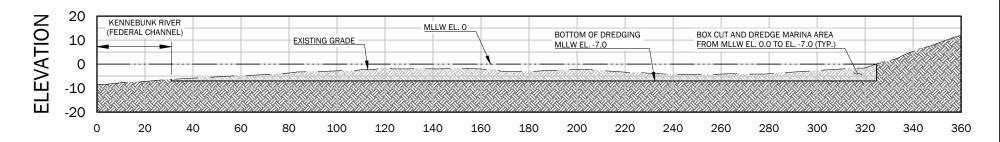
#### ARUNDEL YACHT CLUB DREDGING

ARUNDEL YACHT CLUB 51 OCEAN AVE KENNEBUNKPORT, ME 04046

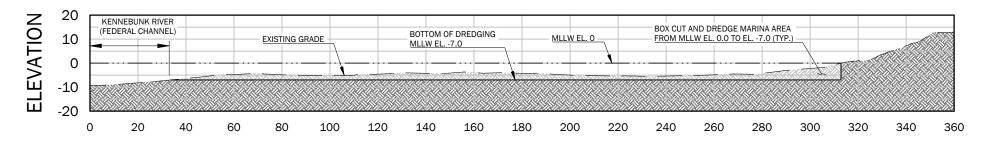
Sheet Title:				
FIG. 1:				
PLAN VIEW				
Joh No ·	782			

OCT. 23, 2024 Scale: AS SHOWN CAR/MNW Drawn: WRW

# Attachment 6: Additional Plan (Section Views)



# STATION Dredging Section A-A'



STATION

Dredging Section B-B'





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#### ARUNDEL YACHT CLUB DREDGING

ARUNDEL YACHT CLUB 51 OCEAN AVE KENNEBUNKPORT, ME 04046

FIG 2:					
•	ON VIEWS				
Job No.:	782				
Date:	OCT. 23, 2024				
Scale:	AS SHOWN				
Drawn:	CAR/MNW				
Checked:	WRW				

**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 an approximately 180-foot by 250-foot area (~45,356 square feet). 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, including the Yachtsman Marina, 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 AYC within the Kennebunk River, which is located approximately 0.75 miles from the mouth of the Kennebunk River.

The shoreline area southeast of the AYC consists of large riprap placed to prevent bank erosion. The yacht club and its neighbor to the northeast have vertical concrete retaining walls. 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 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.

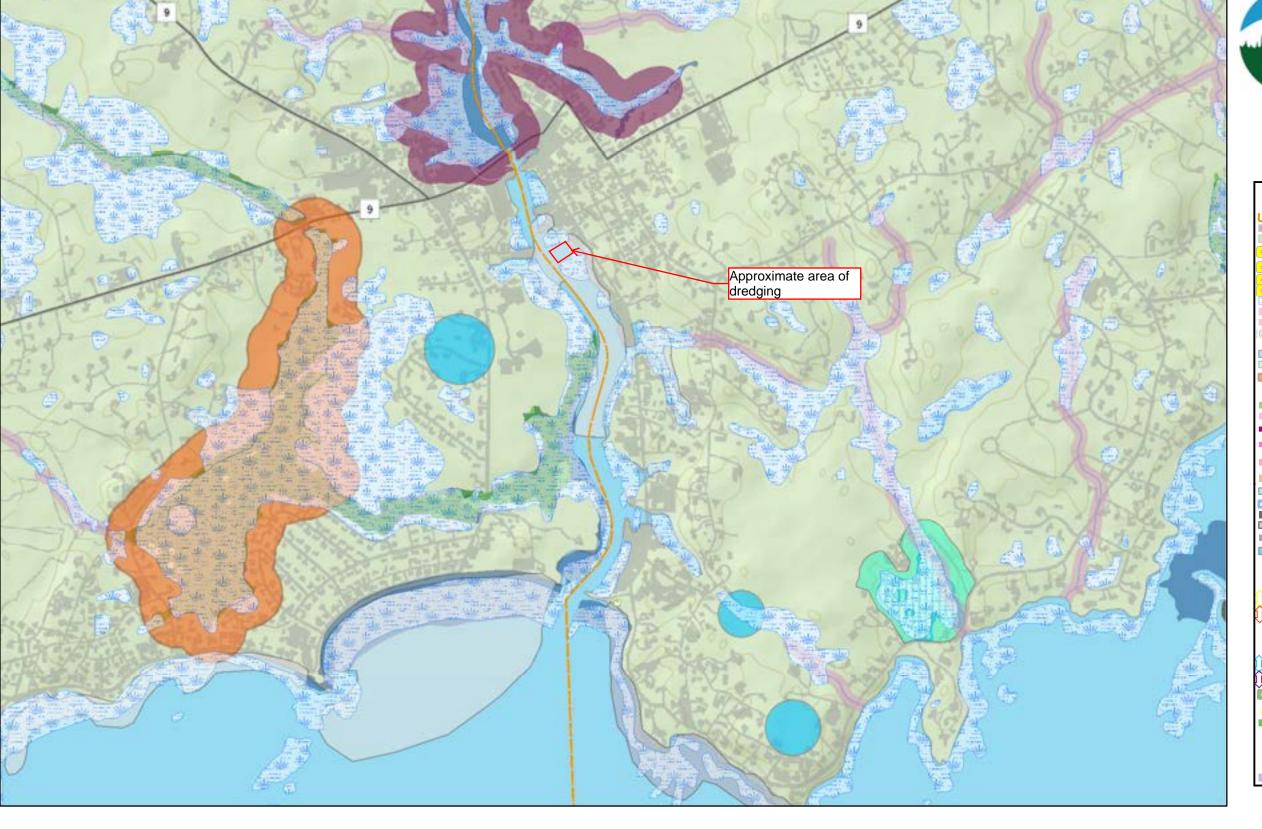
The AYC dredging work is proposed to take place in winter 2025-2026 and to avoid disturbances to EFH and sturgeon populations to the maximum extent possible.

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.







# Legend















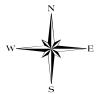




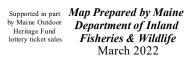






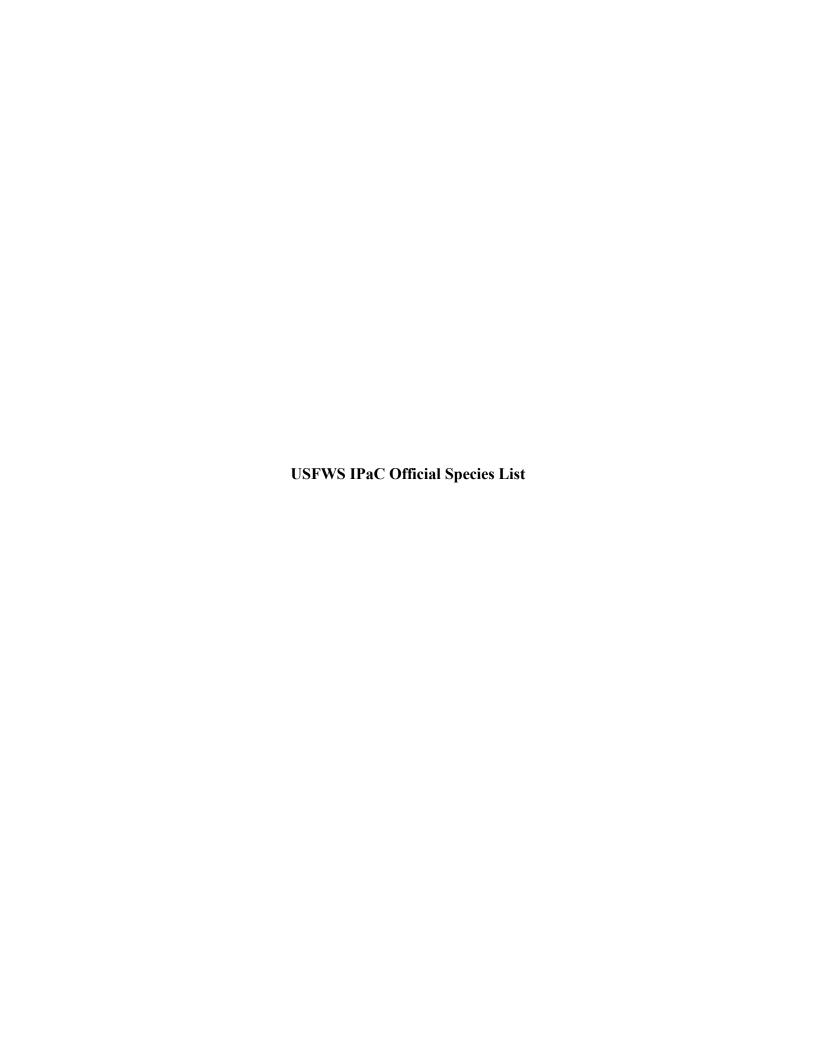














# United States Department of the Interior



# 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: June 15, 2022

Project Code: 2022-0013708

Project Name: AYC

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 ECOS-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 ECOS-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.

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:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.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/birds/policies-and-regulations.php.

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/birds/bird-enthusiasts/threats-to-birds.php.

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 Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

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.

06/15/2022

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Attachment	C	١٠
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Official Species List

# **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: 2022-0013708

Event Code: None Project Name: AYC

Project Type: Disposal Dredge Material

Project Description: This project consists of dredging an area in front of the Arundel Yacht

Club.

## **Project Location:**

Approximate location of the project can be viewed in Google Maps: <a href="https://www.google.com/maps/@43.358029450000004">https://www.google.com/maps/@43.358029450000004</a>,-70.47593825153226,14z



Counties: York County, Maine

# **Endangered Species Act Species**

There is a total of 2 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 Fisheries¹, 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

Threatened

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>

#### Insects

NAME STATUS

#### 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.

# **IPaC User Contact Information**

Agency: Walsh Engineering Associates, Inc.

Name: Randee McDonald

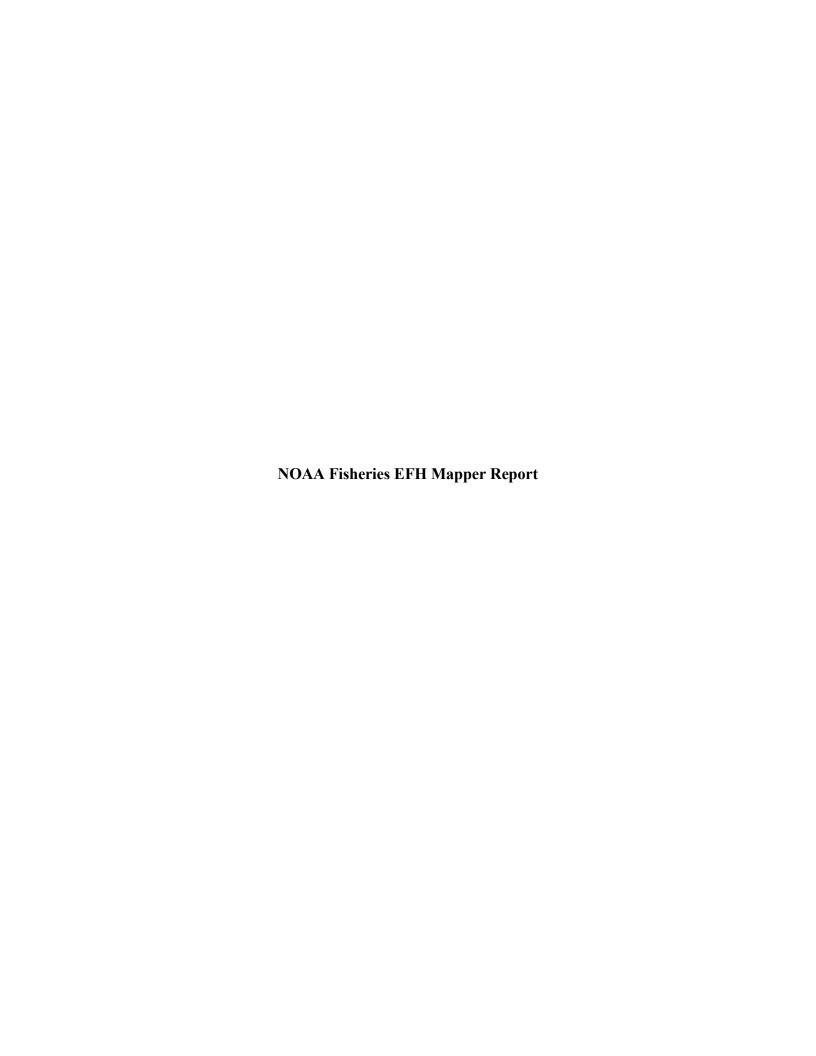
Address: One Karen Drive, Suite 2A

City: Westbrook

State: ME Zip: 04092

Email randee@walsh-eng.com

Phone: 2075539898



8/27/24, 4:13 PM EFH Report

# **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.

<u>Greater Atlantic Regional Office</u>
<u>Atlantic Highly Migratory Species Management Division</u>

#### **Query Results**

Degrees, Minutes, Seconds: Latitude = 43° 21′ 30″ N, Longitude = 71° 31′ 27″ W

Decimal Degrees: Latitude = 43.358, Longitude = -70.476

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>	(2)	Acadian Redfish	Larvae	New England	Amendment 14 to the Northeast Multispecies FMP
<u>"</u>	•	Haddock	Juvenile	New England	Amendment 14 to the Northeast Multispecies FMP
<u>"</u>	•	Little Skate	Adult	New England	Amendment 2 to the Northeast Skate Complex FMP
<u>"</u>	•	Monkfish	Adult, Eggs/Larvae, Juvenile	New England	Amendment 4 to the Monkfish FMP
<u>"</u>	•	Silver Hake	Adult, Eggs/Larvae	New England	Amendment 14 to the Northeast Multispecies FMP
P	•	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.

8/27/24, 4:13 PM EFH Report

#### **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



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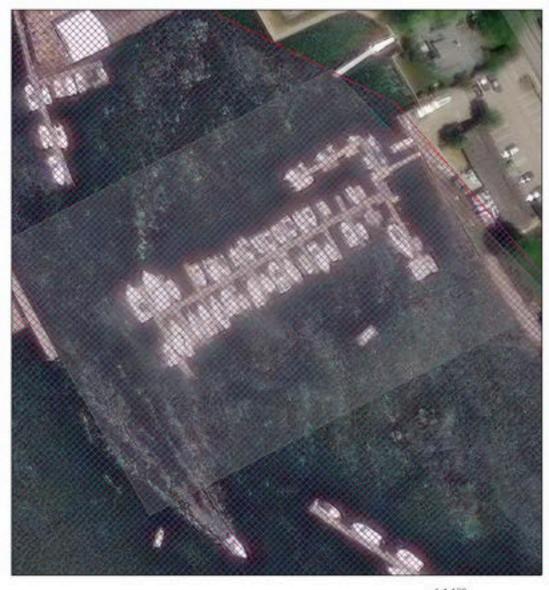


# Drawn Action Area & Overlapping S7 Consultation Areas

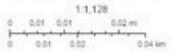
## Area of Interest (AOI) Information

Area: 2.79 acres

Aug 27 2024 14:26:21 Eastern Daylight Time







Naus, Micrael, Bar Community Maja Community, & Openinteethis Microsof, Birl, Tonffon, Gamon, SafeDrain, Geoffelmologies, Ins., NET NASA, USGO, 874, MPS, US Centus Bureau, USGA, USFIRIS

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### Summary

Name	Count	Area(acres)	Length(mi)
Atlantic Sturgeon	2	5.59	N/A
Shortnose Sturgeon	1	2.79	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
1	ANS_C50_ADU_MAF	Atlantic sturgeon	Adult	Migrating & Foraging	N/A
2	ANS_C50_SUB_MAF	Atlantic sturgeon	Subadult	Migrating & Foraging	N/A

#	From	Until	From (2)	Until (2)	Area(acres)
1	01/01	12/31	N/A	N/A	2.79
2	01/01	12/31	N/A	N/A	2.79

### Shortnose Sturgeon

#	Feature ID	Species	Life Stage	Behavior	Zone
1	SNS_C50_ADU_MAF	Shortnose sturgeon	Adult	Migrating & Foraging	N/A

#	From	Until	From (2)	Until (2)	Area(acres)
1	04/01	11/30	N/A	N/A	2.79

about:blank 2/2

**Attachment 10:** 

**Notice of Intent to File** 

#### 10.0 Notice of Intent to File

The applicant must provide public notice for all Individual (Tier III) NRPA permit applications.

- 1. **Newspaper**: The NOI was published in the *Portland Press Herald* on October 2, 2024, which falls within the required 30 days prior to the filing of the application. Proof of the notification is attached.
- 2. **Abutting Property Owners**: Abutters were sent the NOI via certified mail on October 2, 2024, which falls within the 30 days prior to the filing of the application. A list of abutters and proof of certified 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 the Arundel Yacht Club, of 51 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 October 4, 2024. This application is for dredging activities to take place in the Kennebunk River to improve the boating operations (navigation) of the Arundel Yacht Club.

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	0521094	Order Price	\$404.53
Sales Rep.	Joan Jensen	PO No.	10.1 - Public Notice / Sherry Pinard
Account	10155	Payment Type	Invoice
Publication	Portland Press Herald	Number of dates	1
First Run Date	10/02/2024	Last Run Date	10/02/2024
Publication	Online Upsell PPH	Number of dates	1
First Run Date	10/02/2024	Last Run Date	10/02/2024

#### Public Notice

# NOTICE OF INTENT TO FILE

Please take notice that the Arundel Yacht Club, of 51 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)

Juisuuiii  $\Gamma$ provisions of 38 M.R.S. §§ 480-A through 480-BB on or about October 4, 2024. This application is for dredging activities to take place in the Kennebunk River to improve the boating operations (navigation) of the Àrundel Yachf Club. 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** 



October 1, 2024

Dear Abutter/Neighbor of 51 Ocean Ave:

On behalf of the Arundel Yacht Club (AYC) of 51 Ocean Ave, 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 AYC.

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 October 2, 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



November 8, 2024

Dear Abutter/Neighbor of 51 Ocean Ave:

On behalf of the Arundel Yacht Club (AYC) of 51 Ocean Ave, 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 AYC.

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 was published in the *Portland Press Herald* on October 2, 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

Abutters List (1,000-foot)



Kennebunkport, ME November 08, 2024

#### **Subject Property:**

Parcel Number: 10-1-5

CAMA Number: 10-1-5

Vision ID: 3428

Property Address: 51 OCEAN AVENUE

Mailing Address: ARUNDEL YACHT CLUB

PO BOX 328

KENNEBUNKPORT, ME 04046-0328

Abutters:

Parcel Number: 10-1-10

CAMA Number: 10-1-10 Vision ID: 3438

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

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: 10-1-3

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

11/8/2024

Property Address: 57 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

Mailing Address: ROMINE, DONALD J & RHODA M

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

Mailing Address: KENNEBUNKPORT, TOWN OF

**PO BOX 566** 

KENNEBUNKPORT, ME 04046

Mailing Address: KPT MARINE, LLC

PO BOX 2734

KENNEBUNKPORT, ME 04046

Mailing Address: YACHTSMAN HOSPITALITY, LLC

2 LIVEWELL DRIVE, #203

KENNEBUNK, ME 04043





Kennebunkport, ME November 08, 2024

Parcel Number: 10-1-4 CAMA Number:

10-1-4 525

Property Address: OCEAN AVENUE

Vision ID:

Parcel Number: 10-1-6

CAMA Number: 10-1-6

527 Vision ID:

Property Address: 49 OCEAN AVENUE

Parcel Number: 10-1-7 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

Parcel Number: 10-1-7

CAMA Number: 10-1-7B Vision ID: 105722

Property Address: 47 OCEAN AVENUE #8

10-1-7 Parcel Number:

CAMA Number: 10-1-7C

Vision ID: 105722

Property Address: 47 OCEAN AVENUE #6

Parcel Number: 10-1-7

CAMA Number: 10-1-7D Vision ID: 105722

Property Address: 47 OCEAN AVENUE #4

10-1-7

CAMA Number: 10-1-7E

Parcel Number:

11/8/2024

Vision ID: 105722

Property Address: 47 OCEAN AVENUE #2

Parcel Number: 10-1-7

10-1-7F CAMA Number: 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: KENNEBUNKPORT, TOWN OF

**PO BOX 566** 

KENNEBUNKPORT, ME 04046

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

Mailing Address: WOMEN & WINE, LLC

PO BOX 1148

CAMA Number: Vision ID:

10-1-7Z 105722

Property Address: 47 OCEAN AVENUE #MAIN

Parcel Number: CAMA Number:

10-1-8 10-1-8

Vision ID:

3437

10-1-9

Property Address: 45 OCEAN AVENUE

Parcel Number:

CAMA Number: 10-1-9 Vision ID: 537

Property Address: 43 OCEAN AVENUE

Parcel Number: 10-2-1 CAMA Number: 10-2-1

Vision ID:

3442

Property Address: 46 OCEAN AVENUE

10-2-3

10-2-3

10-3-1

10-3-3

547

Parcel Number:

10-2-2 CAMA Number: 10-2-2

Vision ID: 546 Property Address: OCEAN AVENUE

Parcel Number: CAMA Number:

Vision ID:

Property Address: 5 PEARL STREET

Parcel Number:

CAMA Number: 10-3-1 Vision ID: 548

Property Address: 7 PEARL STREET

10-3-2

Parcel Number: CAMA Number:

10-3-2 Vision ID: 549

Property Address: 6 PLEASANT STREET

Parcel Number:

CAMA Number: 10-3-3 Vision ID: 550

Property Address: 35 MAINE STREET

Parcel Number:

10-3-4 10-3-4 CAMA Number: 551

Vision ID:

11/8/2024

Property Address: 33 MAINE STREET

Mailing Address: WILLIAMSON, ROBERT S

PO BOX 1950 KENNEBUNKPORT, ME 04046

Mailing Address: BYERLY, WILLIAM F & MARY C

PO BOX 2675

KENNEBUNKPORT, ME 04046

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 04046



Kennebunkport, ME November 08, 2024

Parcel Number: CAMA Number:

10-3-5

10-3-5 552

Vision ID:

Property Address: 31 MAINE STREET

Parcel Number: 10-4-1 CAMA Number: 10-4-1

Vision ID: 3443

Property Address: 8 PLEASANT STREET

Parcel Number: 10-4-2 CAMA Number: 10-4-2

3444 Vision ID:

Property Address: 10 PLEASANT STREET

Parcel Number: 10-4-3

CAMA Number: 10-4-3 Vision ID: 555

Property Address: 12 PLEASANT STREET

Parcel Number: 10-4-4 CAMA Number: 10-4-4

Vision ID: 556

Property Address: 5 SOUTH STREET

Parcel Number: 10-4-5

CAMA Number: 10-4-5 Vision ID: 3445

Property Address: 3 SOUTH STREET

Parcel Number: 10-4-6 CAMA Number: 10-4-6A

Vision ID: 105723

Property Address: 41 MAINE STREET #1

Parcel Number: 10-4-6 CAMA Number: 10-4-6B

Vision ID: 105723

Property Address: 41 MAINE STREET #2

Parcel Number: 10-4-6 CAMA Number: 10-4-6C

Vision ID: 105723

Property Address: 41 MAINE STREET #3

Parcel Number: 10-4-6 CAMA Number: 10-4-6Z Vision ID: 105723

11/8/2024

Property Address: 41 MAINE STREET #MAIN

Mailing Address: WIDMER, MATTHEW A & AMY M

18 LOUDEN HEIGHTS NORTH

ALBANY, NY 12211

Mailing Address: KENNEBUNKPORT CAPTAINS

COLLECTION, LLC

PO BOX 3089

KENNEBUNKPORT, ME 04046

Mailing Address: MIDDLETON, MARJORIE D & JOHN L JR

PO BOX 1046

KENNEBUNKPORT, ME 04046

Mailing Address: DAVID L KELLY FAMILY TRUST

25 OAK STREET

CHARLESTOWN, MA 02129

Mailing Address: MALTE LUKAS REVOCABLE TRUST

PO BOX 2798

KENNEBUNKPORT, ME 04046

Mailing Address: MATTUCHIO FAMILY IRREVOCABLE

TRUST **PO BOX 169** 

KENNEBUNKPORT, ME 04046

Mailing Address: MORELLI, MICHAEL J & KERRY H

**42 BOULDER TRAIL BRONXVILLE, NY 10708** 

Mailing Address: LEA RAE LEVINES REVOCABLE TRUST

610 SOUTH ROME AVE, UNIT 303

**TAMPA, FL 33606** 

Mailing Address: CAPPS, NOBLE F & NANCY H

PO BOX 1023

KENNEBUNKPORT, ME 04046

Mailing Address: PORT COMMONS CONDO





Kennebunkport, ME November 08, 2024

Parcel Number: CAMA Number:

10-4-7 10-4-7 Mailing Address: MARINO, ELAINE

PO BOX 1537

KENNEBUNKPORT, ME 04046

Vision ID:

561

Parcel Number:

Property Address: 11 GREENE STREET

10-4-8 10-4-8

CAMA Number: Vision ID: 562

Property Address: CORNER MAINE & GREENE ST

Parcel Number: 10-4-9

CAMA Number: 10-4-9 Vision ID: 563

Property Address:

39 MAINE STREET

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

Property Address: 60 OCEAN AVENUE

Parcel Number: 10-5-13

CAMA Number: 10-5-13 Vision ID:

Property Address: 66 OCEAN AVENUE

Parcel Number: 10-5-14

CAMA Number: 10-5-14 Vision ID:

Property Address: 68 OCEAN AVENUE

Parcel Number: 10-5-17

CAMA Number: 10-5-17 Vision ID: 593

Property Address: 10 SOUTH STREET

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

Vision ID: 569

11/8/2024

Property Address: 53 MAINE STREET

Mailing Address: MARINO, ELAINE

PO BOX 1537

KENNEBUNKPORT, ME 04046

Mailing Address: HUNTER, JAMES & JOAN F

39 MAINE STREET

KENNEBUNKPORT, ME 04046

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

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 04046

Mailing Address: ANDONIAN, DAVID & KRIS A

**PO BOX 800** 

KENNEBUNKPORT, ME 04046





Kennebunkport, ME November 08, 2024

Parcel Number: CAMA Number: 10-5-6

10-5-6

Vision ID:

105752

Property Address: 47 MAINE STREET #7

Parcel Number: CAMA Number:

10-5-6 10-5-6A 105752

10-5-6D

105752

10-5-6

10-5-6E

105752

10-5-6

10-5-6F

105752

10-5-6

10-5-6G

105752

10-5-6

10-5-6H

105752

Vision ID:

Property Address: 47 MAINE STREET #8

Parcel Number: CAMA Number:

10-5-6 10-5-6B 105752

Vision ID: Property Address: 47 MAINE STREET #10

Parcel Number: 10-5-6 CAMA Number: 10-5-6C

Vision ID:

105752

Property Address: 47 MAINE STREET #14

10-5-6

Parcel Number: CAMA Number:

Vision ID:

Property Address: 47 MAINE STREET #9

Parcel Number: CAMA Number:

Vision ID:

Property Address: 47 MAINE STREET #11

Parcel Number:

CAMA Number:

Vision ID: Property Address: 47 MAINE STREET #6

Parcel Number:

CAMA Number: Vision ID:

Property Address: 47 MAINE STREET #2 Parcel Number:

CAMA Number: Vision ID:

Property Address: 47 MAINE STREET #3

Parcel Number:

CAMA Number: Vision ID:

11/8/2024

105752

10-5-6

10-5-61

Property Address: 47 MAINE STREET #1

Mailing Address: CROW, KAREN W

PO BOX 342

KENNEBUNK, ME 04043

Mailing Address: DIETZ, KATHLEEN

107 OLD PORT ROAD KENNEBUNK, ME 04043

Mailing Address: CALDERA, RICHARD & MARGARET

47 MAINE STREET, UNIT 10 KENNEBUNKPORT, ME 04046

Mailing Address: GRAHAM, MARY ANN

PO BOX 183

KENNEBUNKPORT, ME 04046

Mailing Address: GROMAN, ELIZABETH L

47 MAINE STREET UNIT #9 KENNEBUNKPORT, ME 04046

Mailing Address: RANDALL, KAREN

PO BOX 40

**LUDLOW, MA 01056** 

Mailing Address: DROMGOOLE, JOHN & CAROL ANN

150 HUBBARD STREET #A CONCORD, MA 01742

Mailing Address: DENOIA, MARC

590 TREMONT STREET

BOSTON, MA 02118

Mailing Address: MARGUERITE J WATERS REVOCABLE

TRUST

47 MAINE STREET #3

KENNEBUNKPORT, ME 04046

Mailing Address: KENNEDY, ILONA & LESLIE

47 MAINE STREET, UNIT 1 KENNEBUNKPORT, ME 04046



Kennebunkport, ME November 08, 2024

Parcel Number: CAMA Number: 10-5-6 10-5-6J Mailing Address: HAGER, CHRISTIE L & STARK, ROYAL J

26 BREWER DRIVE

WESTBOROUGH, MA 01581

Vision ID:

105752

Property Address: 47 MAINE STREET #13

Parcel Number: CAMA Number:

10-5-6 10-5-6K

Vision ID:

105752

Property Address: 47 MAINE STREET #12

Parcel Number: CAMA Number:

10-5-6 10-5-6L

Vision ID:

105752

Property Address: 47 MAINE STREET #5

Parcel Number:

10-5-6

CAMA Number: Vision ID:

10-5-6M 105752

Property Address: 47 MAINE STREET #4

Parcel Number: CAMA Number: 10-5-6 10-5-6Z

Vision ID:

105752

Property Address: 47 MAINE STREET #MAIN

Parcel Number: CAMA Number:

10-5-7 10-5-7

Vision ID:

584

Property Address: 43 MAINE STREET

Parcel Number: CAMA Number:

10-5-8

Vision ID:

10-5-8

3464

Property Address: 6 SOUTH STREET

Parcel Number:

10-5-9

CAMA Number:

10-5-9

Vision ID:

Property Address: 8 SOUTH STREET

Parcel Number:

10-6-1 10-6-1

CAMA Number: Vision ID:

3467

Property Address: 34 MAINE STREET

Parcel Number:

10-6-11A 10-6-11A

CAMA Number: Vision ID:

11/8/2024

3472

Property Address: 15 TOWNE STREET

Mailing Address: AUSTIN, JACK N & HOYT, KATHERINE L

47 MAINE STREET, UNIT 12

KENNEBUNKPORT, ME 04046

Mailing Address: MARTHA NIKITAS STONE REV TRUST

**42 PINE STREET** 

CONCORD, MA 01742

Mailing Address: MCGINN, HOWARD D & JAYNE A

9 SHANANDOAH DRIVE

**PAXTON, MA 01612** 

Mailing Address: TAMARACKS CONDO

Mailing Address: KUDAS, JACEK & SHARRY

**43 MAINE STREET** 

KENNEBUNKPORT, ME 04046

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: TYLER, TROY

15 TOWNE STREET

KENNEBUNKPORT, ME 04046



Kennebunkport, ME November 08, 2024

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

Property Address: 44 MAINE STREET

Parcel Number: 10-6-6

CAMA Number: 10-6-6 Vision ID: 3469

Property Address: 48 MAINE STREET

Parcel Number: 10-6-7

CAMA Number: 10-6-7 3470 Vision ID:

Property Address: 50 MAINE STREET

Parcel Number: 11-1-1 CAMA Number: 11-1-1

Vision ID: 105724

Property Address: 37 OCEAN AVENUE #4

Parcel Number: 11-1-11A1

CAMA Number: 11-1-11A1 Vision ID:

Property Address: 17 OCEAN AVENUE

Parcel Number: 11-1-11A2

CAMA Number: 11-1-11A2 Vision ID:

Property Address: 15 OCEAN AVENUE

Parcel Number: 11-1-11B

CAMA Number: 11-1-11B Vision ID: 624

11/8/2024

Property Address: 19 OCEAN AVENUE

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 04046

Mailing Address: PAPPAGEORGE, PATRICIA

1267 REALTA DRIVE CHARLOTTE, NC 28211

Mailing Address: PRICE, EUGENE THOMAS & KRISTEN E

15 FERNWOOD ROAD

WEST HARTFORD, CT 06119

Mailing Address: ADAMS, DAVID R & ELLEN L

PO BOX 1016

KENNEBUNKPORT, ME 04046

Mailing Address: SHMALO FAMILY, LLC

1023 WAGON WHEEL DRIVE

SARASOTA, FL 34240

Mailing Address: SHMALO FAMILY, LLC

1023 WAGON WHEEL DRIVE

SARASOTA, FL 34240

Mailing Address: SAND DOLLAR HOLDINGS, LLC

6720 SE HARBOR CIRCLE

STUART, FL 34996



Kennebunkport, ME November 08, 2024

Parcel Number: 11-1-12 CAMA Number: 11-1-12

Vision ID: 625

Property Address: 13 OCEAN AVENUE

Parcel Number: 11-1-13 CAMA Number: 11-1-13

Vision ID: 3482

Property Address: 11 OCEAN AVENUE

Parcel Number: 11-11-3

CAMA Number: 11-11-3 Vision ID: 765

Property Address: 4 UNION STREET

Parcel Number: 11-1-1 CAMA Number: 11-1-1A

Vision ID: 105724

Property Address: 37 OCEAN AVENUE #6

Parcel Number: 11-1-1

CAMA Number: 11-1-1B Vision ID: 105724

Property Address: 37 OCEAN AVENUE #2

Parcel Number: 11-1-1

CAMA Number: 11-1-1C Vision ID: 105724

Property Address: 37 OCEAN AVENUE #5

Parcel Number: 11-1-1

CAMA Number: 11-1-1D Vision ID: 105724

Property Address: 37 OCEAN AVENUE #1

Parcel Number: 11-1-1

CAMA Number: 11-1-1E Vision ID: 105724

Property Address: 37 OCEAN AVENUE #3

Parcel Number: 11-1-1

CAMA Number: 11-1-1Z Vision ID: 105724

Property Address: 37 OCEAN AVENUE #MAIN

11-1-2

11-1-2 CAMA Number: Vision ID: 614

Parcel Number:

11/8/2024

Property Address: 35 OCEAN AVENUE

Mailing Address: RED BUILDING TRUST

121 NORTH STREET

KENNEBUNKPORT, ME 04046

Mailing Address: B & C PROPERTIES, LLC

C/O JENNIFER LANIGAN 5301 WESTON

DOWNS DRIVE DURHAM, NC 27707

Mailing Address: JENKINS, DAVID W & DIANE

PO BOX J

KENNEBUNKPORT, ME 04046

Mailing Address: SIMONETTI, ALEXIS A

37 OCEAN AVENUE, #6

KENNEBUNKPORT, ME 04046

Mailing Address: STRAUB, CHARLES W JR & CAROL J

100 STONEHAVEN DRIVE COLUMBIANA, OH 44408

Mailing Address: DESCOTEAUX, DAVID & JULIA

89 HAIGHT HILL ROAD STANFORDVILLE, NY 12581

Mailing Address: REVOCABLE TRUST OF ALICE L ROSE

51 PETTEE STREET #34 NEWTON, MA 02464

Mailing Address: DRANOW, STEVEN & JAMIE

**5 ROOKERY CIRCLE** NEW CITY, NY 10956

Mailing Address: LEESIDE CONDO

Mailing Address: HANDLEN, FRANK W & CUMMINS,

SHARON L **PO BOX 210** 

KENNEBUNKPORT, ME 04046





Kennebunkport, ME November 08, 2024

Parcel Number: 11-1-3

CAMA Number: 11-1-3 3475 Vision ID:

Property Address: 33 OCEAN AVENUE

Parcel Number: 11-1-4

CAMA Number: 11-1-4 3476 Vision ID:

Property Address: 31 OCEAN AVENUE

Parcel Number: 11-1-5

CAMA Number: 11-1-5 Vision ID: 617

Property Address: 29 OCEAN AVENUE

Parcel Number: 11-1-6

CAMA Number: 11-1-6 Vision ID: 3477

Property Address: 27 OCEAN AVENUE

Parcel Number: 11-1-7

CAMA Number: 11-1-7 Vision ID: 620

Property Address: 25 OCEAN AVENUE

Parcel Number: 11-1-8 CAMA Number: 11-1-8

Vision ID: 3479

Property Address: 21 OCEAN AVENUE

Parcel Number: 11-4-5

CAMA Number: 11-4-5

Vision ID: 677

Property Address: 22 MAINE STREET

Parcel Number: 11-4-6

CAMA Number: 11-4-6 678 Vision ID:

Property Address: 24 MAINE STREET

Parcel Number: 11-6-1

CAMA Number: 11-6-1

Vision ID: 713

Property Address: 11 TOWNE STREET

Parcel Number: 11-6-10

CAMA Number: 11-6-10 Vision ID: 722

11/8/2024

Property Address: 28 MAINE STREET

THOMPSON, HARRY A III & JILL M Mailing Address:

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: 2538970 ONTARIO, INC

765 WESTNEY ROAD SOUTH

AJAX, ON L1S 6W1

Mailing Address: BOATHOUSE AT KENNEBUNKPORT, LLC

2 LIVEWELL DR., SUITE 203 KENNEBUNK, ME 04043

Mailing Address: KEATING, SALLY R

PO BOX 1921

KENNEBUNKPORT, ME 04046

Mailing Address: CLIFTON & MARLENE RAUM

REVOCABLE TRUST

24 MAINE STREET

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** 





Kennebunkport, ME November 08, 2024

Parcel Number: 11-6-11 CAMA Number: 11-6-11

Vision ID: 723

Property Address: 30 MAINE STREET

Parcel Number: 11-6-2

CAMA Number: 11-6-2 Vision ID: 714

Property Address: 9 TOWNE STREET

Parcel Number: 11-6-3

CAMA Number: 11-6-3 Vision ID: 715

Property Address: 7 TOWNE STREET

Parcel Number: 11-6-5

CAMA Number: 11-6-5 Vision ID: 717

Property Address: 3 TOWNE STREET

Parcel Number: 11-6-8

CAMA Number: 11-6-8 Vision ID: 720

Property Address: 3 SCHOOL STREET

Parcel Number: 11-6-9

CAMA Number: 11-6-9 Vision ID: 721

Property Address: 26 MAINE STREET

Parcel Number: 11-7-1 CAMA Number: 11-7-1

Vision ID: 724

Property Address: 29 MAINE STREET

Parcel Number: 11-7-10

11-7-10 CAMA Number: Vision ID:

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

11/8/2024

Property Address: 10 PEARL STREET

EISING, PETER A & SUSANNE Mailing Address:

PO BOX 2761

KENNEBUNKPORT, ME 04046

Mailing Address: LILLIAN M BARTLETT REVOCABLE

TRUST

PO BOX 2549

KENNEBUNKPORT, ME 04046

GERE, NICHOLAS D & TRACI L Mailing Address:

7 TOWNE STREET

KENNEBUNKPORT, ME 04046

Mailing Address: GAROTTA, CHRISTIAN

235 RUE SAINT MAURICE

BROSSARD, QUEBEC, QC J4X 2X1

Mailing Address: DONESKI, DAVID J & SANDRA D

94 ROSE HILL WAY

WALTHAM, MA 02453

Mailing Address: STAMPLIS, JOANNE M & MATTHEW

26 MAINE STREET

KENNEBUNKPORT, ME 04046

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

Mailing Address: STEPHEN C PAGE REVOCABLE TRUST

6539 SOUTH MARINA WAY

**STUART, FL 34996** 

Mailing Address: PAUL L MAHONEY REVOCABLE TRUST

6825 SAN MARINO DRIVE

NAPLES, FL 34108





Kennebunkport, ME November 08, 2024

Parcel Number: 11-7-13 CAMA Number: 11-7-13

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

Parcel Number: 11-7-3

CAMA Number: 11-7-3 Vision ID: 726

Property Address: 9 ELM STREET

Parcel Number: 11-7-4

CAMA Number: 11-7-4 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

Property Address: 3 ELM STREET

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

11/8/2024

Property Address: 6 ELM STREET

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** 

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

**BLACK FAMILY REVOCABLE TRUST** Mailing Address:

PO BOX 837

KENNEBUNKPORT, ME 04046

Mailing Address: KENNEBUNKPORT, TOWN OF

**PO BOX 566** 

KENNEBUNKPORT, ME 04046



Kennebunkport, ME November 08, 2024

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: 11-8-4 740 Vision ID:

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: 11-9-10 CAMA Number: 11-9-10

Vision ID: 751

Property Address: 24 OCEAN AVENUE

Parcel Number: 11-9-11

CAMA Number: 11-9-11

Vision ID: 3511

Property Address: 30 OCEAN AVENUE

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 Vision ID: 3512

Property Address: 6 CHESTNUT STREET

Parcel Number: 11-9-14

CAMA Number: 11-9-14 Vision ID: 755

11/8/2024

Property Address: 8 CHESTNUT STREET

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: SHMALO FAMILY, LLC

1023 WAGON WHEEL DRIVE

SARASOTA, FL 34240

Mailing Address: PERKINS, CARLA L

PO BOX 796

KENNEBUNKPORT, ME 04046-0796

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





Kennebunkport, ME November 08, 2024

Parcel Number: 11-9-15

CAMA Number: 11-9-15 Vision ID: 756

Property Address: 10 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: 11-9-2 743 Vision ID:

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: 11-9-5 CAMA Number: 11-9-5

Vision ID: 746

Property Address: 23 MAINE STREET

Parcel Number: 11-9-6

CAMA Number: 11-9-6 Vision ID: 747

Property Address: 19 MAINE STREET

Parcel Number: 11-9-8

CAMA Number: 11-9-8 Vision ID: 749

Property Address: 7 UNION STREET

Parcel Number: 11-9-9

CAMA Number: 11-9-9 Vision ID: 3510

Property Address: 3 UNION STREET

Parcel Number:

8-1-22 CAMA Number: 8-1-22 Vision ID: 197

11/8/2024

Property Address: 75 OCEAN AVENUE

Mailing Address: CAREY, MEGHAN & HUEBINGER, BRAD

155 DODD BLVD HAMPTON, VA 23665

Mailing Address: VASQUEZ, NICHOLAS & KERCADO,

**MELISSA** PO BOX 2742

KENNEBUNKPORT, ME 04046

MCWILLIAMS FAMILY TRUST Mailing Address:

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: SCOTT, ANDREW & GRAHAM, KELLY

**PO BOX 524** 

KENNEBUNKPORT, ME 04046

Mailing Address: HENRY, JOHN G & AOIFE C

MOUNTAIN VIEW BLACKROCK DUNDALK, CO. LOUTH, A91 N923

Mailing Address: PAGANO, ROBERT & DIANE

PO BOX 1743

KENNEBUNKPORT, ME 04046

Mailing Address: JJPT REALTY PARTNERS, LLC

3802 WOODBRIDGE ROAD PEABODY, MA 01960

Mailing Address: TIDEMARK CORPORATION

273 CORPORATE DRIVE, SUITE 150

PORTSMOUTH, NH 03801



Kennebunkport, ME November 08, 2024

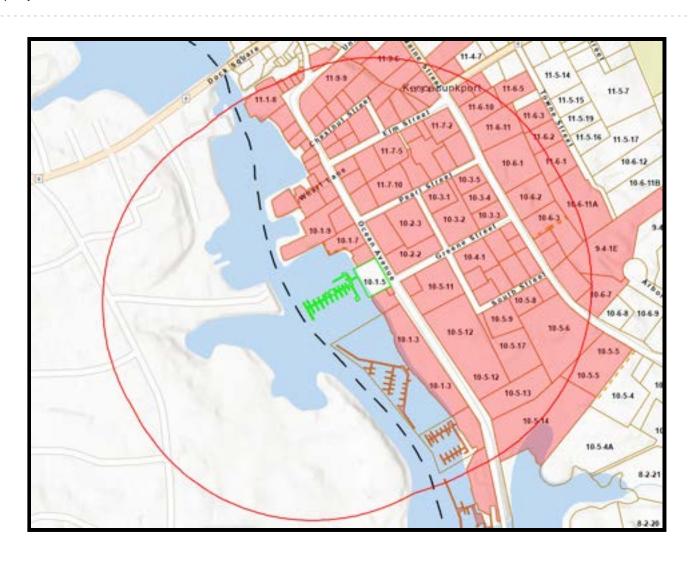
Parcel Number: 9-4-1E **CAMA Number:** 9-4-1E Vision ID: 103703

Property Address: 12 ARBOR LEDGE DRIVE

Mailing Address: FAESSLER, WILLY A & JANICE M

12 ARBOR LEDGE DRIVE

KENNEBUNKPORT, ME 04046



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

088/ / 014/ 011/

8 WESTERN AVENUE #11

COSTELLO, MICHAEL & COSTELLO, DONNA

37 FAIRFIELD DRIVE KENNEBUNK, ME 04043

Location:

Owner:

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:

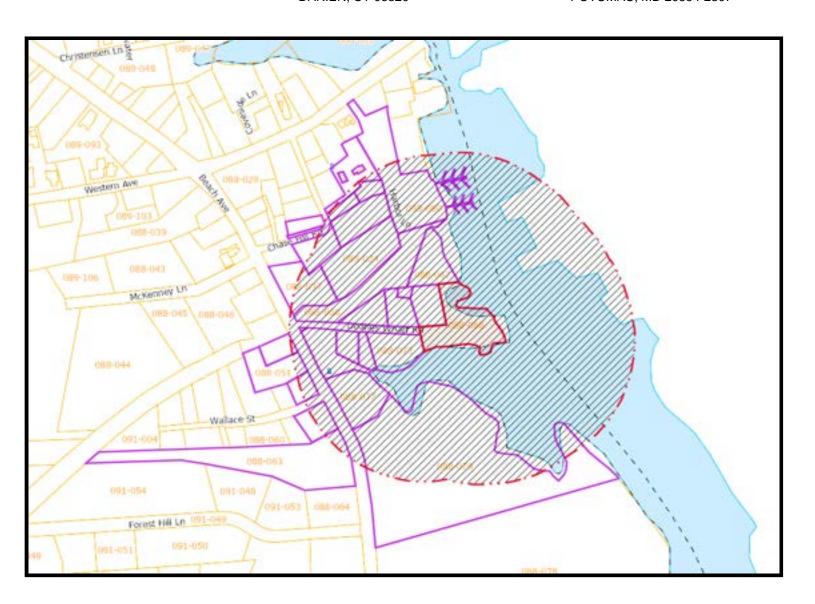
**RIVERVIEW BOATSLIPS** 

**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 Certified Mailing to Abutters Within 150 Feet



06250010282495

USPS CERTIFIED MAIL



9407 1118 9876 5488 3032 04

9407 1118 9876 5488 3032 97

BYERLY, WILLIAM F & MARY C PO BOX 2675 KENNEBUNKPORT ME 04046-2675 prijipipipipilidinii pilitiji pilitiji

\$5.54 US POSTAGE FIRST-CLASS

Oct 01 2024 Mailed from ZIP 04092 1 02 FIRST-CLASS MAIL LETTER RATE

11923275



06250011485640

\$5.54 US POSTAGE FIRST-CLASS

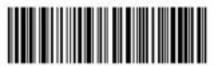
Oct 01 2024 Mailed from ZIP 04092 1 02 FIRST-CLASS MAIL LETTER RATE

11923275



06250010282497

USPS CERTIFIED MAIL



9407 1118 9876 5488 3032 80

EDITH HG MCCONNELL REVOCABLE TRUST PO BOX 1813 KENNEBUNKPORT ME 04046-4813

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#### USPS CERTIFIED MAIL



9407 1118 9876 5488 3032 35

FANTON, ROMA F 39 MEETING HOUSE LN FAIRFIELD CT 06824-2022

թերժայլ[[[թի][[թթեիկիիիթյին հիակիլիիթ]

#### \$5.54 US POSTAGE FIRST-CLASS

Oct 01 2024 Mailed from ZIP 04092 1 02 FIRST-CLASS MAIL LETTER RATE

11923275



06250011485645

11923275

06250010937441

#### USPS CERTIFIED MAIL



9407 1118 9876 5488 3032 73

KENNEBUNKPORT CONSERVATION TRUST PO BOX 7004 CAPE PORPOISE ME 04014-7004

հղեներականի կարկարկանի արևարեր կանականի արևարեր

9407 1118 9876 5488 3038 15

KENNEBUNKPORT, TOWN OF PO BOX 566
KENNEBUNKPORT ME 04046-0566

\$5.54 US POSTAGE FIRST-CLASS

Oct 01 2024 Mailed from ZIP 04092 1 OZ FIRST-CLASS MAIL LETTER RATE

11923275



\$5.54 US POSTAGE FIRST-CLASS

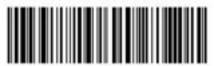
Oct 01 2024 Mailed from ZIP 04092 1 0Z FIRST-CLASS MAIL LETTER RATE





06250011485645

USPS CERTIFIED MAIL



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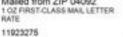


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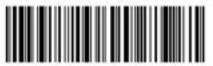
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STOHLMAN, SUZANNE
PO BOX 127
KENNEBUNKPORT ME 04046-0127

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DENOIA, MARC

590 TREMONT STREET

BOSTON MA 02118

DESCOTEAUX, DAVID & JULIA

89 HAIGHT HILL ROAD

STANFORDVILLE NY 12581

DELANCEY-KAY REVOCABLE TRUST

600 MAIN STREET, APT 2303

WORCESTER MA 01608

DOWNS, EVA M
PO BOX 1778
KENNEBUNKPORT ME 04046

DOWNS, EVA M PO BOX 1778 KENNEBUNKPORT ME 04046

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

ENOCH, MATTHEW S & DONNA C

PO BOX 567 KENNEBUNKPORT ME 04046

**DULEY, BRIGITTE I** 

EISING, PETER A & SUSANNE PO BOX 2761 KENNEBUNKPORT ME 04046

642 ALLEGIANCE DRIVE LITITZ PA 17543 FAESSLER, WILLY A & JANICE M
12 ARBOR LEDGE DRIVE
KENNEBUNKPORT ME 04046

GAROTTA, CHRISTIAN
235 RUE SAINT MAURICE
BROSSARD, QUEBEC QC J4X 2X1

GERE, NICHOLAS D & TRACI L 7 TOWNE STREET KENNEBUNKPORT ME 04046

PO BOX 545 KENNEBUNKPORT ME 04046

GOODWIN, KAREN A

GRAHAM, MARY ANN PO BOX 183 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 HANDLEN, FRANK W & CUMMINS, SHARON L PO BOX 210 KENNEBUNKPORT ME 04046 HECKLER, JOHN H & CAROL A
PO BOX 831
KENNEBUNKPORT ME 04046

HENRY, JOHN G & AOIFE C
MOUNTAIN VIEW
BLACKROCK
DUNDALK. CO. LOUTH A91 N923

HUNTER, JAMES & JOAN F 39 MAINE STREET KENNEBUNKPORT ME 04046

PO BOX J KENNEBUNKPORT ME 04046

JENKINS, DAVID W & DIANE

JJPT REALTY PARTNERS, LLC 3802 WOODBRIDGE ROAD PEABODY MA 01960

661 MELALEUCA LANE MIAMI FL 33137

KARAKHANIAN, ALEXANDER & RENA

PO BOX 3089 KENNEBUNKPORT ME 04046

KCC-CGH HOLDINGS, LLC

KEATING, SALLY R PO BOX 1921 KENNEBUNKPORT ME 04046 KENNEBUNKPORT CAPTAINS COLLECTION, LLC PO BOX 3089 KENNEBUNKPORT ME 04046

KENNEDY, ILONA & LESLIE 47 MAINE STREET, UNIT 1 KENNEBUNKPORT ME 04046 KPT MARINE, LLC PO BOX 2734

KENNEBUNKPORT ME 04046

KPT MARINE, LLC

PO BOX 2734 KENNEBUNKPORT ME 04046 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 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

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 MATTHEW C ALLARD REVOCABLE TRUST

54 WESSCUM WOOD ROAD RIVERSIDE CT 06878 MATTUCHIO FAMILY IRREVOCABLE

**TRUST** 

PO BOX 169

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

KENNEBUNKPORT ME 04046

MIDDLETON, MARJORIE D & JOHN L JR

PO BOX 1046

KENNEBUNKPORT ME 04046

MILES, DANIEL F & ANDREA

11 TOWNE STREET

KENNEBUNKPORT ME 04046

MORELLI, MICHAEL J & KERRY H

42 BOULDER TRAIL BRONXVILLE NY 10708

NATOLI, JOAN E & RICHARD

PO BOX 763

KENNEBUNKPORT ME 04046

OCEAN AVENUE REALTY TRUST

PO BOX 949

KENWOOD CA 95452

PAGANO, ROBERT & DIANE

PO BOX 1743

KENNEBUNKPORT ME 04046

PERKINS, CARLA L PERKINS, CARLA L PERKINS, CARLA L PO BOX 796 PO BOX 796 PO BOX 796 KENNEBUNKPORT ME 04046-0796 KENNEBUNKPORT ME 04046-0796 KENNEBUNKPORT ME 04046-0796 PORT COMMONS CONDO PRICE, EUGENE THOMAS & KRISTEN E RANDALL, KAREN 15 FERNWOOD ROAD PO BOX 40 WEST HARTFORD CT 06119 LUDLOW MA 01056 RED BUILDING TRUST REVOCABLE TRUST OF ALICE L ROSE RINALDI, JOHN F & POWELL, BRIAN 121 NORTH STREET 51 PETTEE STREET #34 PO BOX 1079 KENNEBUNKPORT ME 04046 NEWTON MA 02464 KENNEBUNKPORT ME 04046 ROMINE, DONALD J & RHODA M SAND DOLLAR HOLDINGS, LLC SCOTT, ANDREW & GRAHAM, KELLY 325 DUNES BLVD., APT 803 6720 SE HARBOR CIRCLE PO BOX 524 NAPLES FL 34110 STUART FL 34996 KENNEBUNKPORT ME 04046 SHAHIAN, DOUGLAS & LISA SHMALO FAMILY, LLC SIMONETTI, ALEXIS A 37 HICKORY LANE 1023 WAGON WHEEL DRIVE 37 OCEAN AVENUE, #6 KENNEBUNKPORT ME 04046 BOXFORD MA 01921 SARASOTA FL 34240 SPENCER, MARY A SPICEWOOD MAINE, LLC STAMPLIS, JOANNE M & MATTHEW PO BOX 1422 8 SPICEWOOD LANE 26 MAINE STREET KENNEBUNKPORT ME 04046 WILTON CT 06897 KENNEBUNKPORT ME 04046 STEPHEN C PAGE REVOCABLE TRUST STRAUB, CHARLES W JR & CAROL J SWEENEY, JOHN & ANN-MARIE 100 STONEHAVEN DRIVE 6539 SOUTH MARINA WAY 16 MARTIN STREET STUART FL 34996 COLUMBIANA OH 44408 ACTON MA 01720 TAMARACKS CONDO THOMPSON, HARRY A III & JILL M TIDEMARK CORPORATION 273 CORPORATE DRIVE, SUITE 150 PO BOX 20 KENNEBUNKPORT ME 04046 PORTSMOUTH NH 03801 TYLER, TROY VASQUEZ, NICHOLAS & KERCADO, WHETSELL, M HEYWARD JR & SHERRILL **MELISSA** 15 TOWNE STREET

PO BOX 2742

KENNEBUNKPORT ME 04046

2820 COUNTRY CLUB RD

WINSTON-SALEM NC 27104

KENNEBUNKPORT ME 04046

WOMEN & WINE, LLC PO BOX 1148 KENNEBUNKPORT ME 04046 WOMEN & WINE, LLC
PO BOX 1148
KENNEBUNKPORT ME 04046

WOMEN & WINE, LLC PO BOX 1148 KENNEBUNKPORT ME 04046

YANKOWSKI, GEORGE E JR & JANICE G PO BOX 1333 KENNEBUNKPORT ME 04046 **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 publ	ic attended the Public Informational Meeting.
Leyna L. Tobery	10/2/2024
Signature of Applicant or authorized agent	Date

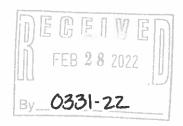
**Attachment 11:** 

**Historic Sites** 

# 11.0 Historic Sites

As required by the Army Corps of Engineers (ACOE), the Maine Historic Preservation Commission (MHPC) and the Tribal Historic Preservation Officers (THPO) of Maine have been consulted regarding this project. A copy of these communications are included with this section.





February 24, 2022

Mr. Kirk F. Mohney, Director Maine Historic Preservation Commission 55 Capitol Street 65 State House Station Augusta, Maine 04333-0065

RE: Arundel Yacht Club Historic Review

51 Ocean Ave, Kennebunkport ME

Map 10, Lot 1, Block 5

Dear Mr. Mohney,

Please take note that the Arundel Yacht Club intends to file permit applications with the Maine DEP for dredging activities located in the Kennebunk River offshore of 51 Ocean Ave in Kennebunkport, Maine. Walsh Engineering Associates is requesting that the MHPC review the area for any known historic and/or archaeological resources. A site plan 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 randee@walsh-eng.com. Thank you in advance for your timely comments.

Respectfully,

Randee McDonald Project Coordinator

Walsh Engineering Associates

Enc: Location Plan

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



February 24, 2022

**THPO** 

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

**THPO** 

Passamaquoddy Tribe of Indians Pleasant Point Reservation PO Box 343 Perry, Maine 04667 soctomah@gmail.com

THPO

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

VIA email as noted above

RE: Arundel Yacht Club Historic Review 51 Ocean Ave, Kennebunkport ME Map 10, Lot 1, Block 5 THPO
Mi'kmaq Nation
7 Northern Road Presque Isle, Maine 04769
kreis@micmac-nsn.gov

THPO

Cultural and Historic Preservation Dept.12 Wabanaki Way Indian Island, Maine 04468 chris.sockalexis@penobscotnation.org

Please take note that the Arundel Yacht Club intends to file permit applications with the Maine DEP for dredging activities located in the Kennebunk River offshore of 51 Ocean Ave in Kennebunkport, Maine. Walsh Engineering Associates is requesting that the THPO review the area for any known historic and/or archaeological resources. A site plan 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 randee@walsh-eng.com. Thank you in advance for your timely comments.

Respectfully,

Randee McDonald Project Coordinator

Walsh Engineering Associates

Enc: Location Plan

## Tribal Historic Preservation Office Passamaquoddy Tribe

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

March 2, 2022

Randee McDonald Project Coordinator One Karen Drive, Suite 2A Westbrook, ME 04092

• Re: Kennebunkport – 51 Ocean Ave

#### Dear Randee;

The Passamaquoddy THPO has reviewed the following applications 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 Projects listed above will not have any impact on cultural and historical concerns of the Passamaquoddy Tribe. Should buried artifacts, human remains, cultural sites or ground features be unexpectedly unearthed during ground disturbing activities, all construction should immediately cease and the resources be examined by a professional archaeologist. Additionally, all appropriate authorities-including all pertinent tribal entities should be notified.

Sincerely;

Donald Soctomah Soctomah@gmail.com THPO Passamaquoddy Tribe **Tribal Historic Preservation Office** 

Mi'kmaq Nation (Formerly known as the Aroostook Band of Micmac)

Kendyl Reis

Tribal Historic Preservation Officer

7 Northern Road

Presque Isle, ME 04769

Phone: (207)764-1972 ext. 161

Fax: (207)764-7667 Email: kreis@micmac-nsn.gov Arundel Yacht Club Project

51 Ocean Ave, Kennebunkport, Maine March 3rd, 2022

Thank you for the opportunity to review the above-referenced project for compliance with National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA), or other, requirements.

Based on the project description, we do not have knowledge of any specific sites or cultural features that exist at the proposed project location.

However, this geographic area does constitute traditional areas that were historically utilized by members of the Mi'kmaq Nation and the other Wabanaki Tribes. Therefore, we respectfully request that if during the course of excavation/construction activities, human remains, artifacts, or any other evidence of Native American presence is discovered, that site activities in the vicinity of the discovery immediately cease, pending notification to us.

In addition, if this project results in wetland disturbances requiring mitigation, we are requesting that you utilize the black ash (<u>Fraginus nigra</u>) as the principal wetland species for wetland restoration activities. The black ash tree has special significance in the culture of the northeastern Tribes and is used extensively for weaving baskets and other Native American crafts. The black ash tree also provides valuable food and habitat for migratory waterfowl and other wildlife. Unfortunately, however, this species has been selected against by foresters and landowners who favor other tree species. As a result of this, and other environmental factors, the black ash tree is in serious decline in Maine. The Mi'kmaq Nation has completed several black ash wetland restoration projects and have a dependable source for highly-quality seedlings, and the experience and expertise to assist you with black ash wetland restoration projects.

On the subject of human remains, artifacts, or any other evidence of Native American presence is discovered. The human remains will be reburied with the appropriate respect for the remains that is required at a distinctive and respectable site. The artifacts and other evidence of Native American discovery will be documented with appropriate detail. The items will be analyzed for the precise period of the items' distinctive period and will be documented by the Tribal Historic Preservation Officer for the Mi'kmaq Nation.

If you have any questions or comments, please feel free to contact me.

Sincerely,

Kendyl Reis Tribal Historic Preservation Officer





### PENOBSCOT NATION CULTURAL & HISTORIC PRESERVATION 12 WABANAKI WAY, INDIAN ISLAND, ME 04468

CHRIS SOCKALEXIS – TRIBAL HISTORIC PRESERVATION OFFICER E-MAIL: <a href="mailto:chris.sockalexis@penobscotnation.org">chris.sockalexis@penobscotnation.org</a>

NAME	Randee McDonald
ADDRESS	Walsh Engineering Associates One Karen Drive, Suite 2A
OWNER'S NAME	Westbrook, ME 04092 Arundel Yacht Club
TELEPHONE	(207) 553-9898
EMAIL	Randee@Walsh-eng.com
PROJECT NAME	Maintenance Dredging
PROJECT SITE	Kennebunkport, ME
DATE OF REQUEST	February 24, 2022
DATE REVIEWED	June 15, 2022

Thank you for the opportunity to comment on the above referenced project. This project appears to have no impact on a structure or site of historic, architectural or archaeological significance to the Penobscot Nation as defined by the National Historic Preservation Act of 1966, as amended.

If there is an inadvertent discovery of Native American cultural materials during the course of the project, please contact my office at (207) 817-7471. Thank you for consulting with the Penobscot Nation Tribal Historic Preservation Office with this project.

Chris Sockalexis, THPO Penobscot Nation **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 May 24, 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 AYC and the nearby Yachtsman Marina, 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.



CENAE-PDE 24 May 2022

**FINAL** Sampling and Analysis Plan for Arundel Yacht Club, Kennebunkport, ME, File Number NAE-2022-00288

1. **Project Description:** The applicant is proposing to mechanically dredge approximately 3,775 cubic yards (CY) of material from shoaled areas totaling just over one acre 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 Arundel Yacht Club located along the Kennebunk River in Kennebunkport, ME. The yacht club building was originally constructed in 1806 and was used as a rope making business until 1816. Sanborn maps from 1911 show that the property was used for a boat house, carriage house, and wagon shed. It has served as the Arundel Yacht Club since 1957 and provides dockage for up to fifty recreational boats and the launching of small sailboats. There is no boat or engine repair that takes place at the property. Land use in the surrounding area includes a mix of residential properties, many with docks, and marina facilities. The Yachtsman Hotel and

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Marina Club, which provides dockage for recreational watercraft, is directly adjacent to the south of the property. The nearby Kennebunkport Marina is approximately 800 feet south of the project area and offers boat slips, full mechanical services, and repairs as well as a boat ramp. Chicks Marina, which has a fuel dock, is adjacent to the southern property boundary of the Kennebunkport Marina, approximately 1,200 feet south of the project area. Downtown Kennebunkport, an area with several restaurants, retail shops, and marine services, is approximately 1,000 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 stormwater discharge pipes within the Arundel Yacht Club and the other marina properties along the river (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 (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 project area was last dredged in 2017 when approximately 1,800 CY of material were removed to a depth of -6 feet 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. Chemistry data, also from 2003, revealed elevated levels of metals (cadmium, copper, and mercury) at the project site. A review of biological testing data from 2014 found sediment from the project area not likely to be acutely toxic to benthic organisms. A suitability determination from 2015 concluded that project sediments were suitable for open water placement at CADS.

The adjacent 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 the 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

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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 2011.

<u>Risk Ranking</u>: 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.

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

Table 1: Project Risk Ranking

**Sample Collection:** In the first phase of testing the applicant shall collect 3. sediment cores from four 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

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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. In addition, a field duplicate sample should be collected for bulk chemistry and grain size analysis and an equipment blank should be collected for chemical analysis off any non-dedicated equipment used in the sampling process.

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 ±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 (WOC). 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 shall immediately notify the applicant, who may wish to seek guidance from NAE on project-specific procedures for preparation of additional elutriate samples requiring 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 the applicant wishes to use alternate species listed in the RIM, then NAE must be contacted prior to sampling to coordinate the need for reference area sample collection and analysis.

- <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

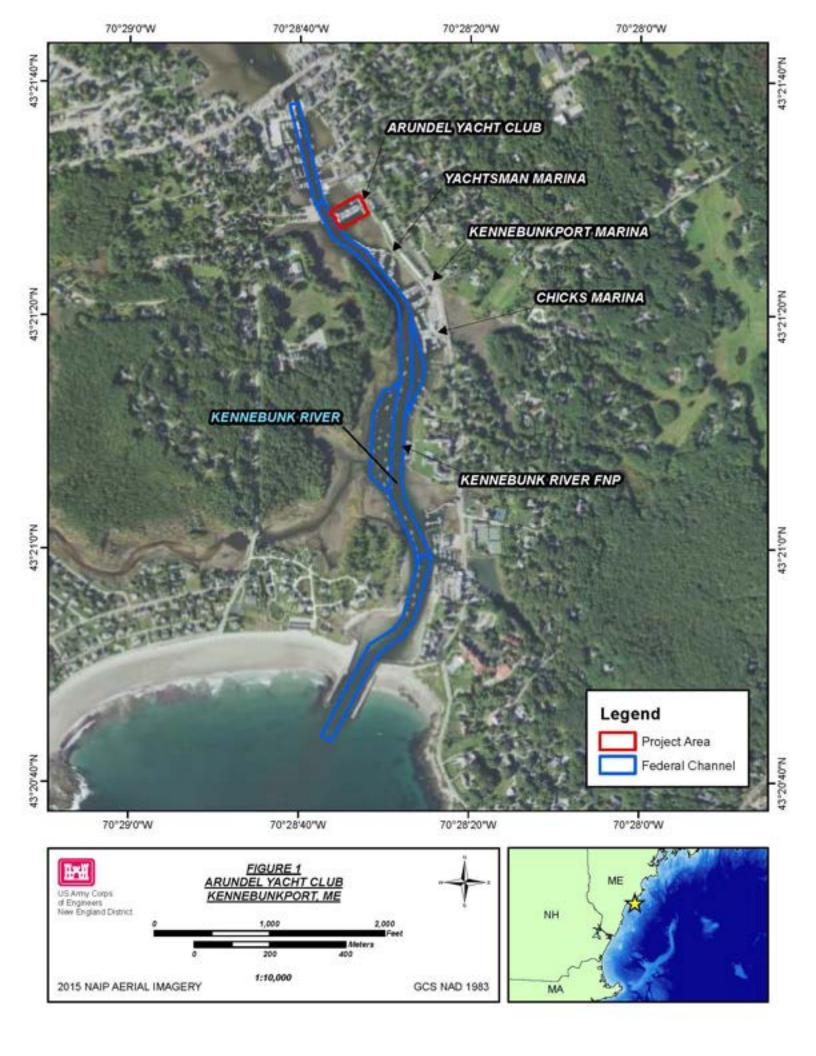
New England District

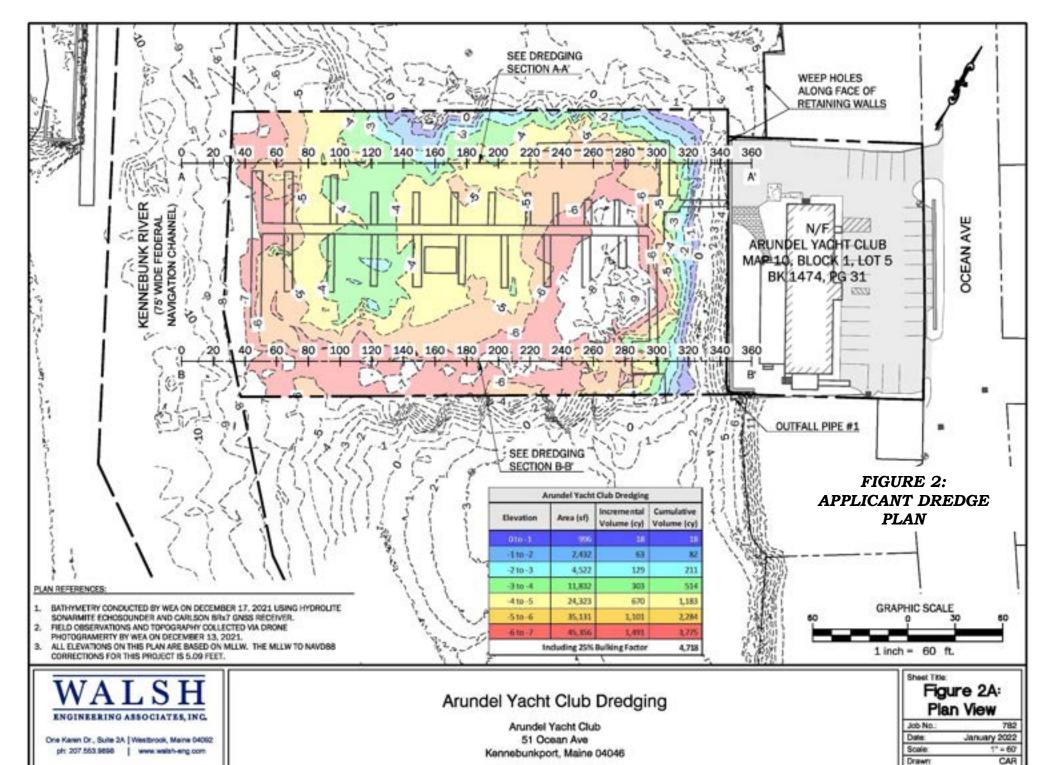
U.S. Army Corps of Engineers

Gabriella Saloio

**Table 2: Arundel Yacht Club Sample Locations** 

Station	Latitude (NAD 83)	Longitude (NAD 83)	Survey Depth (Feet MLLW)	Project Depth (Feet MLLW)	Overdepth (Feet)	Estimated Core length (Feet)
AYC-1	-70.475810	43.358305	-3.9	-6.0	1.0	3.1
AYC-2	-70.475589	43.358010	-1.7	-6.0	1.0	5.3
AYC-3	-70.476321	43.357931	-3.0	-6.0	1.0	4.0
AYC-4	-70.476397	43.358105	-3.0	-6.0	1.0	4.0





Checked

WRW

Copyright © 2022

OE2 - Annoted Yacht Club Decognight CACIOE2 - Room dwg plot date: 1080002 5 50 PM

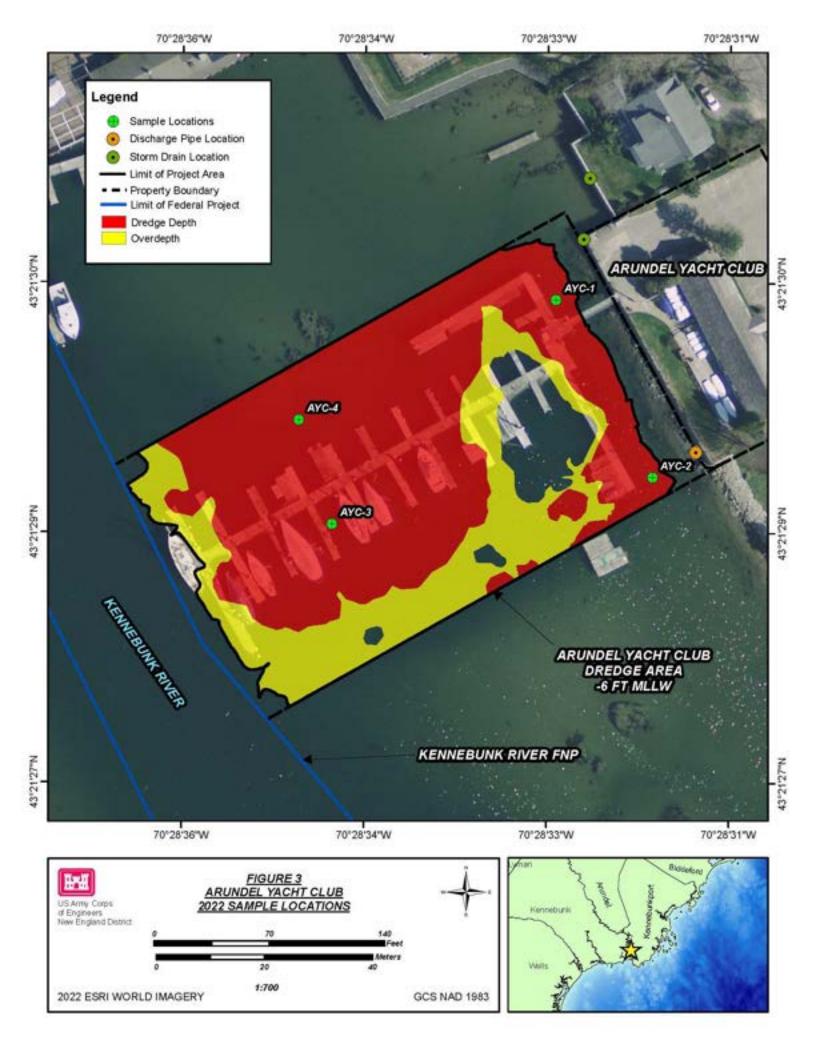


TABLE 3: RECOMMENDED PROCEDURES FOR SAMPLE COLLECTION, PRESERVATION, AND STORAGE

<u>Analyses</u>	Collection <u>Method</u>	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 ^c	Refrigerate. Dry ice ^b or freezer storage is recommended for extended holding times.	≤ 4° Cc	Hg - 28 days Others - 6 Months ^d
Organic Compounds	Grab/corer	475 mL	Solvent-rinsed glass jar with Teflon lid ^c	Refrigerate. Dry ice ^b or freezer storage is recommended for extended holding times.	≤ 4° C/dark ^d	14 days ^e
Particle Size	Grab/corer	75 mL	Whirl-pac bag ^b	Refrigerate	≤ 4° C	Undetermined
Total Organic Carbon	Grab/corer	3 L	Heat treated glass vial with Teflon lined lid ^c	Refrigerate. Dry ice ^c 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 ^e	Completely fill and Refrigerate; sieve	≤ 4° C/dark/airtight	14 days ^{i f}
Reference Sediment	Grab/corer	45-50 L per test	Plastic bag or container ^e	Completely fill and Refrigerate; sieve	≤ 4° C/dark/airtight	14 days ^{i f}
Control Sediment	Grab/corer	21-25 L per test	Plastic bag or container ^e	Completely fill and Refrigerate; sieve	≤ 4° C/dark/airtight	14 days ^{i f}
Water and Elutria	te					
Chemical/Physica	l Analyses					
Metals		Discrete sampler or pump	1 L	Acid-rinsed polyethylene or glass jar	pH <2 with HNO ₃ 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 ^d
Trawl/ Teflon coated grab	30 g	Double Ziploc ^c	Handle with non-metallic forceps; plastic gloves; dry icec	≤ -20° C°	Hg - 14 days Others - 6 months ⁱ
Trawl/ Teflon coated grab	100 g	Hexane-rinsed double aluminum foil and double Ziploc ^c	Handle with hexane-rinsed stainless steel forceps; dry icec	≤ -20° C°	10 days ^{i e}
Trawl/ Teflon coated grab	50 g	Heat cleaned aluminum foil and watertight plastic bag ⁱ	Covered ice chest ^d	≤ -20° Ci	10 days ^{i e}
Trawl/ Teflon coated grab	50 g	Hexane-rinsed double aluminum foil and double Ziploc ^c	Handle with hexane-rinsed stainless steel forceps; dry icec	≤ -20° Ci	10 days ^{i e}
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  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab	or pump  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon 50 g	Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab	Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab  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  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Trawl / Teflon coated grab  Tr

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

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).

^h 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
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

^{*} 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.

#### TABLE 5: ELUTRIATE TESTING PARAMETERS

<u>Parameter</u>	Recommended Analytical <u>Method</u>	Reporting <u>Limit (µg/L)</u>
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	1.0 1.0 1.0 0.6 1.0 0.4 1.0 1.0 0.5
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	NAE-2007-2704	-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							
Sample ID	76Gravei	Coarse	Medium	Fine	%Fines					
	Arun	del Yacht C	lub							
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 of the Kennebunk River Projects, Kennebunkport, Maine Dredging of the Kennebunk River Projects, Kennebunkport, Maine Dredging of the Kennebunk River Projects, Kennebunkport, Maine Dredging of the Kennebunk River Projects, Kennebunkport, Maine Dredging of the Kennebunk River Projects, Kennebunkport, Maine Dredging of the Kennebunk River Projects, Kennebunkport, Maine Dredging of the Kennebunk River Projects, Kennebunkport, Maine Dredging of the Kennebunk River Projects, Kennebunkport, Maine Dredging Order Projects, Kennebunkport, Maine Dredging Order Projects, Kennebunkport, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging$ 

Table 5. Summary of Bulk Sediment Chemistry Results

								Ken	nebunkpo	rt M	'arina		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	ט	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 of the Kennebunk River Projects, Kennebunkport, Maine Dredging of the Kennebunk River Projects, Kennebunkport, Maine Dredging of the Kennebunk River Projects, Kennebunkport, Maine Dredging of the Kennebunk River Projects, Kennebunkport, Maine Dredging of the Kennebunk River Projects, Kennebunkport, Maine Dredging of the Kennebunk River Projects, Kennebunkport, Maine Dredging of the Kennebunk River Projects, Kennebunkport, Maine Dredging of the Kennebunk River Projects, Kennebunkport, Maine Dredging Order Projects, Kennebunkport, Maine Dredging Order Projects, Kennebunkport, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, Maine Dredging Order Projects, 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 Q Result Q Result Q Result Q Result Q Result Q Result Q Result Q Result Q Result Q Result Q Result Q Result Q Result Q Result Q Result Q Result Q Result Q Result Q Result Q Result Q Result Q Result Q Result Q Result Q 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Table 5. Summary of Bulk Sediment Chemistry Results, cont.

CAS   Number   Physical   14762744   Metals   Arsenic   7440382   Cadmium   7440439   Chromium   7440473   Chromium   7440473   Chromium   7440508   Lead   7439921   Mercury   7439976   Nickel   7440666   PAHs   Total LPAH   SUMLPAH   Total HPAH   SUMLPAH   Pesticides	Units  %  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	70 9.6 370 270 218 0.710 51.6 410	IOSI Value 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	Q Q	KBRC- Result  4.98 0.433 26.0 13.8 17.8 0.054	Q	Result  -  3.52  0.300  20.0  9.34  12.2	0	3.30 0.350 20.5 9.52 13.3	Q	Result	E Q	Result  - 3.34 0.277 18.0 8.28	Q Q	Result	Q	Fig. 13.6 KBRC-Result	Q Q	Result  1.58 0.119 11.0 5.32
Parameter         Number           Physical         14762744           Total organic carbon         14762744           Metals         7440382           Cadmium         7440439           Chromium         7440473           Copper         7440508           Lead         7439921           Mercury         7439976           Nickel         7440020           Zinc         7440666           PAHs         SUMLPAH           Total LPAH         SUMLPAH           Total HPAH         SUMLPAH	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	70 9.6 370 270 218 0.710 51.6	1.28 9.66 0.072 31.5 10.9 18.1 0.032 20.8	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	Q	3.52 0.300 20.0 9.34 12.2	Q	3.30 0.350 20.5 9.52	Q	2.47 0.229 15.6 18.6	Q	3.34 0.277 18.0 8.28	Q	2.82 0.237 16.5	Q	5.12 0.451 24.8	Q	1.58 0.119 11.0
Physical         14762744           Total organic carbon         14762744           Metals         Arsenic           Arsenic         7440382           Cadmium         7440439           Chromium         7440473           Copper         7440508           Lead         7439921           Mercury         7439976           Nickel         744020           Zinc         7440666           PAHs         SUMLPAH           Total LPAH         SUMLPAH           Total HPAH         SUMLPAH	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	9.66 0.072 31.5 10.9 18.1 0.032 20.8		5.34 0.463 27.5 13.7 18.8 0.062 15.9		4.98 0.433 26.0 13.8 17.8		3.52 0.300 20.0 9.34 12.2		3.30 0.350 20.5 9.52		2.47 0.229 15.6 18.6		3.34 0.277 18.0 8.28		0.237 16.5		5.12 0.451 24.8		0.119 11.0
Total organic carbon         14762744           Metals         7440382           Arsenic         7440382           Cadmium         7440439           Chromium         7440473           Copper         7440508           Lead         7439921           Mercury         7439976           Nickel         744020           Zinc         7440666           PAHs         SUMLPAH           Total LPAH         SUMLPAH           Total HPAH         SUMLPAH	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	9.66 0.072 31.5 10.9 18.1 0.032 20.8		5.34 0.463 27.5 13.7 18.8 0.062 15.9		4.98 0.433 26.0 13.8 17.8		3.52 0.300 20.0 9.34 12.2		3.30 0.350 20.5 9.52		2.47 0.229 15.6 18.6		3.34 0.277 18.0 8.28		0.237 16.5		5.12 0.451 24.8		0.119 11.0
Metals         7440382           Arsenic         7440382           Cadmium         7440439           Chromium         7440473           Copper         7440508           Lead         7439921           Mercury         7439976           Nickel         7440020           Zinc         7440666           PAHs         SUMLPAH           Total LPAH         SUMLPAH           Total HPAH         SUMLPAH	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	9.66 0.072 31.5 10.9 18.1 0.032 20.8		0.463 27.5 13.7 18.8 0.062 15.9		0.433 26.0 13.8 17.8		0.300 20.0 9.34 12.2		0.350 20.5 9.52		0.229 15.6 18.6		0.277 18.0 8.28		0.237 16.5		0.451 24.8		0.119 11.0
Cadmium         7440439           Chromium         7440473           Copper         7440508           Lead         7439921           Mercury         7439976           Nickel         744020           Zinc         7440666           PAHs         SUMLPAH           Total LPAH         SUMLPAH           Total HPAH         SUMLPAH	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	0.072 31.5 10.9 18.1 0.032 20.8		0.463 27.5 13.7 18.8 0.062 15.9		0.433 26.0 13.8 17.8		0.300 20.0 9.34 12.2		0.350 20.5 9.52		0.229 15.6 18.6		0.277 18.0 8.28		0.237 16.5		0.451 24.8		0.119 11.0
Chromium         7440473           Copper         7440508           Lead         7439921           Mercury         7439976           Nickel         744020           Zinc         7440666           PAHS         SUMLPAH           Total LPAH         SUMLPAH           Total HPAH         SUMLPAH	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	31.5 10.9 18.1 0.032 20.8		27.5 13.7 18.8 0.062 15.9		26.0 13.8 17.8		20.0 9.34 12.2		20.5 9.52		15.6 18.6		18.0 8.28		16.5		24.8		11.0
Copper         7440508           Lead         7439921           Mercury         7439976           Nickel         7440020           Zinc         7440666           PAHs         SUMLPAH           Total LPAH         SUMLPAH           Total HPAH         SUMLPAH	mg/kg mg/kg mg/kg mg/kg mg/kg	34 46.7 0.150 20.9 150	270 218 0.710 51.6	10.9 18.1 0.032 20.8		13.7 18.8 0.062 15.9		13.8 17.8		9.34 12.2		9.52		18.6		8.28						
Lead         7439921           Mercury         7439976           Nickel         7440020           Zinc         7440666           PAHs         SUMLPAH           Total LPAH         SUMLPAH           Total HPAH         SUMLPAH	mg/kg mg/kg mg/kg mg/kg ug/kg	46.7 0.150 20.9 150	218 0.710 51.6	18.1 0.032 20.8		18.8 0.062 15.9		17.8		12.2								7.16		13.6		5.32
Lead         7439921           Mercury         7439976           Nickel         7440020           Zinc         7440666           PAHs         SUMLPAH           Total LPAH         SUMLPAH           Total HPAH         SUMLPAH	mg/kg mg/kg mg/kg mg/kg ug/kg	0.150 20.9 150	0.710 51.6	0.032 20.8		0.062 15.9						13.3		0.67								
Nickel         7440020           Zine         7440666           PAHs         Total LPAH           SUMLPAH         SUMLPAH           Total HPAH         SUMLPAH	mg/kg mg/kg ug/kg	20.9 150	51.6	20.8		15.9		0.054						0.07		11.5		9.29		17.7		4.81
Zinc         7440666           PAHs	mg/kg ug/kg	150								0.052		0.053		0.032		0.067		0.046		0.056		0.023
PAHS  Total LPAH SUMLPAH  Total HPAH SUMHPAH	ug/kg		410	60.6				14.5		11.4		11.3		8.57		9.92		8.67		13.4		6.12
Total LPAH SUMLPAH Total HPAH SUMHPAH		550				68.9		67.7		48.3		50.9		37.2		50.5		39.9		78.2		28.9
Total HPAH SUMHPAH		EEO																				
		332	3,160	48.2		316		321		208		106		114		101		127		217		104
Pesticides	ug/kg	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 SUMCHLOR	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 SumNOAA18	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 ERL Red indicates an exceedance of the ERM																						
U= Compound was analyzed for but was no	t detected	(non-dete	ect)																			
J= Indicates an estimated value	. actorica	(mon dec	000,																			
Non-detects reported as half the MDL																						
Reference site data from DAMOS monitoring	g surveys (	2019 IOS	SN)																			
Total PCBs were calculated using the NOA	18 metho	d																				
Total Chlordane is a sum of alpha and gam	ma chlorda	ane, cis a	nd trans	nonachlo	or, an	d oxychlor	lane	; IOSN valu	e is	a sum of on	ily a	lpha and ga	ımm	a chlordan	е							

# 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 10⁻⁴), 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 (LC₅₀) 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: LC₅₀ Values in Suspended Phase Toxicity Test

Composite	A. bahia	M. beryllina	M. edulis
	LC ₅₀ (%)	LC ₅₀ (%)	LC ₅₀ (%)
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

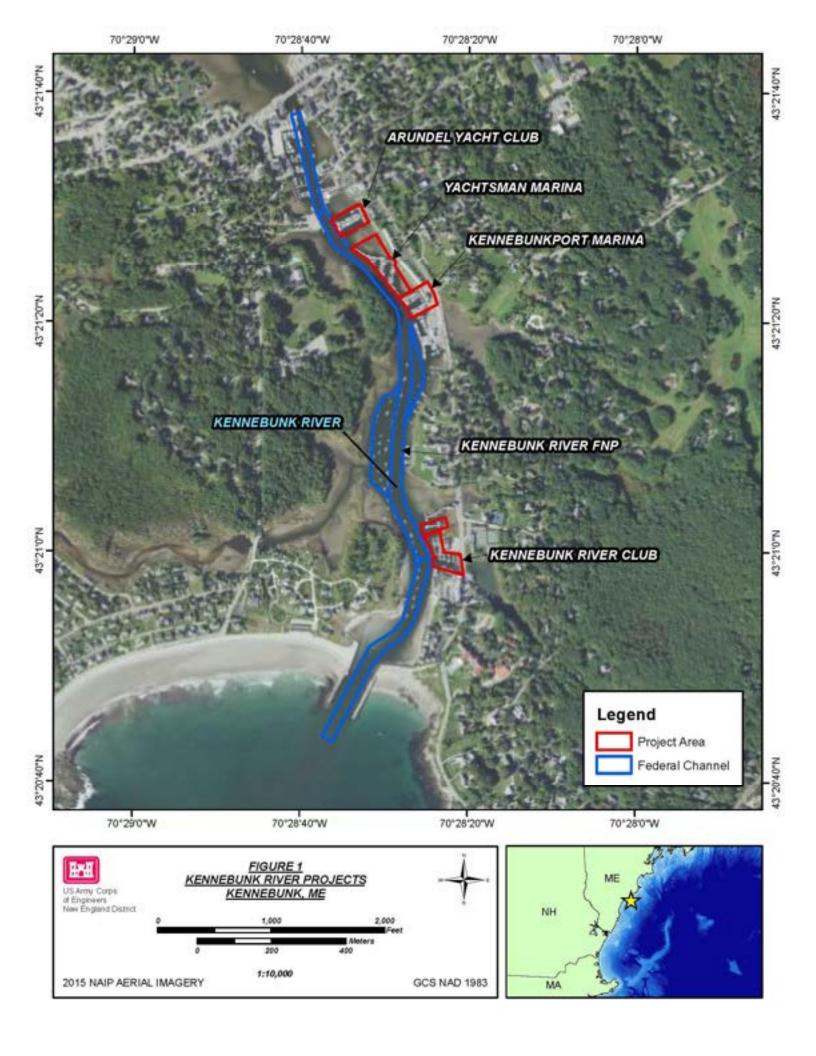
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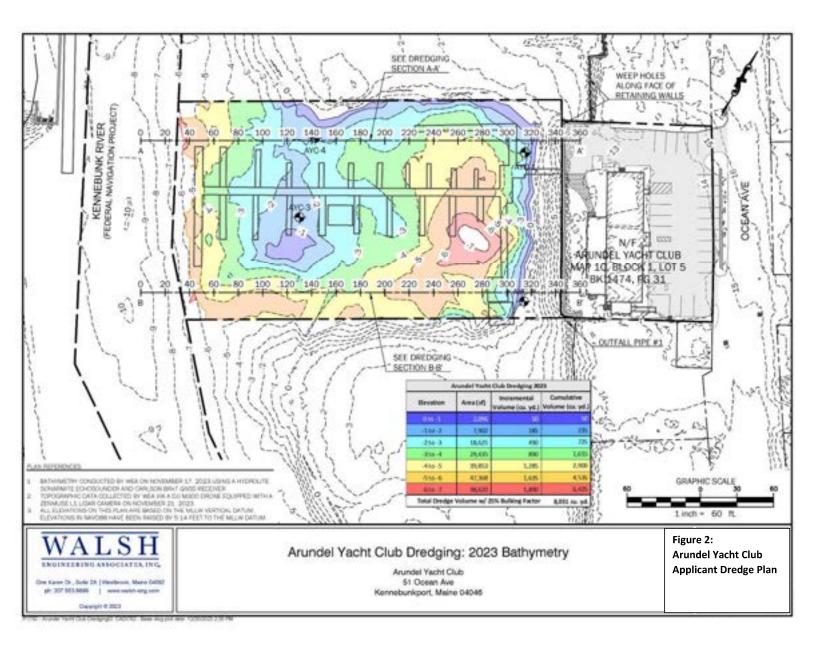
Richard B. Loyd Chief Environmental Resources and Marine Programs Section USACE-New England District

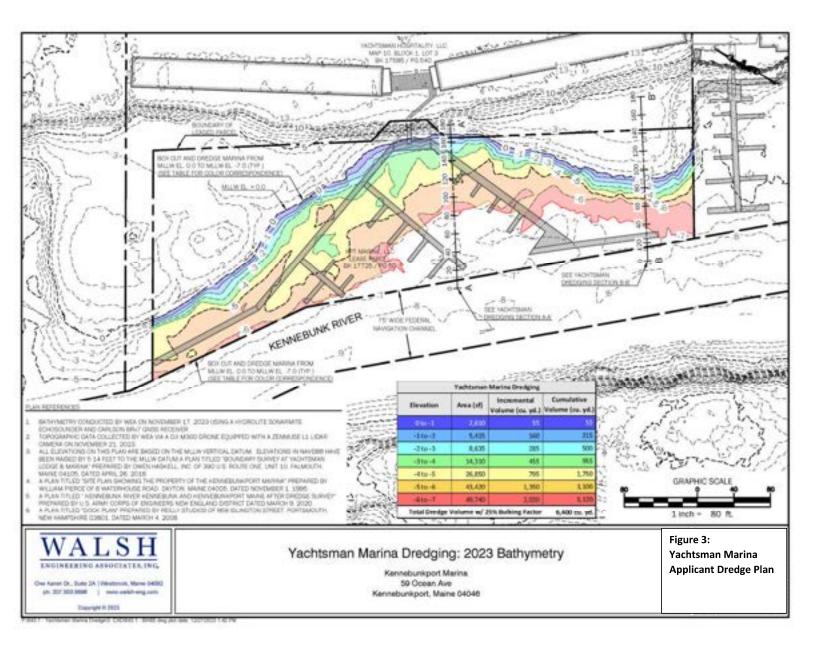
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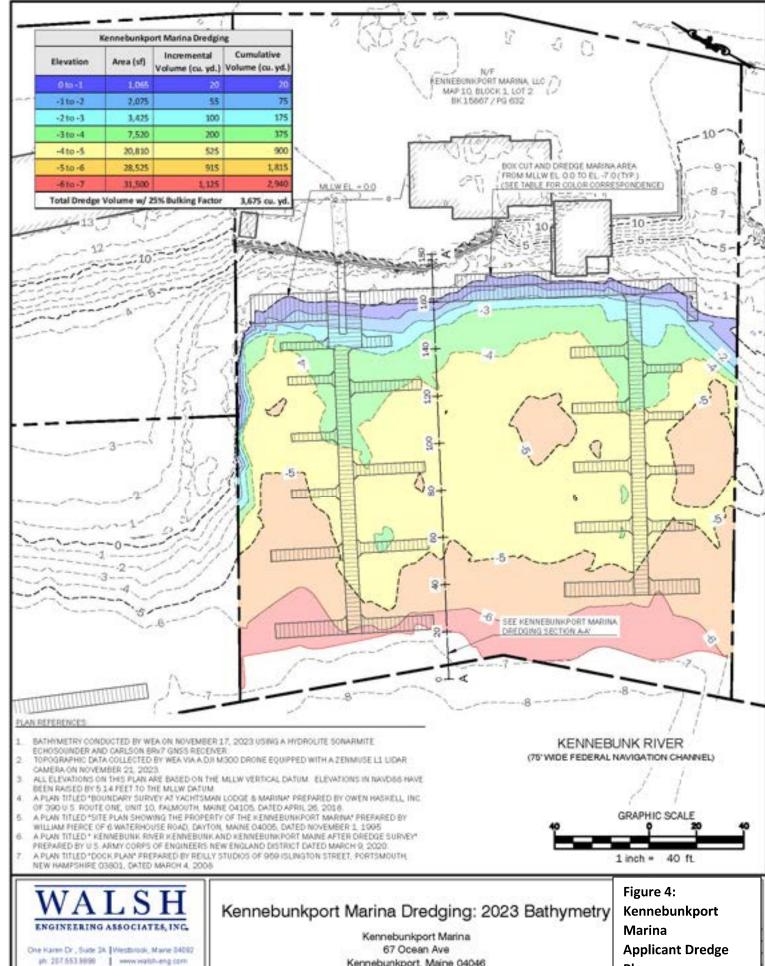
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- USEPA/USACE 1991. Evaluation of Dredged Material Proposed for Ocean Disposal Testing Manual. Environmental Protection Agency, Office of Water and Department of the Army, United States Army Corps of Engineers. Washington, D.C.





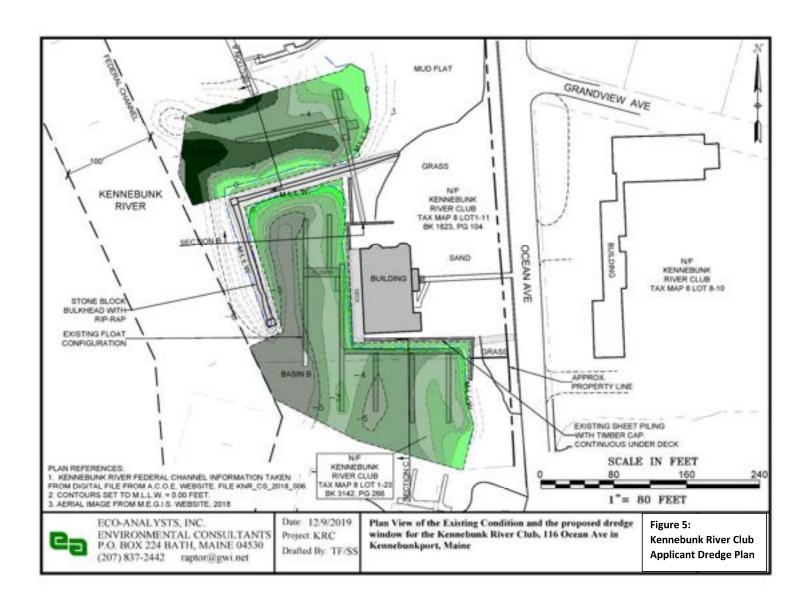


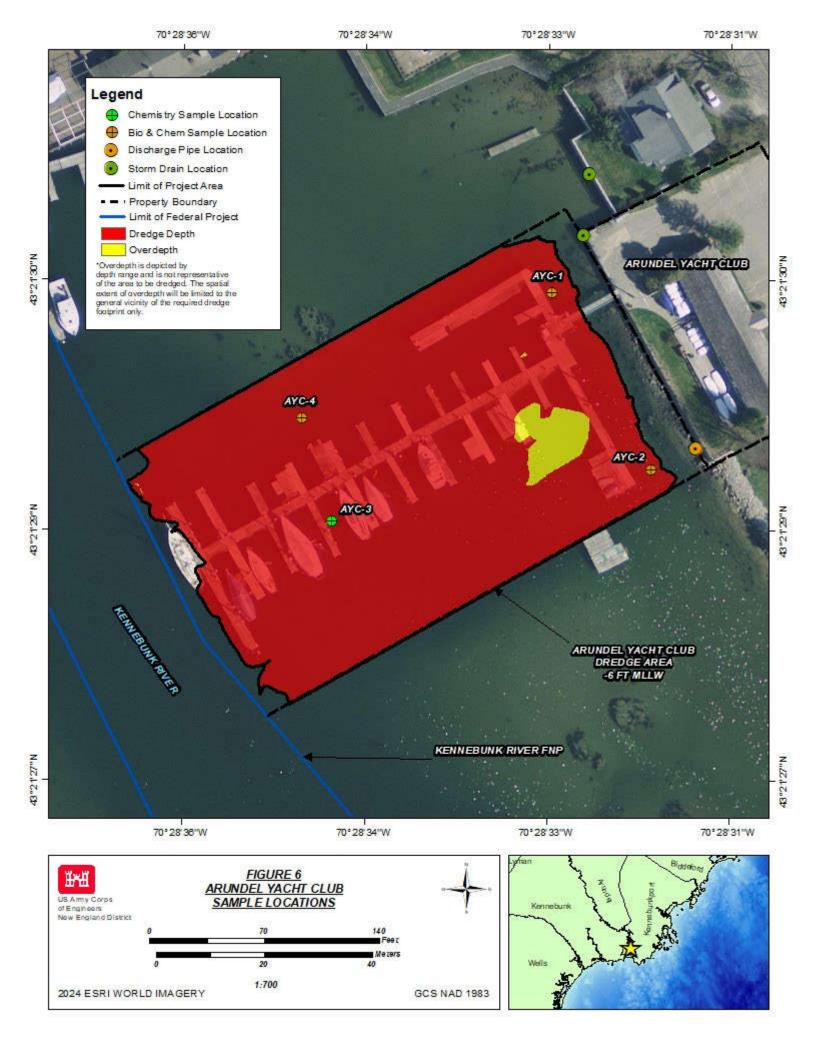


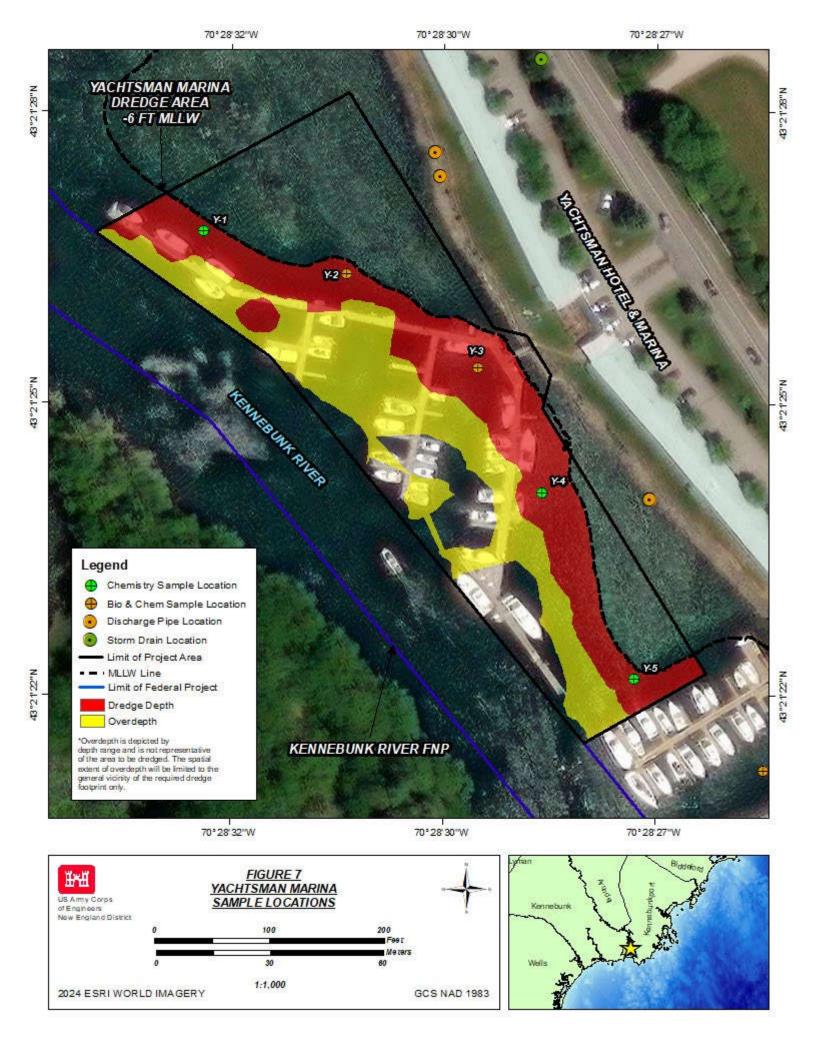
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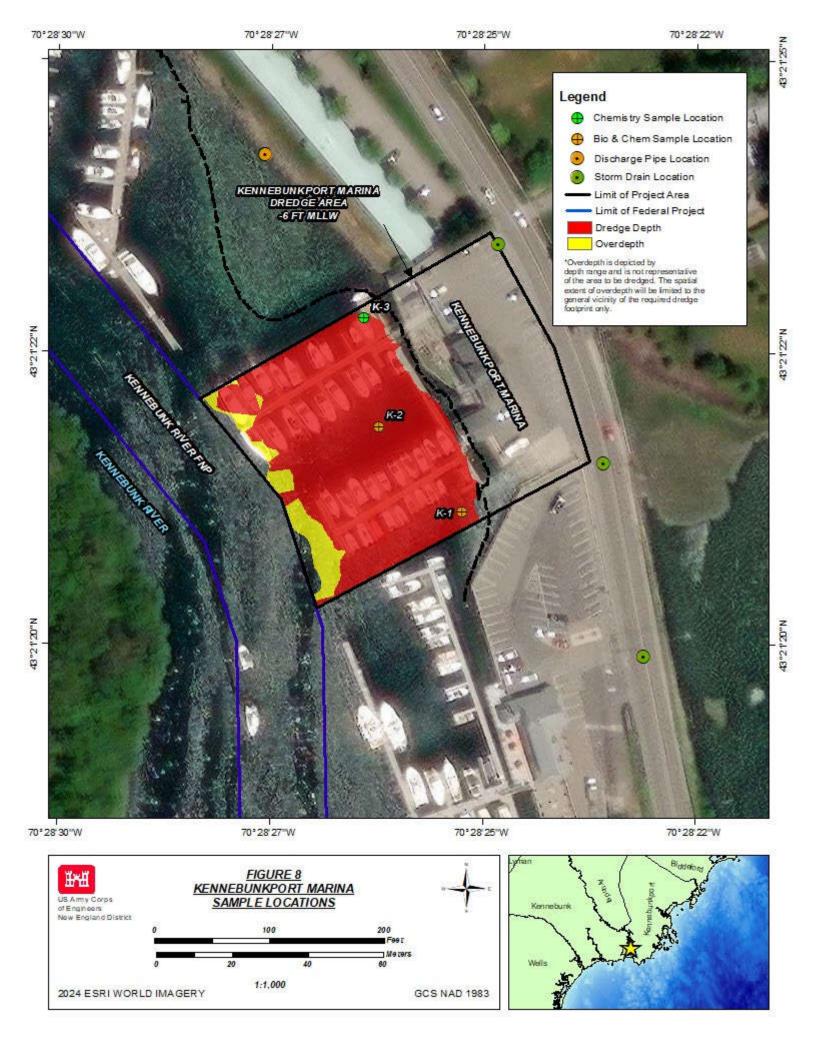
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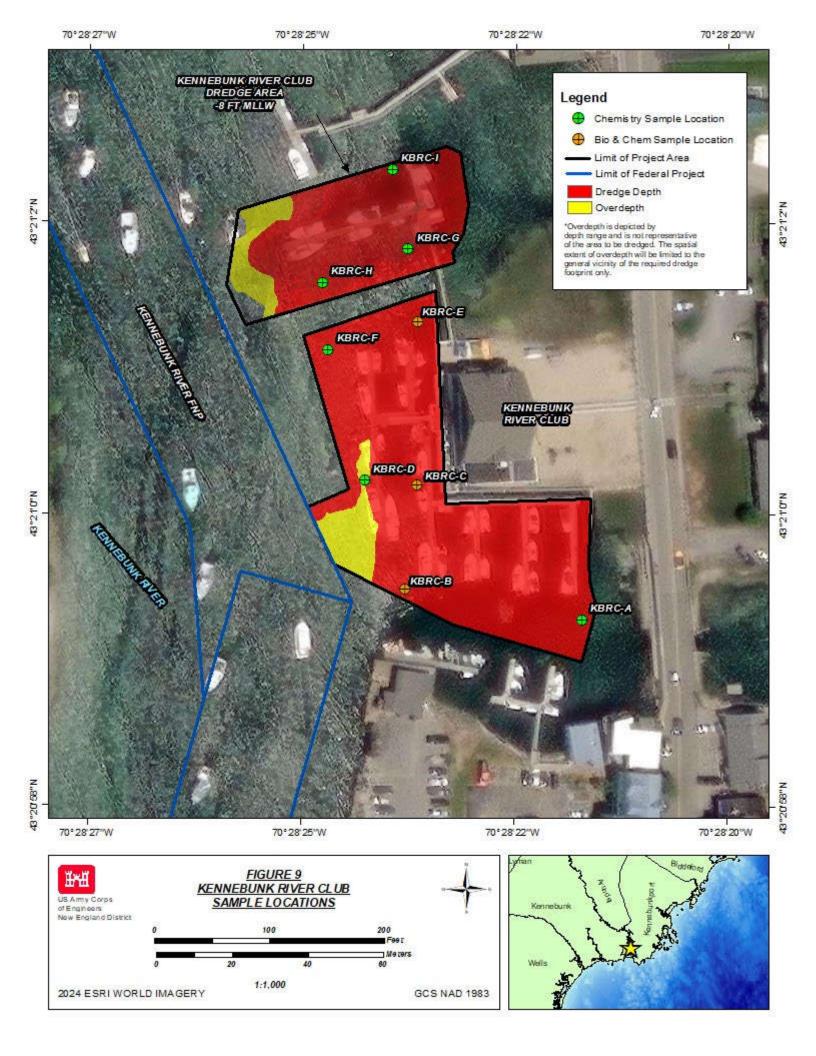
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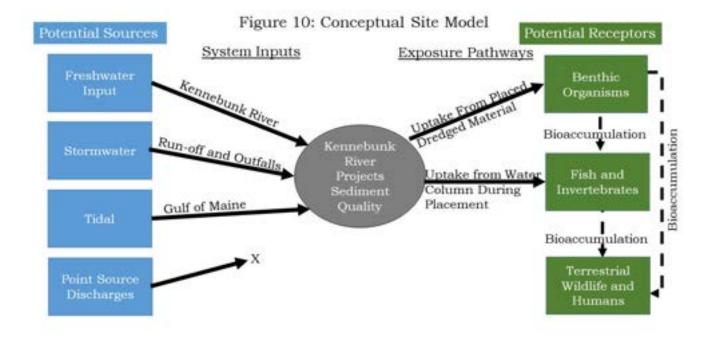












## Appendix A Core Logs and Photographs

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**



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

#### **Core Photo**

made refusal was reached after 2.4' penetration.



Project: <u>Arundel Yacht Cl</u>	<u>ub</u>	<b>Date</b> : <u>7/26/2022</u>	
Sampling Personnel:Dustin J ]	Kach		
Weather: Light Winds, Clea	ar Skies		
Location Method:DGPS: 1	meter accuracy		
Sample ID: <u>AYC-3</u>		Time: 12:55 pm	
Sampler Type: VibraCor	e Sampler		
Depth:3.2' MLLW			
Coordinates: <u>Latitude: 43.357</u>	793	<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

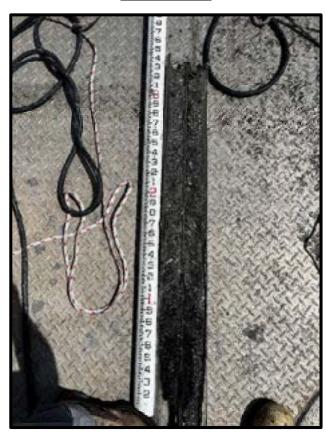
#### **Core Photo**



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

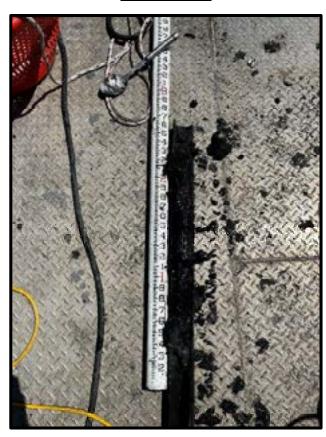
#### **Core Photo**



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**

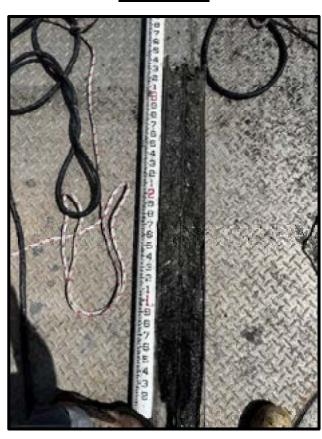
Material Description: <u>0-2.7</u>' composited. Dark silt with hard packed sand at bottom of core.



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

Hysical Total organic carbon Metals Arsensie Cadmium Chromium Copper Lead Lead Wickel Zinc PAHs Accnaphthene	7440382 7440439 7440439 7440439 7440508 7439921 7439976 7440020 7440666	Units % mg/kg mg/kg mg/kg mg/kg mg/kg	8.2 1.2 81 34	70 9.6	108 Value 1.28 9.66	Q.	K-1 Result	(NAE-2001 K-1 Q Result	5-00280 2		V-1		(N	chtsman Ma AE-2004-00						l Yacht Clu 2022-0028		AVC-4	KBRC-A				Ke	ennebunk R (NAE-2007-	2704)			H KBRC-	I KBRC-F
Hysical Total organic carbon Metals Arsensie Cadmium Chromium Copper Lead Lead Wickel Zinc PAHs Accnaphthene	7440382 7440439 7440473 7440508 7439921 7439976 7440020	mg/kg mg/kg	8.2 1.2 81	70 9.6	Value 1.28 9.66	Q				K-3													MDDO I									17 1755	I WDDG D
Hysical Total organic carbon Metals Arsensie Cadmium Chromium Copper Lead Lead Wickel Zinc PAHs Accnaphthene	7440382 7440439 7440473 7440508 7439921 7439976 7440020	mg/kg mg/kg	8.2 1.2 81	70 9.6	1.28 9.66	Q	Result	Q Result					Y-2	Y-3	Y-4	Y-5	AY	C-1	AYC-2	AYC	-3			KBRC-	B KBF	C-C	KBRC-D	KBRC-	E KE	3RC-G	KBRC		
Total organic carbon Metals Arsenic Cadmium Chronium Chronium Chronium Lead Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Metals Met	7440382 7440439 7440473 7440508 7439921 7439976 7440020	mg/kg mg/kg	1.2 81		9.66	Н			QI	Result Q	Result	Q R	esult Q	Result Q	Result 0	Result	Q Resul	lt Q	Result 0	Q Result	Q I	Result Q	Result	Q Result	Q Resui	lt Q	Result C	2 Result	Q Res	ult Q	Result	Q Result	Q Result Q
Metals Arrenic Cadmium Chromium Chromium Copper Lead Mercury Nickel Zinc FAHs Accnaphthene	7440382 7440439 7440473 7440508 7439921 7439976 7440020	mg/kg mg/kg	1.2 81		9.66																												
Arsenie Cadmium Chromium Copper Lead Mercury Nickel Zinc PAHs Accenaphthene	7440439 7440473 7440508 7439921 7439976 7440020	mg/kg mg/kg	1.2 81		9.66		0.37	3.04		2.32	0.93	_	1.72	1.90	1.19	0.20	1.14	$\perp$	1.15	8.46		2.64	-	-	_	$\perp$	-	-	_			-	
Cadmium Chromium Choper Lead Mercury Nickel Zinc PAH8 Acenaphthene	7440439 7440473 7440508 7439921 7439976 7440020	mg/kg mg/kg	1.2 81		9.66	_																											
Chromium Copper Lead Mercury Nickel Zinc PAHa Acenaphthene	7440473 7440508 7439921 7439976 7440020	mg/kg mg/kg	81			_	2.85	6.68		6.34	6.65		3.20	7.96	4.54 0.430	0.984	9.75		6.72	7.78 0.453		0.613	5.34 0.463	4.98 0.433	3.52		3.30 0.350	2.47	3.3		2.82	5.12 0.451	1.58
Copper Lead Mercury Nickel Zinc PAHs Accnaphthene	7440508 7439921 7439976 7440020	mg/kg mg/kg		370	31.5	-	21.9	27.1		26.4	0.225		.235	33.6	23.1	6.71	41.6		26.2	25.6		38.1	27.5	26.0	20.0		20.5	0.229	0.2		0.237	24.8	0.119
Lead Mercury Nickel Zinc PAHs Acenaphthene	7439921 7439976 7440020	mg/kg		370	10.0	+	14.2	16.7		15.4	12.5		3.64	18.3	9.82	1.59	29.4		15.7	25.6		24.3	13.7	13.8	9.34		9.52	18.6	8.2		7.16	13.6	5.32
Nickel Zinc PAHs Acenaphthene	7440020			218	18.1	+	134	21.9		17.1	12.4		12.9	20.2	7.79	1.81	30.9		26.1	21.4		33.7	18.8	17.8	12.2		13.3	8.67	11		0.70	17.7	4.81
Zine PAHs Acenaphthene			0.150		0.032	1	0.051	0.063		0.047	0.045		.051	0.052	0.011	1 0.005	J 0.064		0.086	0.059	J.	0.108	0.062	0.054	0.050		0.053	0.032	0.0		0.046	0.056	0.023
PAHs Acenaphthene	7440666	mg/kg	20.9	51.6	20.8	-	9.17	15.6		15.4	11.3		3.37	21.4	15.1	3.81	25.4		13.0	15.0		22.7	15.9	14.5	11.4	-	11.3	8.57	9.5		8.67	13.4	6.12
Acenaphthene		mg/kg	150			T	56.6	67.4		57.2	42.2		37.6	71.2	45.2	10.2	101		58.1	68.6		98.0	68.9	67.7	48.3	$\neg \neg$	50.9	37.2	50.	.5	39.9	78.2	28.9 J
	83329	ug/kg	16				3.96	J 20.4		15.1	5.30		3.46 J	2.97 J	1.75	J 1.32	J 11.3		23.4	1.40		4.94 J	21.7	18.2	1.35		1.35 t	1.35	U 1.3		1.35	U 1.35	U 1.35 U
Acenaphthylene	208968	ug/kg	44		7.06	$\perp$	30.1	20.6		12.6	9.97		17.0	12.6	0.241	J 0.884	J 23.8		71.1	7.60		15.3	10.0	1.25	U 1.25		1.25 L	1.25	U 1.2		1.25	U 11.9	1.25
Anthracene Fluorene	120127 86737	ug/kg	85.3 19	540	2.40	-	32.5 8.08	34.5		40.4 17.1	26.3 6.97		9.01	18.1 5.98	0.692 .	J 0.640 J 0.186	J 25.0 U 12.9		119	7.96		18.6 4.86 J	90.3	143.0	46.3 15.9		19.6 1.45 U	26.2 J 1.45	U 1.4		25.2	29.1 14.2	15.4 U
Nanhthalene	91203	ug/kg ug/kg				+	8.30	10.2		11.6	5.13		3.99	9.39	2.35 1	J 0.186	U.I 14.5		21.8	29.7		7.95 J	1.15	30.6 II 1.15	11 1.15		1.45 U	1.45	U 1.4		1.15	U 1.15	U 1.15 U
Phenanthrene	85018	ug/kg	240	1500	26.9	+	102	10.2		128	134		120	69.4	2.62	J 2.26	J 101		381	40,7		52.2	1.15	127	142		81.5 U	82.9	J 76		87.1	159	82.9
Total LPAH	SUMERAN	ug/kg				+	185	225		225	188		191	118	7.87	8.67	189		654	90.9		104	316	321	208		106	114	10		127	217	104
Benzo[a]anthracene	56553	ug/kg	261	1,600	21.3	o	115	157		133	127		128	74.0	2.98	J 3.97	136		326	31.0		77.3	311	522	257	+	92	97.2	78		67.0	136	55.8
Benzo(a)pyrene	50328	ug/kg	430	1,600	23.4		129	160		130	132	J :	130	85.3	3.12	J 4.60	140		328	35.7		90.0		J 226	J 146		80 J		71		58	J 129	J 51.8 J
Benzo[b)fluoranthene	205992	ug/kg			36.4		126	180		137	116		141	95.8	3.61	J 5.28	163		320	42.7		93.5	282	J 303	J 210		109 J	87.2	86		86.2	J 201	J 63.6 J
Benzojg,h,ilperylene	191242	ug/kg			23.1	П	88.0	112		90.4	87.6		33.3	63.9	2.36	J 3.32	J 101		206	28.2		61.9		J 82.4	J 60.7		38.2 J	39.7	31.		23.7	J 50	J 26.8 J
Benzo[kjfluoranthene	207089	ug/kg			18.5	₩	91	131		117	106		14.6	61.4	2.23	3.38	J 120		231	31.1		75.7	174	J 251	J 139		77.7 J	67.3	78		52.5	J 110	J 40.5 J
Chrysene Dibenyla blanthracene	218019 53703	ug/kg ug/kg	384	2,800	21.7	+	132	164 24.4		138 20.4	136		140	88.9 15.2	0.253	J 4.68 J 0.723	J 25.3		362	42.9 8.33		94.7	321	455 J 15.5	.I 10.0		9.9 11	95.7 J 10.2	86. 10.		79.0	169	58.6 UJ 9.90 U.
Dibenz(a,h)anthracene Fluoranthene	53703 206440		63.4		4.41	+	239	24.4 364		474	19.6		21.2	15.2	7.05	0.723	J 25.3 291		702	92.7		233	619	1130	0 10.0	L UJ	9.9 U	J 10.2	J 13		10.2	UJ 10.1 209	123 U.J. 9.90 U.J.
Indenol1.2.3-edipyrene	193395	ug/kg	000	5,100	23.6	$\boldsymbol{+}$	83.5	108		94.6	90.1		36.5	67.2	2.39	1 3.20	J 102		215	27.4		64.2	71.2	J 87.5	J 60.5	-	39.5	43.8	33		27.2	J 51.0	J 28.1 J
Pyrene	129000	ug/kg	665	2.600	45.2	-	215	297		330	225		244	144	5.99	12.6	256		594	71.2		181	611	1140	665	- V	166	158	14		122	236	109
	SUMHPAH	ug/kg	1,700	9,600	260	-	1238	1697		1664	1336		338	863	33,3	48.3	1482		3341	411		986	2644	4212	2028		866	838	75		653	1301	567
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	2.86 J	0.093 U	J 0.016 U	J 0.013	UJ 3.87	J	4.34	J 0.274	UJ	1.99 J		1.90	2.10		1.30	1.00	1.2		0.880	1.70	0.680
4,4'-DDE	72559	ug/kg	2.2	27	0.066		2.23	4.53		0.068 U	2.50	J	2.78	0.057 U	0.010 1	0.008	U 7.51	J	5,74	0.167	U	4.37 J	1.90	1.30	1.40		1.30	0.790	1.4		1.30	2.00	0.400
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 1	J 0.017	U 1.62	J	2.60	0.360	U	1.51 J	0.850	1.50	4.00		0.750	0.620	0.9	00	0.530	2.20	0.028 U
Total DDX Aldrin	309002	ug/kg	1.58	46.1	0.112	٠	0.051	11 0.063		0.328 U 0.374 U	0.063		.051 U	0.272 U	0.045 1	J 0.038	U 0.378		0.243	0.801 U 0.915	U	0.374 11	0.008	4.70 II 0.008	7.50		0.008 t	2.41	U 0.0	0	0.008	5.90	U 0.200 U.
		ug/kg ug/kg			0.066		0.051			0.374 U		U 0		0.311 U		0.044	U 0.378			0.915			0.008		11 0.000		0.008 U		U 0.0			U 0.008	
cis-Nenachlor	5103719	ug/kg	_	_	0.019		0.015	U 0.019		0.109 U	0.133		.015 U	0.090 U	0.015	J 0.013	U 0.110		0.071	U 0.265		0.109 U	0.010	U 0.007	U 0.00		0.010 C	0.010	U 0.0		0.007	U 0.007	U 0.007 U
Dieldrin	60571	ug/kg	0.02	8	0.040		0.013	U 0.038		0.226 11	0.038			0.090	0.031	0.026	11 0.23			0.550		0.225 11	0.460	0.850	0.02		1.00	1.20	0.0		0.026	U 0.610	0.026
Endosulfan I	959988	ug/kg		_	0.036	Ü	0.028	U 0.035	Ü	0.206 U	0.035	0 0	.029 U	0.171 U	0.028	0.024	U 0.208	3 U	0.134	U 0.500	U ·	0.206 U	0.009	U 0.009	U 0.009	) U	0.009 L	0.009	U 0.0	09 U	0.009	U 0.009	U 0.009 U
Endosulfan II	33213659	ug/kg			0.019	U	0.015	U 0.018	U	0.106 U	0.018	U 0	.015 U	0.088 U	0.015	J 0.013	U 0.107	7 U	0.069 U	U 0.260	U ·	0.106 U	0.019	U 0.019	U 0.019	U	1.20	0.019	U 0.0	19 U	0.019	U 0.740	0.019 U
Endrin	72208	ug/kg			0.022	U	0.017	U 0.021	U	0.123 U	0.021	U 0	.017 U	0.102 U	0.017	0.014	U 0.124		0.080 U	U 0.300	U ·	0.123 U	0.027	U 0.027	U 0.430		0.760	0.027	U 0.0		0.770	1.90	0.027 U
Gamma-Chlordane (trans)	5103742	ug/kg			0.040		0.031	U 0.039		0.228 U	0.038			0.189 U		J 0.027	U 0.23		0.15 U	U 0.555	U	0.228 U	0.710	0.910	0.220		1.8	0.009	U 0.0		1.50	0.720	0.830 J
Heptachlor	76448	ug/kg			0.041		0.032	U 0.040		0.235 U 0.482 U	0.039		.032 U	0.195 U	0.032 1	J 0.027	U 0.237		0.152   0.312   0.312	U 0.570		0.234 U 0.482 U	0.470	0.300 U 0.009	U 0.005		0.230	0.220	0.0 U 0.0		0.009	U 0.820 U 0.009	0.009 U
Heptachlor epoxide Hexachlorobenzene	1024573	ug/kg			0.085		0.066	U 0.082		0.482 U	0.081	0	.066 U	0.400 U	0.066	J 0.056	U 2.035		1.305	U 1.18		2.02 U	0.009	U 0.009	0.009		0.009 U	0.009	U 0.0		0.009	U 0.009	U 0.200 U. U 0.009 U
Lindane	58899	ug/kg ug/kg	_	_	0.334	- 11	0.274	U 0.341	- 11	2.013 U	0.337		.047 U	0.281 U	0.274	1 0.039	U 0.342		0.219	U 0.825	17 .	D 222 11	0.009	U 0.430	0.010		0.010 C	0.010	U 0.0		0.010	U 0.010	U 0.400 J
Methorsychlor	72435	ug/kg			0.039	11	0.073	11 0.090	II.	0.530 11	0.037			0.442	0.073 1	0.052	11 0.540		0.219	U 1.30	II .	0.530 11	0.015	U 0.125	U 0.12		0.015 U	0.013	U 0.1		0.125	U 0.013	U 0.125 U
Oxychlordane	27304138	ug/kg			0.082	Ŭ	0.063	U 0.079	Ü	0.464 U	0.078	UO	.064 U	0.385 U	0.063	0.054	U 0.469	U	0.301	U 1.13	U ·	0.464 U	0.710	0.010	U 1.60		0.010 t	0.010	U 0.2		0.010	U 0.290	0.200 U.
	8001352	ug/kg			1.71		1.33	U 1.65		9.70 U	1.63		1.34 U	8.10 U	1.33	J 1.13	U 9.80		6.30 t	U 23.8		9.70 U		U 0.019	U 0.019		0.019 t	0.019	U 0.0		0.019	U 0.019	U 0.019 U
trans-Nonachlor	39765805	ug/kg			0.018	U	0.014	U 0.017		0.100 U	0.017		.014 U	0.083 U	0.014	J 0.012	U 0.101		0.065 1	U 0.244		0.100 U	0.009	U 0.010	U 0.010	U (	0.010 L	0.010	U 0.0		0.010	U 0.010	U 0.200 U.
	SUMCHLOR	ug/kg	0.5	- 6	0.300	U	0.233	U 0.289	U	1.710 U	0.285	UO	.234 U	1.42 U	0.233	0.198	U 1.72	U	1.11 U	U 4.2	U	1.7 U	1.4	0.95	1.8		1.8	0.044	U 0.2	65	1.54	1.04	1.25
PCBs	04000405				0.16	12	0.044	11 0.071		0.000	0.050		041 22	0.049	0.041		11 0.000		0.000	0.000	111	0.06	0.015	11 0.01	11 0000		0.015	0.015	77 0.0		0.017	11 0.01	11 0015
	34883437	ug/kg	_	-	0.104		0.041	U 0.050	- 0	0.059 U 0.043 U	0.050		.041 U	0.049 U	0.041 1	J 0.035 I 0.025	U 0.060		0.039	U 0.145		0.06 U	0.015	U 0.015	U 0.01		0.015 U	0.015	U 0.0		0.015	U 0.015	U 0.015 U
PCB 018 PCB 028	7012375	ug/kg ug/kg	_	_	0.076	11	0.030	U 0.037	11	0.043 U	0.036	0 0	050 1	0.030 L	0.030	0.025	U 0.044	10	0.028	0.105	II .	0.043 U	0.017	U 0.017	U 0.01	U U	0.017	0.017	U 0.0	15 U	0.017	U 0.017	U 0.017 U
	41464395	ug/kg			0.129	0	0.056	U 0.062	111	0.074 U	0.062	11 0	.056 U	0.061 U	0.056	0.043	11 0.083	3 11	0.048 (	0.200	TI I	0.073 0	0.015	U 0.013	11 0.001	3 11	0.015 0	0.015	U 0.0	08 II	0.008	U 0.013	U 0.015 U
	41464408	ug/kg		_	0.140	Ŭ	0.055	U 0.068	Ü	0.080 U	0.067		.055 U	0.067 U	0.055	1 0.047	U 0.081	Ŭ	0.052	U 0.195	ŭ,	0.080 U	0.008	U 0.009	U 0.000		0.009 U	0.009	U 0.0	09 U	0.008	U 0.009	U 0.009 U
	35693993	ug/kg			0.080	Ü	0.308	J 0.248	Ĵ	0.046 U	0.038		.031 U	0.038 U	0.031	J 0.027	U 0.046	5 U	0.506	0.111	U ·	0.046 U		U 0.010	U 0.010		0.010 U	0.010	U 0.0	10 U	0.010	U 0.010	U 0.010 U
PCB 066	32598100	ug/kg			0.075	Ü	0.029	U 0.036	U	0.043 U	0.036	UO	.030 U	0.036 U	0.029 1	J 0.025	U 0.043	3 U	0.028	U 0.105	U	0.043 U	0.007	U 0.007	U 0.00	7 U	0.007 U	0.007	U 0.0	07 U	0.007	U 0.007	U 0.007 U
	38380028	ug/kg			0.061		0.302	J 0.030	U	0.035 U	0.029		.024 U	0.029 U	0.024 1	J 0.020	U 0.035		0.023 t	U 0.085		0.035 U	0.007	U 0.007	U 0.00		0.007 U	0.007	U 0.0		0.007	U 0.007	U 0.007 U
	37680732	ug/kg			0.123		0.819	0.059		0.070 U	0.059		.048 U	0.270 J		J 0.041	U 0.357		0.747	0.170		0.070 U	0.006	U 0.006	U 0.004		0.006 U	0.006	U 0.0		0.006	U 0.006	U 0.006 U
	32598144	ug/kg			0.110		0.043	U 0.053		0.063 U			.043 U	0.052 U		J 0.037	U 0.063		0.041 0	U 0.153		0.063 U		U 0.010	U 0.010		0.010 t		U 0.0		0.010	U 0.010	U 0.200
	31508006	ug/kg			0.116	U	0.571	0.056	U	U 880.0	0.056	UO	.046 U	0.055 U	0.045	0.039	U 0.067	U	0.590	0.162	U ·	0.056 U	0.011	U 0.250	0.01		0.011 t	0.011	U 0.0	11 U	0.011		U 0.011 U
PCB 128 PCB 138	38380073	ug/kg ug/kg	_	-	0.137	U	0.053	U 0.066	U	0.078 U	0.066	U 0	.054 U	0.065 U	0.053 1	J 0.046	U 0.079	, ,	0.051 U	0.191	U I	0.078 U	0.005	U 0.005	U 0.003		0.005 L	0.005	U 0.0	usi U	0.005	U 0.005	U 0.005 U
	35065282	ug/kg	_	_	0.088	11	0.922	0.625		0.290 J 0.104 II	0.092		.278 J	0.453 J	0.034	0.029	U 0.389		0.657	0.122		0.050 U	0.280	0.360	0.230		0.220	0.008	U 0.0		0.260	U 0.290	0,008 U
	35065271	ug/kg		_	0.183	U	0.026	U 0.033		0.039 11	0.087		.027 II	0.292 U	0.071	1 0.022	U 0.039		0.025	0.254		0.039 U	0.260	U.310	11 0.01		0.006 C	0.006	U 0.0		0.006	U 0.220	U 0.006 U
PCB 170	35065293	ug/kg		_	0.069	U	0.026	J 0.033		0.039 U	0.032		.027 U	0.032 U	0.020	1 0.023	U 0.040		0.025	U 0.096		0.039 U	0.007	U 0.007	U 0.00		0.007 1	0.007	U 0.0		0.007	U 0.007	U 0.007 U
	52663691	ug/kg			0.037	Ü	0.015	U 0.018		0.021 U				0.018 U		J 0.012	U 0.022		0.014	U 0.052		0.021 U		U 0.006	U 0.00		0.006 U		U 0.0		0.006	U 0.006	U 0.006 U
(PCB 184)	74472483	ug/kg			0.076	U	0.030	U 0.037	U	0.043 U	0.036	UO	.030 U	0.036 U	0.030 1	J 0.025	U 0.044	Ü	0.028 U	U 0.105	U	0.043 U	0.012	U 0.012	U 0.013	U S	0.012 U	0.012	U 0.0	12 U	0.012	U 0.012	U 0.012 U
PCB 187	52663680	ug/kg			0.099	U	0.213	J 0.048	U	0.056 U	0.047	U 0	.039 U	0.047 U	0.039 1	J 0.033	U 0.057	7 U	0.037	U 0.138	U	0.056 U	0.008	U 0.008	U 0.001	3 U	0.008 U	0.008	U 0.0	08 U	0.008	U 0.008	U 0.008 U
	52663782	ug/kg			0.129	U	0.050	U 0.062	U	0.074 U	0.062	UO	.051 U	0.061 U	0.050 1	J 0.043	U 0.075	U	0.048	U 0.180		0.074 U	0.009	U 0.009	U 0.009		0.009 t	0.009	U 0.0	09 U	0.009	U 0.009	U 0.009 U
	40186729	ug/kg			0.132	U	0.051	U 0.064	U	0.075 U	0.063	UO	.052 U	0.063 U	0.051 1	J 0.044	U 0.07€	5 U	0.049 (	U 0.184		0.075 U	0.011	U 0.011	U 0.01		0.011 t	0.011	U 0.0	11 U	0.011	U 0.011	U 0.011 U
		ug/kg					0.059			0.086 U				0.072 U			U 0.087						0.005		U 0.003			0.005				U 0.005	
Total PCBs	Sun/IOAA18	ug/kg	22.7	180	4.02	C	8.34	3.98		2.77	1.92	- 2	2.33	3.56	1.56	1.33	U 3.95		8.87	5.59	ď	2.29 U	1.4	2.1	1.2		0.751	0.326	U 0.3	26 U	0.831	1.3	0.705

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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 ^d 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	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	0.581 a 0.610 a	0.805 ac
Benzo(b)fluoranthene	μg/Kg 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-cd)pyrene	μg/Kg ug/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 158	μg/Kg μg/Kg	0.628 b	0.763	0.462 aNS 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	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 μg/Kg	0.0928 a 4.39	0.0697 a 3.79	0.0920 ac 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 0.0501 a	0.0161 a 0.0752 a	0.0106 ac 0.0495 ac
Oxychlordane Total Chlordanes	μg/Kg μg/Kg	0.0301 a 0.184	0.0732 a 0.277	0.0493 ac 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	$\mu g/Kg$	0.00737 a	0.0111 a	0.00728 ac
Total DDT	μg/Kg	3.32	0.0531	0.688
Dieldrin	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 Total Endosulfans	μg/Kg μg/Kg	0.0115 a 0.0337	0.0173 a 0.0507	0.0113 ac 0.0333
Endrin	μg/Kg μg/Kg	0.0337 0.0132 a	0.0307 0.0199 a	0.0333 0.0131 ac
Heptachlor	μg/Kg 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.

^d Pre-test tissue represents the mean of three replicates, whereas the reference and site composites represent a mean of 5 replicates.

^e 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 ^d 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 ^c
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.

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

^e 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 Fillet				
	Test	6.01E-6	3.72E-2			
	Reference	1.66E-6	1.74E-2			
		Nereis 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	n Fillet		
	Test	5.09E-6	8.9E-2		
	Reference	1.63E-6	3.72E-2		
		Nereis 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	r 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	Х
4,4'-DDD	X
4,4'-DDE	Х
Anthracene	X
Benzo(a)anthracene	X
Benzo(a)pyrene	X
Benzo(b)fluoranthene	X
Benzo(k)fluoranthene	X
Chrysene	X
Fluoranthene	X
Fluorene	×
Naphthalene	×
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	X
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 Ri	ver 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

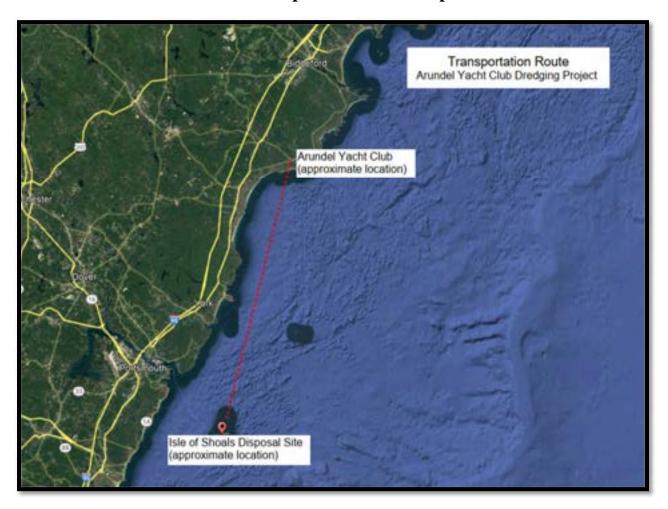
U: Compound was analyzed for but was not detected (non-detect)

J: Indicates an estimated value

^{*} 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 Arundel Yacht Club (AYC), 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 AYC 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 AYC is 8,031 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 14 to 17 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 Arundel Yacht Club (AYC) proposes to dredge approximately 45,356 square feet of the Kennebunk River located offshore and southwest 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 8,031cubic 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: Arundel Yacht Club	_ Phone:		
Application Type: NRPA Tier III	_		
Activity Type: (brief activity description) Dredging approxi	mately 8,031 cy of materia	<u> </u>	
Activity Location: Town: Kennebunkport Cou	ınty: York		
GIS Coordinates, if known:	-		
Date of Survey: 02/24/22 Observer: Randee McDo	onald Phone:	207 553-98	98
	Distance Betw Activity and I		
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?			X
E. A National or State Park?			X
F. 1) A municipal park or public open space?	X		
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 ac	etivity?		
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</li></ul>	g other seasons)	□Yes	⊠No
5. Are any of the resources checked in question 1 used during the time of year during which the activity w		X Yes	□No

### Appendix B:

**MDEP Coastal Wetland Field Survey Checklist** 

## APPENDIX B: MDEP COASTAL WETLAND CHARACTERIZATION: INTERTIDAL & SHALLOW SUBTIDAL FIELD SURVEY CHECKLIST

NAME OF APPLICA		nt Club		PHONE:		
APPLICATION TYP	E: NRPA Tier III					
ACTIVITY LOCATION	ON: TOWN:_ <u></u>	Kennebunkp	oort	COUNTY:	York	
ACTIVITY DESCRI					e stabilization	
DATE OF SURVEY:	January 26, 2022		OBSERVE	R: Randee McDo	nald	
TIME OF SURVEY:	1:30 pm		TIDE AT S	URVEY: Low		
SIZE OF DIRECT IM Intertidal area:	IPACT OR FOOT	ΓPRINT (s	square feet): _Subtidal are	ea:_ 45,356 sq ft		
SIZE OF INDIRECT Intertida	IMPACT, if known area:	wn (square	feet):Subtid	al area:		
HABITAT TYPES PI	oulder/cobble bea	ch □ sa	nd flat ⊠m		nes □salt marsh	1
ENERGY: □ protecte	d ⊠ semi-p	rotected	□ par	tially exposed	□ exposed	l
DRAINAGE: □ drain	s completely	■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing     ■ standing	g water [	□ pools □	stream or channel	
SLOPE: □ >20%	□ 10-20%	□ 5-	-10%	፟ 0-5%		
SHORELINE CHARA bluff/bank (h	ACTER: eight from spring	high tide:	) 🗆 be	ach ⊠rocky	□ vegetated	
FRESHWATER SOU	JRCES: □ stream	⊠ri	iver	□ wetland		
MARINE ORGANIS	MS PRESENT:					
		absent	occasional	common	abundant	
musse			凶			
clams		$\mathbf{X}$				
marine	e worms					
rockw			凶			
eelgras						
lobster		X				
other	-					
SIGNS OF SHORELI	INE OR INTERT	IDAL ERO	OSION?	□ yes	🖄 no	
PREVIOUS ALTERA	ATIONS?			🛛 yes	□ no	
CURRENT USE OF S  ☐ undeveloped	SITE AND ADJA Ճ residential	ACENT UF		□ degraded	★ recreational	
PLEASE SUBMIT T  Description Photographs	THE FOLLOWI  © Overhead					(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 dredged	8,03	cu. yds.							
Sq. ft. to be dredged:	45,	356 sq. ft.							
Max. depth of dre existing grade:	dging below	· -6.0							
Type of material (ex silt, clay, gravel. Dredged:		Silt and sand							
Describe what essediment control measused during the operation. (attach seif necessary):	dredging	tolding the dredge material directly onto the barge (scow) will allow it to be de-watered.							
activity drawings.	dewatered sheet if ocation and leasures on	·	loaded directly onto the bargior to transport.	ge (scow) where it will be					
What equipment will the dredge?	be used for		will be conducted from a floa lam shell bucket and/or bac						
Disposal Location: Upland disposal:  (Check one)  □ On site □ Landfill □ Other □ Portland □ Rockland □ Other Isle of Shoals									

(pink)

#### FOR UPLAND DISPOSAL:

Co	tact the Division of Solid Waste Management at (207) 822-6300:	
	Contacted:	
FO	R OCEAN DISPOSAL:	
	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	al
	<b>NOTE:</b> Applicants are STRONGLY recommended to contact the DEP prior to performing any sedimensampling. Improperly sampled or analyzed sediments may have to be retested.	ıt
X	Submit as <b>Attachment 16</b> , a copy of a map showing the proposed transportation route to the disposal site.	
Lis	all municipalities adjacent to the proposed transportation site: *Submitted as Attachment 15	
	lew Hampshire: Rye, New Castle	
l	laine: Kittery, Eliot, York, Ogunquit	
Αc	opy of the application must be submitted to all municipalities adjacent to the proposed transportation site.	
	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	<b>e</b> .
	(pink)	

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

nelac

#### 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 NH₃-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 NH₃-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 NH₃-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.
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- 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	Accession Number	Time	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 NumberInitial 0Day 0Day 						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   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day   Day						•	
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		Rar	ige		
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	

^a 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		Ra	nge		
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	

^a 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 Surviva	
	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 Surviva	
	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 ₂ )	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 Description		
Number (office use only)	Grab	Composite	Start Date/Time	End Date/Time			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
1							·
		***					
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Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Sectio		<u> </u>	<u> </u>	1			·
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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 My Laboratory	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- \ 52 (Lab Control) 175	
AT3-098	



### TOXICOLOGY LABORATORY BENCH SHEET -ORGANISM RECOVERY RECORD

Project Number: <u>EA.TOX</u> Client: <u>Eco Analyst</u>		TEST ORGANISM	
		Common Name:	_ Opossum shrimp
QC Test Number:	TN-23-326	Scientific Name:	———
Organisms Recovered (		3/20/2> 1500 m	
Treatment	Replicate	Number of Organisms Loaded	Number of Organisms Recovered
AT3- 152	A	20	20
(Lab Control)	В	20	19
	С	20	19
	D	20	20
	Е	20	λο
AT3-098	A	20	20
	В	20	20
<u> </u>	С	20	19
	D	20	
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# TOXICITY TEST WATER QUALITY DATA SHEET - NEW SOLUTIONS

Project Number: EA.TOX	TEST ORGANISM	Beg	ginning Date:	3110123	Time	1530
Client: Eco Analyst	Common Name: Opossum	shrimp End	ling Date:	3/2/13	Time	1000
QC Test Number: TN-23-326	Scientific Name: A. bahia					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)	(2,) a					-	Hd				1	vissolv	Dissolved Oxygen (mg/L)	i) ua8/	mg/L)				S	Salinity (ppt)	(bdc	
Sample #		0	-	5	9	4	40	9	0	-	2	-	4	8	9	-	2	-	-11	8	9	0	-			-	-
AT3-152	Control	6.9	F 72.18						90		+	+	+	+	1	_	+	-	+	+		2		<	1	-	,
AT3-098		O.A.							0		+	+	+	+	2	3	+	+	-	+-	11	35					
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	Time	Time (SS)							1334				$\vdash$	-	35	0						35	1	T		t	+
	Con Sleitini	3							CAN	-	-	H	H	1	1			L						Ť	†	+	+

# TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: EA.TOX	V.TOX	TEST ORGANISM		Beginning Date:	3/10/33	Time: j5	30
Client: Eco Analyst	yst	Common Name:	Opossum shrimp	Ending Date:	3/2/2	Time: 15	9
QC Test Number: TN-23-326	N-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		

Temperature (°C)
310 209 315
210 210 49 20.6
(187 1682 W. Less 1681 1682 1682 Less Less 681
13/14C 12

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:	3/10/13	Time: 15	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 fe		

	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	01	=	12	5	4
AT3-152 Control	1999 9 20.5		8.0 8.119	0	L		1.6	7.574				52	18.2 70.17	1222				
AT3-098	0.121.05 1.05		_	0.3			7.6 7.5	1.5 7.4				2	25.8.2012	9425				
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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 Pore Water	re Water	
Number	Ammonia (mg/L)	Salinity (ppt)	Hd Hd	Temperature (°C)	Ammonia (mg/L)	Salinity (ppt)	Hd (ns)	Temperature (°C)
Control	1,22	31.9	7.5	19. L	3,84	31.2	7.6	0.3/
AT3-098	2.19	)). L	9.4	18.1	15.85	37.0	7	/a.O
							2	
		-						
Meter	VERSASTAR	£89	779	239	VERSASTAR	293	209	627
Initials/Date/ Time	3/15/23 MVL	3/10/12 1220	3/10/12/22	met note	spsles Muc	3/10/12/120	3/10/10>	3/10/13

Client: Eco Analyst

QC Test Number: TN-23-326

FA Somnle		Day 2 Ove	Day 2 Overlying Water			Day 2 I	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	t, si	1.6	3,56	(PPV)	(ne)	(5.3)
AT3-098	202	30.6	8-0		15.30	79 4	7.7	(6)
							\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	5
Meter	VERSASTAR	20)	20)	687	VERSASTAR	269	( 6)	,
Initials/Date/	21/51/6	oftelos 1100	3/1465	com hair	3/15/12/20	3/14/11/11/11	3/14/13 1100	200 July 110
Time	MKL	Y	Á	}		}	*	

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		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	-//	, AA	)	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	$\overline{}$			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) (S) (S) (S) (S) (S) (S) (S) (S) (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 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100 July 100	41.4											101	100	31/8/25 NW-75
		Ammonia (mg/L)	70.1		5.0								_			VERSASTAR	4.00	3/20/2
	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	
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### 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.

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2	3/12/23	0830	れ こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゅう こうしゃ こうしゃ こうしゃ こうしゃ こうしゃ こうしゃ こうしゃ こうし
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### TOXICOLOGY LABORATORY BENCH SHEET - TESTING LOCATION

Project Number:	EA.TOX_
Client: Eco Analys	t
QC Test Number:TN-	23-326

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### 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	is 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	, ,			Analys Diluen Brine: Source	t: No Cry	ncy Roka t Applicable ystal Sea tO - Aquatic	Research C	r Age: 5 d
Sample ID: Sample Date: Receipt Date Sample Age:	: 09 Mar-23 15:3	Ma 0 CA	ode: aterial: AS (PC): ient:	AT3-152 Laboratory Con Eco-Analysts,		ent		Project Source Station	e: Ya	_	nent Evaluat Irina NAE-20 ntrol	
Sample Code	Sample i	D Sa	mple Dat	te Receip	t Date	Sample	Age	Client	Name	P	roject	<u> </u>
AT3-152 IOSN 2019 AT3-098	14-3904- 00-2071- 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-Ar	alysts, Ir		redged Sedi	ment Evalu
Sample Code	Material	Туре		Sample Source	e		Station I	ocation	<del></del>	Lat/Long		
AT3-152 Laboratory Control Sediment IOSN 2019 Reference sediment AT3-098 Marine Sediment				Yachtsman Ma Yachtsman Ma Yachtsman Ma	rina NAE-2	004-00	Laborato IOSN Re 10 Statio	ference		Лu		_
Single Compa	arison Summar	у									<u> </u>	
Analysis ID	Endpoint	_	Comp	parison Method			P-V	alue (	Compari	son Result	t	s
	Survival Rate Survival Rate			oxon Rank Sum Two-Sample Test I Variance t Two-Sample Test			0.73 0.28	381 i	OSN 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 (	).012 ).012 ).012	0.027 0.027 0.027	2.79% 2.79% 2.82%	0.00% 0.00% 1.02%
	Detail			<del></del>	···		<del></del>	MD5:	6DB39A	6AE9ED0DE	D6C333D750	
Survival Rate										OI DODE	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	210010A7C
Survival Rate Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
	Code LC	Rep 1 1.000	Rep 2 0.950	Rep 3 0.950	Rep 4 1.000	Rep 5					_	
Sample									<u>-</u> ,			

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 _f	dpoint: 3	Survival Rate			CET	IS Version:	CETISV	211	
-	Apr-23 16:32		-		-Two Samol	e	CETIS Version: CETISv2. Status Level: 1			<b>4.1.1</b>	
•	or-23 16:32 Analysis: Nonparametric-Two Sample or-23 16:30 MD5 Hash: CF0DC2D65B921694E75EDF509D2DB236								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 Sc	ediment \	achtsman Ma	ırina NAE-20	04-00 Lal	boratory Cor	ntrol			
IOSN 2019	Reference	sediment	`	/achtsman Ma	nina 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		•			
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  i) 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  i) 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	Sedin	nent Te			<del></del>					13-1892-87
											EA-E	ST, Inc. PB
1 *	18-2338-9679 Endpoint: Survival Rate 07 Apr-23 16:32 Analysis: Parametric-Tw					ua Campla	CETIS Version: CETISv2.1.1				v2.1.1	
_	07 Apr-23 16	Status Level: 1								4.040.5		
Batch ID:	12-9216-370						10 1000100		itoi ib.	005-34	1-210-5	
I _	12-92 16-370 10 Mar-23 15		rest ry Protoc	ype:S		D114 (000 t)				lancy Roka		
Ending Date: 2			Specie		S ACE NED mericamysis					lot Applicable	Э	
Test Length: 9			Taxon:		inencamysis	Dariia				Crystal Sea	_	
<u> </u>	<del></del> _		-						urce: A	RO - Aquatio	c Research	Or Age: 5 d
Sample Code IOSN 2019	Sample 00-207		Sample 10 Mar			ot Date	Sample A	ige Cli	ent Name		Project	
AT3-098	07-155			-23 -23 13:(	10 Mai	r-23 o-23 16:30	16h	Eco	-Analysts,	inc.	Dredged Se	ediment Eval
			001 00	20 10.0	JU US FEL	-23 10:30	30d 3h					
Sample Code	Materia				ample Sour			tation Loca	tion	<u>Lat/</u> Lon	g	
IOSN 2019 AT3-098		ice sedime	nt		achtsman Ma			OSN Referer				_
A10-090	Manne	Sediment		Y	achtsman Ma	arina NAE-2	004-00 1	0 Stations at	4 Marinas	Mu		
Data Transform		Alt Hy	/p				Compar	ison Result				PMSD
Angular (Correct	ted)	C > T						passed sur		ndpoint		3.29%
Equal Variance	t Two-Sam	ple Test										·
Sample I vs	•	•	df To	est Stat	t Critical	Men	D Time	D. V-1				
Reference Sed	AT3-098			.577	1.86	0.0731	P-Type CDF	P-Value 0.2898		n(α:5%)		
Auxiliant Toota							<u> </u>	0.2090	14011-216	inificant Effe	CT	
Auxiliary Tests												
Attribute Outlier	Test	<del></del>				Test Stat		P-Value	Decisio	n(α:5%)		
Odiller	Grupps	Extreme V	/alue T	est		1.16	2.29	1.0000	No Outi	iers Detected		
ANOVA Table					· ·							
Source	Sum Sc	uares	M	ean Sq	uare	DF	F Stat	P-Value	Decisio	n(a:5%)		
Between	0.00128		0.	001287	7	1	0.333	0.5796	Non-Significant Effect			
Error	0.03090		0.	003863	0	8	_		•			
Total	0.03219					9						
ANOVA Assump	ptions Tests								<del>_</del>			
Attribute	Test					Test Stat	Critical	P-Value	Decisio	n(a·1%)		
Variance		Ratio F Te			· · · · · · · · · · · · · · · · · · ·	1	23.2	1.0000	Equal V	<del></del>		
Distribution	Shapiro-	Wilk W No	rmality	Test		0.799	0.741	0.0142	•	Distribution		
Survival Rate Su	ummary	-				=		<del></del>				
Sample	Code	Count	Me	an	95% LCL	95% UCL	Median	Min	Wass	04.1	<b>01</b> 50 5	
IOSN 2019	RS	5		980	0.946	1.000	1.000	0.950	1.000	Std Err	CV%	%Effect
AT3-098		5		70	0.936	1.000	0.950	0.950	1.000	0.012 0.012	2.79% 2.82%	0.00% 1.02%
Angular (Correct	ted) Transfo	rmod Sum								0.012	2.0270	1.0270
Sample			-									
IOSN 2019	Code RS	Count 5		an	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%_	%Effect
AT3-098	110	5		110 390	1.340 1.310	1.490	1.460	1.350	1.460	0.028	4.40%	0.00%
		<del></del> _	1.0	-	1.010	1.470	1.350 ————	1.350 	1.460	0.028	4.47%	1.61% 
Survival Rate De												
Sample	Code	Rep 1		p 2	Rep 3	Rep 4	Rep 5					
IOSN 2019	RS	0.950	1.0		1.000	0.950	1.000				·	
AT2 000		1.000	1.0	100	0.950	0.950	0.950					
AT3-098												
AT3-098 Angular (Correct	ted) Transfo	rmed Deta	ıil		<del>-</del>							
	ted) Transfo Code	rmed Deta Rep 1	il Re	<del></del>	Rep 3	Rep 4	Rep 5	-				
Angular (Correct					Rep 3	Rep 4 1.350	Rep 5 1.460					

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 of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of 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)

3

## 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		

68271	4 5 6																
y (ppt)	-	-		_	-	+	+		_	H	H	-	l	-			
Salinity (ppt)	60	-	-	_	-	+	+	-	_				1	_	-		
w	64	_				+	+						1				
	-	_	6		_	1	1	-									
	0	F	6.16			1	1					L					
	9					1	1						ļ				
(a/L)	S												ļ				
m) max	4																
Dissolved Oxygen (mg/L)	m																
paylos	7																
Diss	-																
	0	17	1.		1												
	9												Ī				
	5						T						Ī				
	10						T						T				
Hd	3						T						Ī				
	2					T	T	1					Ī				
	1					T	Ť	1		Т			T				
	0	Ó	100			T	Ť	1									
	9					T	Ť	1					T			$\top$	
	S					T	t	1			$\vdash$				+		
(00)	4					T	+	1							+		
rature	m					t	t	1									
Temperature (°C)	2					-	+										
H	-					t	+	+									
	0	08	0.60			t	+	+					H		+	++-	
			3/			t	+	+					H		+	++	
		Control															
	Sample #	AT3-(9)+	AT3-098														



# TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

						_			_	_					_	
2	2				7	848.262 858,184 79 7.477 76 808,1 7,500 625,20,1 219 21,319,522,0	20.00									
Time: 1430	Time: 1330				9	19.5	9.									
ime:	ime:			(bdd)	5	21.3	22.t									
1	-			Salinity (ppt)	4	21.9	22.0									
_	7		ę.	Sa	2 3	20.1	900									
2/0	3 10 13	0.6	100		_	20.5	210									
31101123	^		.50		-	960	7									
			tensit		7	7.5	3.3									
Beginning Date:	ate:		th In	g/L)	9	3	5									
imming	Ending Date:		ž,	m) usa	S	000	7.9									
Beg	End		light	Oxyg	4	78	75									
	1	1	24 hr	Dissolved Oxygen (mg/L)	m	4.7	43									
	1	sns	riod:	Dis	2	1.4	7.2									
		mulos	otope		1	R	29									
		Leptocheirus plumulosus	Ph		7	7.	5.5									
	podii	chein	- ppt		9	8	8	1								
	Amphipod	Lepto	20		5	83	25									
			nity:	Hd	4	23	28		l.							
SM	ame	fame:	Sali	. 4	3	8.2	8.2									
TEST ORGANISM	Common Name:	Scientific Name:	mg/L		2	48	8.3									
ORC	Comm	Scient	0.4		-	83	4.8									
TEST	-		ö		7	201499 21,083	210 NO BLO BLO 8.2									
É			0.		9	49	310					- 6				
			5.0-5	(,,)	5	2016	210				8				į.	
			He	Temperature (°C)	4		210				Г			4	-	2
			ς.	Temp	3	17.7	200									
×		3-32	20		2	1.0	0.12									
EA.TOX	lyst	TN-23-327	:dus		-	Ag 21.0 21.7 21.0	20,0 21.0 22.0 21.0									
~	Ans		S: T	7		1				1						
per:	Eco Analyst	nber.	ALUE			Control						Ó				
Num		st Nur	ET V		55.				000							
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 #	AT3-153	AT3-098									

[3] (82 (82 (42 ) 642 64) 682 [83] (83

681/1/82 1682/187 Jun 1581 1562

Meter Number 681 166L

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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)	ture (°C	6				Hd	_				ä	Dissolved Oxygen (mg/L)	Oxyg	E (B)	(7)			S	Salinity (ppt)	(bbt)		
Sample #	6 8	10 1	11 12	13	14	90	6	10 11	12	13	14	90	6	10	Ξ	12	13	14	80	9 10	=======================================	12	13	4
ATS- (S) Control	0,12 1,02 1,04	0.12		_		198.	3.2 7.	14-	_			5	7.4	7.9				10	21.02202	120:	1			
A15-098	0.12 4.12 1.00	0.12					7	+-					7:7	× ×					277 (6.5) (7.4)	×/				
				-				-	-															
																								$\perp$
Meter Number (GY)	789	189		Н		63	989	183				185	683	189			Ħ		89 165	189 78	25	Н	Ш	Ш
T	14.0	080	+	-	-	OX	OX39 3318 0850	550	-	+	4	150	-	0			$\top$			3/8/8/50	300	4	4	4
Initii	Initials K.4	3	_	_		K4 /	No.	-	-	_		Z	200	90					F	N 00	1			

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	0.59	21.3	ى: م	1.51	2.46	20,3	0.8	19,1
AT3-098	2.57	21.6	0.8	9.61	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	315/23 MKL	3/1. lm	of when	Mul w m	3/15/23	31:0/2	3/11/23	1/10/25

Client: Eco Analyst

	Day 2 Over	Day 2 Overlying Water			Day 2 Pore Water	re Water	
Ammonia (mg/L)	Salinity (ppt)	hd (sa)	Temperature (°C)	Ammonia (mg/L)	Salinity (ppt)	(ns)	Temperature (°C)
0.91	20.9	Ø-0	0.51	2.36	23.1	7.6	15.3
2,60	707	8-(	19.0	18,30	22.7	7.6	19.6
VERSASTAR	769	739	229	VERSASTAR	789	2,39	739
3/15/13	3/11/12	1/11/23 III	will while	3/15/23 #	7111/2/1/E	2/11/23	1/1/1
ME		1	4	MKL	*	<i>m</i>	<b>\</b>

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	781	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)	289
Initials/Date/ Time	3/15/12 MVC	3/14/123 1/40/7	3114123 MY074	3114113 M4070	3/15/13 MKL	अस्पाद हामाह	314173	31H123 1145 4



Client: Eco Analyst

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

Eco Analyst

QC Test Number: TN-23-327 Client: _

						1		 	 					
	Temperature (°C)	22.0	21.9								189	3/18/23	math	
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



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.E	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 ⁿ
Initials/Date/ Time	3/28/23 NVL	SEARY CEAR PAIN	26.26% ST	States 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.TC</u>	OX
Client: Eco Analyst	
QC Test Number: TN-23-	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>	1
Day	Testing Location	Date	Time	Initials
0	25	3/10/20	ISW	7
1	29	3/11/23	1022	BC
2	25	3/12/13	1456	JL
3	25	3/13/23	1219	7b
4	25	3114123	1219	RP
5	25	3115/23	1312	SC
6	<u> 35</u>	3/16/23	1600)	Uno
7	25 25 25 25	3117/23		L
88	25	3118123	1105	To
9	<u> 25</u>	3/19/23	1315	86
10	25	3/20/23	0850	Th
11				
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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

Tampio Dato. Co mai 20					ry control ced	Cample Station: Laboratory Control
Sample	Rep	Pos	# Exposed	# Survived	# Reburied	Notes
AT3-152	1	1	20	19		
AT3-152	2	4	20	20		
\T3-152	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		
\T3-098	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	s 10-d Survival a	na Keburia	ıı Seaimi	ent lest						EA-ES	ST, Inc. PBC
Batch ID; Start Date: Ending Date: Test Length:	18-4074-9173 10 Mar-23 14:34 20 Mar-23 13:34 9d 23h	0 Pro	st Type: otocol: ecies: con:	Survival-Rebui EPA/600/R-94 Leptocheirus p Malacostraca	/025 (1994)		I I	Diluent: I Brine: (	Nancy Roka Not Applicable Crystal Sea ARO - Aquatic		Or <b>Age:</b>
Sample ID: Sample Date Receipt Date Sample Age:	: 09 Mar-23 15:30	Ma O CA	de: terial: S (PC): ent:	AT3-152 Laboratory Cor Eco-Analysts,		ent	5	Source:	Oredged Sedir Yachtsman Ma Laboratory Col	arina NAE-2	
Sample Code	e Sample II	D Sai	nple Dat	e Receip	t Date	Sample	Age (	lient Name		roject	
AT3-152 IOSN 2019 AT3-098	14-3904-1 00-2071-8 07-1559-4	3579 10	Mar-23 Mar-23 Feb-23 1:	09 Mar 10 Mar	-23 15:30	38h 14h 30d 2h		co-Analysts			diment Evalu
Sample Code	e Material	Гуре		Sample Source	e .		Station Lo	cation	Lat/Long	]	·
AT3-152 IOSN 2019 AT3-098		sediment		Yachtsman Ma Yachtsman Ma Yachtsman Ma	ırina NAE-2	004-00	Laboratory IOSN Refe 10 Stations		s Mu		
Single Comp	arison Summary	/								<del></del>	
Analysis ID	Endpoint		Comp	arison Method	ī		P-Val	ue Comp	arison Resul	t	
	Survival Rate Survival Rate			on Rank Sum ⁻ al Variance t Tv			0.039 0.911		2019 failed sur 98 passed sur		-
Test Accepta	bility			· · · · · · · · · · · · · · · · · · ·	· ·	ТД	C Limits				
Analysis ID	Endpoint		Attribu	ıte	Test Stat			Overla	p Decision	1	
09-6242-9666	Survival Rate		Contro	l Resp	0.98	0.9	<<	Yes	Passes (	Criteria	
Survival Rate	Summary			···							
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Er	r 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	RS	5	0.930	0.896	0.964	0.900	0.950	0.012	0.027	2.94%	5.10%
AT2 000		5	0.950	0.950	0.950	0.950	0.950	0.000	0.000	0.00%	3.06%
AT3-098				<del>.</del> –							
AT3-098 Survival Rate	Detail			· · · ·			1	MD5: A9FBI	58A28141E8	27CEAD3E	25AD5132/
Survival Rate Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		MD5: A9FBI	58A28141E8	27CEAD3E	25AD5132/
Survival Rate Sample AT3-152	<b>Code</b> LC	Rep 1 0.950	Rep 2	Rep 3	Rep 4 1.000	Rep 5		MD5: A9FBI	-58A28141E8	27CEAD3E	25AD5132/
Survival Rate Sample	Code			<u>-</u>				MD5: A9FBI	-58A28141E8	27CEAD3E	25AD5132/

### **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	ı-d Survival a	nd Reburia	l Sedime	nt Test						EA-ES	ST, Inc. PBC
Analysis ID: 0	9-6242-9666	Enc	ipoint:	Survival Rate			CET	IS Versior	n: 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	BEE15B2ADF0	C4B9839C1/	471D8F53E	EC313 Edit	or ID:	005-341	-210-5	
Batch ID: 1	8-4074-9173	Tes	t Type: 3	Survival-Rebur	ial		Ana	lyst: Na	ancy Roka	•	
Start Date: 1	0 Mar-23 14:3	0 Pro	tocol: l	EPA/600/R-94/	025 (1994)		Dilu	ent: No	ot Applicable		
Ending Date: 26		0 <b>Sp</b> e	cies: l	_eptocheirus pl	umulosus		Brin	e: Cr	ystal Sea		
Test Length: 9	1 23h	Тах	on: !	Malacostraca	•		Sou	rce: AF	RO - Aquatic	Research (	Or <b>Age:</b>
Sample Code	Sample [		nple Date	Receip	t Date	Sample Ag	je Clie	nt Name	Р	roject	
AT3-152	14-3904-1		Mar-23			38h	Eco-	Analysts, I	inc. D	redged Se	diment Evalu
IOSN 2019	00-2071-8	3579 10 N	vlar-23	10 Mar-	23	14h					
Sample Code	Material [*]	Туре		Sample Sourc	е	Sta	ation Locat	ion	Lat/Long		
AT3-152	Laborator	y Control Se	ediment \	∕achtsman Ma	rina NAE-20	04-00 Lal	boratory Co	ntrol			
IOSN 2019	Reference	e sediment	`	/achtsman Ma	rina NAE-20	04-00 10	SN Referenc	ce			
Data Transform		Alt Hyp				Comparis	son Result				PMSD
Angular (Correct	∍d)	C > T				IOSN 201	9 failed sun	vival rate e	ndpoint		3.05%
Wilcoxon Rank	Sum Two-Sa	mple Test									
Sample I vs	Sample II	df	Test St	at Critical	Ties	P-Type	P-Value	Decisio	n(α:5%)		
Lab Control Sedi	m Reference	Sed* 8	18	· <del>-</del>	1	Exact	0.0397	Significa	ınt Effect		
Test Acceptabili	ty Criteria	TAC L	imits	<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	Basisia	n/a:E9/ )		
Outlier		Extreme Val	ue Test		1.25	2.29	1.0000	Decision	ers Detected		
ANOVA Table				<u> </u>					0.0 20100104		····
Source	Sum Squ	aroe	Mean S	Sauare	DF	F Stat	P-Value	Doginio	n/avE9/)		
Between	0.0283984				1		r-value	Decision	nt Effect		
Error				<del>,</del>	j ,		0.0402		nir Enecr		
	0.026566	-	0.02839	208	8	8.55	0.0192	Olgranio			
Total	0.026566 0.054964		0.0283	208	9	8.55 -	0.0192	O Igi inioo			
	0.0549644			208		8.55	0.0192				
ANOVA Assump	0.0549644 otions Tests			208	9	<del>-</del>			n(a:1%)		
	0.054964 otions Tests Test	4	0.00332	208	9 Test Stat	Critical	P-Value	Decision			
ANOVA Assump	0.0549644 otions Tests Test Variance I		0.00332	-	9	<del>-</del>		<b>Decision</b> Equal Va		ion	
ANOVA Assump Attribute Variance	0.0549644  otions Tests  Test  Variance I  Shapiro-W	4 Ratio F Test	0.00332	-	9 <b>Test Stat</b> 1.39	Critical 23.2	P-Value 0.7572	<b>Decision</b> Equal Va	ariances	ion	
ANOVA Assump Attribute Variance Distribution	0.0549644  otions Tests  Test  Variance I  Shapiro-W	4 Ratio F Test	0.00332	-	9 <b>Test Stat</b> 1.39	Critical 23.2	P-Value 0.7572	<b>Decision</b> Equal Va	ariances		%Effect
ANOVA Assump Attribute Variance Distribution Survival Rate St	0.0549644  tions Tests  Test  Variance I Shapiro-W  ummary  Code	4 Ratio F Test Vilk W Norm	0.00332 ality Test	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-Nor Max	ariances mal Distribut Std Err	cv%	%Effect
ANOVA Assump Attribute Variance Distribution Survival Rate St Sample	0.0549644  tions Tests  Test  Variance I Shapiro-W	4 Ratio F Test Vilk W Norm Count	0.00332	-	9 Test Stat 1.39 0.7	Critical 23.2 0.741	<b>P-Value</b> 0.7572 0.0009	Decision Equal Va Non-Nor	ariances mal Distribut		%Effect 0.00% 5.10%
ANOVA Assump Attribute Variance Distribution Survival Rate St Sample AT3-152	0.0549644  variance I 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-Nor  Max 1.000	ariances 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  variance I 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-Nor Max 1.000 0.950	Std Err 0.012 0.012	<b>CV%</b> 2.79% 2.94%	0.00% 5.10%
ANOVA Assump Attribute Variance Distribution Survival Rate St Sample AT3-152 IOSN 2019 Angular (Correct	0.0549644  variance I Shapiro-V  ummary Code LC RS  ted) Transfor	Ratio F Test Vilk W Norm  Count 5 5 7med Summ Count	0.00332  ality Test  Mean 0.980 0.930  nary  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% %Effect
ANOVA Assump Attribute Variance Distribution Survival Rate St Sample AT3-152 IOSN 2019 Angular (Correct Sample	0.0549644  vitions Tests  Test  Variance I Shapiro-V  ummary  Code  LC  RS  ted) Transfor	Ratio F Test Vilk W Norm  Count 5 5	0.00332  ality Test  Mean 0.980 0.930	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-Nor Max 1.000 0.950	Std Err 0.012 0.012	<b>CV%</b> 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 I Shapiro-W  Ummary  Code  LC  RS  ted) Transfor  Code  LC  RS	Ratio F Test Vilk W Norm  Count 5 5 Tmed Summ Count 5	o.00332  ality Test  Mean 0.980 0.930  mary  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 I Shapiro-W  Ummary  Code  LC  RS  ted) Transfor  Code  LC  RS	Ratio F Test Vilk W Norm  Count 5 5 Tmed Summ Count 5	o.00332  ality Test  Mean 0.980 0.930  mary  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 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%
ANOVA Assump Attribute Variance Distribution Survival Rate St Sample AT3-152 IOSN 2019 Angular (Correct Sample AT3-152 IOSN 2019	0.0549644  variance   Shapiro-W  ummary Code LC RS  ted) Transfor Code LC RS	Ratio F Test Vilk W Norm  Count 5 5 7 med Summ Count 5 5 5	0.00332  ality Test  Mean 0.980 0.930  arry 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	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%

Analyst: NR QA: JR

### **CETIS Analytical Report**

Report Date:

07 Apr-23 16:35 (p 2 of 3)

Test Code/ID:

TN-23-327Lp / 08-3039-3260

Leptocheirus	10-d	Survival a	and Reb	ourial Se	diment Test
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EA-EST, Inc. PBC

Analysis ID: 09-6242-9666

Endpoint: Survival Rate

CETIS Version:

CETISv2.1.1

Analyzed:

07 Apr-23 16:34

Analysis: Nonparametric-Two Sample

Status Level:

Edit Date:

07 Apr-23 16:33

MD5 Hash: BEE15B2ADFC4B9839C1A71D8F53EC313 Editor ID:

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	1.460	1.460	1.350	Π
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 <b>Age:</b>
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/Lone	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	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 Median 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 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	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
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 data report)	(Retained at Lab or in 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

^{*} 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").
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- 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 ₃ -N)	Purged Ammonia (mg/L NH ₃ -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

Test Species	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 ^(a)	28-Day Mean Percent Survival
LABORATORY CONTROL	AT3-152	72 / 75 ^b	93
IOSN REFERENCE	N/A	N/A	90
10 Stations at 4 Marinas Mud	AT3-098	140 / 150	93

⁽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 ^(a)	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

⁽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 ^d Mean Qual	IOSN 2019 Mean Qual	Composite Mean Qual
Trace Metals		Mean Quan	wear Quar	Mean Quan
Arsenic, total	mg/Kg	2.00	2.25	2.02 NS
Cadmium, total	mg/Kg	0.0300 ь	0.0252 b	0.0338 bS
Chromium, total	mg/Kg	0.620 b	0.0686 b	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	μg/Kg	0.381 a 0.903 ab	0.286 a	4.22 aNS 0.610 abS
Anthracene	μg/Kg	0.903 ab 0.775 a	0.310 a 0.581 a	0.610 abs 0.766 ac
Benzo(a)anthracene Benzo(a)pyrene	μg/Kg μg/Kg	0.773 a 0.813 a	0.581 a 0.610 a	0.700 ac 0.805 ac
Benzo(b)fluoranthene	μg/Kg μg/Kg	1.08 a	0.807 a	2.43 aS
Benzo(k)fluoranthene	μg/Kg 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	μg/Kg	0.0638 a	0.0480 a	0.0632 ac
PCB 018	μg/Kg	0.0465 a	0.0349 a	0.0460 ac
PCB 028	μg/Kg	0.0790 a	0.0593 a	0.0784 ac
PCB 044	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 0.0752 a	0.0347 a	0.0457 ac
PCB 101	μg/Kg	0.0752 a 0.0675 a	0.0564 a 0.0506 a	0.0745 ac 0.810 aS
PCB 105 PCB 118	μg/Kg μg/Kg	0.0073 a 0.0713 a	0.0534 a	0.0706 ac
PCB 128	μg/Kg μg/Kg	0.0713 a 0.0842 a	0.0632 a	0.0834 ac
PCB 138	μg/Kg 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	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	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 Total Chlordanes	μg/Kg	0.0501 a 0.184	0.0752 a 0.277	0.0495 ac 0.182
	μg/Kg			
4,4'-DDT 4,4'-DDD	μg/Kg μg/Kg	0.0159 a 3.29 ab	0.0238 a 0.0182 a	0.0158 ac 0.665 S
4,4'-DDE	μg/Kg μg/Kg	0.00737 a	0.0182 a 0.0111 a	0.003 3 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 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	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
	100			
Methoxychlor Toxaphene	μg/Kg	0.0575 a 1.05 a	0.843 a 1.58 a	0.0568 ac 1.04 ac

#### 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.

^d Pre-test tissue represents the mean of three replicates, whereas the reference and site composites represent a mean of 5 replicates.

^e Analysis conducted after removal of a statistical outlier.

TABLE 11 STATISTICAL COMPARISONS OF M. nasuta BODY BURDENS VS. IOSN 2019 REFERENCE DATA

Compound	Units	Pre-Test ^d 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		1.07. 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	0.0183 ac
Methoxychlor Toyanhene	μg/Kg μg/Kα	0.0285 a	0.411 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.

^d Pre-test tissue represents the mean of three replicates, whereas the reference and site composites represent a mean of 5 replicates.

^c 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:**

^a 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	F	RLs	MDLs	COC	Units	R	Ls	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 ^a	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	$\mu g/Kg$	20	6.6	1.38
PCB 052	$\mu g/Kg$	0.5	0.66 a	0.1	Pyrene	$\mu g/Kg$	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	μg/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	$\mu g/Kg$	-	0.33	0.0501
PCB 128	$\mu g/Kg$	-	0.66 a	0.172	Alpha-Chlordane	$\mu g/Kg$	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 slightl				as they	Heptachlor epoxide	μg/Kg	1	0.66	0.106
are based on actual tissue ma	ass, and fina	l extrac	t volume	s 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	e used in the	statistic	cal analys	sis may	Oxychlordane	$\mu g/Kg$	-	0.66	0.102
also vary.					Toxaphene	$\mu g/Kg$	50	16.6	2.14
^a RL is high but MDL meets	RIM requir	ement.			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>	
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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
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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 Muhhhh	Date/Time
Relinquished By:	Date/Time 2/8/23 (13.2	Received By Laborato Yus Mul	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

Project Number: E	A.TOX	
Client: <u>Eco Analysts</u>		
	N-23-302	
		· -
	TEST ORGA	ANISM INFORMATION
Common Name: Sar	nd worm	Adults Isolated (Time, Date):
1	reis virens	( 1) =
Lot Number: NV-	<u>රව්ථ</u>	Acclimation: 1 day Age: Adult
Source: ARO		
		ST INITIATION
<u>Date</u> 3  3   みる	Time Initia	
3 (3)0 3	1930 CR	Sediment Added to Chambers
<u> </u>		Overlying Water Added to Chambers
3/8/23	[130 UAD]	UG Organisms Transferred
		EST SET-UP
Sample Number(s): AT3-	152 (Lab Control), AT3-0	098
		(LD3-もしし)
Treatment	Volume Test	
AT3-153- (Lab Contr	rol) 5L	22L
AT3-098		
	$\downarrow$	1
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### TOXICOLOGY LABORATORY BENCH SHEET -ORGANISM LOADING RECORD

Project Number: <u>EA.TOX</u>		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 (date, time, initials):		s): 3-8-33 1130 Uto 17G	
Treatment	Replicate	Number of Organisms Loaded	
AT3-152	A	30	
(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>			
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* 15 organisms loaded due to technicion error.

(5) 3/8/2003 dR ATS-T30

03/01/00

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	Sand worm	Nereis virens	DO: >2.5 mg/L Salinity: 30 ppt		ν														
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Project Number:	Client:	QC Test Number:	TARGET		Sample #	AT3-153	AT3-098												

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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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		10											ber	Time	Initials
		Lab Control					:					l	Meter Number	I	Init
	# #		86										\ 		
	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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Dissolved Oxygen (mg/L)	19	12	7,1												6,3%	0844	び
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ature	18	*												:	77	~3	
Temperature (°C)	17   1	٥,	B												2	#	#
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	16	Ŕ	<u>ස්</u>												88	982	త
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		Lab Control													ter Nı		l I
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	# •	ගු	860														
	Sample #	AT3-159	AT3-098														
	VΩ	Ä	7		<u> </u>												

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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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	28	30.9	30.8	.		<u></u>					İ		\ Y J	(M)	<b>%</b>
	27														
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Salinity (ppt)	25	Ç	Ç						<u> </u>					<u>-</u>	
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/L)	27														
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Temperature (°C)	25														
Ten	24	· ·	-												,
	23	193	<u>6</u>										684	)  W	ಶ
	22														
		ontrol											Meter Number	Time	Initials
		Lab Control				ļ 							Meter		
l <del></del>	# •	33	860												
ļ	Sample #	AT3-152	AT3-098												
		_`	1												

### 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		-												
	Day Date														
	Day Date														
	Day Date														
þ	Day Date								•						
Number Removed	Day Date														
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	Day Date				!	 									
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Number Loaded	Day 0 Date 3(&	95	90	30		Qξ	30	30	O£	30					1130/7G
	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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D 76 3/12/23



### TOXICOLOGY LABORATORY BENCH SHEET - RENEWAL RECORD

Project 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	103-404	3/15/13	0928	J2_
8 9	102 112	2/17/23	11.78	100
$\frac{9}{10}$	CB3-493	01/1/97	1630	Lino
11				
12	LD3-123	3/10/13	1401_	TL
13	12 2 12 2	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 1	- 4		
19	LD3-454	3/27/23	1129	ス
20 21	LD3-470	7100107	1430	B
$\frac{21}{22}$	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	

····	1	· · · · · · · · · · · · · · · · · · ·	<del>,</del>	<u>.</u>
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
21	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: <u>Eco Analysts</u>							
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 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

		- 00111101									EA-E3	i, inc. PBC
•	1000 1, p. 1.				ns			Analyst Diluent: Brine: Source:	: No Cr	ancy Roka of Applicable ystal Sea RO - Aquatic	Research C	r <b>Age</b> :
Sample ID: Sample Date: Receipt Date: Sample Age:	03 Mar-23 12:3	<b>M</b> :	ode: aterial: AS (PC): ient:	AT3-152 Laboratory Control Sediment Eco-Analysts, Inc.				Project: Source: Station:	Ya	edged Sedirr achtsman Mar boratory Con	rina NAE-20	
Sample Code AT3-152 IOSN 2019 AT3-098	AT3-152 11-9755-1044 03 Mar-2 OSN 2019 13-4648-8170 08 Mar-2			03 Mar-23 12:30 5d 11h 08 Mar-23 11h				Client N Eco-Ana			roject redged Sed	ment Evalu
Sample Code Material Type Sample Source Station Location Lat/Long  AT3-152 Laboratory Control Sediment Yachtsman Marina NAE-2004-00 Laboratory Control  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  Single Comparison Summary  Analysis ID Endpoint Comparison Method P-Value Comparison Result S												
02-5654-4767 12-2728-1176	Survival Rate		•	•			0.24 0.75		IOSN 2019 passed survival rate AT3-098 passed survival rate			
Survival Rate Sample AT3-152	Summary Code LC	Count 3	<b>Mean</b> 0.933	<b>95% L</b> 0.646	CL 95% UCI 1.220	. Min 0.800	<b>Max</b>		<b>td Err</b> .067	<b>Std Dev</b> 0.115	CV% 12.37%	%Effect 0.00%
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		.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	EB280407C	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	Sa	mple ID	San	nple Dat	te.	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			nificant Effect	1	
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 Variances			
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: NR 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):  Neonates Pulled (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					
Client: Eco Analy	<u>rs</u> ts					
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
<u>*</u>			
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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:	ta Photoperiod: 161,8 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		9.6						(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

Time: 1345	25				2 9	8	32.0									129	SE SE	હ
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ניז	7/2		ty: <u>50</u>		-	_					2.							
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Beginning Date:	ate:		ght Ir	(g/L)	9											$\downarrow$ _ $\sim$		
innin	Ending Date:			Dissolved Oxygen (mg/L)	5	B _O	8.5									3	E	Ş
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			16	solved	33						:							
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	clam	suta	P		7	0%	<u>ا</u>				*					7,89	Bul	3
	Blunt nose clam	Macoma nasuta	30 ppt		9													
	31unt	Иасо	99		5	80	63									L S S	33.5	द्धि
7	paled		_mg/L Salinity:	Hd	4											1		
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TEST ORGANISM	Соттоп Name:	Scientific Name:	1.5			-											~	
Ξ	0	S	DO: <u>&gt;2.5</u>		7	13.0	130									8	Mi.I	₹
			1		9		-							 			ڪ(	٣
			6.0 - 9.0	(0)	2	$J_{\ell}$	13·O							 		28	75	CAN
				Temperature (°C)	4	13.03.5	<i>i</i> ,									3	₹.	<u>**</u>
			°C pH:	emper	3			:								1		
<b>M</b>		-303	1 1	Ţ	2	13.0	13.0			 						189	भ्राप्त	Z
EA.TOX	ysts	TN-23-303	յք։			22										(S)	æ	_
E	4nal,	Ĭ	: Ten			76	:									Jer -	Time	als
i.	Eco Analysts	ber:	LUES			Lab Control	:									Meter Number	T.	Initials
\dmn\		Num]	ΓVA			Lab										Mete		
Project Number:	Client:	QC Test Number:	TARGET VALUES: Temp: 12		Sample#	AT3491	AT3-098											

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Project N	Project Number:	EA	EA.TOX						TE	TEST OF	ORGANISM	ISM							Beg	Beginning Date:	g Date	- 1	3	79	~	Tim	<u>و</u> الل	Time: 345
Client:	Eco Analysts	<u>naly</u>	rsts						ŭ	mmo	Common Name:	ë	Blu	Blunt nose clam	e clar				Enc	Ending Date: _	ate: _		412	2710	4126123	Time:	ë	1245
QC Test]	QC Test Number:	I	TN-23-303	303					Sc	ientifi	Scientific Name: Macoma nasuta	<u>.</u>	Ma	coma	nasutc													
TARGET	TARGET VALUES: Temp: 12 °C pH: 6.0 - 9.0 DO: >2.5	Tem	p: 12	₂ گر	) pH	: 6.0	0.6-0	DC -	;;     	- 1	_mg/L Salinity: _30_ ppt Photoperiod: _161,8 d Light Intensity: 50 - 100 fc	alinit	γ: 	- 00 - D	pt I	hotor	eriod	: 16	1,8 d	ij	ght Int	ensity	: 50 -	100 fc				
				T _{er}	mpera	Temperature (°C)	Ď					Hd					ig .	ssolve	d Oxy ₂	Dissolved Oxygen (mg/L)	g/L)				Salin	Salinity (ppt)	<b>_</b>	
Sample #		∞	6	10	-	11	12	13 1	41	8	9 10		12	13	41	∞	6	10	11	12	13	14	∞	6	10	=	12 1	13 14
4T3-191	Lab Control		05)		2	130 130	SA.	<u> </u>	30	රා	0.6 0.6		2%		7.7		7			C.%		8.5		3).4		~	872	20.5
AT3-098			5.			- XX	130	<u>~</u>	13.0	₹ T			8.5	~	3,7		0,1			しジ		8,5		30,5		W.	\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	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:	ر ۶	139	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	5210		ı	Time: 1245	124	W
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	o <del>j</del> C				
				Temperature (°C)	rature	(2)					Hd					Dis	solved	Oxyg	Dissolved Oxygen (mg/L)	1			Sa	Salinity (ppt)	] g		
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
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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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			Temr	Temperature (°C)	(°C)				İ		Hď		Ç.		D	Dissolved Oxygen (mg/L)	zd Oxy	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	3 24	25	26	27	28	22	23	24	25   2	26 27	7 28	~
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Time		<u>S</u>	_	_ <del></del>	6639		P180	0	<u>12</u>		\ <del>S</del>	3	180	=	2			1		0814	<u>'   C</u>	1505	+	\$* \{\cdot\}	<u> </u>		. 1
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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	EGICIN	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:Blu	ınt 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	باك	3/28/23	3/28/23

Ally 3

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+	1100045125	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
LD3-539	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	0908	KY
24				
25				
26	190, 200	4/24/23	<u> </u>	LAD _
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	ion -	Survival En	EA-EST, Inc. PBC	
Start Date: End Date: Sample Date:	26 A	far-23 .pr-23 far-23	12.45	-,	I: US ACE	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 Source	nt: No	ncy Roka t Applicable t Applicable tO - 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 Control Sediment Eco-Analysts, Inc.				Proje Sourc Static	ce: Ya	Dredged Sediment Evaluation Yachtsman Marina NAE-2004-003 Laboratory Control		
Sample Code			Sample Dat	te Rec	eipt Date	Sample	Age	Client	t Name		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	ource	············	Station I	_ocatio	n	Lat/Long		<u> </u>
AT3-191 IOSN 2019 AT3-098	Reference	Laboratory Control Sediment Yachtsman Marina NAE-2004-00 Laboratory Control Reference sediment Yachtsman Marina NAE-2004-00 IOSN Reference Marine Sediment Yachtsman Marina NAE-2004-00 10 Stations at 4 Marinas Mu										
Single Compa	rison Summa	ry		<del> </del>							<del></del>	
Analysis ID	Endpoint		Comp	arison Metl	hod		P-V	alue	Compari	son Result		٤
06-3628-8518			Equal	Variance t T	wo-Sample To	est		8889 IOSN 2019 passed survival rate				
15-9977 <b>-</b> 3478	Survival Rate		Equal	Variance t T	wo-Sample Te	est	0.79	68		passed surv		
Survival Rate	Summary								<del>-</del>			
Sample	Code	Count	Mean	95% L	CL 95% UC	Min	Max	τ .	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	Ю	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 Endpoi	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 atus Level: itor ID:	n: CETISv 1 005-341		
1	•	5 5	Test Type: Protocol: Species: Taxon:	Survival US ACE NED Macoma nasu Bivalvia	, ,	<u> </u>	Dil 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 Ag	ge Cli	ent Name		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	ition	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	t			PMSD
Angular (Correct	ed)	C > T				IOSN 201	19 passed	survival rate	endpoint		8.16%
Equal Variance	t Two-Sample	e Test			·					-	
Sample I vs			df Test	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 Outli	ers Detected		
ANOVA Table	_										
Source	Sum Squ	ares	Mean	Square	DF	F Stat	P-Value	Decisio	n(α:5%)		
Between	0.011287		0.011		1	1.86	0.2221	Non-Sig	nificant Effec	t	
Error Total	0.0365073		0.006	0845	7	<del></del> ,					
			<del>-</del> .						·	<del></del>	<u> </u>
ANOVA Assump					T 05	0.10.					
Variance	Test Variance l	Ratio E T	est .		Test Stat	199	P-Value 0.6357	Decisio Equal V			
Distribution			omality Tes	st	0.928	0.645	0.4950	=	Distribution		
Survival Rate S	ummary									-	
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	ned Su	nmary						<del> </del>		
Sample	Code	Count	Mean	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											
Sample	Code	Rep 1	Rep 2		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						3.000	· · · · · · · · · · · · · · · · · · ·		<u> </u>		
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					

### **CETIS Analytical Report**

Report Date:

Test Code/ID:

08 May-23 23:12 (p 2 of 2)

						·		Test	Code/ID:	TN-23-3	03MnSurv	/ 05-1648 <b>-</b> 007
Bioaccumulati	ion Evaluatio	on - Survi	ival E	Endpoin	t		· -	<del>-</del>				EST, Inc. PBO
Analyzed:	15-9977-347 08 May-23 23	3:12	Ana	lysis:	Parametric	-Two Sample		St	ETIS Versi atus Leve		v2.1.1	<u>·</u>
<u> </u>	08 May-23 23		MD:	Hash:	ED41FF2F	03C95AC3423	3E56D <b>60D</b> 1	13F732 <b>E</b> 0	litor ID:	005-34	1-210-5	
l	03 <b>-</b> 8883-453	=			Survival			Aı	nalyst:	Nancy Roka		
	29 Mar-23 13			tocol:		ED RIM (2004)	)	Di	luent:	Not Applicabl	е	
Ending Date: 2		:45	-	cies:	Macoma na	ısuta		Bi	ine:	Not Applicable	е	
Test Length: 2	27u 23n		Tax	on: ———	Bivalvia	<u> </u>		Sc	ource:	ARO - Aquati	c Research	or Age:
Sample Code IOSN 2019	Sample			ple Dat		eipt Date	Sample A	\ge Cl	ent Name		Project	
AT3-098	13-4648 07-1559			/lar-23 eb-23 1:		/lar-23	21d 14h	Ed	o-Analysts	, Inc.	Dredged S	ediment Evalu
			U0 F	ep-23 1.	3:00 09 F	eb-23 16:30	49d 1h					
Sample Code IOSN 2019	Materia		4		Sample So			tation Loc		Lat/Lon	g	
AT3-098		ice sedime Sediment	ent			Marina NAE-2		OSN Refere				_
					Tacilisinan	Marina NAE-2	2004-00 10	0 Stations a	t 4 Marina:	s Mu		
Data Transform Angular (Correct		Alt H C > T		_	<del></del>			ison Resul				PMSD
							AT3-098	passed su	rvival rate	endpoint		6.91%
Equal Variance	t Two-Sam	ole Test								-		
Sample I vs			df	Test St			P-Type	P-Value	Decision	on(α:5%)		
Reference Sed	AT3-098		8	-0.876	1.86	0.12	CDF	0.7968	Non-Si	gnificant Effe	ct	
Auxiliary Tests							<del></del>		<del></del>			
Attribute	Test					Test Stat	Critical	P-Value	Decisio	on(α:5%)		
Outlier	Grubbs	Extreme '	Value	e Test		1.96	2.29	0.2713		liers Detected		·
ANOVA Table												
Source	Sum Sq	uares		Mean S	duare	DF	F Stat	P-Value	Dogiale	m/m-E0/ 1		
Between	0.00799	4		0.007994		1	0.768	0.4065	Decision(α:5%) Non-Significant Effect			
Error	0.08331			0.01041	143	8		51.7500	11011-01	Junicarit Filet	al.	
Total —————————	0.09130	84 			<u>-</u>	9				_		
ANOVA Assump	otions Tests							<del>-</del>				
Attribute	Test					Test Stat	Critical	P-Value	Decisio	n(α:1%)		
Variance		Ratio F T				1.76	23.2	0.5962		ariances	·	
Distribution		Wilk W No	orma.	lity Test		0.937	0.741	0.5215	Normal	Distribution		
Survival Rate Su	ummary											
Sample	Code	Count		Mean	95% LC	L 95% UCL	Median	Min	Max	Std Err	CV%	%Effect
OSN 2019	RS	5		0.940	0.888	0.992	0.950	0.900	1.000	0.019	4.45%	0.00%
AT3-098		5		0.960	0.892	1.000	0.967	0.867	1.000	0.025	5.71%	-2.13%
Angular (Correct	ted) Transfo	rmed Sur	nma	ry					<del></del>	<del></del>	<u> </u>	
Sample	Code	Count		Mean	95% LC	L 95% UCL	Median	Min	Max	Std Err	CV%	%Effect
OSN 2019	RS	5		1.330	1.220	1.440	1.350	1.250	1.460	0.039	6.53%	0.00%
\T3-098		5		1.390	1.240	1.530	1.390	1.200	1.480	0.052	8.32%	-4.25%
Survival Rate De	etail								<del></del>			
Sample	Code	Rep 1	1	Rep 2	Rep 3	Rep 4	Rep 5					
OSN 2019	RS	0.950		0.900	1.000	0.900	0.950					
	RS	0.950 1.000		0.900 1.000	1.000 0.867	0.900 0.967	0.950 0.967		_			
OSN 2019		1.000								<del>-</del>	<del></del>	
OSN 2019 xT3-098		1.000	ail							<del>-</del>		
OSN 2019 xT3-098 ungular (Correct	ted) Transfor	1.000 med Deta	ail	1.000	0.867	0.967	0.967					

Analyst: NR 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		

^{* =} 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

			OSN Reference		
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 <mark>J</mark>	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

^{* =} 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

^{* =} 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 11:31Species:Nereis virensSample 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

				, -		•		,				
Sample	Rep	Pos	Body Burden	Arsenic	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	ıry										
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	mary										
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	ry										
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	y										
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

					_				- '	est Co	de/ID.	111-2	.5-502		7-8839-3412
Bioaccumula	tion Evalu	uation - Met	als - N	ereis v	irens									EA-ES	Γ, Inc. PBC
Analysis ID: Analyzed:	14-3802- 19 Aug-2		Ana	point: lysis:	Para	metric-Two	•			Statu	S Versio ıs Level:		'ISv2.	1.1	
Edit Date:	08 May-2	23 22:49	MD	Hash:	DF2	BDA9EB0E	E0632414F0	C98407CF	1225E	Edito	r ID:				
Batch ID:	13-8417-	6872	Test	Туре:	Bioa	ccumulatio	n - Metals			Analy	yst: N	lancy Rok	а		
Start Date:	08 Mar-2		Prof	ocol:	US A	ACE NED F	RIM (2004)			Dilue		lot Applica			
Ending Date:	•		•	cies:		eis virens				Brine		rystal Sea			
Test Length:	27d 23h		Taxo	on:	Poly	chaeta				Sour	ce: A	RO - Aqua	atic Re	esearch C	r Age:
Sample Code	Sa	mple ID	Sam	ple Da	te	Receipt	Date	Sample A	\ge	Clien	t Name		Pro	ject	
IOSN 2019	13-	-4648-8170	08 N	/lar-23		08 Mar-		12h		Eco-A	Analysts,	Inc.	Dre	dged Sed	iment Evalu
AT3-098	07-	-1559-4974	08 F	eb-23 ′	13:00	09 Feb-	23 16:30	27d 23h							
Sample Code	Ma	terial Type			Sam	ple Sourc	е	s	tation I	Locatio	on	Lat/L	.ong		
IOSN 2019	Re	ference sedi	ment		Yacl	ntsman Ma	rina NAE-20	004-00	OSN Re	eferenc	е				
AT3-098	Ма	rine Sedime	nt		Yacl	ntsman Ma	rina NAE-20	004-00 1	0 Statio	ns at 4	Marinas	Mu			
Data Transfor	rm	Alt	Нур					Compai	rison R	esult					PMSD
Untransformed	b	C <	T					AT3-098	passe	d arser	nic endpo	oint			14.66%
Equal Variand	ce t Two-	Sample Tes	t												
		nple II		Tost	Stat	Critical	MSD	P-Type	P-V	'alue	Decisio	on(α:5%)			
Reference Sec		3-098	8	-1.3	Jiai	1.86	0.33	CDF	0.88			gnificant E	ffect		
Auxiliary Test															
Attribute		est	\ / - l-	T t			Test Stat			alue		on(α:5%)	-4 - J		
Outlier	Gi	rubbs Extren	ne Valu	ie Lest			1.44	2.29	1.00	J00	No Out	liers Detec	cted		
ANOVA Table	•														
Source	Su	m Squares		Mean	Squ	are	DF	F Stat	P-V	'alue	Decisio	on(α:5%)			
Between		3225		0.132			1	1.68	0.23	310	Non-Si	gnificant E	ffect		
Error		296		0.078	7		8	_							
Total	0.7	6185					9								
ANOVA Assu	mptions 7	Γests													
Attribute	Te						Test Stat	Critical		'alue	Decisio	on(α:1%)			
Variance		riance Ratio					2.05	23.2	0.50			/ariances			
Distribution	Sh	apiro-Wilk W	/ Norm	ality ⊺e	st		0.922	0.741	0.37	/32	Normal	Distribution	on		
Arsenic Sumr	mary														
Sample	Co	de Co	unt	Mean		95% LCL	95% UCL	Median	Min	1	Max	Std E	Err	CV%	%Effect
IOSN 2019	RS			2.25		1.85	2.65	2.26	1.92		2.63	0.145		14.46%	0.00%
AT3-098		5		2.02		1.74	2.3	2.12	1.65	5	2.21	0.102	2	11.24%	10.22%
7110 000														_	
Arsenic Detai	il														
	il Co	de Re	p 1	Rep 2	2	Rep 3	Rep 4	Rep 5							
Arsenic Detai				Rep 2	2	<b>Rep 3</b> 1.93	<b>Rep 4</b> 2.63	<b>Rep 5</b> 2.51							

Report Date: Test Code/ID: 19 Aug-23 06:54 (p 2 of 8) TN-23-302NvMet / 07-8839-3412

							Test C				
Bioaccumulat	tion Evaluation	- Metals -	Nereis vi	rens						EA-ES	Γ, Inc. PBC
Analysis ID: Analyzed: Edit Date:	14-9372-2871 19 Aug-23 6:54 08 May-23 22:4	Ar	ndpoint: nalysis: D5 Hash:	Cadmium Parametric-Tv B96EBCBC73	•	78FD7B5D1	Sta	ΓIS 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 11:3 05 Apr-23 10:31 27d 23h	1 Pr I Sp	est Type: otocol: pecies: xon:	Bioaccumulat US ACE NED Nereis virens Polychaeta			Dilu Bri	ient: No ne: Cr	ancy Roka ot Applicable ystal Sea RO - Aquatic	Research C	r <b>Age</b> :
Sample Code	Sample II	D Sa	mple Dat	te Recei	pt Date	Sample Ag	je Clie	nt Name	Pı	roject	
IOSN 2019 AT3-098	13-4648-8 07-1559-4		Mar-23 Feb-23 1	08 Ma 3:00 09 Fel	nr-23 b-23 16:30	12h 27d 23h	Eco	-Analysts,	nc. Di	redged Sed	iment Evalı
Sample Code	Material ⁷	Гуре		Sample Sour	ce	Sta	ation Loca	tion	Lat/Long		
IOSN 2019	Reference	e sediment		Yachtsman M	larina NAE-20	004-00 IO	SN Referer	ice			
AT3-098	Marine Se	ediment		Yachtsman M	larina NAE-20	004-00 10	Stations at	4 Marinas	Mu		
Data Transfor	m	Alt Hyp				Compari	son Result				PMSD
Untransformed	d	C < T				AT3-098	failed cadm	ium endpo	nt		20.18%
	vs Sample II  AT3-098*			Stat Critical 1.86	<b>MSD</b> 0.00509	<b>P-Type</b> CDF	<b>P-Value</b> 0.0069		n(α:5%) unt Effect		
Auxiliary Test	ts										
Attribute	Test				Test Stat	Critical	P-Value	Decisio	n(α:5%)		
0 "			-		4 77	2.29	0.5500	NI - O - 41	ers Detected		
Outlier	Grubbs E	Extreme Va	alue Test		1.77	2.20	0.5560	No Outil	CI3 Detected		
ANOVA Table	-	Extreme Va	alue Test		1.//	2.23	0.5560	No Outil	- Detected		
	-			Square	1.77 <b>DF</b>	F Stat	P-Value		n(α:5%)		
ANOVA Table	<u> </u>	ares						Decisio			
ANOVA Table Source Between Error	Sum Squ 0.0001849 0.0001496	<b>ares</b> 9	Mean	1849	<b>DF</b> 1 8	F Stat	P-Value	Decisio	n(α:5%)		
ANOVA Table Source Between Error Total	Sum Squ 0.0001849 0.0001490 0.000334	<b>ares</b> 9	<b>Mean</b> 0.000	1849	<b>DF</b>	F Stat	P-Value	Decisio	n(α:5%)		
ANOVA Table Source Between Error Total ANOVA Assur	Sum Squ 0.0001849 0.0003344 mptions Tests	<b>ares</b> 9	<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 Squ 0.0001849 0.0001496 0.0003349 mptions Tests Test	<b>ares</b> 9 6 5	<b>Mean</b> 0.000 0.0000	1849	DF 1 8 9	F Stat 9.89 — Critical	P-Value 0.0137	Decisio Significa Decisio	n(α:5%) ant Effect n(α:1%)		
ANOVA Table Source Between Error Total ANOVA Assur	Sum Squ 0.0001849 0.0003349 0.0003349 mptions Tests Test Variance	<b>ares</b> 9	Mean 0.000 0.0000	1849 0187	<b>DF</b> 1 8	<b>F Stat</b> 9.89	<b>P-Value</b> 0.0137	Decisio Significa  Decisio Equal V	n(α:5%) ant Effect n(α:1%) ariances		
ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	Sum Squ 0.0001849 0.0003349 0.0003349 mptions Tests Test Variance Shapiro-V	ares 9 6 5 Ratio F Te	Mean 0.000 0.0000	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	Decisio Significa  Decisio Equal V	n(α:5%) ant Effect n(α:1%)		
ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution	Sum Squ 0.0001849 0.0003349 0.0003349 mptions Tests Test Variance Shapiro-V	ares 9 6 5 Ratio F Te	Mean 0.000 0.0000	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	Decisio Significa  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  Cadmium Sur	Sum Squ 0.0001849 0.0003349 0.0003349 mptions Tests Test Variance Shapiro-V	ares 9 6 5 Ratio F Te Vilk W Nor  Count 5	Mean 0.000 0.0000 st mality Tes	95% LCI 2 0.0183	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 0.9959	Decisio Significa  Decisio Equal V Normal  Max 0.032	n(α:5%)  Int Effect  n(α:1%)  ariances  Distribution	CV% 21.99%	0.00%
ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Cadmium Sur Sample	Sum Squ 0.0001849 0.0003349 0.0003349 mptions Tests Test Variance Shapiro-V mmary Code	ares 9 6 5 Ratio F Te Vilk W Nor	Mean 0.000 0.0000 st mality Tes	95% LCI 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	Decisio Significa  Decisio 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 Squ 0.0001849 0.0003344 mptions Tests Test Variance Shapiro-V mmary Code RS	ares 9 6 5 Ratio F Te Vilk W Nor  Count 5	Mean 0.000 0.0000 st mality Tes	95% LCI 2 0.0183	DF 1 8 9  Test Stat 4.58 0.989  L 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	Decisio Significa  Decisio Equal V Normal  Max 0.032	n(a:5%) ant Effect  n(a: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 Squ 0.0001849 0.0003344 mptions Tests Test Variance Shapiro-V mmary Code RS	ares 9 6 5 Ratio F Te Vilk W Nor  Count 5	Mean 0.000 0.0000 st mality Tes	95% LCI 2 0.0183 3 0.0306	DF 1 8 9  Test Stat 4.58 0.989  L 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	Decisio Significa  Decisio Equal V Normal  Max 0.032	n(a:5%) ant Effect  n(a: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 Squ 0.0001849 0.0003349 0.0003349 mptions Tests	ares 9 6 5 Ratio F Te Vilk W Nor  Count 5 5	Mean 0.000 0.0000 st mality Tes Mean 0.025; 0.0338	95% LCI 2 0.0183 3 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	Decisio Significa  Decisio Equal V Normal  Max 0.032	n(a:5%) ant Effect  n(a:1%) ariances Distribution  Std Err  0.00248	21.99%	0.00%

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							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					

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Bioaccumulat	ion Evaluation	- Metals -	Nereis vi	rens						EA-ES	Γ, Inc. PBC
•	13-8883-2132		•					S Version		2.1.1	
•	19 Aug-23 6:54		•	Parametric-Tw F85C5A6258C	•	CESOSSE		us Level:	1		
Edit Date:	08 May-23 22:4	iyi ivi	D5 Hasn:	F65C5A6256C	,D4ED4D3 I <i>F</i>	ACEZ99ZUB	STUF Edit	טר וט:			
Batch ID:	13-8417-6872	Te	est Type:	Bioaccumulati			Anal	-	ancy Roka		
	08 Mar-23 11:3		otocol:	US ACE NED	RIM (2004)		Dilu		ot Applicable		
•	05 Apr-23 10:3	•	oecies:	Nereis virens			Brin		ystal Sea		
Test Length:	27d 23h	Та	ixon:	Polychaeta			Sou	rce: AF	RO - Aquatic	Research C	r Age:
Sample Code	Sample I	D Sa	ample Dat	e Receip	t Date	Sample Ag	e Clie	nt Name	Р	roject	
IOSN 2019	13-4648-	8170 08	8 Mar-23	08 Mar	-23	12h	Eco-	Analysts, l	Inc. D	redged Sed	iment Evalı
AT3-098	07-1559-	4974 08	Feb-23 1	3:00 09 Feb	-23 16:30	27d 23h					
Sample Code	Material	Туре		Sample Source	е	Sta	ition Locati	on	Lat/Long	ı	
IOSN 2019	Referenc	e sedimen	t	Yachtsman Ma	arina NAE-20	004-00 103	SN Reference	е			
AT3-098	Marine S	ediment		Yachtsman Ma	arina NAE-20	004-00 10	Stations at	4 Marinas	Mu		
Data Transfor	m	Alt Hyp	ı			Comparis	on Result				PMSD
Untransformed		C < T				AT3-098	passed copp	er endpoi	nt		17.25%
Faual Varianc	e t Two-Sampl	e Test									
	/s Sample II		df Test S	tat Critical	MSD	P-Type	P-Value	Decisio	n(a:5%)		
			มา เยอเอ	itat Ciliicai	IVISD	r-iype	r-value	Decisio	II(u.5 /6)		
•	•		3 -0.657	1.86	0.206	CDF	0.7353	Non-Sig	nificant Effec	t	
Reference Sed	AT3-098		3 -0.657	1.86	0.206	CDF	0.7353	Non-Sig	nificant Effec	t	
•	AT3-098		3 -0.657	1.86	0.206	CDF	0.7353	Non-Sig	nificant Effec	t	
Reference Sed	AT3-098	8		1.86	0.206 Test Stat	Critical	0.7353 P-Value	Non-Sig  Decisio		t	
Reference Sed  Auxiliary Tests	AT3-098			1.86				Decisio			
Reference Sed  Auxiliary Tests  Attribute	AT3-098	8		1.86	Test Stat	Critical	P-Value	Decisio	n(α:5%)		
Reference Sed  Auxiliary Tests  Attribute  Outlier	AT3-098	Extreme Va	alue Test	1.86 Square	Test Stat	Critical	P-Value	<b>Decisio</b> No Outli	n(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table	AT3-098 s Test Grubbs	Extreme Va	alue Test	Square	Test Stat	Critical 2.29	<b>P-Value</b> 0.6291	Decisio No Outli	n(α:5%) ers Detected		
Auxiliary Tests Attribute Outlier ANOVA Table Source	AT3-098 s Test Grubbs Sum Squ	Extreme Va	alue Test Mean	Square 3225	Test Stat 1.73	Critical 2.29	P-Value 0.6291 P-Value	Decisio No Outli	n(α:5%) ers Detected n(α:5%)		
Reference Sed  Auxiliary Tests  Attribute  Outlier  ANOVA Table  Source  Between	AT3-098  Test  Grubbs  Sum Squ  0.013322	Extreme Values	Mean 0.013	Square 3225	<b>Test Stat</b> 1.73 <b>DF</b> 1	Critical 2.29	P-Value 0.6291 P-Value	Decisio No Outli	n(α:5%) ers Detected n(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error	AT3-098  Test  Grubbs  Sum Squ  0.013322 0.24655 0.259872	Extreme Values	Mean 0.013	Square 3225	Test Stat 1.73  DF 1 8	Critical 2.29	P-Value 0.6291 P-Value	Decisio No Outli	n(α:5%) ers Detected n(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total	AT3-098  Test  Grubbs  Sum Squ  0.013322 0.24655 0.259872	Extreme Values	Mean 0.013	Square 3225	Test Stat 1.73  DF 1 8	Critical 2.29  F Stat 0.432	P-Value 0.6291 P-Value	Decisio No Outli  Decisio Non-Sig	n(α:5%) ers Detected n(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur	AT3-098  Test  Grubbs  Sum Squ  0.013322 0.24655 0.259872  nptions Tests  Test	Extreme Values	Mean 0.0133 0.0308	Square 3225	Test Stat 1.73  DF 1 8 9	Critical 2.29  F Stat 0.432	P-Value 0.6291 P-Value 0.5293	Decisio No Outli  Decisio Non-Sig	n(α:5%) ers Detected n(α:5%) nificant Effec		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur	AT3-098  Test Grubbs Sum Squ 0.013322 0.24655 0.259872  Inptions Tests Test Variance	Extreme Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Valu	Mean 0.0133 0.0308	<b>Square</b> 3225 3187	Test Stat 1.73  DF 1 8 9  Test Stat	Critical 2.29  F Stat 0.432  Critical	P-Value 0.6291  P-Value 0.5293	Decisio No Outli  Decisio Non-Sig  Decisio Equal Va	n(α:5%) ers Detected n(α:5%) nificant Effec		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assurt Attribute Variance	Sum Squ 0.013322 0.24655 0.259872 nptions Tests Variance Shapiro-\	Extreme Values  Jares  5  Ratio F Te	Mean 0.0133 0.0308	<b>Square</b> 3225 3187	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	Decisio No Outli  Decisio Non-Sig  Decisio Equal Va	n(α:5%) ers Detected n(α:5%) nificant Effect n(α:1%) ariances		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution	Sum Squ 0.013322 0.24655 0.259872 nptions Tests Variance Shapiro-\	Extreme Values  Jares  5  Ratio F Te	Mean 0.0133 0.0308	<b>Square</b> 3225 3187	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	Decisio No Outli  Decisio Non-Sig  Decisio Equal Va	n(α:5%) ers Detected n(α:5%) nificant Effect n(α:1%) ariances		%Effect
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution Copper Summ	AT3-098  Test Grubbs  Sum Squ 0.013322 0.24655 0.259872  Inptions Tests Test Variance Shapiro-Variance	Extreme Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Value Valu	Mean 0.0133 0.0308	<b>Square</b> 3225 3187	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	Decisio No Outli  Decisio Non-Sig  Decisio Equal Va	n(α:5%) ers Detected n(α:5%) nificant Effect n(α:1%) ariances Distribution	ot .	<b>%Effect</b> 0.00%
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution Copper Summ	AT3-098  S Test Grubbs  Sum Squ 0.013322 0.24655 0.259872  Inptions Tests Test Variance Shapiro-N  Test Code	Extreme Valuares 5 Ratio F Te Vilk W Nor	Mean 0.0133 0.0308  sst mality Tes	Square 3225 3187 st 95% LCL	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  Median	P-Value 0.5293  P-Value 0.7399 0.7163	Decisio No Outli  Decisio Non-Sig  Decisio Equal Vanormal	n(α:5%) ers Detected n(α:5%) nificant Effect n(α:1%) ariances Distribution Std Err	cv%	
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Copper Summ Sample IOSN 2019	AT3-098  Test Grubbs  Sum Squ 0.013322 0.24655 0.259872  Inptions Tests Variance Shapiro-Variance Code RS	Extreme Valuares 5 Ratio F Te Vilk W Nor	Mean 0.0133 0.0308 est mality Tes  Mean 1.2	Square 3225 3187 st  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 0.5293  P-Value 0.7399 0.7163  Min 0.996	Decisio No Outli  Decisio Non-Sig  Decisio Equal Vanormal  Max 1.4	n(α:5%) ers Detected  n(α:5%) nificant Effect  n(α:1%) ariances Distribution  Std Err  0.0713	<b>CV%</b> 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	AT3-098  Test Grubbs  Sum Squ 0.013322 0.24655 0.259872  Inptions Tests Variance Shapiro-Variance Code RS	Extreme Valuares 5 Ratio F Te Vilk W Nor	Mean 0.0133 0.0308 est mality Tes  Mean 1.2	Square 3225 3187 st 95% LCL 0.999 0.888	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 0.5293  P-Value 0.7399 0.7163  Min 0.996	Decisio No Outli  Decisio Non-Sig  Decisio Equal Vanormal  Max 1.4	n(α:5%) ers Detected  n(α:5%) nificant Effect  n(α:1%) ariances Distribution  Std Err  0.0713	<b>CV%</b> 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	AT3-098  Test Grubbs  Sum Squ 0.013322 0.24655 0.259872  Inptions Tests Variance Shapiro-Variance RS	Extreme Valuares 5 Ratio F Te Wilk W Nor  Count 5 5	Mean 0.0133 0.0308  est mality Tes  Mean 1.2 1.12	Square 3225 3187 st 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 0.5293  P-Value 0.7399 0.7163  Min 0.996	Decisio No Outli  Decisio Non-Sig  Decisio Equal Vanormal  Max 1.4	n(α:5%) ers Detected  n(α:5%) nificant Effect  n(α:1%) ariances Distribution  Std Err  0.0713	<b>CV%</b> 13.32%	0.00%

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<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 ⁻	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 5 Ratio F Tes Vilk W Norr	0.0003	3343 st	8 9 <b>Test Stat</b> 1.95 0.871	Critical 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%

**Report Date:** 19 Aug-23 06:54 (p 6 of 8) **Test Code/ID:** TN-23-302NvMet / 07-8839-3412

Bioaccumulat	ion Evaluation	- Metals -	Nereis vii	rens							EA-ES	Γ, Inc. PBC
Analysis ID: Analyzed: Edit Date:	12-6341-4781 19 Aug-23 6:54 08 May-23 22:4	<b>A</b> r	•	Mercury Parametric-Two B14DF90D09FF	•	76DE339A1	S	ETIS Versi tatus Leve ditor ID:		TISv2.	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>Տ</b> ք	otocol: pecies:	Bioaccumulation US ACE NED R Nereis virens Polychaeta			Di Bi	iluent: rine:	Nancy Ro Not Applic Crystal Se ARO - Aq	cable ea	Research C	r <b>Age:</b>
Sample Code	Sample I	D Sa	ample Dat	e Receipt	Date	Sample Ag	je C	lient Name		Pro	oject	
IOSN 2019 AT3-098	13-4648- 07-1559-		Mar-23 Feb-23 1	08 Mar-2 3:00 09 Feb-2		12h 27d 23h	E	co-Analysts	, Inc.	Dre	edged Sed	iment Evalı
Sample Code	Material	Туре		Sample Source	)	Sta	ation Loc	ation	Lat/	Long		
IOSN 2019	Referenc	e sediment	t	Yachtsman Mar	ina NAE-20	004-00 10	SN Refer	ence				
AT3-098	Marine So	ediment		Yachtsman Mar	ina NAE-20	004-00 10	Stations	at 4 Marina	s Mu			
Data Transfor	m	Alt Hyp	ı			Comparis	son Resu	ılt				PMSD
Untransformed		C < T				AT3-098	passed m	ercury end	point			34.73%
	vs Sample II AT3-098	(	df Test S	tat Critical 1.86	MSD 0.00542	P-Type CDF	<b>P-Valu</b> 0.9925		on(α:5% ignificant			
Auxiliary Test	s											
Attribute	Test				Took Chat	0-1411						
	1000				rest Stat	Critical	P-Valu	e Decis	ion(α:5%	)		
Outlier		Extreme Va	alue Test		2.16	2.29	<b>P-Valu</b> 0.1085		on(α:5% tliers Det			
Outlier  ANOVA Table	Grubbs I	Extreme Va	alue Test									
-	Grubbs I			Square				No Ou		ected		
ANOVA Table	Grubbs I	ıares		-	2.16	2.29	0.1085	No Ou	tliers Det	ected )		
ANOVA Table Source Between Error	Sum Squ 0.000201 0.000169	Jares 8 7	Mean	2018	2.16 <b>DF</b> 1	2.29 <b>F Stat</b>	0.1085 <b>P-Valu</b>	No Ou	tliers Dete	ected )		
ANOVA Table Source Between	Sum Squ 0.000201	Jares 8 7	<b>Mean</b> 0.0002	2018	2.16 <b>DF</b>	2.29 <b>F Stat</b>	0.1085 <b>P-Valu</b>	No Ou	tliers Dete	ected )		
ANOVA Table Source Between Error Total	Sum Squ 0.000201 0.000169	Jares 8 7	<b>Mean</b> 0.0002	2018	2.16 <b>DF</b> 1	2.29 <b>F Stat</b>	0.1085 <b>P-Valu</b>	No Ou	tliers Dete	ected )		
ANOVA Table Source Between Error Total ANOVA Assur	Sum Squ 0.000201 0.000371 mptions Tests Test	8 7 6	<b>Mean</b> 0.0002 2.122E	2018	2.16  DF  1 8 9	F Stat 9.51	0.1085  P-Valu  0.0150  P-Valu	e Decis Signifi e Decis	tliers Detailon(α:5% cant Effection(α:1%	ected ) ct		
ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	Sum Squ 0.000201 0.000169 0.000371  mptions Tests	ares 8 7 6 Ratio F Te	Mean 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-Valu 0.0150  P-Valu 0.1376	e Decis Signifi  e Decis Equal	tiliers Detailon(α:5%) cant Effect ion(α:1%) Variances	ected ) ct		
ANOVA Table Source Between Error Total ANOVA Assur	Sum Squ 0.000201 0.000371  mptions Tests Test Variance Shapiro-V	8 7 6	Mean 0.0002 2.122E	2018 E-05	2.16  DF  1 8 9	F Stat 9.51	0.1085  P-Valu  0.0150  P-Valu	e Decis Signifi  e Decis Equal	tliers Detailon(α:5% cant Effection(α:1%	ected ) ct		
ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution	Sum Squ 0.000201 0.000371  mptions Tests Test Variance Shapiro-V	ares 8 7 6 Ratio F Te	Mean 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  0.741	0.1085  P-Valu 0.0150  P-Valu 0.1376	e Decis Signifi  e Decis Equal	tiliers Detailon(α:5%) cant Effect ion(α:1%) Variances	) ct ) stion	CV%	%Effect
ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Mercury Summanule Sample IOSN 2019	Sum Squ 0.000201 0.000169 0.000371  mptions Tests     Test     Variance     Shapiro-V	Ratio F Te Vilk W Nor	Mean 0.0002 2.122E st mality Tes  Mean 0.0156	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	0.1085  P-Valu 0.0150  P-Valu 0.1376 0.1815	e Decis  Begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin begin beg	tliers Detailon(α:5%) cant Effect fon(α:1%) Variances al Distribu	) ct ) stion	<b>CV%</b> 16.72%	%Effect 0.00%
ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Mercury Summanue	Sum Squ 0.000201 0.000169 0.000371 mptions Tests Test Variance Shapiro-V mary Code	uares 8 7 6 Ratio F Te Vilk W Nor	Mean 0.0002 2.122E st mality Tes	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	0.1085  P-Valu 0.0150  P-Valu 0.1376 0.1815	e Decis Signifi  e Decis Equal Norma  Max 0.018	tiliers Detailon(α:5%) cant Effect con(α:1%) Variances al Distribut Std 0.00	ected ) ot ) s tion  Err		
ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Mercury Summanul Sample IOSN 2019	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 st mality Tes  Mean 0.0156	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-Valu 0.0150  P-Valu 0.1376 0.1815  Min 0.012	e Decis Signifi  e Decis Equal Norma  Max 0.018	tiliers Detailon(α:5%) cant Effect con(α:1%) Variances al Distribut Std 0.00	) ct ) s tion Err	16.72%	0.00%
ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Mercury Sumi Sample IOSN 2019 AT3-098	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 st mality Tes  Mean 0.0156	95% LCL 6 0.0124 62 -0.000797	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-Valu 0.0150  P-Valu 0.1376 0.1815  Min 0.012	e Decis Signifi  e Decis Equal Norma  Max 0.018	tiliers Detailon(α:5%) cant Effect con(α:1%) Variances al Distribut Std 0.00	) ct ) s tion Err	16.72%	0.00%
ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Mercury Summand Sample IOSN 2019 AT3-098  Mercury Detail	Sum Squ 0.000201 0.000169 0.000371  mptions Tests	Ratio F Te Vilk W Nor  Count 5	Mean 0.0002 2.122E st mality Tes  Mean 0.0156 0.0066	95% LCL 6 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-Valu 0.0150  P-Valu 0.1376 0.1815  Min 0.012	e Decis Signifi  e Decis Equal Norma  Max 0.018	tiliers Detailon(α:5%) cant Effect con(α:1%) Variances al Distribut Std 0.00	) ct ) s tion Err	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>	
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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	)
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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	VS	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				
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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: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a: tion(a	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 109 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		OC48774CE ²	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	ID Sa	mple Date	Receip	t Date	Sample Age	e Clier	nt Name	P	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	y										
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											
		Da. 4	D 0	Rep 3	Rep 4	Rep 5					
Sample	Code	Rep 1	Rep 2	IVeh 2	.тор .	.top o					
	Code 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 <mark>U</mark>	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		

^{* =} 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
0.460 <mark>U</mark>	0.954 J	0.480 U
0.283 <mark>U</mark>	0.287 U	0.295 U
0.307 <mark>U</mark>	0.311 <mark>U</mark>	0.320 U
0.575 <mark>U</mark>	0.585 <mark>U</mark>	0.600 U
0.605 U	0.610 U	0.630 U
0.800 <mark>U</mark>	0.810 <mark>U</mark>	0.830 U
0.367 <mark>U</mark>	0.372 <mark>U</mark>	0.382 <mark>U</mark>
0.257 <mark>U</mark>	0.260 <mark>U</mark>	0.267 U
0.560 <mark>U</mark>	0.565 <mark>U</mark>	0.580 U
0.297 <mark>U</mark>	0.301 <mark>U</mark>	0.310 U
0.453 <mark>U</mark>	0.459 <mark>U</mark>	0.472 U
	0.832 <mark>J</mark>	0.267 U
0.600 <mark>U</mark>	0.610 <mark>U</mark>	0.625 U
0.396 <mark>U</mark>	1.24 <mark>J</mark>	0.412 U
2.01 J	3.10 J	1.23 J
0.665 <mark>U</mark>	0.675 <mark>U</mark>	0.695 U
9.18	12.0	8.39
	REP3  0.460 U 0.283 U 0.307 U 0.575 U 0.605 U 0.800 U 0.367 U 0.257 U 0.560 U 0.297 U 0.453 U 0.543 J 0.600 U 0.396 U 2.01 J 0.665 U	REP3 REP4  0.460 U 0.954 J 0.283 U 0.287 U 0.307 U 0.311 U 0.575 U 0.585 U 0.605 U 0.610 U 0.800 U 0.810 U 0.367 U 0.260 U 0.560 U 0.565 U 0.297 U 0.301 U 0.453 U 0.459 U 0.543 J 0.832 J 0.600 U 0.610 U 0.396 U 1.24 J 2.01 J 3.10 J 0.665 U 0.675 U

^{* =} 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 <b>J</b>	0.610 U	1.24 J	0.635 U
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 <mark>U</mark>	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 U
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 <mark>J</mark>	3.92 J
PAH Total	27.8	28.1	67.4	31.7	26.8

^{* =} 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	(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 Control	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	ite Sample	Age Clien	ıt 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 (Long	
IOSN 2019	Reference sedim	ent	Yachtsman Marina	NAE-2004-00	IOSN Reference	е		
AT3-098	Marine Sedimen	t	Yachtsman Marina	NAE-2004-00	10 Stations at 4	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-Sar	mple Test	0.0634	AT3-098 passed	d acenaphthene	1
10-1846-2388	Acenaphthylene	Unequ	ual Variance t Two-S	Sample Test	0.0922	AT3-098 passed	d acenaphthylene	1
14-8405-4060	Anthracene	Unequ	ual Variance t Two-S	Sample Test	0.0352	AT3-098 failed	anthracene	1
02-1204-0422	Benzo(a)anthracene	Equal	Variance t Two-Sar	mple Test	<1.0E-05	AT3-098 failed I	benzo(a)anthracene	1
10-8756-9954	Benzo(a)pyrene	Equal	Variance t Two-Sar	mple Test	<1.0E-05	AT3-098 failed I	benzo(a)pyrene	1
09-2700-3438	Benzo(b)fluoranthene	Equal	Variance t Two-Sar	mple Test	<1.0E-05	AT3-098 failed I	benzo(b)fluoranthene	1
18-4472-6594	Benzo(b)fluoranthene	Wilco	xon Rank Sum Two	-Sample Test	0.0040	AT3-098 failed I	benzo(b)fluoranthene	1
13-4397-7733	Benzo(g,h,i)perylene	Equal	Variance t Two-Sar	mple Test	<1.0E-05	AT3-098 failed l	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 I	benzo(g,h,i)perylene	1
11-9752-3554	Benzo(k)fluoranthene	Equal	Variance t Two-Sar	mple Test	<1.0E-05	AT3-098 failed I	benzo(k)fluoranthene	1
04 4504 6740	Benzo(k)fluoranthene	Wilco	xon Rank Sum Two	Sample Test	0.0040	AT3 008 failed I	benzo(k)fluoranthene	1

Unequal Variance t Two-Sample Test

Unequal Variance t 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

Equal Variance t Two-Sample Test

Equal Variance t Two-Sample Test

Unequal 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**

Sample	Code	Count	Mean	95% 1.01	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Sample											
IOSN 2019 AT3-098	RS	5 5	0.563 0.883	0.291 0.437	0.835 1.33	0.458 0.61	0.954 1.31	0.0979 0.16	0.219 0.359	38.90% 40.64%	0.00% -56.92%
Acenaphthylene	Summary	<u>-</u>									
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.286	0.28	0.292	0.282	0.294	0.0023	0.00514	1.80%	0.00%
AT3-098		5	4.22	-2.6	11	0.371	12.2	2.46	5.5	130.12%	-1377.0
Anthracene Sur	nmary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.31	0.303	0.317	0.306	0.319	0.00249	0.00557	1.80%	0.00%
AT3-098		5	0.61	0.27	0.949	0.404	0.965	0.122	0.273	44.81%	-96.49%
Benzo(a)anthra	cene Summa	ary									
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.581	0.566	0.596	0.57	0.6	0.00534	0.0119	2.05%	0.00%
AT3-098		5	0.766	0.748	0.784	0.755	0.79	0.0066	0.0147	1.93%	-31.84%
Benzo(a)pyrene	Summary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.61	0.595	0.625	0.6	0.63	0.00524	0.0117	1.92%	0.00%
AT3-098		5	0.805	0.785	0.825	0.79	0.83	0.00707	0.0158	1.96%	-31.97%
Benzo(b)fluora	nthene Sumr	mary									
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effec
IOSN 2019	RS	5	0.807	0.79	0.824	0.795	0.83	0.00624	0.014	1.73%	0.00%
AT3-098		5	2.43	-1.36	6.23	1.04	7.9	1.37	3.06	125.62%	-201.49
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	0.259	0.253	0.265	0.255	0.267	0.00211	0.00472	1.82%	0.00%
AT3-098		5	0.427	0.184	0.669	0.336	0.776	0.0874	0.195	45.79%	-64.58%
Benzo(k)fluorar	nthene Sumr	mary									
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.371	0.362	0.379	0.365	0.382	0.00305	0.00681	1.84%	0.00%
AT3-098		5	6.45	-10.1	23	0.481	30.3	5.96	13.3	206.62%	-1641.0
Chrysene Sumr	nary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.564	0.552	0.576	0.555	0.58	0.0043	0.00962	1.71%	0.00%
AT3-098		5	1.14	0.469	1.81	0.735	1.82	0.241	0.539	47.35%	-101.95
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	0.3	0.294	0.307	0.296	0.31	0.00243	0.00542	1.81%	0.00%
AT3-098		5	0.396	0.387	0.406	0.39	0.409	0.00352	0.00786	1.98%	-31.96%
	ummary										
Fluoranthene S	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
	Ooue		0.500	0.263	0.875	0.451	1.01	0.11	0.247	43.35%	0.00%
Fluoranthene S Sample IOSN 2019	RS	5	0.569	0.200	0.070					10.0070	0.0070

### **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

							EA-EST, Inc. PBC
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	110	0.81	0.79	0.8	0.795	0.83	
Danza/h\fluores	athona Datai	1					MD5: B9DBFEDE27A858016CB5293AEE0B8C7
Benzo(b)fluoraı			D 0	D 0	D 4	D 5	MD3. B9DBFEDEZ/A030010CB3293AEE0B0C/
Sample IOSN 2019	Code RS	<b>Rep 1</b> 0.8	<b>Rep 2</b> 0.795	<b>Rep 3</b> 0.8	<b>Rep 4</b> 0.81	<b>Rep 5</b> 0.83	
AT3-098	K3	1.07	1.04	0.8 7.9	1.05	1.1	
		1.07	1.04	7.0	1.00		NDE 07505D507005505405400500D4000
Benzo(g,h,i)per	-						MD5: 97E05B58C7062EF6512E109593DA9630
Sample IOSN 2019	Code RS	Rep 1 0.257	Rep 2	Rep 3	Rep 4	Rep 5	
AT3-098	KS	0.257	0.255 0.336	0.257 0.339	0.26 0.338	0.267 0.776	
			0.550	0.559	0.550	0.770	
Benzo(k)fluorar							MD5: 5AC16B10241B3E60E75B2811EC01D1A9
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019 AT3-098	RS	0.368 0.492	0.365 0.481	0.366 30.3	0.371 0.483	0.382 0.505	
		0.492	0.461	30.3	0.463	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
· idorantiiono B	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
				0.450	0.450	0.470	
Sample IOSN 2019	RS	1.01	0.451	0.453	0.459	0.472	

### **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	<	T	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

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Bioaccumula	tion	Evaluation - F	PAHs -	Ner	reis									EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19	6281-0431 Aug-23 6:55 May-23 22:50	1	۱	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 05		I S	Prot	ocol: cies:	US <i>A</i> Nere	ccumulatio ACE NED F els 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	)	Receipt	Date	Sample <i>A</i>	Age	Clien	t Name	P	Project	
IOSN 2019 AT3-098		13-4648-817 07-1559-497	70 (	)8 M	ar-23 eb-23 13		08 Mar-	23	12h 27d 23h			Analysts,		Dredged Sed	iment Evalu
Sample Code		Material Ty	pe		;	Sam	ple Source	9	S	tation	Location	on	Lat/Long	g	
IOSN 2019		Reference s	edime	nt	,	Yach	ntsman Ma	rina NAE-20	04-00 10	OSN Re	eferenc	е			
AT3-098		Marine Sedi	ment		•	Yach	ntsman Ma	rina NAE-20	04-00 1	0 Statio	ons at 4	Marinas	Mu		
Data Transfor	m		Alt Hy	rρ					Compa	rison R	Result				PMSD
Untransformed	t		C < T						AT3-098	3 passe	ed acen	aphthene	endpoint		62.12%
Equal Variand	ce t ·	Гwo-Sample 1 Sample II	Гest	df	Test St	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 Effe	ct	
Auxiliary Test Attribute Outlier	ts	Test Grubbs Ext	treme \	√alu	e Test			Test Stat	Critical		<b>/alue</b>		on(α:5%) liers Detected	d	
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	
	mnti														
ANOVA Assur	iiipti	Test						Test Stat	Critical	P-\	/alue	Decisio	on(α:1%)		
Variance Distribution		Variance Ra Shapiro-Will			ality Test	t		2.69 0.794	23.2 0.741		616 124	•	/ariances Distribution		
Acenaphthen	e Su	mmary													
Sample		Code	Count		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															

1.24

0.635

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0.38

0.371

0.374

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Bioaccumula	tion	Evaluation - P	AHs -	Ner	eis									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	rot	ocol: cies:	US / Nere	ccumulatio ACE NED F eis 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 A	Age	Clien	t Name	Pr	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. Dr	redged Sedi	ment Evalu
Sample Code		Material Typ	ре			Sam	ple Source	e		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	I0 Statio	ons at 4	Marinas	Mu		
Data Transfor	m	Į.	Alt Hy	γp					Compa	rison R	Result				PMSD
Untransformed	t	C	C < T						AT3-09	8 passe	ed 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	b	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	Squa	are	DF	F Stat	P-V	/alue	Decisio	n(α:5%)		
Between		38.7499			38.749	99		1	2.57	0.1	478	Non-Sig	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 Rat Shapiro-Wilk			ality Tes	st		1140000 0.837	23.2 0.741		0E-05 402	•	l Variances Distribution		
Acenaphthyle	ne S	Summary													
Sample		Code C	Count		Mean		95% LCL	95% UCL	Median	Mir Mir	1	Max	Std Err	CV%	%Effect
IOSN 2019		RS 5			0.286		0.28	0.292	0.284	0.2		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 C	).284		0.282	_	0.283	0.287	0.295			_			
A TO 000		_			~ ~ - 4		~ ~ - 4	400							

12.2

7.79

Report Date: Test Code/ID:

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Bioaccumulatio	on Evaluation -	PAHs - I	Nereis							EA-ES	T, Inc. PBC
Analyzed: 1	4-8405-4060 9 Aug-23 6:55 8 May-23 22:50	A	nalysis:	Anthracene Parametric-Tw 0EE18B918309		F3897FAFF	Stat	IS Versior us Level: or ID:	n: CETISv2	2.1.1	
	•	P S	est Type: rotocol: pecies: axon:	Bioaccumulation US ACE NED I 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 ID 13-4648-8 07-1559-4	170 08	ample Da 3 Mar-23 3 Feb-23 1	08 Mar		<b>Sample A</b> ç 12h 27d 23h		<b>nt Name</b> -Analysts, I		r <b>oject</b> redged Sed	iment Evalu
Sample Code IOSN 2019 AT3-098	Material T Reference Marine Se	sedimen	t	Sample Source 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	<u> </u>			Compari	son Result				PMSD
Untransformed		C < T				AT3-098	failed anthra	acene endp	oint		83.97%
Unequal Varian	s Sample II			Stat Critical	MSD	P-Type	P-Value	Decision	, ,		
Reference Sed	AT3-098*		4 2.45	2.13	0.26	CDF	0.0352	Significa	nt Effect		
Auxiliary Tests Attribute	Test				Test Stat	Critical	P-Value	Decisio	n(α:5%)		
Outlier	Grubbs E	xtreme V	alue Test		1.95	2.29	0.2857	No Outli	ers Detected		
ANOVA Table	S S		Maan	S	DE	F 04-4	D. Value	Destates	··· ( ···· <b>5</b> 0/ )		
Source Between	0.223951	ares	0.223	Square	<b>DF</b>	F Stat	<b>P-Value</b> 0.0400	Decision	n(α:5%) int Effect		
Error Total	0.298555 0.522507		0.037		8	_	0.0400	Olgriilloa	ini Enoot		
ANOVA Assum	ptions Tests										
Attribute 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 Sui	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 Det	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	0.311 0.404	0.32 0.422					

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Bioaccumula	tion Evaluatio	n - PAHs - I	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	To	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	Material	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 Hyp	)			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 I		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	s										
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	1										
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 Assu	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 Summa	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					
		Ų.,,,	3.700	5 0	5.700	J J					

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									Test Co	ue/ID.	200		17-1765-7444
Bioaccumulati	ion E	valuation -	PAHs -	Nere	eis							EA-E	ST, Inc. PBC
Analyzed:	19 Au	756-9954 ug-23 6:55 ay-23 22:50	A	analy:	sis: F	Benzo(a)pyre Parametric-Tv 106A0BC1B		CA08067BE0	Statu	S Versio us Level: or ID:		v2.1.1	
	08 Ma 05 Ap		F S	est T Proto Speci axon	col: L	Bioaccumulat JS ACE NED Jereis virens Polychaeta			Analy Dilue Brine Sour	ent: N e: C	ancy Roka ot Applicabl rystal Sea RO - Aquati		Or <b>Age:</b>
Sample Code		Sample ID	S	Samp	le Date	Recei	ot Date	Sample Ag	e Clien	nt Name		Project	
IOSN 2019 AT3-098		13-4648-8° 07-1559-49		)8 Ma )8 Fel	ar-23 b-23 13	08 Ma :00 09 Fe		12h 27d 23h	Eco- <i>i</i>	Analysts,	Inc.	Dredged Se	diment Evalu
Sample Code		Material T	ype		s	ample Soul	ce	Sta	ation Location	on	Lat/Lor	ng	
IOSN 2019		Reference		nt	Y	achtsman M	arina NAE-20	004-00 10	SN Referenc	:e			
AT3-098		Marine Sec	diment		Υ	'achtsman M	arina NAE-20	004-00 10	Stations at 4	1 Marinas	Mu		
Data Transform	m		Alt Hy	p				Comparis	son Result				PMSD
Untransformed			C < T					AT3-098 f	ailed benzo(	(a)pyrene	endpoint		2.68%
Equal Variance	e t Tv	vo-Sample	Test				MOD	P-Type	P-Value	Decisio	vn(a:5%)		
· •		Sample II AT3-098*			Test St 22.2	1.86	<b>MSD</b> 0.0164	CDF	<1.0E-05		ant Effect		
Sample I v	l /	-					0.0164			Significa			
Sample I v Reference Sed Auxiliary Tests	l /	AT3-098*	ktreme \	8 :	22.2		0.0164	CDF	<1.0E-05	Significa	ant Effect	ed	
Sample I v Reference Sed Auxiliary Tests Attribute	s	AT3-098*  Test	xtreme \	8 :	22.2		0.0164  Test Stat	CDF  Critical	<1.0E-05 <b>P-Value</b>	Significa	ant Effect on(α:5%)	ed	
Sample I v Reference Sed Auxiliary Tests Attribute Outlier	s	AT3-098*  Test		8 :	22.2	1.86	0.0164  Test Stat	CDF  Critical	<1.0E-05 <b>P-Value</b>	Significa Decision No Outl	ant Effect on(α:5%)	d	
Sample I v Reference Sed Auxiliary Tests Attribute Outlier ANOVA Table	s	AT3-098*  Test  Grubbs Ex	ıres	8 :	22.2 Test	1.86 quare	0.0164 <b>Test Stat</b> 1.91	CDF  Critical 2.29	<1.0E-05  P-Value  0.3427	Decision Decision	ant Effect on(α:5%) iers Detecte	ed	
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total	s	Test Grubbs Ex  Sum Squa 0.0950625 0.00155 0.0966125	ıres	8 :	22.2  Test  Mean S 0.09506	1.86 quare	0.0164  Test Stat 1.91  DF 1 8	CDF  Critical 2.29  F Stat	<1.0E-05  P-Value 0.3427  P-Value	Decision Decision	on(α:5%) liers Detecte on(α:5%)	od	
Sample I v Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum	s	Test Grubbs Ex  Sum Squa 0.0950625 0.00155 0.0966125 ns Tests	ıres	8 :	22.2  Test  Mean S 0.09506	1.86 quare	0.0164  Test Stat 1.91  DF 1 8 9	CDF  Critical 2.29  F Stat 491	P-Value 0.3427 P-Value <1.0E-05	Decision No Outl	on(α:5%) liers Detecte on(α:5%) ant Effect	ed	
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute	s	Test Grubbs Ex  Sum Squa 0.0950625 0.00155 0.0966125 ms Tests Test	ires	/alue	22.2  Test  Mean S 0.09506	1.86 quare	0.0164  Test Stat 1.91  DF 1 8 9	CDF  Critical 2.29  F Stat 491  Critical	P-Value 0.3427 P-Value <1.0E-05	Decision No Outl	on(α:5%) iers Detecte on(α:5%) ant Effect on(α:1%)	ed	
Sample I v Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum	s	Test Grubbs Ex  Sum Squa 0.0950625 0.00155 0.0966125 ns Tests	ares	8 :/alue	Test  Mean S 0.09506 0.00019	1.86 quare 625 138	0.0164  Test Stat 1.91  DF 1 8 9	CDF  Critical 2.29  F Stat 491	P-Value 0.3427 P-Value <1.0E-05	Decision Signification Decision Signification Decision Equal V	on(α:5%) liers Detecte on(α:5%) ant Effect		
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance	s mption	Test Grubbs Ex  Sum Squa 0.0950625 0.00155 0.0966125 ms Tests Test Variance R Shapiro-W	ares	8 :/alue	Test  Mean S 0.09506 0.00019	1.86 quare 625 138	0.0164  Test Stat 1.91  DF 1 8 9  Test Stat 1.82	Critical 2.29  F Stat 491  Critical 23.2	P-Value 0.3427 P-Value <1.0E-05 P-Value 0.5768	Decision Signification Decision Signification Decision Equal V	on(α:5%) iers Detecte on(α:5%) ant Effect on(α:1%) /ariances		
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution	s mption	Test Grubbs Ex  Sum Squa 0.0950625 0.00155 0.0966125 ms Tests Test Variance R Shapiro-W	ares	/alue	Test  Mean S 0.09506 0.00019	1.86 quare 625 138	0.0164  Test Stat 1.91  DF 1 8 9  Test Stat 1.82 0.866	Critical 2.29  F Stat 491  Critical 23.2 0.741	P-Value 0.3427 P-Value <1.0E-05 P-Value 0.5768	Decision Signification Decision Signification Decision Equal V	on(α:5%) iers Detecte on(α:5%) ant Effect on(α:1%) /ariances		%Effect
Sample I v Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  Benzo(a)pyren	s mption	Test Grubbs Ex  Sum Squa 0.0950625 0.00155 0.0966125  ms Tests Test Variance R Shapiro-W	ares Satio F T	/alue	Test  Mean S 0.09506 0.00019	1.86 quare 625 938	0.0164  Test Stat 1.91  DF 1 8 9  Test Stat 1.82 0.866	Critical 2.29  F Stat 491  Critical 23.2 0.741	P-Value 0.3427  P-Value <1.0E-05  P-Value 0.5768 0.0909	Decision  Decision  Decision  Signification  Decision  Equal V  Normal	on(α:5%) liers Detecte on(α:5%) ant Effect on(α:1%) /ariances Distribution	CV%	%Effect 0.00%
Sample I v Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  Benzo(a)pyren Sample	s mption	Test Grubbs Ex  Sum Squa 0.0950625 0.00155 0.0966125 ns Tests Test Variance R Shapiro-W mmary Code	atio F Tilk W No	/alue	Test  Mean S 0.09506 0.00019	1.86 quare 325 938	0.0164  Test Stat 1.91  DF 1 8 9  Test Stat 1.82 0.866	Critical 2.29  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	Decision  Decision  Signification  Decision  Signification  Decision  Equal V  Normal	on(α:5%) liers Detecte on(α:5%) ant Effect on(α:1%) /ariances Distribution Std Err	<b>CV%</b> 4 1.92%	
Sample I v Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  Benzo(a)pyren Sample IOSN 2019	mption	Test Grubbs Ex  Sum Squa 0.0950625 0.00155 0.0966125  Test Variance R Shapiro-W mmary Code RS	tatio F Till W No	/alue	Test  Mean S 0.09506 0.00019  ity Test  Mean 0.61	1.86  quare 625 938	0.0164  Test Stat 1.91  DF 1 8 9  Test Stat 1.82 0.866  95% UCL 0.625	Critical 2.29  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 Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signifi	on(α:5%) iers Detecte on(α:5%) ant Effect  on(α:5%) ant Effect  on(α:1%) /ariances Distribution  Std Err 0.00524	<b>CV%</b> 4 1.92%	0.00%
Sample I v Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  Benzo(a)pyren Sample IOSN 2019 AT3-098	mption	Test Grubbs Ex  Sum Squa 0.0950625 0.00155 0.0966125  Test Variance R Shapiro-W mmary Code RS	tatio F Till W No	8 :	Test  Mean S 0.09506 0.00019  ity Test  Mean 0.61	1.86  quare 625 938	0.0164  Test Stat 1.91  DF 1 8 9  Test Stat 1.82 0.866  95% UCL 0.625	Critical 2.29  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 Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signifi	on(α:5%) iers Detecte on(α:5%) ant Effect  on(α:5%) ant Effect  on(α:1%) /ariances Distribution  Std Err 0.00524	<b>CV%</b> 4 1.92%	0.00%
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution  Benzo(a)pyren Sample IOSN 2019 AT3-098  Benzo(a)pyren	mption	Test Grubbs Ex  Sum Squa 0.0950625 0.00155 0.0966125 ms Tests Test Variance R Shapiro-W mmary Code RS	eatio F Tilk W No	8 :/alue	22.2  Mean S 0.09506 0.00019  ity Test  Mean 0.61 0.805	1.86  quare 625 638  95% LC 0.595 0.785	0.0164  Test Stat 1.91  DF 1 8 9  Test Stat 1.82 0.866  95% UCL 0.625 0.825	Critical 2.29  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 Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signification Signifi	on(α:5%) iers Detecte on(α:5%) ant Effect  on(α:5%) ant Effect  on(α:1%) /ariances Distribution  Std Err 0.00524	<b>CV%</b> 4 1.92%	0.00%

Report Date: 19 Aug-23 06:56 (p 6 of 16) Test Code/ID: TN-23-302NvPAH / 17-1765-7444

										Test Co	de/ID:	1 IN-23-302	2NvPAH / 17	-1705-7444
Bioaccumula	tion l	Evaluation -	PAHs -	Nere	eis								EA-EST	, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 <i>A</i>	1472-6594 Aug-23 6:55 May-23 22:50	A	Endpo Analy: MD5 H	sis:	Nonp:		nthene -Two Sampl 40E1F9527		Statu	S Versior us Level: or ID:	n: CETISv2 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	08 N 05 A	•	F	Test T Proto Speci Taxon	col:   es:	JS A	cumulation CE NED For services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services services	on - PAHs RIM (2004)		Anal Dilue Brine Sour	ent: No e: Cr	ancy Roka ot Applicable ystal Sea RO - Aquatic	Research O	· Age:
Sample Code	•	Sample ID	S	Samp	le Date	)	Receip	t Date	Sample Ag	e Clier	nt Name	P	roject	
IOSN 2019 AT3-098		13-4648-81 07-1559-49		)8 Ma )8 Fel	ır-23 b-23 13	3:00	08 Mar- 09 Feb-		12h 27d 23h	Eco-	Analysts, I	nc. D	redged Sedi	ment Evalı
Sample Code	)	Material Ty	/pe		,	Samp	le Sourc	e	Sta	ation Locati	on	Lat/Long		
IOSN 2019		Reference		nt	,	Yacht	tsman Ma	rina NAE-20	004-00 10	SN Reference	e			
AT3-098		Marine Sed	liment		`	Yacht	tsman Ma	rina NAE-20	004-00 10	Stations at 4	4 Marinas	Mu		
Data Transfo	rm		Alt Hy	γp					Comparis	son Result				PMSD
Untransforme	d		C < T						AT3-098 1	failed benzo	b)fluorant	hene endpoir	nt	314.95%
Wilcoxon Ra Sample I Reference Se	vs	sample II AT3-098*	ple Tes	df	<b>Test St</b> 15		Critical	Ties	P-Type Exact	<b>P-Value</b> 0.0040	Decision	n(α:5%) Int Effect		
Auxiliary Tes	ts	_												
Attribute	ts	Test						Test Stat		P-Value	Decisio			
-	ts	<b>Test</b> Grubbs Ex	treme \	/alue	Test			Test Stat	Critical 2.29	<b>P-Value</b> 0.0004	<b>Decisio</b> Outlier E			
Attribute			treme \	/alue	Test									
Attribute Outlier					Test	Squar	re					Detected		
Attribute Outlier ANOVA Table		Grubbs Ex					re	2.68	2.29	0.0004	Outlier D	Detected	t	
Attribute Outlier ANOVA Table Source Between Error		Sum Squar 6.60969 37.3628			Mean S	9	re	2.68  DF  1 8	2.29 F Stat	0.0004 P-Value	Outlier D	Detected n(α:5%)	t	
Attribute Outlier ANOVA Table Source Between		Sum Squar			<b>Mean S</b> 6.6096	9	re	2.68 <b>DF</b> 1	2.29 F Stat	0.0004 P-Value	Outlier D	Detected n(α:5%)	t	
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu	)	Sum Squar 6.60969 37.3628 43.9725 ons Tests			<b>Mean S</b> 6.6096	9	re	2.68  DF 1 8 9	2.29  F Stat  1.42	0.0004 P-Value 0.2683	Outlier E  Decisio  Non-Sig	n(α:5%) nificant Effec	t	
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute	)	Sum Squar 6.60969 37.3628 43.9725 ons Tests Test	res		<b>Mean S</b> 6.6096	9	re	2.68  DF 1 8 9	F Stat 1.42 Critical	0.0004  P-Value  0.2683  P-Value	Decisio Non-Sig	n(α:5%) nificant Effec	t	
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance	)	Sum Squal 6.60969 37.3628 43.9725 cons Tests Test Variance Ra	res atio F T	est	<b>Mean \$</b> 6.6096: 4.6703:	9 5	re	2.68  DF  1  8  9  Test Stat  47900	2.29  F Stat  1.42  Critical  23.2	0.0004  P-Value 0.2683  P-Value <1.0E-05	Decisio Non-Sig  Decisio Unequal	n(a:5%) nificant Effec n(a:1%) Variances		
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution	e mptic	Sum Squar 6.60969 37.3628 43.9725 cons Tests Test Variance Ra Shapiro-Wil	res atio F T Ik W No	est	<b>Mean \$</b> 6.6096: 4.6703:	9 5	re	2.68  DF 1 8 9	F Stat 1.42 Critical	0.0004  P-Value  0.2683  P-Value	Decisio Non-Sig  Decisio Unequal	n(α:5%) nificant Effec		
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(b)fluo	e mptic	Sum Squar 6.60969 37.3628 43.9725 ons Tests Test Variance Rashapiro-Willene Summan	res atio F T Ik W No	est	<b>Mean \$</b> 6.6096; 4.6703;	9 5 5		2.68  DF  1 8 9  Test Stat 47900 0.63	2.29  F Stat  1.42  Critical  23.2  0.741	0.0004  P-Value 0.2683  P-Value <1.0E-05 0.0001	Decisio Non-Sig  Decisio Unequal Non-Nor	n(α:5%) nificant Effec n(α:1%) Variances mal Distribut	ion	
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(b)fluo Sample	e mptic	Sum Square 6.60969 37.3628 43.9725 cons Tests Variance Ra Shapiro-Willene Summar Code	atio F T lk W No ry Count	- est ormal	Mean \$ 6.6096; 4.6703; ity Test	9 5 5	95% LCL	2.68  DF  1 8 9  Test Stat 47900 0.63	2.29  F Stat 1.42  Critical 23.2 0.741  Median	0.0004  P-Value 0.2683  P-Value <1.0E-05 0.0001  Min	Decisio Non-Sig  Decisio Unequal Non-Nor	n(α:5%) nificant Effec n(α:1%) Variances mal Distribut	ion CV%	%Effect
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(b)fluo Sample IOSN 2019	e mptic	Sum Squar 6.60969 37.3628 43.9725 ons Tests Test Variance Rashapiro-Willene Summan	atio F T lk W No ry Count 5	est	Mean \$ 6.6096; 4.6703; ity Test  Mean 0.807	9 5 5	<b>95% LCL</b> 0.79	2.68  DF  1  8  9  Test Stat  47900 0.63  95% UCL 0.824	2.29  F Stat 1.42  Critical 23.2 0.741  Median 0.8	P-Value 0.2683  P-Value <1.0E-05 0.0001  Min 0.795	Decisio Non-Sig  Decisio Unequal Non-Nor  Max 0.83	n(a:5%) nificant Effec n(a:1%) Variances mal Distribut  Std Err 0.00625	ion <b>CV%</b> 1.73%	0.00%
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(b)fluo Sample	e mptic	Sum Square 6.60969 37.3628 43.9725 cons Tests Variance Ra Shapiro-Willene Summar Code	atio F T lk W No ry Count	est	Mean \$ 6.6096; 4.6703; ity Test	9 5 5	95% LCL	2.68  DF  1 8 9  Test Stat 47900 0.63	2.29  F Stat 1.42  Critical 23.2 0.741  Median	0.0004  P-Value 0.2683  P-Value <1.0E-05 0.0001  Min	Decisio Non-Sig  Decisio Unequal Non-Nor	n(α:5%) nificant Effec n(α:1%) Variances mal Distribut	ion CV%	
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(b)fluo Sample IOSN 2019	mptic	Sum Squal 6.60969 37.3628 43.9725 ons Tests Test Variance Ra Shapiro-Willene Summal Code RS	atio F T lk W No ry Count 5	est	Mean \$ 6.6096; 4.6703; ity Test  Mean 0.807	9 5 5	<b>95% LCL</b> 0.79	2.68  DF  1  8  9  Test Stat  47900 0.63  95% UCL 0.824	2.29  F Stat 1.42  Critical 23.2 0.741  Median 0.8	P-Value 0.2683  P-Value <1.0E-05 0.0001  Min 0.795	Decisio Non-Sig  Decisio Unequal Non-Nor  Max 0.83	n(a:5%) nificant Effec n(a:1%) Variances mal Distribut  Std Err 0.00625	ion <b>CV%</b> 1.73%	0.00%
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(b)fluo Sample IOSN 2019 AT3-098	mptic	Sum Squal 6.60969 37.3628 43.9725 ons Tests Test Variance Ra Shapiro-Willene Summal Code RS	atio F T lk W No ry Count 5	est	Mean \$ 6.6096; 4.6703; ity Test  Mean 0.807	9 5 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	<b>95% LCL</b> 0.79	2.68  DF  1  8  9  Test Stat  47900 0.63  95% UCL 0.824	2.29  F Stat 1.42  Critical 23.2 0.741  Median 0.8	P-Value 0.2683  P-Value <1.0E-05 0.0001  Min 0.795	Decisio Non-Sig  Decisio Unequal Non-Nor  Max 0.83	n(a:5%) nificant Effec n(a:1%) Variances mal Distribut  Std Err 0.00625	ion <b>CV%</b> 1.73%	0.00%
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	Sum Squa 6.60969 37.3628 43.9725 ons Tests Test Variance R: Shapiro-Willene Summar Code RS	atio F T lk W No ry Count 5	est	Mean \$ 6.6096: 4.6703: ity Test  Mean 0.807 2.43	9 5 5 5	<b>95% LCL</b> 0.79 -1.36	2.68  DF  1 8 9  Test Stat 47900 0.63  95% UCL 0.824 6.23	2.29  F Stat  1.42  Critical  23.2  0.741  Median  0.8  1.07	P-Value 0.2683  P-Value <1.0E-05 0.0001  Min 0.795	Decisio Non-Sig  Decisio Unequal Non-Nor  Max 0.83	n(a:5%) nificant Effec n(a:1%) Variances mal Distribut  Std Err 0.00625	ion <b>CV%</b> 1.73%	0.00%

**Report Date:** 19 Aug-23 06:56 (p 7 of 16) **Test Code/ID:** TN-23-302NvPAH / 17-1765-7444

							Test Co	de/ID:	TN-23-302	NVPAH / 1	7-1765-7444
Bioaccumula	tion Evaluation	- PAHs - N	ereis							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	13-4397-7733 19 Aug-23 6:55 08 May-23 22:5	An	alysis:	Benzo(g,h,i)per Parametric-Two 5FE12096E656	Sample	02296512A	Statu	S Version: is Level: or ID:	: CETISv2 1	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	16-7806-7369 08 Mar-23 11:3: 05 Apr-23 10:32 27d 23h	2 <b>Pro</b> 2 <b>Sp</b>	st Type: otocol: ecies: con:	Bioaccumulation US ACE NED F Nereis virens Polychaeta			Analy Dilue Brine Sour	ent: Not e: Cry	ncy Roka t Applicable rstal Sea O - Aquatic F	Research (	Or <b>Age:</b>
Sample Code	Sample II	D Sa	mple Dat	e Receip	t Date	Sample Ag	e Clien	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-A	Analysts, Ir	nc. Dr	edged Sec	liment Evalu
Sample Code	Material ⁻	Гуре		Sample Sourc	е	Sta	ition Location	on	Lat/Long		
IOSN 2019 AT3-098	Reference Marine Se	e sediment ediment		Yachtsman Ma Yachtsman Ma			SN Referenc Stations at 4		⁄lu		
Data Transfor	m	Alt Hyp				Comparis	on Result				PMSD
Untransformed	d	C < T				AT3-098 f	ailed benzo(	g,h,i)peryle	ene endpoint		2.05%
Equal Varian	ce t Two-Sample	e Test									
Sample I	vs Sample II	d	f Test S	Stat Critical	MSD	P-Type	P-Value	Decision	(α:5%)		
Reference Sec	d AT3-098*	7	28.5	1.89	0.00532	CDF	<1.0E-05	Significar	nt Effect		
ANOVA Table	ı										
Source	Sum Squ	ares	Mean	Square	DF	F Stat	P-Value	Decision	(α:5%)		
Between	0.01424		0.0142	24	1	813	<1.0E-05	Significar	nt Effect		
Error	0.000122		1.751	E-05	7	_					
Total	0.014362	б 			8						
ANOVA Assu	mptions Tests										
Attribute	Test				Test Stat	Critical	P-Value	Decision	(α:1%)		
Variance		Ratio F Tes			2.01	46.2	0.5916	Equal Va			
Distribution	Shapiro-V	Vilk W Norr	nality Tes	st	0.871	0.701	0.1264	Normal D	istribution		
Benzo(g,h,i)p	erylene Summa	ry									
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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Test Code/ID: TN-23-302NvPAH / 17-1765-7444

	<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: D5 Hash:	Benzo(k)fluora Parametric-Tw 6855E33D32D	o Sample	8ABC8834I	Statu	S Version is Level: or ID:	: CETISv2	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	16-7806-7369 08 Mar-23 11: 05 Apr-23 10:3 27d 23h	32 <b>P</b> 32 <b>S</b>	est Type: rotocol: pecies: axon:	Bioaccumulation 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 Dat	te Receip	t Date	Sample Ag	e Clier	t Name	Pr	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, Ir	nc. Dr	edged Sed	diment Evalu
Sample Code	Material	Туре		Sample Source	e	Sta	ation 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	son 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 [*]	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	rmality 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					

Report Date: Test Code/ID: 19 Aug-23 06:56 (p 9 of 16) TN-23-302NvPAH / 17-1765-7444

Bioaccumulati	ion Evaluation - PA	NHs - Ne	reis							EA-ES	T, Inc. PBC
Analyzed:	14-6869-2556 19 Aug-23 6:55 08 May-23 22:50	Anal	•	rysene rametric-Two 13485DA463		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	<b>.</b>	
Ending Date:	05 Apr-23 10:32	Spe	cies: Ne	reis virens			Bri	ne: Cr	ystal Sea		
Test Length:	27d 23h	Taxo	on: Pol	ychaeta			So	urce: AF	RO - Aquatic	Research C	r <b>Age</b> :
Sample Code	Sample ID	Sam	ple Date	Receip	t Date	Sample Ag	e Cli	ent Name	F	Project	
IOSN 2019	13-4648-8170	08 M	lar-23	08 Mar-	-23	12h	Eco	o-Analysts, I	nc. [	Oredged 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	)	Sa	mple Sourc	е	Sta	ition Loca	tion	Lat/Long	g	
IOSN 2019	Reference see	diment	Ya	chtsman Ma	rina NAE-20	004-00 108	SN Refere	nce			
AT3-098	Marine Sedim	ent	Ya	chtsman Ma	rina NAE-20	004-00 10	Stations a	t 4 Marinas	Mu		
Data Transform	m Al	t Hyp				Comparis	on Resul	t			PMSD
Untransformed	С	< T				AT3-098 f	ailed chrys	ene endpoi	nt		91.18%
Unequal Varia	nce t Two-Sample	Test									
Sample I v	s 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 Extre	me Valu	e Test		1.89	2.29	0.3574	No Outli	ers Detected	t	
ANOVA Table											
Source	Sum Squares	5	Mean Squ	uare	DF	F Stat	P-Value	Decisio	n(α:5%)		
Between	0.826563		0.826563		1	5.68	0.0443		int Effect		
Error	1.16379		0.145474		8			Ū			
Total	1.99035				9	_					
ANOVA Assun	nptions Tests										
Attribute	Test				Test Stat	Critical	D Value	Decisio	n(α:1%)		
	1000					Critical	P-Value				
Variance	Variance Ration	o F Test			3140	23.2	<1.0E-0	5 Unequal	Variances		
Variance Distribution			ality Test					•	Variances Distribution		
	Variance Ration Shapiro-Wilk		ality Test		3140	23.2	<1.0E-0	•			
Distribution	Variance Rati Shapiro-Wilk nmary Code Co		ality Test  Mean	95% LCL	3140 0.858	23.2 0.741	<1.0E-0	•		CV%	%Effect
Distribution  Chrysene Sum	Variance Ration Shapiro-Wilk Manary	W Norma		<b>95% LCL</b> 0.552	3140 0.858	23.2 0.741	<1.0E-09 0.0714	Normal I	Distribution	<b>CV%</b> 1.71%	%Effect 0.00%
Distribution  Chrysene Sum Sample	Variance Rati Shapiro-Wilk nmary Code Co	W Norma	Mean		3140 0.858 <b>95% UCL</b>	23.2 0.741 <b>Median</b>	<1.0E-09 0.0714 <b>Min</b>	Normal I	Distribution Std Err		
Chrysene Sum Sample IOSN 2019	Variance Ratic Shapiro-Wilk Inmary  Code Code RS 5 5	W Norma	<b>Mean</b> 0.564	0.552	3140 0.858 <b>95% UCL</b> 0.576	23.2 0.741 <b>Median</b> 0.56	<1.0E-09 0.0714 <b>Min</b> 0.555	Max 0.58	Std Err 0.0043	1.71%	0.00%
Chrysene Sum Sample IOSN 2019 AT3-098	Variance Ratic Shapiro-Wilk Inmary  Code Code RS 5 5	W Norma	<b>Mean</b> 0.564	0.552	3140 0.858 <b>95% UCL</b> 0.576	23.2 0.741 <b>Median</b> 0.56	<1.0E-09 0.0714 <b>Min</b> 0.555	Max 0.58	Std Err 0.0043	1.71%	0.00%
Chrysene Sum Sample IOSN 2019 AT3-098	Variance Ratic Shapiro-Wilk Inmary  Code Code RS 5 5 ail  Code Re	ount	<b>Mean</b> 0.564 1.14	0.552 0.469	3140 0.858 <b>95% UCL</b> 0.576 1.81	23.2 0.741 <b>Median</b> 0.56 0.77	<1.0E-09 0.0714 <b>Min</b> 0.555	Max 0.58	Std Err 0.0043	1.71%	0.00%

Report Date: 19 Aug-23 06:56 (p 10 of 16)
Test Code/ID: TN-23-302NvPAH / 17-1765-7444

	,	-						Test Co	de/ID:	114 20 002	ZINVI AII/	7-1765-744
Bioaccumulat	ion Evaluati	on - PAHs	- Ne	reis							EA-ES	T, Inc. PBC
Analyzed:	19-8988-888 19 Aug-23 6 08 May-23 2	:55	Anal	ysis: P	oibenz(a,h)antl arametric-Two 03DE0113FD	o Sample	0D47ABC1E	Statu	S Version is Level: or ID:	: CETISv2 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	•	1:32		ocol: L	ioaccumulatio IS ACE NED f lereis virens olychaeta			Analy Dilue Brine Sour	ent: Not	ncy Roka t Applicable /stal Sea O - Aquatic	Research (	Or <b>Age:</b>
Sample Code	Sampl	e ID	Sam	ple Date	Receip	t Date	Sample Age	e Clien	t Name	Р	roject	
IOSN 2019 AT3-098		8-8170 9-4974		lar-23 eb-23 13:	08 Mar- 00 09 Feb-		12h 27d 23h	Eco-A	Analysts, Ir	nc. D	redged Sed	diment Eval
Sample Code	Materi	al Type		s	ample Sourc	e	Sta	tion Location	on	Lat/Long	1	
IOSN 2019		nce sedim	ent		achtsman Ma		04-00 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 Transfor	m	Alt I	Тур				Comparis	on Result				PMSD
Untransformed	l	C < 1	-				AT3-098 fa	ailed dibenz	(a,h)anthra	cene endpo	int	2.64%
Equal Varianc								<b>D</b> 1/ 1	Danisias	. / <b>=</b> 0/ \		
•			df 8	Test Sta 22.5	1.86	<b>MSD</b> 0.00794	P-Type CDF	<b>P-Value</b> <1.0E-05	<b>Decision</b> Significar	•		
Sample I Reference Sed	AT3-09						CDF			nt Effect		
Sample I Reference Sed Auxiliary Test	AT3-09 s Test		8	22.5		0.00794	CDF	<1.0E-05	Significar Decision	nt Effect		
Sample I Reference Sed Auxiliary Test	s Test	8*	8	22.5		0.00794  Test Stat	CDF  Critical	<1.0E-05	Significar Decision	nt Effect n(α:5%)		
Sample I Reference Sed Auxiliary Test Attribute Outlier	s Test	8*	8	22.5	1.86	0.00794  Test Stat	CDF  Critical	<1.0E-05	Significar Decision	nt Effect n(α:5%) ers Detected		
Sample I Reference Sed Auxiliary Test: Attribute Outlier ANOVA Table Source Between	s Test	8* es Extreme	8	e Test	1.86 quare	0.00794  Test Stat 1.98  DF 1	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 Reference Sed Auxiliary Test: Attribute Outlier ANOVA Table Source Between Error	Sum S 0.0230 0.0003	s Extreme  quares  4 649	8	e Test  Mean S	1.86 quare	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%)		
Sample I Reference Sed Auxiliary Test: Attribute Outlier ANOVA Table Source Between Error	Sum S	s Extreme  quares  4 649	8	22.5 e Test  Mean S 0.02304	1.86 quare	0.00794  Test Stat 1.98  DF 1	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 Reference Sed Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur	Sum S 0.0234	s Extreme  quares 4 649 049	8	22.5 e Test  Mean S 0.02304	1.86 quare	0.00794  Test Stat 1.98  DF 1 8 9	CDF  Critical 2.29  F Stat 505	P-Value 0.2560 P-Value <1.0E-05	Decision No Outlie	nt Effect n(α:5%) ers Detected n(α:5%)		
Sample I Reference Sed Auxiliary Test: Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute	Sum S 0.0230 0.00234 mptions Test	s Extreme squares 4 649 049	8 Valu	22.5 e Test  Mean S 0.02304	1.86 quare	0.00794  Test Stat 1.98  DF 1 8 9	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%)		
Sample I Reference Sed Auxiliary Test: Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	Sum S 0.0230 0.0003 0.0234 mptions Test Varian	es Extreme  squares 4 649 049 cs	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 2.29  F Stat 505  Critical 23.2	P-Value -1.0E-05 P-Value -1.0E-05 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 Test: Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	Sum S 0.0230 0.0003 0.0234 mptions Test Varian	s Extreme squares 4 649 049	8 Valu	e Test  Mean S 0.02304 4.561E-	1.86 quare	0.00794  Test Stat 1.98  DF 1 8 9	Critical 2.29  F Stat 505  Critical	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 Test: Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution	Sum S 0.0230 0.0003 0.0234 mptions Test Varian Shapir	es Extreme  Gquares  4  649  049  cs  ce Ratio F  o-Wilk W I	8 Valu	22.5  e Test  Mean S 0.02304 4.561E-	<b>quare</b> 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	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		
Reference Sed Auxiliary Test: Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution Dibenz(a,h)and	Sum S 0.0230 0.0003 0.0234 mptions Test Varian Shapir thracene Su Code	es Extreme  squares 4 649 049 cs ce Ratio F o-Wilk W I	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	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%	
Reference Sed Auxiliary Test: Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution Dibenz(a,h)an Sample IOSN 2019	Sum S 0.0230 0.0003 0.0234 mptions Test Varian Shapir	s Extreme squares 4 649 049 cs ce Ratio F o-Wilk W I mmary Cour	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	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 Test: Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution Dibenz(a,h)an Sample	Sum S 0.0230 0.0003 0.0234 mptions Test Varian Shapir thracene Su Code	es Extreme  squares 4 649 049 cs ce Ratio F o-Wilk W I	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	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%	0.00%
Reference Sed Auxiliary Test: Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution Dibenz(a,h)an Sample IOSN 2019	Sum S 0.0230 0.0003 0.0234 mptions Test Varian Shapir thracene Su Code RS	s Extreme squares 4 649 049 cs ce Ratio F o-Wilk W I mmary Cour 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	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(a:5%) ers Detected n(a:5%) nt Effect n(a:5%) nt Effect n(a:1%) ariances Distribution Std Err 0.00243	<b>CV%</b> 1.81%	0.00%
Reference Sed Auxiliary Test: Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution Dibenz(a,h)an Sample IOSN 2019 AT3-098	Sum S 0.0230 0.0003 0.0234 mptions Test Varian Shapir thracene Su Code RS	s Extreme squares 4 649 049 cs ce Ratio F o-Wilk W I mmary Cour 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	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(a:5%) ers Detected n(a:5%) nt Effect n(a:5%) nt Effect n(a:1%) ariances Distribution Std Err 0.00243	<b>CV%</b> 1.81%	%Effect 0.00% -31.96%
Auxiliary Test: Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Dibenz(a,h)an Sample IOSN 2019 AT3-098  Dibenz(a,h)an	Sum S 0.0230 0.0003 0.0234 mptions Test Varian Shapir thracene Su Code RS	s Extreme squares 4 649 049 ce Ratio F o-Wilk W I mmary Cour 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 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(a:5%) ers Detected n(a:5%) nt Effect n(a:5%) nt Effect n(a:1%) ariances Distribution Std Err 0.00243	<b>CV%</b> 1.81%	0.00%

**Report Date:** 19 Aug-23 06:56 (p 11 of 16) **Test Code/ID:** TN-23-302NvPAH / 17-1765-7444

	,						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 ⁻	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 P-Value 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  Iptions 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 So 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 0.0003  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 So 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 0.0003  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 0.0003  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

										T	est Co	ae/ID:		114-20-0	, OZ 1 <b>1</b> 1	1 / 1 / 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	mptior	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	Critical 2.29  F Stat 10.9  Critical	P-V 0.022 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	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 Tillk 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	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 Tillk 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	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	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 Ev	aluation -	PAHs	- Ne	reis									EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 Aug	35-5860 g-23 6:56 y-23 22:50		Anal	•	Para	metric-Two	o Sample 76677B373	05CC020	)F17AD	Statu	S Versions Level:		/2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	08 Mar 05 Apr			Prot	ocol: ( cies: 1	JS A Nere	ccumulatio CE NED F is virens chaeta	on - PAHs RIM (2004)			Analy Dilue Brine Sour	ent: N	lancy Roka lot Applicable crystal Sea .RO - Aquatic		or <b>Age</b> :
Sample Code	. 5	Sample ID		Sam	ple Date	<del></del>	Receipt	t Date	Sample .	Aae	Clien	t Name	F	Project	
IOSN 2019 AT3-098	1	3-4648-81 7-1559-49	70	08 N	lar-23 eb-23 13		08 Mar-	23	12h 27d 23h			Analysts,		Dredged Sed	iment Evalu
Sample Code	· N	/laterial Ty	ре		9	Sam	ple Sourc	e	,	Station	Location	on	Lat/Lon	<del></del> g	
IOSN 2019	F	Reference	sedime	ent	`	Yach	tsman Ma	rina NAE-20	04-00 I	OSN R	eferenc	е			
AT3-098	N	//arine Sed	iment		`	Yach	tsman Ma	rina NAE-20	04-00	10 Statio	ons at 4	Marinas	s Mu		
Data Transfor	rm		Alt H	ур					Compa	rison R	esult				PMSD
Untransformed	d		C < T						AT3-09	8 failed	naphth	alene en	dpoint		108.55%
Equal Variand			Test	.,									( =0()		
Sample I Reference Sec		ample II T3-098*		df 8	<b>Test St</b> 2.49	-	1.86	<b>MSD</b> 0.706	P-Type CDF		<b>/alue</b> 188		on(α:5%) ant Effect		
		13-090		0	2.43		1.00	0.700	CDI	0.0	100	Olgrillio	ant Lifett		
Auxiliary Test															
Attribute		Test			<del>-</del> ·			Test Stat			/alue		on(α:5%)		
Outlier		Grubbs Ex	treme	valu	e rest			1.9	2.29	0.3	485	No Out	liers Detected	<u> </u>	
ANOVA Table	•														
Source	5	Sum Squa	res		Mean S	Squa	re	DF	F Stat		/alue	Decision	on(α:5%)		
Between		2.23445			2.2344			1	6.2	0.0	376	Signific	ant Effect		
Error Total		2.88487 5.11932			0.36060	09		9	_						
ANOVA Assu															
Attribute		<b>Test</b> /ariance Ra	otio E	Toot				Test Stat	23.2		<b>/alue</b> 978		on(α:1%)		
Variance Distribution		ariance Ri Shapiro-Wi			ality Test			4.14 0.927	23.2 0.741		978 218		/ariances Distribution		
Naphthalene		•	0				05%   01	050/ 1101	M!!		_		O4 -1	0)/0/	0/ 5554
Sample		Code	Count	τ	Mean		95% LCL	95% UCL	Mediar			Max	Std Err	CV%	%Effect
IOSN 2019 AT3-098	r	RS	5 5		0.651 1.6		0.185 0.65	1.12 2.54	0.412 1.65	0.3 0.5		1.24 2.32	0.168 0.341	57.59% 47.75%	0.00% -145.31%
Naphthalene	Detail				1.0					0.0			0.011	11.1070	1 10.0176
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						
AT0.000			4.05		0.00		0.000		4.0						

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 ⁻ 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		.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	tion Evalu	ation - PAH	ls - Ne	reis									EA-ES	Γ, Inc. PBC
Analysis ID: Analyzed: Edit Date:	13-2043- 19 Aug-23 08 May-2	3 6:56	Ana	lpoint: lysis: 5 Hash:	Para	ametric-Two	o Sample C61834386	F3A2DF	12E9E0		S Versio is Level: or ID:	n: CETISv 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	•	3 11:32	Pro	tocol:	US /	accumulatio ACE NED F eis virens rchaeta				Analy Dilue Brine Sour	ent: N e: C	ancy Roka ot Applicable rystal Sea RO - Aquatic		r <b>Age</b> :
Sample Code	San	nple ID	San	nple Da	te	Receipt	t Date	Sample	Age	Clien	t Name	Р	roject	
IOSN 2019 AT3-098		4648-8170 1559-4974		/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	Mat	terial Type			Sam	ple Source	e		Station	Location	on	Lat/Long	9	
IOSN 2019	Ref	erence sedir	ment		Yacl	htsman Ma	rina NAE-20	004-00	IOSN Re	ferenc	е			
AT3-098	Mar	ine Sedimer	nt		Yacl	htsman Ma	rina NAE-20	004-00	10 Statio	ns at 4	Marinas	Mu		
Data Transfor	m	Alt	Нур					Compa	arison R	esult				PMSD
Untransformed	t	C <	Т					AT3-09	98 failed	pyrene	endpoint	t		254.76%
Unequal Varia		o-Sample To	est df	Test S	Stat	Critical	MSD	P-Type	e P-V	'alue	Decisio	on(α:5%)		
Reference Sec		-098*	4	6.9		2.13	1.72	CDF	0.0			ant Effect		
Auxiliary Test Attribute Outlier	Te	<b>st</b> ubbs Extrem	ıe Valı	ue Test			Test Stat	Critica 2.29	II <b>P-V</b>	<b>'alue</b> 209		on(α:5%) iers Detected	I	
ANOVA Table	)													
Source	Sur	n Squares		Mean	Squ	are	DF	F Stat	P-V	alue	Decisio	on(α:5%)		
Between	77.	1173		77.11	73		1	47.5	0.0	001	Signific	ant Effect		
Error		9749		1.621	86		8	_						
Total	90.0	0922					9							
ANOVA Assur														
Attribute	Tes	-					Test Stat			alue		on(α:1%)		
Variance Distribution		iance Ratio∃ piro-Wilk W			st .		20900 0.895	23.2 0.741	<1.0 0.19	0E-05 925		Il Variances Distribution		
Pyrene Summ		ibiio-ssiik ss	INUITI	anty 16	J.		0.030	0.741	0.13	JZJ	INUITIAL	Distribution		
Sample	Coc	de Cou	ınt	Mean		95% LCL	95% UCL	Media	n Min	,	Max	Std Err	CV%	%Effect
IOSN 2019	RS	5	4116	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	Cod	de 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		

^{* =} 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 U	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 <mark>U</mark>
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

^{* =} 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 <mark>U</mark>	0.0650 U
PCB 18	0.0463 <mark>U</mark>	0.0453 U	0.0457 U	0.0455 <mark>U</mark>	0.0475 <mark>U</mark>
PCB 28	0.0790 U	0.0770 U	0.0775 <b>U</b>	0.0775 <mark>U</mark>	0.0810 U
PCB 44	0.0880 U	0.0860 U	0.0865 U	0.0860 <del>U</del>	0.0900 U
PCB 52	0.0489 <mark>U</mark>	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 <mark>U</mark>	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 <del>U</del>	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 <mark>U</mark>	0.0415 U	0.0414 <mark>U</mark>	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 <b>U</b>	0.0790 <b>U</b>	0.0830 U
PCB 209	0.0925 <mark>U</mark>	0.0905 <mark>U</mark>	0.0910 <mark>U</mark>	0.0910 U	0.0950 U
Total PCBs	6.21	7.34	11.3	3.29	3.92

^{* =} 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 0E	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 < 1	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	ongene	ers - Ne	reis				oue/ID.		EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	13-8217-62 19 Aug-23 6 08 May-23 2	3:57	Endpoi Analysi MD5 Ha	s: Pa	CB 018 rametric-Two DA257F039I	•	781E2EB20	Sta	TIS Version tus Level: tor ID:	: CETISv2 1	.1.1	
Batch ID: Start Date: Ending Date: Test Length:		1:33 0:33	Test Ty Protoco Species Taxon:	ol: US s: Ne	paccumlation ACE NED F reis virens lychaeta		lv	Dili Bri	uent: No ne: Cry	ncy Roka t Applicable ystal Sea tO - Aquatic F	Research (	Or <b>Age:</b>
Sample Code IOSN 2019 AT3-098		48-8170	Sample 08 Mar- 08 Feb-	23	Receipt 08 Mar- 0 09 Feb-	-23	<b>Sample A</b> 12h 27d 23h	_	ent Name o-Analysts, I		<b>oject</b> edged Sed	diment Evalu
Sample Code IOSN 2019 AT3-098	Refer	ial Type ence sedime e Sediment	ent	Ya	mple Sourc chtsman Ma chtsman Ma	rina NAE-20	004-00 IC	tation Loca OSN Referer O Stations a		<b>Lat/Long</b>		
Data Transfor	m	Alt H	ур				Compar	ison Resul	İ			PMSD
Untransformed	l	C < T					AT3-098	failed pcb (	18 endpoint	:		2.65%
Sample I Reference Sec	vs Sampl	e II		est Stat	Critical	MSD 0.000925	<b>P-Type</b> CDF	<b>P-Value</b> <1.0E-09	<b>Decision</b> Significa	, ,		
Auxiliary Test Attribute Outlier	Test	bs Extreme	Value T	est		Test Stat	Critical 2.29	<b>P-Value</b> 0.2663	<b>Decision</b> No Outlie	n(α:5%) ers Detected		
ANOVA Table		Squares	М	ean Sq	uare	DF	F Stat	P-Value	Decision	n(α:5%)		
Between Error Total	0.000 4.947 0.000	E-06		000310 184E-07		1 8 9	502 —	<1.0E-0	5 Significa	nt Effect		
ANOVA Assur Attribute Variance Distribution	Test Variar	nce Ratio F		· Test		<b>Test Stat</b> 1.91 0.826	<b>Critical</b> 23.2 0.741	<b>P-Value</b> 0.5462 0.0299	<b>Decision</b> Equal Va Normal I	<u> </u>		
PCB 018 Sum	mary											
Sample IOSN 2019 AT3-098	Code RS	<b>Coun</b> 5 5	0.	<b>ean</b> 0349 046	<b>95% LCL</b> 0.0341 0.0449	<b>95% UCL</b> 0.0357 0.0472	Median 0.0345 0.0457	Min 0.0345 0.0453	Max 0.036 0.0475	Std Err 0.000292 0.000403	<b>CV%</b> 1.87% 1.96%	%Effect 0.00% -31.92%
PCB 018 Deta	il											
Sample	Code	Rep 1		ер 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					

Report Date: Test Code/ID: 19 Aug-23 06:58 (p 3 of 18) TN-23-302NvPCB / 04-0924-3837

Diagonium	tion Fralmation	DOD Com	N.							EA EC	T Inc. DDC
Віоасситиіа	tion Evaluation									EA-ES	T, Inc. PBC
Analysis ID:	11-4561-0244		lpoint: PO		0 1			S Version		.1.1	
Analyzed: Edit Date:	19 Aug-23 6:57 08 May-23 22:5		•	rametric-Two 664154466A	•	621086E00		s Level:	1		
Euit Date.	00 May-20 22.0						oz Euito	. וט.			
Batch ID:	16-3825-9393			oaccumlation		V	Analy		ncy Roka		
Start Date:	08 Mar-23 11:3			S ACE NED F	RIM (2004)		Dilue		t Applicable		
•	05 Apr-23 10:3	•		ereis virens			Brine	,	/stal Sea		
Test Length:	27d 23h	ı ax	on: Po	lychaeta			Sour	ce: AR	O - Aquatic F	Research C	or <b>Age:</b>
Sample Code			nple Date	Receipt	t Date	Sample Ag	e Clien	t Name		oject	
IOSN 2019	13-4648-8		Mar-23	08 Mar-		12h	Eco-A	Analysts, Ir	nc. Dr	edged Sec	liment Evalı
AT3-098	07-1559-4	4974 08	Feb-23 13:0	0 09 Feb-	23 16:30	27d 23h					
Sample Code	Material	Туре	Sa	mple Source	е	Sta	ation Location	on	Lat/Long		
IOSN 2019	Reference	e sediment	Ya	ichtsman Ma	rina NAE-20	004-00 105	SN Referenc	e			
AT3-098	Marine Se	ediment	Ya	ichtsman Ma	rina NAE-20	004-00 10	Stations at 4	Marinas N	<b>Л</b> и		
Data Transfor	m	Alt Hyp				Comparis	son Result				PMSD
Untransformed	t	C < T				AT3-098 f	ailed pcb 02	8 endpoint			2.72%
Egual Variand	ce t Two-Sampl	e Test									
	vs Sample II	di	Test Stat	Critical	MSD	P-Type	P-Value	Decision	n(a:5%)		
Reference Sec		8	22.1	1.86	0.00161	CDF	<1.0E-05	Significar	• •		
								9			
Auxiliary Test											
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	1										
Source	Sum Squ	iares	Mean Sq	uare	DF	F Stat	P-Value	Decision	η(α:5%)		
Between	0.000912	0	0.000912	10	1	486	<1.0E-05	Significa	nt Effect		
Error	0.000015		1.875E-0	6	8						
Total				<u> </u>		_					
Total	0.000927	0			9						
	0.000927 mptions Tests	0				_					
		0				Critical	P-Value	Decision	n(α:1%)		
ANOVA Assur	mptions Tests Test	0 Ratio F Tes	t	0	9	Critical 23.2	<b>P-Value</b> 0.3988	<b>Decision</b> Equal Va	<u> </u>		
ANOVA Assur	mptions Tests Test Variance		=		9 Test Stat			Equal Va	<u> </u>		
ANOVA Assur Attribute Variance	mptions Tests  Test  Variance  Shapiro-V	Ratio F Tes	=		9 <b>Test Stat</b> 2.49	23.2	0.3988	Equal Va	riances		
ANOVA Assur Attribute Variance Distribution	mptions Tests  Test  Variance  Shapiro-V	Ratio F Tes	=		9 <b>Test Stat</b> 2.49	23.2 0.741	0.3988	Equal Va	riances	CV%	%Effect
ANOVA Assur Attribute Variance Distribution PCB 028 Sum	mptions Tests Test Variance Shapiro-V	Ratio F Tes Vilk W Norn	nality Test		9  Test Stat 2.49 0.871	23.2 0.741	0.3988 0.1027	Equal Va Normal D	riances Distribution	<b>CV%</b> 1.75%	%Effect 0.00%
ANOVA Assur Attribute Variance Distribution PCB 028 Sum Sample	mptions Tests Test Variance Shapiro-V mary Code	Ratio F Tes Vilk W Norm Count	Mean	95% LCL	9  Test Stat 2.49 0.871  95% UCL	23.2 0.741 Median	0.3988 0.1027 <b>Min</b>	Equal Va	Distribution  Std Err		
ANOVA Assur Attribute Variance Distribution PCB 028 Sum Sample IOSN 2019	Test Variance Shapiro-V mary Code RS	Ratio F Tes Vilk W Norn Count	Mean 0.0593	<b>95% LCL</b> 0.058	9 Test Stat 2.49 0.871  95% UCL 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	riances Distribution  Std Err  0.000464	1.75%	0.00%
ANOVA Assur Attribute Variance Distribution PCB 028 Sum Sample IOSN 2019 AT3-098	Test Variance Shapiro-V mary Code RS	Ratio F Tes Vilk W Norn Count	Mean 0.0593 0.0784	<b>95% LCL</b> 0.058 0.0764	9 Test Stat 2.49 0.871  95% UCL 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	riances Distribution  Std Err  0.000464	1.75%	0.00%
ANOVA Assur Attribute Variance Distribution PCB 028 Sum Sample IOSN 2019 AT3-098 PCB 028 Deta	Test Variance Shapiro-V  mary  Code  RS	Ratio F Tes Vilk W Norn  Count  5 5	Mean 0.0593	<b>95% LCL</b> 0.058	9 Test Stat 2.49 0.871  95% UCL 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	riances Distribution  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 Agos
		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	P-Typ	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	4 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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									Test	Code/ID:	1 IN-23-302	INVPCB / 04	-0924-3837
Bioaccumulat	tion Eval	uation - PCB	Cong	eners -	Nerei	s						EA-EST	, Inc. PBC
Analysis ID: Analyzed: Edit Date:	13-3296- 19 Aug-2 08 May-2	23 6:57	Ana	point: lysis: i Hash:	Nonpa	arametric-	Two Sampl		St	ETIS Versi tatus Leve ditor ID:		.1.1	
Batch ID: Start Date: Ending Date: Test Length:	•	23 11:33 3 10:33	Prot	ocol: cies:	US A	CE NED F s virens	- PCBs - N RIM (2004)	V	Di Bi	iluent: rine:	Nancy Roka Not Applicable Crystal Sea ARO - Aquatic F	Research Or	Age:
Sample Code	Sa	mple ID	Sam	ple Dat	e	Receipt	Date	Sample Ag	je C	ient Name	e Pr	oject	
IOSN 2019 AT3-098		-4648-8170 -1559-4974		1ar-23 eb-23 1	3:00	08 Mar- 09 Feb-		12h 27d 23h	E	co-Analysts	s, Inc. Dr	edged Sedi	ment Evalu
Sample Code	Ма	terial Type			Samp	le Source	)	St	ation Loc	ation	Lat/Long		
IOSN 2019	Re	ference sedir	ment		Yacht	sman Mar	ina NAE-20	04-00 IO	SN Refer	ence			
AT3-098	Ма	rine Sedimer	nt		Yacht	sman Mar	ina NAE-20	004-00 10	Stations	at 4 Marina	as Mu		
Data Transfor	m	Alt	Нур					Compari	son Resu	ılt			PMSD
Untransformed	i	C <	Т					AT3-098	failed pcb	052 endpo	oint		439.72%
Wilcoxon Rar Sample I Reference Sec	vs San	wo-Sample inple II 3-098*	Test df 8	<b>Test S</b>	Stat C	Critical 	Ties	P-Type Exact	<b>P-Valu</b> 0.0040		ion(α:5%) icant Effect		
Auxiliary Test Attribute Outlier	Te	est rubbs Extrem	ıe Valu	e Test			Test Stat 2.68	Critical 2.29	<b>P-Valu</b> 0.0004		i <b>on(α:5%)</b> r Detected		
ANOVA Table													
Source	Su	m Squares		Mean	Squar	е	DF	F Stat	P-Valu	e Decis	ion(α:5%)		
Between Error Total	0.1	)245421   52273   76815		0.0245 0.0190			1 8 9	1.29 —	0.2890	Non-S	Significant Effect		
ANOVA Assur	mntions [*]												
	iiptioiio	Tests											
Attribute	Te						Test Stat	Critical	P-Valu	e Decis	ion(α:1%)		
Attribute Variance Distribution	<b>Te</b> :				st		<b>Test Stat</b> 89600 0.628	Critical 23.2 0.741	<b>P-Valu</b> <1.0E-0.0001	05 Unequ	i <b>ion(α:1%)</b> ual Variances Normal Distributi	on	
Variance	<b>Te</b> Va Sh	st riance Ratio			st		89600	23.2	<1.0E-	05 Unequ	ual Variances	on	
Variance Distribution	<b>Te</b> Va Sh	st riance Ratio apiro-Wilk W	Norm			95% LCL	89600	23.2	<1.0E-	05 Unequ	ual Variances	on CV%	%Effect
Variance Distribution PCB 052 Sum	Va Sh	st riance Ratio apiro-Wilk W	Norm	ality Tes	9	<b>95% LCL</b> 0.0361	89600 0.628	23.2 0.741	<1.0E- 0.0001	05 Unequ Non-N Max	ual Variances Normal Distributi Std Err		%Effect 0.00%
Variance Distribution  PCB 052 Sum Sample	Te: Va Sh mary	st riance Ratio apiro-Wilk W	Norm	ality Tes	9 0		89600 0.628 <b>95% UCL</b>	23.2 0.741 Median	<1.0E- 0.0001 <b>Min</b>	05 Unequ Non-N Max 0.038	ual Variances Normal Distributi  Std Err  0.000292	CV%	
Variance Distribution  PCB 052 Sum Sample IOSN 2019	Te: Va Sh mary Co	riance Ratio apiro-Wilk W	Norm	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	<1.0E- 0.0001 <b>Min</b> 0.0365	05 Unequ Non-N Max 0.038	ual Variances Normal Distributi  Std Err  0.000292	<b>CV%</b> 1.77%	0.00%
Variance Distribution  PCB 052 Sum Sample IOSN 2019 AT3-098	Te: Va Sh mary Co RS	riance Ratio apiro-Wilk W	Norm	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	<1.0E- 0.0001 <b>Min</b> 0.0365	05 Unequ Non-N Max 0.038	ual Variances Normal Distributi  Std Err  0.000292	<b>CV%</b> 1.77%	0.00%
Variance Distribution  PCB 052 Sum Sample IOSN 2019 AT3-098  PCB 052 Deta	Te: Va Sh mary Co RS	riance Ratio apiro-Wilk W  de Cou 5 5 5	Norm	Mean 0.0369 0.136	9 9 	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	<1.0E- 0.0001 <b>Min</b> 0.0365	05 Unequ Non-N Max 0.038	ual Variances Normal Distributi  Std Err  0.000292	<b>CV%</b> 1.77%	0.00%

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		•								Т	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 <i>A</i>	5197-6838 Aug-23 6:57 May-23 22:5	2	Anal	point: lysis: i Hash:	Para	metric-Two	o Sample C5FC80005	5026805	1CE78A		S Versior is Level: or ID:	n: CETISv2. 1	1.1	
Batch ID: Start Date: Ending Date: Test Length:	08 N 05 A	•		Prot	ocol: cies:	US A	ccumlation ACE NED F is virens chaeta	- PCBs - N RIM (2004)	V		Analy Dilue Brine Sour	ent: No e: Cr	nncy Roka ot Applicable ystal Sea RO - Aquatic F	Research (	Or <b>Age:</b>
Sample Code		Sample II	)	Sam	ple Da	te	Receipt	Date	Sample	Age	Clien	t Name	Pr	oject	
IOSN 2019 AT3-098		13-4648-8 07-1559-4			lar-23 eb-23 1	13:00	08 Mar- 09 Feb-		12h 27d 23	h	Eco-/	Analysts, I	nc. Dr	edged Sec	liment Evalu
Sample Code		Material T	уре			Sam	ple Sourc	е		Station	Location	on	Lat/Long		
IOSN 2019		Reference	sedim	nent		Yach	ntsman Ma	rina NAE-20	04-00	IOSN Re	eferenc	е			
AT3-098		Marine Se	dimen	t		Yach	ntsman Ma	rina NAE-20	004-00	10 Statio	ns at 4	Marinas	Mu		
Data Transfor	m		Alt I	Нур					Comp	arison R	esult				PMSD
Untransformed	t		C < 7	Γ					AT3-0	98 failed	pcb 06	6 endpoin	t		2.56%
Equal Variand Sample I Reference Sec	vs	Sample II AT3-098*	Test	df 8	Test \$		Critical 1.86	MSD 0.000889	P-Typ		<b>/alue</b> 0E-05	<b>Decisio</b> Significa	n(α:5%) nt Effect		
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> 022	<b>Decisio</b> No Outli	n(α:5%) ers Detected		
ANOVA Table	,														
Source		Sum Squ			Mean		are	DF	F Stat		alue	Decisio	· ,		
Between Error		0.0003025 4.575E-06			0.000 5.719			1 8	529	<1.	0E-05	Significa	nt Effect		
Total		0.0003071			3.7 13	L-01		9	_						
ANOVA Assu	mpti	ons Tests													
Attribute		Test						Test Stat	Critic	al P-V	'alue	Decisio	n(a:1%)		
Variance		Variance I	Ratio F	Test				2.52	23.2	0.39		Equal Va	· ,		
Distribution		Shapiro-W	/ilk W	Norma	ality Te	st		0.905	0.741	0.2	468	•	Distribution		
PCB 066 Sum	mar	y													
Sample		Code	Cou	nt	Mean	ı	95% LCL	95% UCL	Media	ın Mir	ì	Max	Std Err	CV%	%Effect
IOSN 2019		RS	5		0.034	7	0.034	0.0354	0.034	5 0.0	34	0.0355	0.000255	1.64%	0.00%
AT3-098			5		0.045	7	0.0446	0.0468	0.045	3 0.04	45	0.0472	0.000405	1.98%	-31.70%
PCB 066 Deta	il														
Sample		Code	Rep	1	Rep 2	2	Rep 3	Rep 4	Rep 5						
IOSN 2019		RS	0.034	45	0.034		0.0345	0.035	0.035	5					
AT3-098			0.046	6	0.045		0.0453	0.0451	0.0472	2					
·															

Report Date: Test Code/ID: TN

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												ae/ID:			4-0924-3837
Bioaccumula	tion	Evaluation -	PCB	Cong	eners -	Ner	eis							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 /	3869-0510 Aug-23 6:57 May-23 22:52	2	Ana	point: lysis: i Hash:	Para	3 101 ametric-Two 3241FC036	•	5C7670	8DBA23	Statu	S Version is Level: or ID:	: CETISv2 1	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	08 I 05 <i>I</i>	•		Prot	ocol: cies:	US /	accumlation ACE NED Feis virens rchaeta		V		Analy Dilue Brine Sour	ent: Not	ncy Roka t Applicable rstal Sea O - 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			lar-23 eb-23 1	3:00	08 Mar- 09 Feb-		12h 27d 23l	า	Eco-A	Analysts, Ir	nc. Dr	edged Sec	liment Evalu
Sample Code	)	Material T	уре			Sam	ple Source	)		Station	Location	on	Lat/Long		
IOSN 2019		Reference	sedim	ent		Yacl	htsman Mar	ina NAE-20	04-00	IOSN Re	eferenc	e			
AT3-098		Marine Se	diment			Yacl	htsman Mar	ina NAE-20	04-00	10 Statio	ons at 4	Marinas N	⁄lu		
Data Transfor	rm		Alt F	lур					Comp	arison R	esult				PMSD
Untransformed	b		C < T	•					AT3-0	98 failed	pcb 10	1 endpoint			2.73%
Equal Variand Sample I Reference Sed	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	0.20	090	No Outlie	rs Detected		
ANOVA Table	,														
Source		Sum Squa	ares		Mean	Squ	are	DF	F Stat	P-V	'alue	Decision	(α:5%)		
Between		0.0008190	)		0.000	8190		1	478	<1.	0E-05	Significar	nt Effect		
Error		0.0000137	•		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 F						2.7	23.2		588	Equal Va			
Distribution		Shapiro-W	ilk W 1	Norma	ality Tes	st		0.906	0.741	0.2	574	Normal D	istribution		
PCB 101 Sum	ımar	y									-				
Sample		Code	Cour	nt	Mean		95% LCL	95% UCL	Media	n Min	1	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	ail														
Sample		Code	Rep	1	Rep 2	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	Analy	sis: P	CB 105 Parametric-Two C1EFD20B2A		CF7730003	EED4		S Version: s Level: or ID:	CETISv2.	1.1	
Batch ID: Start Date: Ending Date: Test Length:	•	:33 I	Test T Proto Speci Taxon	col: U es: N	lioaccumlation IS ACE NED F Iereis virens l'olychaeta		V		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	Sample Aç	ge	Clien	t Name	Pro	oject	
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-A	Analysts, Ind	c. Dre	edged Sed	liment Evalu
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 Transfor	m	Alt Hy	ур				Compari	son R	esult				PMSD
Untransformed	t	C < T					AT3-098	failed _l	pcb 10	5 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	386	(	0.00058	86	1	397	<1.0	DE-05	Significan	Effect		
Error	1.039E-			1.484E-	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 Var			
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-23-30	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	:84-6417 ıg-23 6:57 ay-23 22:52		Anal	point: ysis: Hash:	Para	metric-Two	o Sample 401A34EA9	00AE797	230695		S Version is Level: or ID:	: CETISv2	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	08 Ma 05 Ap				ocol: cies:	US A	ccumlation ACE NED F is virens chaeta	- PCBs - N RIM (2004)	V		Analy Dilue Brine Sour	ent: No e: Cry	ncy Roka t Applicable ⁄stal Sea O - Aquatic	Research (	Or <b>Age:</b>
Sample Code		Sample ID		Sam	ple Da	te	Receipt	Date	Sample	Age	Clien	t Name	Р	roject	
IOSN 2019 AT3-098		13-4648-81 07-1559-49			lar-23 eb-23 1	3:00	08 Mar- 09 Feb-		12h 27d 23	h	Eco-/	Analysts, Ir	nc. D	redged Sec	iment Evalu
Sample Code		Material Ty	/pe			Sam	ple Source	9		Station	Location	on	Lat/Long	1	
IOSN 2019		Reference	-	ent		Yach	itsman Mai	rina NAE-20	004-00	IOSN Re	eferenc	e			
AT3-098		Marine Sec	liment			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	Tost	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	treme	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			0.000 1.55E			1 8 9	477 _	<1.	0E-05	Significa	nt Effect		
ANOVA Assur	mntice	ao Tooto													
Attribute	iiiptioi	Test						Test Stat	Critica	al D_\	/alue	Decision	(a:1%)		
Variance		Variance R	atio F	Test				2.35	23.2		279	Equal Va	· ,		
Distribution		Shapiro-Wi			ality Tes	st		0.858	0.741		713	•	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

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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 -0.2361.16 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

									rest	Code/ID:					-0924-383
Bioaccumula	tion Evalua	tion - PCB	Cong	eners -	Nerei	s							EA:	-EST	, Inc. PBC
Analysis ID: Analyzed: Edit Date:	20-6837-76 19 Aug-23 08 May-23	6:57	Ana	lysis:		netric-Two	o Sample D509F4E07	717A8201D	St	TIS Vers atus Lev itor ID:		CETISv 1	2.1.1		
Batch ID: Start Date: Ending Date: Test Length:	•	11:33	Prot	ocol: cies:	US A	CE NED F s virens	- PCBs - N RIM (2004)	V	Di Br	alyst: uent: ine: urce:	Not A	ey Roka Applicable tal Sea - Aquatic		ch Oı	Age:
Sample Code	Sam	ple ID	Sam	ple Dat	e	Receipt	t Date	Sample Ag	je CI	ent Nam	ie	P	roject		
IOSN 2019 AT3-098		648-8170 559-4974		1ar-23 eb-23 1	3:00	08 Mar- 09 Feb-		12h 27d 23h	Ed	o-Analys	ts, Inc	. С	redged	Sedi	ment Evalı
Sample Code	Mate	rial Type			Samp	le Sourc	е	Sta	ation Loc	ation		Lat/Long	3		
IOSN 2019		rence sedin	nent		Yacht	sman Ma	rina NAE-20	004-00 IO	SN Refere	nce					
AT3-098	Marii	ne Sedimen	ıt		Yacht	sman Ma	rina NAE-20	004-00 10	Stations a	ıt 4 Marir	nas Mu	I			
Data Transfor	m	Alt	Нур					Compari	son Resu	t					PMSD
Untransformed	d t	C < .	Т					AT3-098	passed po	b 153 en	dpoint				57.00%
Equal Variand	ce t Two-Sa vs Samp	•	df	Test S	Stat C	Critical	MSD	P-Type	P-Value	e Deci	sion(c	x:5%)			
Sample I Reference Sec	•		8	0.403		1.86	0.435	CDF	0.3489	Non-	Signifi	cant Effe	ct		
	ts Tes	98	8	0.403			0.435 <b>Test Stat</b> 2.14		0.3489 <b>P-Value</b> 0.1193	e Deci	sion(c				
Auxiliary Test Attribute Outlier	d AT3-C	98	8	0.403			Test Stat	Critical	P-Value	e Deci	sion(c	x:5%)			
Reference Sec Auxiliary Test Attribute	d AT3-C	98 t bbs Extrem	8	0.403	1	1.86	Test Stat	Critical	P-Value	e Deci	sion(c	x:5%) Detected			
Auxiliary Test Attribute Outlier ANOVA Table	AT3-C	98	8	0.403	1 Squar	1.86	Test Stat	Critical 2.29	<b>P-Value</b> 0.1193	No C	sion(c	x:5%) Detected	I		
Auxiliary Test Attribute Outlier ANOVA Table Source	AT3-C	98 t obs Extrem Squares 21841	8	0.403		1.86	Test Stat 2.14	Critical 2.29	P-Value 0.1193 P-Value	No C	sion(c	x:5%) Detected x:5%)	I		
Auxiliary Test Attribute Outlier ANOVA Table Source Between	AT3-C ts Tes Grul Sum 0.022	98 bbs Extrem Squares 21841	8	0.403 ne Test Mean 0.022		1.86	Test Stat 2.14  DF 1	Critical 2.29	P-Value 0.1193 P-Value	No C	sion(c	x:5%) Detected x:5%)	I		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	Tes Grul  Sum 0.022 1.094	98  bbs Extrem  Squares 21841 455 673	8	0.403 ne Test Mean 0.022		1.86	<b>Test Stat</b> 2.14 <b>DF</b> 1 8	Critical 2.29	P-Value 0.1193 P-Value	No C	sion(c	x:5%) Detected x:5%)	I		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total	Tes Grul  Sum 0.022 1.094	98  bbs Extrem  Squares 21841 455 673	8	0.403 ne Test Mean 0.022		1.86	<b>Test Stat</b> 2.14 <b>DF</b> 1 8	Critical 2.29  F Stat 0.162	P-Value 0.1193 P-Value	Deci No C	sion(c	x:5%) 5 Detected x:5%) cant Effec	I		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur	Sum 0.02: 1.094 1.110 mptions Te	98  bbs Extrem  Squares 21841 455 673	8 e Valu	0.403  He Test  Mean  0.022  0.1368		1.86	<b>Test Stat</b> 2.14 <b>DF</b> 1 8 9	Critical 2.29  F Stat 0.162	P-Value 0.1193 P-Value 0.6977	Deci No C	Sion(c Outliers Sion(c Signifi	x:5%) cant Effect x:1%)	I		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute	AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-0   AT3-	98 bbs Extrem Squares 21841 455 673 sts	8 e Valu	0.403  Test  Mean  0.022  0.1368	<b>Squar</b> 1841 319	1.86	Test Stat 2.14  DF 1 8 9  Test Stat	Critical 2.29  F Stat 0.162  Critical	P-Value 0.1193  P-Value 0.6977	Deci Non-	sion(continue)	x:5%) cant Effect x:1%)	I		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	Sum 0.022 1.094 1.110 mptions Te Varia Shap	98 bbs Extrem Squares 21841 155 573 sts	8 e Valu	0.403  Test  Mean  0.022  0.1368	<b>Squar</b> 1841 319	1.86	Test Stat 2.14  DF 1 8 9  Test Stat 8.7	Critical 2.29  F Stat 0.162  Critical 23.2	P-Value 0.1193  P-Value 0.6977  P-Value 0.0594	Deci Non-	sion(continue)	x:5%) cant Effect x:1%) ances	I		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution	Sum 0.022 1.094 1.110 mptions Te Varia Shap	98  Squares 21841 455 373  sts  nce Ratio F iro-Wilk W	8 e Valu	0.403  Test  Mean  0.022  0.1368	<b>Squar</b> 1841 319	1.86	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 0.1193  P-Value 0.6977  P-Value 0.0594 0.3498  Min	Deci Non-	sion(controllers) sion(controllers) sion(controllers) sion(controllers)	x:5%) cant Effect x:1%) ances	cv%		%Effect
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 153 Sum Sample IOSN 2019	Sum 0.022 1.09 1.110 mptions Te Varia Shap	98  Squares 21841 455 373  sts  nce Ratio F iro-Wilk W	8 e Valu	0.403  Mean 0.022 0.1368	<b>Squar</b> 1841 319 st	1.86 re 95% LCL	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	P-Value 0.1193 P-Value 0.6977 P-Value 0.0594 0.3498	Peci No C  Deci Non-  Deci Equa Norm	sion(c Dutliers sion(c Signifi sion(c al Varianal Dis	x:5%) cant Effect x:1%) cances tribution  Std Err 0.0751	l ct		0.00%
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 153 Sum Sample	Sum 0.022 1.094 1.116 mptions Te Varias Shap	98  Squares 21841 455 373 sts  nce Ratio F iro-Wilk W	8 e Valu	0.403  Mean 0.022 0.1368  Mean	<b>Squar</b> 1841 319 st	1.86 re	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	Deci No C	Sion(controllers) Signification(controllers) Signification(controllers) Signification(controllers)	x:5%) cant Effect x:1%) cances tribution  Std Err	cv%	%	
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 153 Sum Sample IOSN 2019	Sum 0.022 1.094 1.110 mptions Te Varias Shap	98 bbs Extrem Squares 21841 155 373 sts nce Ratio F iro-Wilk W Cou 5	8 e Valu	0.403  Mean 0.0222 0.1368  ality Tes  Mean 0.763	<b>Squar</b> 1841 319 st	1.86 re 95% LCL	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	Deci Non-	Sion(controllers) Signification(controllers) Signification(controllers) Signification(controllers)	x:5%) cant Effect x:1%) cances tribution  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 0.022 1.094 1.110 mptions Te Varias Shap	98  cobs Extrem  Squares 21841 1555 673  sts  nce Ratio Firo-Wilk W  5 5 5	8 e Valu	0.403  Mean 0.0222 0.1368  ality Tes  Mean 0.763	<b>Squar</b> 1841 319 6t 6 0	1.86 re 95% LCL	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	Deci No C	Sion(controllers) Signification(controllers) Signification(controllers) Signification(controllers)	x:5%) cant Effect x:1%) cances tribution  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 0.02: 1.09 1.110 mptions Te Test Varia Shap mmary Code RS	98  cobs Extrem  Squares 21841 1555 673  sts  nce Ratio Firo-Wilk W  5 5 5	8 e Valu	0.403  Mean 0.022 0.1368  ality Tes  Mean 0.763 0.857	<b>Squar</b> 1841 319  st	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	Deci No C	Sion(controllers) Signification(controllers) Signification(controllers) Signification(controllers)	x:5%) cant Effect x:1%) cances tribution  Std Err 0.0751	CV% 22.01	%	0.00%

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Test Code/ID: TN-23-302NvPCB / 04-0924-3837

								To	est Co	de/ID:	111-23-302	INVPCD / 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	alysis:	PCB 170 Paramet 593B298	tric-Two	Sample 46DF34D8l	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:		NED R	- PCBs - N	V		Analy Dilue Brine Sour	<b>nt</b> : No : Cr	ancy Roka ot Applicable ystal Sea RO - Aquatic F	Research (	Or <b>Age:</b>
Sample Code	Sample	ID Sa	mple Da	te F	Receipt	Date	Sample A	\ge	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	Source	)	s	tation l	ocatio	n	Lat/Long		
IOSN 2019	Referenc	e sediment		Yachtsm	nan Mar	ina NAE-20	04-00 10	OSN Re	ference	9			
AT3-098	Marine S	ediment		Yachtsm	nan Mar	ina 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					AT3-098	3 failed _l	pcb 170	) endpoin	t		2.70%
	vs Sample II AT3-098*			<b>Stat Cri</b> 1.8		MSD 0.000836	<b>P-Type</b> CDF		alue E-05	<b>Decisio</b> Significa	n(α:5%) ant Effect		
Auxiliary Test Attribute Outlier	s Test Grubbs	Fytrom o Va				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	Sum Sqı			Square		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	<b>P-V</b> <1.(	alue DE-05	<b>Decisio</b> Significa	n(α:5%) ant Effect		
Source Between Error Total	Sum Squ	<b>uares</b> 55	Mean 0.000 5.059	2455 E-07		<b>DF</b> 1 8	<b>F Stat</b> 485	<b>P-V</b> <1.(	alue DE-05 alue	Decisio Significa  Decisio Equal Va	n(α:5%) ant 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 <1.0 P-V 0.62	alue DE-05 alue	Decisio Significa  Decisio Equal Va	n(α:5%)  ant 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	% LCL	DF 1 8 9  Test Stat 1.7 0.846	F Stat 485  Critical 23.2	P-V <1.0	alue DE-05 alue 206 515	Decisio Significa  Decisio Equal Va	n(α:5%)  Int Effect  n(α:1%)  ariances  Distribution	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 st mality Te	2455 E-07 st	% <b>LCL</b>	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 Significa  Decisio Equal Va	n(α:5%)  ant 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-V  mary Code	uares 55 66 96 Ratio F Tea Wilk W Nori	Mean 0.000 5.059  st mality Te	2455 E-07 st 95%		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 Vanormal	n(α:5%) ant Effect  n(α:1%) ariances Distribution  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-V mary Code RS	uares 55 66 96 Ratio F Ter Wilk W Norr	Mean 0.000 5.059  st mality Tes  Mean 0.031	2455 E-07 st 95%	302	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 P-V 0.622 0.05 Min 0.03	alue DE-05 alue 206 515	Decisio  Decisio  Equal Vanormal I	n(a:5%) ant Effect  n(a:1%) ariances 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-V mary Code RS	uares 55 66 96 Ratio F Ter Wilk W Norr	Mean 0.000 5.059  st mality Tes  Mean 0.031	2455 E-07 st 959 0.0 9 0.0	302 399	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 P-V 0.622 0.05 Min 0.03	alue DE-05 alue 206 515	Decisio  Decisio  Equal Vanormal I	n(a:5%) ant Effect  n(a:1%) ariances 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 Tes  Mean 0.031 0.040	2455 E-07 st 95% 0.0 9 0.0	302 399	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 P-V 0.622 0.05 Min 0.03	alue DE-05 alue 206 515	Decisio  Decisio  Equal Vanormal I	n(a:5%) ant Effect  n(a:1%) ariances Distribution  Std Err  0.000274	1.98%	0.00%

Report Date: 19 Aug-23 06:58 (p 14 of 18)
Test Code/ID: TN-23-302NvPCB / 04-0924-3837

							Test Co	ae/ID:	114-23-302	INVECD/0	4-0924-3837
Bioaccumulation	on Evaluation -	PCB Conc	geners -	Nereis						EA-ES	T, Inc. PBC
Analyzed:	05-3230-0024 19 Aug-23 6:57 08 May-23 22:52	Ana	lysis:	PCB 180 Parametric-Two A9C9E9D4AAI		3610834025	Statu	S Version: is Level: or ID:	CETISv2.	.1.1	
	•	B Pro	tocol:	Bioaccumlatior US ACE NED F Nereis virens Polychaeta		v	Analy Dilue Brine Sour	ent: Not e: Cry	ncy Roka Applicable stal Sea O - Aquatic F	Research C	Or <b>Age:</b>
Sample Code	Sample ID	San	nple Date	e Receip	t Date	Sample Ag	e Clien	t Name	Pro	oject	
IOSN 2019 AT3-098	13-4648-8 ⁻ 07-1559-49		//ar-23 ⁻ eb-23 13	08 Mar- 3:00 09 Feb-		12h 27d 23h	Eco-A	Analysts, Ir	ic. Dre	edged Sec	liment Evalu
Sample Code	Material T	ype	ļ	Sample Sourc	e	Sta	tion Location	on	Lat/Long		
IOSN 2019	Reference		,	Yachtsman Ma	rina NAE-20	004-00 108	SN Referenc	e			
AT3-098	Marine Sec	diment	,	Yachtsman Ma	rina NAE-20	004-00 10	Stations at 4	Marinas N	<b>1</b> u		
Data Transform	n	Alt Hyp				Comparis	on Result				PMSD
Untransformed		C < T				AT3-098 f	ailed pcb 18	0 endpoint			2.45%
Equal Variance Sample I vs Reference Sed	s Sample II AT3-098*	Test df	<b>Test S</b>	tat Critical	MSD 0.000778	P-Type CDF	<b>P-Value</b> <1.0E-05	<b>Decision</b> Significar	<u> </u>		
Auxiliary Tests Attribute Outlier	Test	xtreme Valu	ue Test		Test Stat	Critical 2.29	<b>P-Value</b> 0.1372	<b>Decision</b> No Outlie	(α:5%) rs Detected		
ANOVA Table											
Source											
Between	Sum Squa	ires	Mean	Square	DF	F Stat	P-Value	Decision	(α:5%)		
Error Total	Sum Squa 0.0002540 3.503E-06 0.0002575	)	Mean \$ 0.0002 4.379E	540	<b>DF</b> 1 8	<b>F Stat</b> 580	<b>P-Value</b> <1.0E-05	<b>Decision</b> Significan	• •		
Error	0.0002540 3.503E-06 0.0002575	)	0.0002	540	1 8				• •		
Error Total	0.0002540 3.503E-06 0.0002575	)	0.0002	540	1 8	580		Significar	nt Effect		
Error Total ANOVA Assum	0.0002540 3.503E-06 0.0002575 ptions Tests Test	)	0.0002 4.379E	540	1 8 9	580	<1.0E-05		t Effect (α:1%)		
Error Total ANOVA Assum Attribute	0.0002540 3.503E-06 0.0002575  ptions Tests Test Variance R	5	0.0002 4.379E	540 -07	1 8 9 Test Stat	580 — Critical	<1.0E-05	Significar  Decision  Equal Va	t Effect (α:1%)		
Error Total  ANOVA Assum Attribute  Variance	0.0002540 3.503E-06 0.0002575 ptions Tests Test Variance F Shapiro-W	Ratio F Test	0.0002 4.379E	540 -07	1 8 9 <b>Test Stat</b> 3.38	580  Critical 23.2	<1.0E-05  P-Value 0.2653	Significar  Decision  Equal Va	t Effect (α:1%) riances		
Error Total  ANOVA Assum Attribute  Variance Distribution	0.0002540 3.503E-06 0.0002575 ptions Tests Test Variance F Shapiro-W	Ratio F Test	0.0002 4.379E	540 -07	1 8 9 <b>Test Stat</b> 3.38 0.877	580  Critical 23.2 0.741	<1.0E-05  P-Value 0.2653	Significar  Decision  Equal Va	t Effect (α:1%) riances	CV%	%Effect
Error Total  ANOVA Assum Attribute  Variance Distribution  PCB 180 Summ	0.0002540 3.503E-06 0.0002575  Aptions Tests Test Variance R Shapiro-W	Ratio F Test	0.0002 4.379E	540 -07 t t 95% LCL	1 8 9 <b>Test Stat</b> 3.38 0.877	580  Critical 23.2 0.741	<b>P-Value</b> 0.2653 0.1206	Decision Equal Va Normal D	(α:1%) riances istribution	<b>CV%</b> 1.41%	%Effect 0.00%
ANOVA Assum Attribute Variance Distribution  PCB 180 Summ Sample	0.0002540 3.503E-06 0.0002575  Iptions Tests  Test  Variance F Shapiro-W  nary  Code	Ratio F Test 'ilk W Norm	0.0002 4.379E	540 E-07 t <b>95% LCL</b> 0.0312	1 8 9 <b>Test Stat</b> 3.38 0.877	580  Critical 23.2 0.741  Median	<1.0E-05  P-Value 0.2653 0.1206  Min	Decision Equal Va Normal D	(α:1%) riances istribution  Std Err		
ANOVA Assum Attribute Variance Distribution  PCB 180 Summ Sample IOSN 2019	0.0002540 3.503E-06 0.0002575 ptions Tests Test Variance R Shapiro-W nary Code RS	Ratio F Test (ilk W Norm Count	0.0002 4.379E ality Test Mean 0.0318	540 E-07 t <b>95% LCL</b> 0.0312	1 8 9 <b>Test Stat</b> 3.38 0.877 <b>95% UCL</b> 0.0324	580  Critical 23.2 0.741  Median 0.0315	P-Value 0.2653 0.1206  Min 0.0315	Decision Equal Va Normal D  Max 0.0325	(α:1%) riances istribution  Std Err 0.0002	1.41%	0.00%
ANOVA Assum Attribute Variance Distribution  PCB 180 Sumn Sample IOSN 2019 AT3-098	0.0002540 3.503E-06 0.0002575 ptions Tests Test Variance R Shapiro-W nary Code RS	Ratio F Test (ilk W Norm Count	0.0002 4.379E ality Test Mean 0.0318	540 E-07 t <b>95% LCL</b> 0.0312	1 8 9 <b>Test Stat</b> 3.38 0.877 <b>95% UCL</b> 0.0324	580  Critical 23.2 0.741  Median 0.0315	P-Value 0.2653 0.1206  Min 0.0315	Decision Equal Va Normal D  Max 0.0325	(α:1%) riances istribution  Std Err 0.0002	1.41%	0.00%
ANOVA Assum Attribute Variance Distribution PCB 180 Summ Sample IOSN 2019 AT3-098 PCB 180 Detail	0.0002540 3.503E-06 0.0002575  Iptions Tests	Ratio F Test filk W Norm Count 5	0.0002 4.379E ality Tesi Mean 0.0318 0.0419	540 -07 t 95% LCL 0.0312 0.0409 Rep 3	1 8 9 <b>Test Stat</b> 3.38 0.877 <b>95% UCL</b> 0.0324 0.0429	Critical 23.2 0.741  Median 0.0315 0.0415	P-Value 0.2653 0.1206  Min 0.0315	Decision Equal Va Normal D  Max 0.0325	(α:1%) riances istribution  Std Err 0.0002	1.41%	0.00%

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Test Code/ID: TN-23-302NvPCB / 04-0924-3837

										Т	est Co	de/ID:	I IN-23-3	UZINV	/PCB / 0	4-0924-383
Bioaccumulati	ion E	valuation -	РСВ С	onge	eners -	- Nere	eis								EA-ES	T, Inc. PBC
Analyzed:	19 A	569-7612 .ug-23 6:57 1ay-23 22:52		Analy	ysis:	Para	metric-Two	Sample 7562EB7E0	C3DE2C	74B3B7		S Versio s Level: r ID:		v2.1.	1	
	08 M 05 A	•	; ;	Test Proto Spec Taxo	ocol: ies:	US A	ccumlation ACE NED Feis virens chaeta	- PCBs - N RIM (2004)	V		Analy Dilue Brine Sour	nt: N	ancy Roka ot Applicabl rystal Sea RO - Aquati		search C	Or <b>Age:</b>
Sample Code		Sample ID	) ;	Samı	ple Dat	te	Receipt	Date	Sample	Age	Clien	t Name		Proje	ect	
IOSN 2019 AT3-098		13-4648-8 ⁻ 07-1559-49		08 Mi 08 Fe	ar-23 eb-23 1	13:00	08 Mar- 09 Feb-		12h 27d 23h		Eco-A	Analysts,	Inc.	Dred	ged Sed	iment Eval
Sample Code		Material T	уре			Sam	ple Source	•	;	Station I	Locatio	on	Lat/Lon	ng		
IOSN 2019		Reference		ent		Yach	ntsman Mai	ina NAE-20	004-00	OSN Re	ferenc	<u></u> е				
AT3-098		Marine Sec	diment			Yach	ntsman Mai	ina NAE-20	004-00	10 Statio	ns at 4	Marinas	Mu			
Data Transfori	m		Alt Hy	ур					Compa	rison R	esult					PMSD
Untransformed	I		C < T						AT3-09	8 failed	pcb 18	7 endpoi	nt			2.64%
Equal Varianc Sample I Reference Sed	vs	wo-Sample Sample II AT3-098*	Test		Test 9	Stat	Critical	<b>MSD</b> 0.00121	P-Type CDF		alue DE-05		on(α:5%) ant Effect			
Auxiliary Tests Attribute Outlier	s 	Test Grubbs Ex	xtreme '	Value	e Test			Test Stat	Critica 2.29	0.26	<b>alue</b> 691		on(α:5%) liers Detecte	ed		
Attribute			xtreme '	Value	e Test									ed		
Attribute Outlier				Value	e Test Mean	Squa	are			0.26		No Outl		ed		
Attribute Outlier ANOVA Table		Sum Squa 0.0005256 8.4E-06	ares	Value		5256	are	1.97 <b>DF</b> 1	2.29	0.26 P-V	691	No Outl	iers Detecte	ed		
Attribute Outlier ANOVA Table Source Between Error Total		Sum Squa 0.0005256 8.4E-06 0.0005340	ares	Value	<b>Mean</b> 0.000	5256	are	1.97 <b>DF</b>	2.29 <b>F Stat</b>	0.26 P-V	691 alue	No Outl	iers Detecte	ed		
Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assum		Sum Squa 0.0005256 8.4E-06 0.0005340 ons Tests	ares	Value	<b>Mean</b> 0.000	5256	are	1.97 <b>DF</b> 1 8 9	2.29 <b>F Stat</b> 501	0.26 P-V <1.0	691 alue	Decision Signification	on(α:5%) ant Effect	ed		
Attribute Outlier ANOVA Table Source Between Error Total		Sum Squa 0.0005256 8.4E-06 0.0005340	ares		<b>Mean</b> 0.000	5256	are	1.97 <b>DF</b> 1	2.29 <b>F Stat</b> 501	0.26 P-V <1.0	alue DE-05	Decision Decision	iers Detecte	ed		
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur		Sum Squa 0.0005256 8.4E-06 0.0005340 ons Tests Test	ares	Test	<b>Mean</b> 0.0009 1.05E	5256 -06	are	1.97  DF  1 8 9	F Stat 501 Critica	0.26 P-V <1.0	G91 Galue DE-05 Galue 371	Decision  Decision  Decision  Decision  Equal V	on(α:5%) ant Effect on(α:1%)			
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	nptic	Sum Squa 0.0005256 8.4E-06 0.0005340 ons Tests Test Variance F Shapiro-W	ares	Test	<b>Mean</b> 0.0009 1.05E	5256 -06	are	1.97  DF  1 8 9  Test Stat 2.11	2.29  F Stat 501  Critica 23.2	0.26 P-V <1.0	G91 Galue DE-05 Galue 371	Decision  Decision  Decision  Decision  Equal V	on(α:5%) ant Effect on(α:1%) //ariances			
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution	nptic	Sum Squa 0.0005256 8.4E-06 0.0005340 ons Tests Test Variance F Shapiro-W	ares	Test	<b>Mean</b> 0.0009 1.05E	5256 -06	are	1.97  DF  1 8 9  Test Stat 2.11 0.852	2.29  F Stat 501  Critica 23.2 0.741	0.26 P-V <1.0 I P-V 0.48 0.06	alue DE-05 alue 371	Decision  Decision  Decision  Decision  Equal V	on(α:5%) ant Effect on(α:1%) //ariances		CV%	%Effect
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assurt Attribute Variance Distribution  PCB 187 Sumi	nptic	Sum Squa 0.0005256 8.4E-06 0.0005340 ons Tests Test Variance F Shapiro-W	Ratio F	Test	Mean 0.0009 1.05E	5256 -06		1.97  DF  1 8 9  Test Stat 2.11 0.852	2.29  F Stat 501  Critica 23.2 0.741	0.26 P-V <1.0 I P-V 0.48 0.06	falue DE-05 Falue 371 610	Decision  Decision  Decision  Equal V  Normal	on(α:5%) ant Effect on(α:1%) /ariances Distribution	. (	CV% 1.80%	%Effect 0.00%
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assurt Attribute Variance Distribution  PCB 187 Summanue Sample	nptic	Sum Squa 0.0005256 8.4E-06 0.0005340 ons Tests Test Variance F Shapiro-W Code	Ratio F	Test	Mean 0.000: 1.05E	5256 -06 st	95% LCL	1.97  DF  1 8 9  Test Stat 2.11 0.852	2.29  F Stat 501  Critica 23.2 0.741	0.26  P-V  <1.0  1 P-V  0.48  0.06	(alue DE-05 (alue 371 610	Decision  Decision  Equal V  Normal	on(α:5%) ant Effect on(α:1%) /ariances Distribution Std Err	(1)		
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assure Attribute Variance Distribution  PCB 187 Summanular Sample IOSN 2019	mptio	Sum Squa 0.0005256 8.4E-06 0.0005340 ons Tests Test Variance F Shapiro-W Code	Ratio F Tilk W N	Test	Mean 0.0456	5256 -06 st	<b>95% LCL</b> 0.0446	1.97  DF  1 8 9  Test Stat 2.11 0.852  95% UCL 0.0466	2.29  F Stat 501  Critica 23.2 0.741  Median 0.0455	0.26  P-V  <1.0  1 P-V  0.48  0.06  1 Min  0.04	(alue DE-05 (alue 371 610	Decision Signification Signification Signification Decision Equal V Normal Max 0.047	on(α:5%) ant Effect  on(α:1%) /ariances Distribution  Std Err 0.00036	(1)	1.80%	0.00%
Attribute Outlier ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  PCB 187 Sumi Sample IOSN 2019 AT3-098	mptio	Sum Squa 0.0005256 8.4E-06 0.0005340 ons Tests Test Variance F Shapiro-W Code	Ratio F Tilk W N	Test lorma	Mean 0.0456	5256 -06 st	<b>95% LCL</b> 0.0446	1.97  DF  1 8 9  Test Stat 2.11 0.852  95% UCL 0.0466	2.29  F Stat 501  Critica 23.2 0.741  Median 0.0455	0.26  P-V  <1.0  1 P-V  0.48  0.06  1 Min  0.04	(alue DE-05 (alue 371 610	Decision Signification Signification Signification Decision Equal V Normal Max 0.047	on(α:5%) ant Effect  on(α:1%) /ariances Distribution  Std Err 0.00036	(1)	1.80%	0.00%
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 187 Sumi Sample IOSN 2019 AT3-098  PCB 187 Detail	mptio	Sum Squa 0.0005256 8.4E-06 0.0005340 ons Tests Test Variance F Shapiro-W Code RS	Ratio F 7	Test lorma	Mean 0.0003 1.05E  Mean 0.0456 0.060	5256 06 	<b>95% LCL</b> 0.0446 0.0586	1.97  DF  1 8 9  Test Stat 2.11 0.852  95% UCL 0.0466 0.0616	2.29  F Stat 501  Critica 23.2 0.741  Median 0.0455 0.0595	0.26  P-V  <1.0  1 P-V  0.48  0.06  1 Min  0.04	(alue DE-05 (alue 371 610	Decision Signification Signification Signification Decision Equal V Normal Max 0.047	on(α:5%) ant Effect  on(α:1%) /ariances Distribution  Std Err 0.00036	(1)	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	uation - PCB	Cong	eners - N	lereis						EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	02-2598- 19 Aug-2 08 May-2	23 6:57	Anal	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 3 10:33	Prot	ocol: L	lioaccumlatior IS ACE NED I Iereis virens olychaeta		v	Analy Dilue Brine Sour	ent: No e: Cry	ncy Roka It Applicable ystal Sea RO - Aquatic F	Research (	Or <b>Age:</b>
Sample Code	Sa	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		lar-23 eb-23 13:	08 Mar- 00 09 Feb-	-23	12h 27d 23h		Analysts, Ir	nc. Dr	edged Sed	liment Evalu
Sample Code	Ма	terial Type		S	ample Sourc	е	Sta	tion Location	on	Lat/Long		
IOSN 2019	Re	ference sedir	ment	Y	'achtsman Ma	rina NAE-20	04-00 IOS	N Referenc	e			
AT3-098	Ма	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 <	T				AT3-098 fa	ailed pcb 19	5 endpoint	t		2.65%
Equal Variand	ce t Two-		:									
							P-Type	P-Value	Decision	2/a·50/.\		
•		nple II	df		at Critical	MSD				• •		
Sample I Reference Sec		nple II 3-098*	<b>dt</b> 8	Test Sta	1.86	<b>MSD</b> 0.00158	CDF	<1.0E-05	Significa	• •		
•	d AT3	-				_		<1.0E-05		• •		
Reference Sec	d AT3	-				_	CDF	<1.0E-05 <b>P-Value</b>		nt Effect		
Reference Sec	d AT3	3-098*	8	22.4		0.00158	CDF		Significal Decision	nt Effect		
Reference Sec Auxiliary Test Attribute	d AT3	9-098* 9-st	8	22.4		0.00158  Test Stat	CDF  Critical	P-Value	Significal Decision	nt Effect		
Auxiliary Test Attribute Outlier	d AT3	9-098* 9-st	8	22.4	1.86	0.00158  Test Stat	CDF  Critical	P-Value	Significal Decision	nt Effect n(α:5%) ers Detected		
Auxiliary Test Attribute Outlier ANOVA Table	Su	est rubbs Extrem	8	22.4 ne Test	1.86 quare	0.00158  Test Stat 1.9	CDF  Critical 2.29	<b>P-Value</b> 0.3527	Decision No Outlie	nt Effect n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source	AT3	est rubbs Extrem	8	22.4 Te Test Mean S	1.86 <b>quare</b> 25	0.00158  Test Stat 1.9  DF	CDF  Critical 2.29  F Stat	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	Su 0.0	m Squares	8	22.4  e Test  Mean S 0.00090	1.86 <b>quare</b> 25	0.00158  Test Stat 1.9  DF 1	CDF  Critical 2.29  F Stat	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	Su 0.0 0.0	m Squares 1009025 1000144 1009169	8	22.4  e Test  Mean S 0.00090	1.86 <b>quare</b> 25	0.00158  Test Stat 1.9  DF 1 8	CDF  Critical 2.29  F Stat	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	Su 0.0 0.0	m Squares 1009025 10090169	8	22.4  e Test  Mean S 0.00090	1.86 <b>quare</b> 25	0.00158  Test Stat 1.9  DF 1 8	CDF  Critical 2.29  F Stat 501	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	Su One One One One One One One One One One	m Squares 1009025 10090169	8 ne Valu	22.4  e Test  Mean S 0.00090	1.86 <b>quare</b> 25	0.00158  Test Stat 1.9  DF 1 8 9	CDF  Critical 2.29  F Stat 501	P-Value 0.3527 P-Value <1.0E-05	Decisior No Outlie  Decisior Significan	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	Su 0.0 0.0 0.0 mptions Te	m Squares 1009025 10090169 Fests	8 are Valu	22.4  e Test  Mean S 0.00090 0.00000	1.86 <b>quare</b> 25	0.00158  Test Stat 1.9  DF 1 8 9	CDF  Critical 2.29  F Stat 501  Critical	P-Value  9.3527  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	Su 0.0 0.0 0.0 mptions	m Squares 1009025 1000144 1009169 1005 1005 1005 1005 1005 1005 1005 100	8 are Valu	22.4  e Test  Mean S 0.00090 0.00000	1.86 <b>quare</b> 25	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	Decisior No Outlie  Decisior Significan  Decisior Equal Va	nt Effect  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	Su 0.0 0.0 0.0 mptions	m Squares 1009025 1000144 1009169 Tests st riance Ratio I	8 ne Valu	22.4  e Test  Mean S 0.00090 0.00000	1.86 <b>quare</b> 25	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	P-Value	Decisior No Outlie  Decisior Significan  Decisior Equal Va	nt Effect  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 PCB 195 Sum	Su O.0 O.0 O.0 Tee Va Sh.	m Squares 1009025 1000144 1009169 Fests st riance Ratio lapiro-Wilk W	8 ne Valu	Mean S 0.00090 0.00000	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	P-Value 0.3527  P-Value <1.0E-05  P-Value 0.6920 0.0264	Decision  No Outlie  Decision  Significan  Decision  Equal Va  Normal D	nt Effect  n(α:5%) ers Detected  n(α:5%) nt Effect  n(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 195 Sum Sample	Su 0.0 0.0 0.0 mptions Text Va Sh	m Squares 1009025 1000144 1009169 Fests st riance Ratio lapiro-Wilk W	8 ne Valu	Mean S 0.00090 0.00000	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	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	Su O.0 O.0 O.0 O.0 Sh. Imary Co	m Squares 1009025 1000144 1009169 Tests st riance Ratio I apiro-Wilk W	8 ne Valu	22.4  Mean S 0.00090 0.00000  ality Test  Mean 0.0596	1.86  quare 25 118  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	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	Su O.0 O.0 O.0 O.0 Sh. Imary Co	m Squares 1009025 1000144 1009169 Tests st riance Ratio I apiro-Wilk W de Cou	F Test Norma	22.4  Mean S 0.00090 0.00000  ality Test  Mean 0.0596	1.86  quare 25 118  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	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	Su O.0 O.0 O.0 mptions Tes Va Sh. mary Co RS	m Squares 009025 0000144 0009169 Fests st riance Ratio   apiro-Wilk W	F Test Norma	22.4  Mean S 0.00090 0.00000  ality 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	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 Evaluation	on - PCB C	onger	ners - Ne	ereis						EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	15-1840-551 19 Aug-23 6: 08 May-23 2:	57	Analys		CB 209 trametric-Two 76423FBBBI	•	9235BEA0F	Statu	S Version is Level: or ID:	n: CETISv2. 1	1.1	
Batch ID: Start Date: Ending Date: Test Length:	•	:33 I	Test T Protoc Specie Taxon	col: US es: Ne	paccumlation S ACE NED F Preis virens Ilychaeta		v	Anal <u>y</u> Dilue Brine Sour	ent: No e: Cr	ancy Roka ot Applicable ystal Sea RO - Aquatic F	Research (	Or <b>Age:</b>
Sample Code	Sampl	e ID :	Sampl	le Date	Receipt	t Date	Sample Ag	e Clien	t Name	Pre	oject	
IOSN 2019 AT3-098			08 Mar 08 Feb	r-23 o-23 13:0	08 Mar- 0 09 Feb-		12h 27d 23h	Eco-/	Analysts, I	nc. Dre	edged Sed	liment Evalu
Sample Code	Materi	al Type		Sa	mple Sourc	е	Sta	tion Location	on	Lat/Long		
IOSN 2019	Refere	nce sedime	ent	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	ур					on Result				PMSD
Untransformed	t	C < T					AT3-098 f	ailed pcb 20	9 endpoin	t		2.75%
Equal Variand			df 1	Test Stat	Critical	MSD	P-Type	P-Value	Decisio	n(α:5%)		
Sample I	vs Sample	II	uı ı	. cot otat	o i i i i i i							
Sample I Reference Sec	-			21.6	1.86	0.00192	CDF	<1.0E-05	Significa	nt Effect		
Reference Sec Auxiliary Test Attribute	d AT3-098	3*	8 2	21.6		Test Stat	Critical	P-Value	Decision	n(α:5%)		
Reference Sec Auxiliary Test Attribute Outlier	ts Test Grubb		8 2	21.6					Decision			
Auxiliary Test Attribute Outlier ANOVA Table	ts Test Grubb	s Extreme \	8 2	21.6 Test	1.86	Test Stat	Critical 2.29	<b>P-Value</b> 0.2877	Decision No Outlie	n(α:5%) ers Detected		
Auxiliary Test Attribute Outlier ANOVA Table Source	d AT3-096 ts Test Grubb	s Extreme \	8 2	21.6 Test <b>Mean S</b> q	1.86 uare	Test Stat 1.95	Critical 2.29	P-Value 0.2877 P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between	Test Grubb Sum S 0.0012	s Extreme \quares	Value	Test  Mean Sq 0.001243	1.86 uare 2	Test Stat 1.95  DF 1	Critical 2.29	<b>P-Value</b> 0.2877	Decision No Outlie	n(α:5%) ers Detected		
Auxiliary Test Attribute Outlier ANOVA Table Source	d AT3-096 ts Test Grubb	s Extreme \( \text{quares} \)  quares 432 213	Value	21.6 Test <b>Mean S</b> q	1.86 uare 2	Test Stat 1.95	Critical 2.29	P-Value 0.2877 P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	Test Grubb Sum S 0.0012 0.0000 0.0012	s Extreme \( \) quares 432 213 645	Value	Test  Mean Sq 0.001243	1.86 uare 2	Test Stat 1.95  DF 1 8	Critical 2.29	P-Value 0.2877 P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total	Test Grubb Sum S 0.0012 0.0000 0.0012	s Extreme \( \) quares 432 213 645	Value	Test  Mean Sq 0.001243	1.86 uare 2	Test Stat 1.95  DF 1 8	Critical 2.29  F Stat 467	P-Value 0.2877 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	Sum S 0.0012 0.0000 0.0012 Test	s Extreme \( \) quares 432 213 645	Value	Test  Mean Sq 0.001243	1.86 uare 2	Test Stat 1.95  DF 1 8 9	Critical 2.29  F Stat 467	P-Value 0.2877 P-Value <1.0E-05	Decision No Outlin  Decision Significa	n(α:5%) ers Detected n(α:5%) int Effect n(α:1%)		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute	AT3-098	s Extreme ' quares 432 213 645	Value	Test  Mean Sq 0.001243 2.663E-0	1.86 uare 2	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 Significa  Decision Equal Va	n(α:5%) ers Detected n(α:5%) int Effect n(α:1%)		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	Sum S 0.0012 0.0000 0.0012 mptions Test Variance Shapire	s Extreme ' quares 432 213 645 s	Value	Test  Mean Sq 0.001243 2.663E-0	1.86 uare 2	Test Stat 1.95  DF 1 8 9  Test Stat 1.73	Critical 2.29  F Stat 467  Critical 23.2	P-Value	Decision Significa  Decision Equal Va	n(α:5%) ers Detected n(α:5%) int Effect n(α:1%) ariances		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution	Sum S 0.0012 0.0000 0.0012 mptions Test Variance Shapire	s Extreme ' quares 432 213 645 s	Value  Value  Test Iormalit	Test  Mean Sq 0.001243 2.663E-0	1.86 uare 2	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	Decision Significa  Decision Equal Va	n(α:5%) ers Detected n(α:5%) int Effect n(α:1%) ariances	CV%	%Effect
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 209 Sum	Sum S 0.0012 0.0000 0.0012 mptions Test Variance Shapire	s Extreme ' quares 432 213 645 s ce Ratio F 7	Value  Value  Test lormalit	Test  Wean Sq 0.001243 2.663E-0	1.86 uare 2 6	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	Decision Significa  Decision Equal Va Normal I	n(α:5%) ers Detected  n(α:5%) ent Effect  n(α:1%) eriances 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	Sum S 0.0012 0.0000 0.0012 mptions Test Variance Shapire	s Extreme ' quares 432 213 645 s ee Ratio F 7 b-Wilk W N	Value  Value  Test Iormalit  t  N	Test  Mean Sq 0.001243 2.663E-0	1.86  uare 2 6	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	Decision Significa  Decision Equal Va Normal [	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) eriances Distribution	2.00%	
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 209 Sum Sample IOSN 2019	Sum S 0.0012 0.0000 0.0012 mptions Test Variance Shapire mary Code RS	s Extreme \( \text{quares} \) 432 213 645 s ee Ratio F \( \text{D} \) -Wilk W N  Count	Value  Value  Test Iormalit  t  N	Z1.6  Test  Mean Sq D.001243 Z.663E-0  ty Test  Mean D.0697	1.86  uare 2 6  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	Decision Significa  Decision Equal Va Normal I  Max 0.072	n(α:5%) ers Detected  n(α:5%) int Effect  n(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	Sum S 0.0012 0.0000 0.0012 mptions Test Variance Shapire mary Code RS	s Extreme \( \text{quares} \) 432 213 645 s ee Ratio F \( \text{D} \) -Wilk W N  Count	Value  Value  Test lormalit  C	Z1.6  Test  Mean Sq D.001243 Z.663E-0  ty Test  Mean D.0697	1.86  uare 2 6  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	Decision Significa  Decision Equal Va Normal I  Max 0.072	n(α:5%) ers Detected  n(α:5%) int Effect  n(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	Sum S 0.0012 0.0000 0.0012 mptions Test Variance Shapire mmary Code RS	quares 432 213 645 s ee Ratio F To-Wilk W No	Value  Value  Test lormalit  t  C	21.6  Test  Mean Sq 0.001243 2.663E-0  ty Test  Mean 0.0697 0.092	1.86  uare 2 6  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	Decision Significa  Decision Equal Va Normal I  Max 0.072	n(α:5%) ers Detected  n(α:5%) int Effect  n(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 <b>U</b>		
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 <mark>U</mark>	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 <b>U</b>	0.0251 <mark>U</mark>		
Heptachlor epoxide	0.0515 <mark>U</mark>	0.0530 U	0.0515 <mark>U</mark>		
Hexachlorobenzene	0.215 <mark>U</mark>	0.221 <mark>U</mark>	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 <b>U</b>		

^{* =} 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)

	IOSN 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 U	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>									

^{* =} 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 <mark>U</mark>	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 <mark>U</mark>	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 <mark>U</mark>	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 <mark>U</mark>
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 <mark>U</mark>
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 <mark>U</mark>	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 U	0.0358 <mark>U</mark>	0.0357 <mark>U</mark>	0.0373 U
Methoxychlor	0.0570 U	0.0560 U	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 <mark>U</mark>

^{* =} 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:	: Yachtsman Marina NAE-2004-00		
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  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 epoxide 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  Oxychlordane Equal Variance t Two-Sample Test  Equal Variance t Two-Sample Test  Equal Variance t Two-Sample Test  Equal Variance t Two-Sample Test  Diedrin 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%

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	· , · · · ·						Test Code/ID:	TN-23-302NvPest / 04-3042-6729
Bioaccumulation	Evaluation	ո - Pesticide։	s - Nereis					EA-EST, Inc. PBC
4-4'-DDD Detail							MD5: 3AC	C2F24637BB4B91C14DF8039C1C2CD6
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: 84E	3C18EA1D182D890C2937CB78D64AB
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: B6A	
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	NO	0.0255	0.0255	0.0255	0.024	0.0243		
A10-000		0.0100	0.0100	0.0100	0.0100	0.0102		
aldrin Detail							MD5: 467	9F2E9C684641004BB74E92D0F039E
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	Detail						MD5: CC2	2ADF7117E500C15BD9DA5DD158D663
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 De	tail						MD5: F48	BAD9D55CDAFA5A98435658706EC3E
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: 100	664800AE1E04003B6578BDFD32221
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 Deta	nil						MD5: 6F8	7B91E6641DEEFABEB5CD93E1AC3A4
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	110	0.0221	0.033	0.033	0.0333	0.0227		
	-11	0.0221	0.0210	0.0210	0.0211	0.0227	MDE. 222	00054070000504400220447450200
endosulfan II Det							MD5: 323	9C6E4B7D89C5811C9339447AF03BD
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: A0E	D2C6B4F9ECDCA13F956098900D5B9E
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 (Lin	dane) Deta	ail					MD5: 614	F84BF6F415E980BF132BF85F8F69F
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		

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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 Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Va	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	Pre	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	i(α:5%) nificant Effect		
			40			LXact	1.0000	14011-31gi	IIIICANI LITECT		
Auxiliary Tes [.] 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	uaros	Mean Sq	uaro	DF	F Stat	P-Value	Decision	v(a: 50/.)		
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

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		<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					

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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%

Report Date: Test Code/ID: 19 Aug-23 07:00 (p 6 of 19) TN-23-302NvPest / 04-3042-6729

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

Report Date: Test Code/ID: 19 Aug-23 07:00 (p 7 of 19) TN-23-302NvPest / 04-3042-6729

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 Sout	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	ΓIS 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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	<b>,</b>									Т	est Co	de/ID:	TN-23-302N	NvPest / 0	4-3042-6729
Bioaccumula	tion l	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:	Para	sulfan II metric-Two FC0525BI	o Sample 064452BBA	.F68001	6AD88A		S Version: is Level: or ID:	CETISv2.	1.1	
Batch ID: Start Date: Ending Date: Test Length:	08 N 05 A	•			ocol: cies:	US A Nere		n - Pesticid 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 ´	13:00	08 Mar- 09 Feb-		12h 27d 23l	า	Eco-/	Analysts, Ind	c. Dre	dged Sed	iment Evalu
Sample Code	,	Material T	уре			Sam	ple Source	e		Station	Location	on	Lat/Long		
IOSN 2019		Reference		ent		-		rina NAE-20	04-00	IOSN Re	ferenc	е			
AT3-098		Marine Se	diment	t		Yach	tsman Maı	rina NAE-20	004-00	10 Static	ns at 4	Marinas M	u		
Data Transfor	rm		Alt H	Нур					Comp	arison R	esult				PMSD
Untransformed	d		C < 1	Г					AT3-0	98 passe	d endo	sulfan ii end	lpoint		2.40%
Equal Variand	ce t T vs	wo-Sample	Test	df	Test	Stat	Critical	MSD	P-Typ	e P-V	'alue	Decision(	α:5%)		
Reference Sec		AT3-098		8	-26.7		1.86	0.000415	CDF	1.00			icant Effect		
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> 461	<b>Decision(</b> No Outliers	α:5%) s Detected		
ANOVA Table	)	Sum Sau	250		Moon	Sauc	·ro	DF	F Stat	D.V	'alue	Decision	e. E0/ \		
Between		8.880E-05			8.880	Squa	ii e	1	713		0E-05	Decision( Significant			
Error		9.97E-07	•		1.246			8	7 10		oL 00	Olgriilloaria	Liloot		
Total		8.980E-05	j					9	_						
ANOVA Assu	mptic	ons Tests													
Attribute		Test						Test Stat	Critica	al P-V	'alue	Decision(	α:1%)		
Variance		Variance F	Ratio F	Test				4.06	23.2	0.20	034	Equal Vari	ances		
Distribution		Shapiro-W	/ilk W I	Norma	ality Te	st		0.869	0.741	0.09	969	Normal Dis	stribution		
endosulfan II	Sum	mary													
Sample		Code	Cour	nt	Mean	l	95% LCL	95% UCL	Media	n Min	1	Max	Std Err	CV%	%Effect
IOSN 2019		RS	5		0.017		0.0167	0.0179	0.017	0.0		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	il			·										
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	-					<u> </u>
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	INVPest / U	4-3042-6729
Bioaccumulation	on Evaluation	- Pesticide	s - Nere	is						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-T DD2B453810		12113D055	Statu	S Version is Level: or ID:	: CETISv2 1	.1.1	
	•	4 Pro	st Type: otocol: ecies: kon:	Bioaccumula US ACE NED Nereis virens Polychaeta		es	Anal Dilue Brine Sour	ent: No e: Cry	ncy Roka t Applicable ystal Sea tO - Aquatic F	Research (	Or <b>Age</b> :
Sample Code	Sample I	D Sa	mple Da	te Recei	pt Date	Sample Ag	je Clier	nt Name	Pr	oject	
IOSN 2019 AT3-098	13-4648-8 07-1559-4		Mar-23 Feb-23 1	08 Ma 3:00 09 Fe		12h 27d 23h	Eco-	Analysts, lı	nc. Dr	edged Sec	liment Evalu
Sample Code	Material	Туре		Sample Soul	ce	Sta	ation Locati	on	Lat/Long		
IOSN 2019		e sediment		Yachtsman M	larina NAE-20	004-00 IO	SN Referenc	e			
AT3-098	Marine Se	ediment		Yachtsman M	larina NAE-20	004-00 10	Stations at 4	l Marinas I	Mu		
Data Transform	n	Alt Hyp				Compari	son Result				PMSD
Untransformed		C < T				AT3-098	passed endr	in endpoint	t		2.03%
Equal Variance Sample I vs Reference Sed	•			Stat Critical	MSD 0.000404	P-Type CDF	<b>P-Value</b> 1.0000	<b>Decision</b> Non-Sign	n(α:5%) nificant Effect		
Auxiliary Tests Attribute Outlier	Test				Test Stat	Critical	P-Value	Decision	η(α:5%)		
Gutilei	Grubbs E	Extreme Va	lue Test		1.85	2.29	0.4121	No Outlie	ers Detected		
ANOVA Table	Grubbs E	Extreme Va	lue Test		1.85	2.29	0.4121	No Outlie	ers Detected		
	Grubbs E Sum Squ			Square	1.85 <b>DF</b>	2.29 <b>F Stat</b>	0.4121 <b>P-Value</b>	No Outlie			
ANOVA Table	Sum Squ 0.000115 9.42E-07	uares		1153					າ(α:5%)		
ANOVA Table Source Between Error Total	Sum Squ 0.000115 9.42E-07 0.000116	uares	<b>Mean</b> 0.000	1153	<b>DF</b> 1 8	F Stat	P-Value	Decision	າ(α:5%)		
ANOVA Table Source Between Error Total ANOVA Assum	Sum Squ 0.000115 9.42E-07 0.000116	uares	<b>Mean</b> 0.000	1153	<b>DF</b> 1 8	<b>F Stat</b> 979	P-Value <1.0E-05	<b>Decision</b> Significa	n(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 2	<b>Mean</b> 0.000 1.178	1153	DF 1 8 9	F Stat 979 — 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 Squ 0.000115 9.42E-07 0.000116  ptions Tests Test Variance	uares	Mean 0.000 1.178	1153 E-07	<b>DF</b> 1 8	<b>F Stat</b> 979	P-Value <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 Squ 0.000115 9.42E-07 0.000116  ptions Tests Test Variance Shapiro-V	ares 3 2 Ratio F Tes	Mean 0.000 1.178	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 Significa  Decision Equal Va	n(α:5%) nt Effect n(α:1%) ariances		
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 1.178	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 Significa  Decision Equal Va	n(α:5%) nt Effect n(α:1%) ariances	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	Jares 3 2 Ratio F Tes Vilk W Norr	Mean 0.000 1.178	1153 E-07 st	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 Significa Decision Equal Va Normal D	n(α:5%)  nt Effect  n(α:1%)  ariances  Distribution	<b>CV%</b> 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	Patio F Tes Vilk W Norr	Mean 0.000 1.178	1153 E-07 st 95% LC 9 0.0194	DF 1 8 9  Test Stat 2.89 0.938	F Stat 979  Critical 23.2 0.741  Median	P-Value <1.0E-05 P-Value 0.3282 0.5309 Min	Decision Significa  Decision Equal Va Normal D	n(α:5%) nt Effect n(α:1%) ariances 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 Norr	Mean 0.000 1.178 st mality Tes  Mean 0.019	1153 E-07 sst <b>95% LC</b> 9 0.0194	DF 1 8 9  Test Stat 2.89 0.938  L 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 Significa  Decision Equal Va Normal D  Max 0.0205	n(α:5%) nt Effect  n(α:1%) ariances 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 Norr	Mean 0.000 1.178 st mality Tes  Mean 0.019	1153 E-07 St 95% LC 9 0.0194 1 0.0128	DF 1 8 9  Test Stat 2.89 0.938  L 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 Significa  Decision Equal Va Normal D  Max 0.0205	n(α:5%) nt Effect  n(α:1%) ariances 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 Test Variance Shapiro-V ry Code RS	Ratio F Tee Vilk W Norr  Count 5 5	Mean 0.000 1.178 st mality Tes  Mean 0.019: 0.013	95% LC 9 0.0194 1 0.0128	DF 1 8 9  Test Stat 2.89 0.938  L 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 Significa  Decision Equal Va Normal D  Max 0.0205	n(α:5%) nt Effect  n(α:1%) ariances Distribution  Std Err  0.000187	2.10%	0.00%

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	•								Test Co				
Bioaccumulat	tion I	Evaluation -	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	•	F S	est 1 Proto Speci axor	ies: Ne	paccumulatio S ACE NED F reis 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	8	Samp	le Date	Receipt	Date	Sample Ag	e Clien	t Name	Pr	oject	
IOSN 2019 AT3-098		13-4648-81 07-1559-49		)8 Ma )8 Fel	ar-23 b-23 13:0	08 Mar- 0 09 Feb-		12h 27d 23h	Eco-A	Analysts, Ir	nc. Dr	edged Sed	diment Evalu
Sample Code	)	Material Ty	/pe		Sa	mple Source	e	Sta	tion Location	on	Lat/Long		
IOSN 2019		Reference	sedimer	nt	Ya	chtsman Ma	rina NAE-20	004-00 109	SN Referenc	е			
AT3-098		Marine Sed	liment		Ya	chtsman Ma	rina NAE-20	004-00 10	Stations at 4	Marinas N	Лu		
Data Transfor	rm		Alt Hy	p				Comparis	on Result				PMSD
Untransformed	t		C < T					AT3-098 p	assed gamr	ma-bhc (lin	dane) endpoi	int	1.90%
<b>Equal Variance</b>									<b>D</b> V .		/ <b>=</b> 0/\		
Sample I Reference Sec		Sample II AT3-098			Test Stat -33.3	Critical 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 \	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 \	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 Ex  Sum Squar 0.0008724		8 /alue	-33.3  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 Ex  Sum Squa  0.0008724 6.278E-06		8 /alue	-33.3 Test	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%)		
Sample I Reference Sec Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total	ts	Test Grubbs Ex  Sum Squar 0.0008724 6.278E-06 0.0008786		8 /alue	-33.3  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%)		
Sample I Reference Sec Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur	ts	Test Grubbs Ex  Sum Squal 0.0008724 6.278E-06 0.0008786 ons Tests		8 /alue	-33.3  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		
Sample I Reference Sec Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute	ts	Test Grubbs Ex  Sum Squar 0.0008724 6.278E-06 0.0008786 cons Tests Test	res	/alue	-33.3  Test  Mean Sq 0.000872	1.86 uare	0.00104  Test Stat 2.04  DF 1 8 9  Test Stat	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 Sector Auxiliary Testor Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assurt Attribute Variance	ts	Test Grubbs Ex  Sum Squal 0.0008724 6.278E-06 0.0008786 ons Tests	res atio F T	8 /alue	-33.3  Test  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 Significant  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 Ex  Sum Squal 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  Test  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 Significant  Decision Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) riances		
Sample I Reference Sec Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution gamma-BHC	mptic	Test Grubbs Ex  Sum Squal 0.0008724 6.278E-06 0.0008786 ons Tests  Test Variance Ra Shapiro-Wil	res atio F T Ik W No	/alue	-33.3  Test  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 0.741	1.0000  P-Value 0.2007  P-Value <1.0E-05  P-Value 0.4705	Decision Significant  Decision Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) riances	CV%	%Effect
Sample I Reference Sec Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution gamma-BHC ( Sample	mptic	Test Grubbs Ex  Sum Squal 0.0008724 6.278E-06 0.0008786  Dons Tests Test Variance Ray	res atio F T Ik W No	/alue	-33.3  Mean Sq 0.000872 7.848E-0	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	Critical 2.29  F Stat 1110  Critical 23.2 0.741	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	ers Detected  (α:5%)  ers Detected  (α:5%)  nt Effect  (α:1%)  riances  Distribution		%Effect 5.20%
Sample I 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 Ex  Sum Squal 0.0008724 6.278E-06 0.0008786 ons Tests Test Variance Ray Shapiro-Will dane) Summa	atio F T lk W No ary Count	/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%	
Sample I 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 Ex  Sum Squal 0.0008724 6.278E-06 0.0008786 ons Tests Test Variance Rs Shapiro-Will dane) Summa Code RS	atio F T lk W No ary Count 5	/alue	-33.3  Mean Sq 0.000872 7.848E-0	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 Ex  Sum Squal 0.0008724 6.278E-06 0.0008786 ons Tests Test Variance Ray 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	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%
Sample I Reference Sec Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute	mptic	Test Grubbs Ex  Sum Squal 0.0008724 6.278E-06 0.0008786 ons Tests Test Variance Ray 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	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%

Report Date: Test Code/ID: 19 Aug-23 07:00 (p 12 of 19) TN-23-302NvPest / 04-3042-6729

Bioaccumulat	tion E	valuation -	Pesticid	es - N	lereis							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 Au	006-7514 ug-23 6:59 lay-23 22:53	Aı	nalysi	s: Nor	mma-chlorda nparametric- IFFD0E4077	Two Sample		Statu	S Version is Level: or ID:	: CETISv2. 1	1.1	
Batch ID: Start Date: Ending Date: Test Length:	08 Ma 05 Ap	•	Pi Si	est Ty rotoco pecies exon:	ol: US s: Ner	accumulatio ACE NED F reis virens ychaeta		es	Analy Dilue Brine Sour	ent: No	ncy Roka t Applicable /stal Sea O - Aquatic F	Research (	Or <b>Age:</b>
Sample Code	<del></del>	Sample ID	) Si	ample	Date	Receipt	t Date	Sample Ag	e Clien	t Name	Pro	oject	
IOSN 2019 AT3-098		13-4648-81 07-1559-49		Mar- B Feb-	23 23 13:00	08 Mar- 09 Feb-	23	12h 27d 23h		Analysts, Ir	nc. Dre	edged Sed	liment Evalu
Sample Code	,	Material Ty	уре		Sar	mple Source	e	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 Sec	diment		Yad	chtsman 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 Sur	m Two-Sam	nple Test	:									
Sample I Reference Sec		Sample II AT3-098		<b>df Te</b>		Critical	Ties 0	P-Type Exact	<b>P-Value</b> 1.0000	<b>Decision</b> Non-Sign	n(α:5%) nificant Effect		
Reference Sec Auxiliary Test Attribute Outlier	d /		1	3 40	)			Exact		Non-Sign  Decision	ificant Effect		
Auxiliary Test Attribute Outlier ANOVA Table	d /	AT3-098  Test  Grubbs Ex	xtreme V	8 40	est		0 Test Stat 2.06	Critical 2.29	1.0000 P-Value 0.1825	Non-Sign  Decision  No Outlie	n(α:5%) ers Detected		
Auxiliary Test Attribute Outlier ANOVA Table Source	d /	AT3-098  Test  Grubbs Ex	xtreme V	3 40	ean Squ	uare	Test Stat 2.06	Critical 2.29 F Stat	1.0000  P-Value  0.1825  P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table	d /	AT3-098  Test  Grubbs Ex	xtreme V	8 40 alue T M 0.	est	Jare	0 Test Stat 2.06	Critical 2.29	1.0000 P-Value 0.1825	Non-Sign  Decision  No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between	d /	Test Grubbs Ex  Sum Squa 0.0003969	xtreme V	8 40 alue T M 0.	ean Squ	Jare	0 Test Stat 2.06 DF	Critical 2.29 F Stat	1.0000  P-Value  0.1825  P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	ts	Test Grubbs Ex  Sum Squa 0.0003969 2.575E-06 0.0003995	xtreme V	8 40 alue T M 0.	ean Squ	Jare	0 Test Stat 2.06  DF 1 8	Critical 2.29 F Stat	1.0000  P-Value  0.1825  P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total	ts	Test Grubbs Ex  Sum Squa 0.0003969 2.575E-06 0.0003995	xtreme V	8 40 alue T M 0.	ean Squ	Jare	0 Test Stat 2.06  DF 1 8	Critical 2.29  F Stat 1230	1.0000  P-Value  0.1825  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	ts	Test Grubbs Ex  Sum Squa 0.0003969 2.575E-06 0.0003995 Ins Tests Test Variance R	xtreme Va	M 0. 3.	ean Squ 0003969 219E-07	Jare	0 Test Stat 2.06  DF 1 8 9  Test Stat 1.94	Critical 2.29  F Stat 1230  Critical 23.2	1.0000  P-Value 0.1825  P-Value <1.0E-05  P-Value 0.5359	Decision Significant  Decision Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) riances		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute	ts	Test Grubbs Ex  Sum Squa 0.0003969 2.575E-06 0.0003995 ons Tests Test	xtreme Va	M 0. 3.	ean Squ 0003969 219E-07	Jare	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 Significant  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 mption	Test Grubbs Ex  Sum Squa 0.0003969 2.575E-06 0.0003995 Ins Tests Test Variance R Shapiro-Wi	xtreme Va	M 0. 3.	ean Squ 0003969 219E-07	Jare	0 Test Stat 2.06  DF 1 8 9  Test Stat 1.94	Critical 2.29  F Stat 1230  Critical 23.2	1.0000  P-Value 0.1825  P-Value <1.0E-05  P-Value 0.5359	Decision Significant  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 gamma-chlore Sample	ts mption	Test Grubbs Ex  Sum Squa 0.0003969 2.575E-06 0.0003995 Ins Tests Test Variance R Shapiro-Wi Summary Code	xtreme Va	M 0. 3.	ean Squ 0003969 219E-07	 Jare 9	0 Test Stat 2.06  DF 1 8 9  Test Stat 1.94 0.785	Exact  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  Decision Equal Va Non-Norr	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) eriances mal Distribution	on CV%	%Effect
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution gamma-chlore Sample IOSN 2019	ts mption	Test Grubbs Ex  Sum Squa 0.0003969 2.575E-06 0.0003995 Ins Tests Test Variance R Shapiro-Wi	extreme Varies  Ratio F Tellik W Nor	M 0. 3. MM	ean Squ 0003969 219E-07	95% LCL 0.0361	0 Test Stat 2.06  DF 1 8 9  Test Stat 1.94 0.785  95% UCL 0.0377	Exact  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  Equal Va Non-Norr  Max 0.038	n(α:5%) ers Detected n(α:5%) nt Effect n(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	ts mption	Test Grubbs Ex  Sum Squa 0.0003969 2.575E-06 0.0003995 Ins Tests Test Variance R Shapiro-Wi Summary Code	xtreme Vares Ratio F Teilk W Nor	M 0. 3. MM	ean Squ 0003969 219E-07	 Jare 9	0 Test Stat 2.06  DF 1 8 9  Test Stat 1.94 0.785	Exact  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  Decision Equal Va Non-Norr	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) eriances mal Distribution	CV%	
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution gamma-chlore Sample IOSN 2019	ts mption	Test Grubbs Ex  Sum Squa 0.0003969 2.575E-06 0.0003995 Ins Tests Test Variance R Shapiro-Wi Summary Code RS	extreme Varies  Ratio F Tellik W Nor	M 0. 3. MM	ean Squ 0003969 219E-07	95% LCL 0.0361	0 Test Stat 2.06  DF 1 8 9  Test Stat 1.94 0.785  95% UCL 0.0377	Exact  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  Equal Va Non-Norr  Max 0.038	n(α:5%) ers Detected n(α:5%) nt Effect n(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 mption	Test Grubbs Ex  Sum Squa 0.0003969 2.575E-06 0.0003995 Ins Tests Test Variance R Shapiro-Wi Summary Code RS	extreme Varies  Ratio F Tellik W Nor	M 0. 3. M 0. M 0. M 0. M 0. M 0. M 0. M	ean Squ 0003969 219E-07	95% LCL 0.0361	0 Test Stat 2.06  DF 1 8 9  Test Stat 1.94 0.785  95% UCL 0.0377	Exact  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  Equal Va Non-Norr  Max 0.038	n(α:5%) ers Detected n(α:5%) nt Effect n(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 mption	Test Grubbs Ex  Sum Squa 0.0003969 2.575E-06 0.0003995 Ins Tests Test Variance R Shapiro-Wi Summary Code RS  Detail	xtreme Varies Ratio F Teilk W Nor Count 5 5	M 0. 3. Mality M 0. O. Ref	ean Squ 0003968 219E-07	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	Exact  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  Equal Va Non-Norr  Max 0.038	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) riances mal Distribution Std Err 0.000292	<b>CV%</b> 1.77%	3.56%

Report Date: Test Code/ID: 19 Aug-23 07:00 (p 13 of 19) TN-23-302NvPest / 04-3042-6729

Rinaccumula											
Dioaccamaia	tion Evaluation - P	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: Pa	otachlor epo rametric-Two 680CECAFI	o Sample	0DD3C7F79		S Version: is Level: or ID:	CETISv2.	.1.1	
Batch ID:	08-2970-4074	Tes	<b>Type:</b> Bio	accumulatio	n - Pesticid	es	Anal	yst: 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	Tax	on: Pol	ychaeta			Sour	ce: AR	O - Aquatic F	Research C	Or <b>Age:</b>
Sample Code	Sample ID	San	ple Date	Receip	t Date	Sample Ag	e Clier	t Name	Pro	oject	
IOSN 2019	13-4648-817	70 08 N	/lar-23	08 Mar-	-23	12h	Eco-/	Analysts, In	ic. 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	e Material Typ	ре	Sa	mple Sourc	е	Sta	ition Location	on	Lat/Long		
IOSN 2019	Reference s	ediment	Ya	chtsman Ma	rina NAE-20	004-00 103	SN Referenc	е			
AT3-098	Marine Sedi	ment	Ya	chtsman Ma	rina NAE-20	004-00 10	Stations at 4	Marinas N	<b>1</b> u		
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	est									
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 Sq	uare	DF	F Stat	P-Value	Decision	(a:5%)		
<b>Source</b> Between	Sum Square 0.0017556	es	<b>Mean Sq</b>		<b>DF</b>	<b>F Stat</b> 1120	<b>P-Value</b> <1.0E-05	<b>Decision</b> Significar	, ,		
		es		6					, ,		
Between	0.0017556	es	0.001755	6	1				, ,		
Between Error Total	0.0017556 0.0000125	es	0.001755	6	1 8				, ,		
Between Error Total	0.0017556 0.0000125 0.0017681	es	0.001755	6	1 8	1120			nt Effect		
Between Error Total  ANOVA Assu	0.0017556 0.0000125 0.0017681 mptions Tests Test Variance Ra	itio F Test	0.001755 1.563E-06	6	1 8 9 <b>Test Stat</b> 2.13	1120 — Critical 23.2	<1.0E-05  P-Value  0.4833	Significar  Decision  Equal Va	t Effect (α:1%) riances		
Between Error Total ANOVA Assu Attribute	0.0017556 0.0000125 0.0017681 mptions Tests Test	itio F Test	0.001755 1.563E-06	6	1 8 9 Test Stat	1120  Critical	<1.0E-05	Significar  Decision  Equal Va	nt Effect (α:1%)		
Between Error Total  ANOVA Assu Attribute Variance Distribution	0.0017556 0.0000125 0.0017681  mptions Tests  Test  Variance Ra Shapiro-Wilk	itio F Test k W Norm	0.001755 1.563E-06	6	1 8 9 <b>Test Stat</b> 2.13 0.826	1120 Critical 23.2 0.741	P-Value 0.4833 0.0300	Decision Equal Va Normal D	(α:1%) riances istribution		
Between Error Total  ANOVA Assu Attribute Variance Distribution	0.0017556 0.0000125 0.0017681  mptions Tests  Test  Variance Ra Shapiro-Wilk  poxide Summary Code	itio F Test	0.0017556 1.563E-06	6	1 8 9 <b>Test Stat</b> 2.13	1120 Critical 23.2 0.741	<1.0E-05  P-Value  0.4833	Significar  Decision  Equal Va	t Effect (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-Wilk  poxide Summary Code	itio F Test k W Norm	0.0017550 1.563E-00 ality Test Mean 0.078	95% LCL 0.0762	1 8 9 <b>Test Stat</b> 2.13 0.826 <b>95% UCL</b> 0.0798	1120  Critical 23.2 0.741  Median 0.0775	P-Value 0.4833 0.0300  Min 0.077	Decision Equal Va Normal D  Max 0.0805	(α:1%) riances istribution  Std Err 0.000652	<b>CV%</b> 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-Wilk  poxide Summary  Code  RS	itio F Test k W Norm Count	0.0017556 1.563E-06	95% LCL	1 8 9 <b>Test Stat</b> 2.13 0.826	1120 Critical 23.2 0.741 Median	<1.0E-05  P-Value 0.4833 0.0300  Min	Decision Equal Va 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-Wilk  coxide Summary Code  RS	utio F Test k W Norm Count	0.0017550 1.563E-00 ality Test Mean 0.078	95% LCL 0.0762	1 8 9 <b>Test Stat</b> 2.13 0.826 <b>95% UCL</b> 0.0798	1120  Critical 23.2 0.741  Median 0.0775	P-Value 0.4833 0.0300  Min 0.077	Decision Equal Va 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-Wilk  poxide Summary  Code  RS  (9)	utio F Test k W Norm Count	0.0017550 1.563E-00 ality Test Mean 0.078	95% LCL 0.0762	1 8 9 <b>Test Stat</b> 2.13 0.826 <b>95% UCL</b> 0.0798	1120  Critical 23.2 0.741  Median 0.0775	P-Value 0.4833 0.0300  Min 0.077	Decision Equal Va 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-Wilk  poxide Summary Code  RS  g  poxide Detail Code	ntio F Test k W Norm Count 5	0.0017550 1.563E-06 1.563E-06 ality Test Mean 0.078 0.0515	95% LCL 0.0762 0.0503	1 8 9 <b>Test Stat</b> 2.13 0.826 <b>95% UCL</b> 0.0798 0.0527	1120  Critical 23.2 0.741  Median 0.0775 0.051	P-Value 0.4833 0.0300  Min 0.077	Decision Equal Va 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

Bioaccumulat	tion Evaluation	- Pesticide	es - Nereis							EA-ES	ST, Inc. PB0
Analysis ID: Analyzed: Edit Date:	11-6127-2344 19 Aug-23 6:59 08 May-23 22:5	) An		neptachlor Parametric-Two 323F09EECF1		)4B63712D	Stat	IS Version us Level: or 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	4 Pro 4 Sp	otocol: l	Bioaccumulatio JS ACE NED F Vereis virens Polychaeta		es	Ana Dilu Brin Sou	ent: No e: Cry	ncy Roka t Applicable ystal Sea tO - Aquatic F	Research (	Or <b>Age:</b>
Sample Code IOSN 2019 AT3-098	Sample I 13-4648- 07-1559-	8170 08	mple Date Mar-23 Feb-23 13	08 Mar-	23	<b>Sample A</b> 12h 27d 23h		nt Name Analysts, li		<b>oject</b> edged Sed	diment Eval
Sample Code IOSN 2019 AT3-098		e sediment	١	Sample Source /achtsman Ma /achtsman Ma	rina NAE-20	004-00 IO	ation Locat SN Reference Stations at	се	<b>Lat/Long</b> Mu		
Data Transfor	·m	Alt Hyp				Compari	son Result				PMSD
Untransformed		C < T					passed hept	achlor end	point		1.79%
	vs Sample II AT3-098			at Critical 1.86	<b>MSD</b> 0.000679	<b>P-Type</b> CDF	<b>P-Value</b> 1.0000	<b>Decisior</b> Non-Sigr	n(α:5%) nificant Effect		
Auxiliary Test Attribute Outlier	Test	Extreme Va	lue Test		Test Stat	Critical 2.29	<b>P-Value</b> 0.2146	<b>Decision</b> No Outlie	n(α:5%) ers Detected		
ANOVA Table	Sum Squ	ıares	Mean S	Square	DF	F Stat	P-Value	Decision	n(a:5%)		
Between Error Total	0.000414 2.668E-0 0.000417	7 6	0.0004 ² 3.335E-	147	1 8 9	1240	<1.0E-05		<u> </u>		
ANOVA Assur	mptions Tests Test				Test Stat	Critical	P-Value	Decision	n(a:1%)		
Variance Distribution	Variance	Ratio F Tes Vilk W Norr			1.76 0.788	23.2 0.741	0.5988 0.0104	Equal Va	·		
heptachlor Sเ	ımmary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
IOSN 2019 AT3-098	RS	5 5	0.0379 0.025	0.0371 0.0244	0.0387 0.0256	0.0375 0.0248	0.0375 0.0246	0.039 0.0258	0.000292 0.00022	1.72% 1.97%	0.00% 33.98%
heptachlor De	etail										
	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
Sample	Code			. top o		iveb o					

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Bioaccumulat	tion Eval	uation - Pes	ticides	- Nerei	is							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	02-5060- 19 Aug-2 08 May-2	3 6:59	Ana	lysis:	Paran	chlorobenz metric-Two 196EED561		756438884	Statu	S Version is Level: or ID:	ı: CETISv2 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	•	3 11:34 3 10:34	Prof	tocol: cies:	US A	CE NED F s virens	n - Pesticide RIM (2004)	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	Sa	mple ID	San	ple Dat	te	Receipt	Date	Sample Ag	e Clien	t Name	Pı	oject	
IOSN 2019 AT3-098		4648-8170 ·1559-4974		⁄lar-23 [:] eb-23 1	3:00	08 Mar- 09 Feb-	23	12h 27d 23h		Analysts, I	nc. Di	redged Sed	diment Evalu
Sample Code	Ма	terial Type			Samp	ole Source	9	Sta	tion Location	on	Lat/Long		
IOSN 2019	Re	ference sed	iment		Yacht	tsman Mar	rina NAE-20	04-00 IOS	SN Referenc	е			
AT3-098	Ма	rine Sedime	ent		Yacht	tsman Mar	rina NAE-20	04-00 10	Stations at 4	Marinas I	Mu		
Data Transfor	rm	Alt	Нур					Comparis	on Result				PMSD
Untransformed	d	C <	< T					AT3-098 p	assed hexa	chloroben	zene endpoir	ıt	1.87%
Equal Variand	ce t Two-	-	t				MOD	P-Type	P-Value	Decision	n(a:5%)		
•		nple II -098	df 8	-33.9		Critical 1.86	<b>MSD</b> 0.00608	CDF	1.0000		nificant Effect	t	
•	d AT3 ts	•	8	-33.9				CDF		Non-Sign	nificant Effect	t	
Reference Sec Auxiliary Test Attribute	ts Te	-098 est	8	-33.9			0.00608  Test Stat	CDF  Critical	1.0000 P-Value	Non-Sign	nificant Effect	t .	
Reference Sec Auxiliary Test Attribute Outlier	ts Te	-098 est	8	-33.9		1.86	0.00608  Test Stat	CDF  Critical	1.0000  P-Value 0.2054  P-Value	Non-Sign	nificant Effect n(α:5%) ers Detected	t .	
Reference Sec  Auxiliary Test Attribute Outlier  ANOVA Table	d AT3 ts  Te  Gi  Su  0.00	-098 est rubbs Extrer	8	-33.9	Squar	1.86	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%)	t	
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	ts  Te  Gi  Su  0.0 0.0 0.0	rubbs Extrer  m Squares 30747 00214 30961	8	-33.9  ue Test  Mean  0.0307	Squar	1.86	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	ts  Te  Gi  Su  0.0 0.0 0.0	m Squares 30747 00214 30961	8	-33.9  ue Test  Mean  0.0307	Squar	1.86	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	ts Te	m Squares 30747 00214 30961	8 ne Valu	-33.9  we Test  Mean 0.030: 2.675	Squar	1.86	0.00608  Test Stat 2.03  DF 1 8 9	CDF  Critical 2.29  F Stat 1150	1.0000  P-Value 0.2054  P-Value <1.0E-05	Decision No Outlie  Decision Significa	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	ts Te Occupants Te Va	m Squares 30747 00214 30961	8 ne Valu	-33.9  we Test  Mean 0.030: 2.675	<b>Squa</b> i 747 E-05	1.86	0.00608  Test Stat 2.03  DF 1 8 9  Test Stat	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 Te One One One One One One One One One On	m Squares 30747 00214 30961  Tests st riance Ratio	8 ne Valu	-33.9  we Test  Mean 0.030: 2.675	<b>Squa</b> i 747 E-05	1.86	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 Te One One One One One One One One One On	m Squares 30747 00214 30961 Fests st riance Ratio apiro-Wilk V	8 ne Valu	-33.9  we Test  Mean 0.030: 2.675	<b>Squa</b> i 747 E-05	1.86	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	ts Te Occupants Su Occupants Te Va Sh	m Squares 30747 00214 30961 Fests st riance Ratio apiro-Wilk W	8 ne Valu	-33.9  Mean 0.0300 2.675	<b>Squa</b> 747 E-05	1.86 re	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		%Effect 0.00%
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution hexachlorobe Sample	ts Te Occupance Su Su Occupance Su Su Occupance Su Su Occupance Su Co	m Squares 30747 00214 30961 Fests st riance Ratio apiro-Wilk V	8 ne Valu	-33.9  Mean 0.030 2.675	<b>Squa</b> i 747 E-05	1.86 re	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	ts Te Va Sh Penzene Su Co	m Squares 30747 00214 30961 Fests st riance Ratio apiro-Wilk W mmary de Co	8 ne Valu	-33.9  Mean 0.030: 2.675  ality Tes  Mean 0.326	<b>Squa</b> i 747 E-05	1.86 re 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	ts Te G O O O O O O O O O O O O O O O O O O	m Squares 30747 00214 30961 Fests st riance Ratio apiro-Wilk W mmary de Co	F Test V Norm	-33.9  Mean 0.030: 2.675  ality Tes  Mean 0.326	<b>Squa</b> i 747 E-05	1.86 re 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	ts Te G O O O O O O O O O O O O O O O O O O	m Squares 30747 00214 30961 Fests st riance Ratio apiro-Wilk W immary de Co 5 5 etail de Re	F Test / Norm unt	-33.9  Mean 0.030: 2.675I  ality Tes  Mean 0.326 0.215	<b>Squa</b> i 747 E-05	1.86  re  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%

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Bioaccumula	tion Evaluation	- Pesticide	es - Nere	IS						EA-ES	T, Inc. PBC
Analysis ID:	17-5795-8568		dpoint:	Methoxychlor	T C '	_		S Version:		.1.1	
Analyzed: Edit Date:	19 Aug-23 6:59 08 May-23 22:5		alysis: )5 Hash:	Nonparametric 1BF0DC5558A	•			ıs Level: or ID:	1		
Batch ID:	08-2970-4074			Bioaccumulatio		es	Analy		ncy Roka		
Start Date:	08 Mar-23 11:3 05 Apr-23 10:3		otocol: ecies:	US ACE NED I Nereis virens	RIM (2004)		Dilue Brine		: Applicable stal Sea		
Test Length:	•	•	xon:	Polychaeta			Sour	,	o - Aquatic F	Research (	)r Age:
									-		Ago.
Sample Code	•		mple Da	•		Sample Ag		t Name		oject	
IOSN 2019 AT3-098	13-4648-		Mar-23	08 Mar-		12h 27d 23h	Eco-/	Analysts, Ir	ic. Dre	edged Sec	liment Evalu
A13-096	07-1559-	4974 06	Feb-23 1	3.00 09 Feb	-23 16:30	27u 23li					
Sample Code		•		Sample Source	е		tion Location		Lat/Long		
IOSN 2019		e sediment		Yachtsman Ma			SN Referenc				
AT3-098	Marine S	ediment		Yachtsman Ma	rina NAE-20	004-00 10	Stations at 4	Marinas N	⁄lu		
Data Transfor	rm	Alt Hyp				Comparis	son Result				PMSD
Untransformed	d	C < T				AT3-098	passed meth	oxychlor e	ndpoint		1.59%
Wilcoxon Rar	nk Sum Two-Sa	mple Test									
	vs Sample II	•	If Test S	Stat Critical	Ties	P-Type	P-Value	Decision	(a:5%)		
Reference Sec	•	8			0	Exact	1.0000		ificant Effect		
Auxiliary Test											
Attribute	Test		lus Tast		Test Stat		P-Value	Decision	· /		
Outlier	Grubbs i	Extreme Va	ilue rest		2.52	2.29	0.0067	Outlier De	elected		
ANOVA Table	•										
Source	Sum Squ	ıares	Mean	Square	DF	F Stat	P-Value	Decision	(α:5%)		
	oun oqu			- 1			1 Value				
Between	1.54528		1.545	28	1	12000	<1.0E-05	Significar	nt Effect		
Error	1.54528 0.001034			28	8				nt Effect		
	1.54528		1.545	28	=				nt Effect		
Error Total	1.54528 0.001034		1.545	28	8				nt Effect		
Error Total	1.54528 0.001034 1.54631		1.545	28	8	12000					
Error Total  ANOVA Assur Attribute  Variance	1.54528 0.001034 1.54631 mptions Tests Test Variance	3 Ratio F Te	1.545. 0.000	28 1293	9	12000	<1.0E-05  P-Value 0.0001	Significan  Decision  Unequal	ı(α:1%) Variances		
Error Total ANOVA Assur Attribute	1.54528 0.001034 1.54631 mptions Tests Test Variance	3	1.545. 0.000	28 1293	8 9 Test Stat	12000 Critical	<1.0E-05	Significan  Decision  Unequal	ι(α:1%)	on	
Error Total  ANOVA Assur Attribute  Variance	1.54528 0.001034 1.54631 mptions Tests Test Variance Shapiro-V	3 Ratio F Te	1.545. 0.000	28 1293	8 9 <b>Test Stat</b> 240	12000 Critical	<1.0E-05  P-Value 0.0001	Significan  Decision  Unequal	ı(α:1%) Variances	on	
ANOVA Assur Attribute Variance Distribution	1.54528 0.001034 1.54631 mptions Tests Test Variance Shapiro-V	3 Ratio F Te	1.545. 0.000	28 1293 st	8 9 <b>Test Stat</b> 240 0.783	12000 Critical 23.2 0.741	<1.0E-05  P-Value 0.0001	Significan  Decision  Unequal	ı(α:1%) Variances	on CV%	%Effect
ANOVA Assur Attribute Variance Distribution Methoxychlor	1.54528 0.001034 1.54631 mptions Tests Test Variance Shapiro-V	3 Ratio F Te Vilk W Nori	1.545 0.000 st mality Tes	28 1293 st 95% LCL	8 9 <b>Test Stat</b> 240 0.783	12000 Critical 23.2 0.741	<b>P-Value</b> 0.0001 0.0090	Decision Unequal Non-Norr	ι <b>(α:1%)</b> Variances nal Distributio		%Effect 0.00%
ANOVA Assur Attribute Variance Distribution Methoxychlor Sample	1.54528 0.001034 1.54631 mptions Tests Test Variance Shapiro-V	Ratio F Ter Vilk W Norr Count	1.545 0.000 st mality Tes	28 1293 st <b>95% LCL</b> 0.823	8 9 <b>Test Stat</b> 240 0.783 <b>95% UCL</b>	12000  Critical 23.2 0.741  Median	<1.0E-05  P-Value 0.0001 0.0090  Min	Decision Unequal Non-Norr	(α:1%) Variances nal Distributio Std Err	<b>CV%</b> 1.90%	
ANOVA Assur Attribute Variance Distribution Methoxychlor Sample IOSN 2019	1.54528 0.001034 1.54631  mptions Tests      Variance     Shapiro-V      Code  RS	Ratio F Te Vilk W Nori Count 5	1.545 0.000 st mality Tes Mean 0.843	28 1293 st <b>95% LCL</b> 0.823	8 9 <b>Test Stat</b> 240 0.783 <b>95% UCL</b> 0.863	12000  Critical 23.2 0.741  Median 0.835	P-Value 0.0001 0.0090  Min 0.83	Decision Unequal Non-Norr  Max 0.87	(α:1%) Variances nal Distribution  Std Err  0.00718	<b>CV%</b> 1.90%	0.00%
ANOVA Assur Attribute Variance Distribution Methoxychlor Sample IOSN 2019 AT3-098	1.54528 0.001034 1.54631  mptions Tests      Variance     Shapiro-V      Code  RS	Ratio F Te Vilk W Nori Count 5	1.545: 0.000 st mality Tes Mean 0.843 0.0566	28 1293 st <b>95% LCL</b> 0.823 8 0.0555	8 9 <b>Test Stat</b> 240 0.783 <b>95% UCL</b> 0.863 0.0581	12000  Critical 23.2 0.741  Median 0.835 0.0565	P-Value 0.0001 0.0090  Min 0.83	Decision Unequal Non-Norr  Max 0.87	(α:1%) Variances nal Distribution  Std Err  0.00718	<b>CV%</b> 1.90%	0.00%
Error Total  ANOVA Assur Attribute Variance Distribution  Methoxychlor Sample IOSN 2019 AT3-098  Methoxychlor	1.54528 0.001034 1.54631 mptions Tests	Ratio F Ter Vilk W Norn  Count 5	1.545 0.000 st mality Tes Mean 0.843	28 1293 st <b>95% LCL</b> 0.823 8 0.0555	8 9 <b>Test Stat</b> 240 0.783 <b>95% UCL</b> 0.863	12000  Critical 23.2 0.741  Median 0.835	P-Value 0.0001 0.0090  Min 0.83	Decision Unequal Non-Norr  Max 0.87	(α:1%) Variances nal Distribution  Std Err  0.00718	<b>CV%</b> 1.90%	0.00%

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									T	est Co	de/ID:	I IN-23	5-3021	NvPest / C	4-3042-672
Bioaccumula	ation E	Evaluation - P	esticide	s - Nere	is									EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 A	281-2806 ug-23 6:59 lay-23 22:53	Ana	lysis:	Para	hlordane metric-Two )F939E6D4	Sample 1B28903EE	27C11A10	CEE1		S Versions S Level: Or ID:		ISv2.	1.1	
Batch ID: Start Date: Ending Date: Test Length:	08 M : 05 A	•	Pro Spe	t Type: tocol: ecies: on:	US A Nere	ccumulatio ACE NED F is virens chaeta	n - Pesticido RIM (2004)	es		Analy Dilue Brine Sour	ent: N e: C	lancy Rok lot Applica Crystal Sea ARO - Aqua	ible a	Research (	Or <b>Age:</b>
Sample Code	9	Sample ID	Sar	nple Da	te	Receipt	Date	Sample A	ge	Clien	t Name		Pro	oject	
IOSN 2019 AT3-098		13-4648-817 07-1559-497		Mar-23 Feb-23 1	13:00	08 Mar- 09 Feb-		12h 27d 23h		Eco-A	∖nalysts,	Inc.	Dre	edged Sed	diment Evalu
Sample Code	9	Material Typ	Эе		Sam	ple Source	Э	St	tation I	ocatio	on	Lat/L	ong		
IOSN 2019		Reference se	ediment		Yach	ıtsman Mar	rina NAE-20	04-00 IC	SN Re	ference	e				
AT3-098		Marine Sedir	ment		Yach	ıtsman Maı	rina NAE-20	004-00 10	) Statio	ns at 4	Marinas	s Mu			
Data Transfor	rm	,	Alt Hyp					Compar	ison R	esult					PMSD
Untransformed	d	(	C < T					AT3-098	passe	d oxych	nlordane	endpoint			1.85%
Equal Varian				· <b>-</b>	24-4	0-1411	MOD	D. T	5.4		Desiri	( 50/)			
Sample I Reference Sec		AT3-098	8 8	-34.2		Critical 1.86	<b>MSD</b> 0.00139	P-Type CDF	1.00	alue		on(α:5%) gnificant E	·ffo ot		
Auxiliary Test Attribute Outlier	its	Test Grubbs Exti	reme Val	ue Test			Test Stat	Critical 2.29	<b>P-V</b>	alue 321		on(α:5%) liers Detec	cted		
<b>ANOVA Table</b>	e														
ANOVA Table Source	е	Sum Square	es	Mean	Squa	ıre	DF	F Stat	P-V	alue	Decisio	on(α:5%)			
Source Between Error	e	Sum Square 0.0016487 1.125E-05	es	<b>Mean</b> 0.001 1.407	6487	are	1 8	<b>F Stat</b> 1170		alue )E-05		on(α:5%) cant Effect			
Source Between Error Total		0.0016487 1.125E-05 0.0016599	es	0.001	6487	are	1								
Source Between Error Total  ANOVA Assu		0.0016487 1.125E-05 0.0016599 ons Tests	es	0.001	6487	are	1 8 9	1170	<1.(	)E-05	Signific	cant Effect			
Source Between Error Total  ANOVA Assu Attribute		0.0016487 1.125E-05 0.0016599 ons Tests		0.001 1.407	6487	are	1 8 9 Test Stat	1170  Critical	<1.(	DE-05	Signific	cant Effect			
Source Between Error Total  ANOVA Assu		0.0016487 1.125E-05 0.0016599 ons Tests	tio F Tes	0.001 1.407	6487 E-06	are	1 8 9	1170	<1.(	alue 194	Decision Equal \	cant Effect			
Source Between Error Total  ANOVA Assu Attribute Variance	ımptio	0.0016487 1.125E-05 0.0016599 ons Tests Test Variance Ra Shapiro-Wilk	tio F Tes	0.001 1.407	6487 E-06	are	1 8 9 <b>Test Stat</b> 2.26	1170 	<1.0 P-V 0.44	alue 194	Decision Equal \	cant Effect  on(α:1%)  /ariances			
Source Between Error Total  ANOVA Assu Attribute Variance Distribution	ımptio	0.0016487 1.125E-05 0.0016599 ons Tests Test Variance Ra Shapiro-Wilk	tio F Tes	0.001 1.407	6487 E-06	95% LCL	1 8 9 <b>Test Stat</b> 2.26	1170 	<1.0 P-V 0.44	alue 194 646	Decision Equal \	cant Effect  on(α:1%)  /ariances	on	CV%	%Effect
Source Between Error Total  ANOVA Assu Attribute Variance Distribution  oxychlordane	ımptio	0.0016487 1.125E-05 0.0016599 Ins Tests Test Variance Ra Shapiro-Wilk	tio F Tes	0.001 1.407 t tality Te	6487 E-06		1 8 9 <b>Test Stat</b> 2.26 0.854	1170	P-V 0.44 0.06	alue 194 646	Decision Equal Normal	on(α:1%) /ariances   Distributio	on E <b>rr</b>	<b>CV%</b> 1.86%	%Effect 0.00%
Source Between Error Total  ANOVA Assu Attribute Variance Distribution  oxychlordane Sample	ımptio	0.0016487 1.125E-05 0.0016599 ons Tests Test Variance Ra Shapiro-Wilk mary Code RS	tio F Tes k W Norn	0.001 1.407 t nality Te	6487 E-06 st	95% LCL	1 8 9 <b>Test Stat</b> 2.26 0.854 <b>95% UCL</b>	1170  Critical 23.2 0.741  Median	P-V 0.44 0.06	alue 194 646	Decision Equal Normal	on(α:1%) /ariances   Distribution   Std E   0.000	on Err 0625		
Source Between Error Total  ANOVA Assu Attribute Variance Distribution  oxychlordane Sample IOSN 2019	umptio	0.0016487 1.125E-05 0.0016599 Ins Tests Variance Ra Shapiro-Wilk Imary Code RS	tio F Tes	0.001 1.407 t t mality Te Mean 0.075	6487 E-06 st	<b>95% LCL</b> 0.0735	1 8 9 <b>Test Stat</b> 2.26 0.854 <b>95% UCL</b> 0.0769	1170  Critical 23.2 0.741  Median 0.0745	P-V 0.44 0.06  Min 0.07	alue 194 646	Decision Equal Normal Max 0.0775	on(α:1%) /ariances   Distribution   Std E   0.000	on Err 0625	1.86%	0.00%
Source Between Error Total  ANOVA Assu Attribute Variance Distribution  oxychlordane Sample IOSN 2019 AT3-098	umptio	0.0016487 1.125E-05 0.0016599 ons Tests Test Variance Ra Shapiro-Wilk mary Code RS 5	tio F Tes	0.001 1.407 t t mality Te Mean 0.075	6487 E-06 st	<b>95% LCL</b> 0.0735	1 8 9 <b>Test Stat</b> 2.26 0.854 <b>95% UCL</b> 0.0769	1170  Critical 23.2 0.741  Median 0.0745	P-V 0.44 0.06  Min 0.07	alue 194 646	Decision Equal Normal Max 0.0775	on(α:1%) /ariances   Distribution   Std E   0.000	on Err 0625	1.86%	0.00%
Source Between Error Total  ANOVA Assu Attribute Variance Distribution  oxychlordane Sample IOSN 2019 AT3-098  oxychlordane	umptio	0.0016487 1.125E-05 0.0016599 Ins Tests Test Variance Ra Shapiro-Wilk Imary Code RS 5	tio F Tes	0.001 1.407 t t nality Te Mean 0.075 0.049	6487 E-06 st	<b>95% LCL</b> 0.0735 0.0484	1 8 9 <b>Test Stat</b> 2.26 0.854 <b>95% UCL</b> 0.0769 0.0507	1170  Critical 23.2 0.741  Median 0.0745 0.0491	P-V 0.44 0.06  Min 0.07	alue 194 646	Decision Equal Normal Max 0.0775	on(α:1%) /ariances   Distribution   Std E   0.000	on Err 0625	1.86%	0.00%

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										Test Co				
Bioaccumulat	tion E	Evaluation -	Pestic	ides	- Nereis	5							EA-ES	ST, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 A	:624-1676 .ug-23 6:59 /lay-23 22:53		Anal	•	Parame	tric-Two	o Sample 727A15219	31703F25[	Statu	S Versionus Level: or ID:	n: CETISv 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	08 M 05 A	•	! :		ocol: l		E NED F	n - Pesticide RIM (2004)	es	Anal Dilue Brine Sour	ent: No e: Ci	ancy Roka ot Applicable rystal Sea RO - Aquatic		Or <b>Age:</b>
Sample Code	)	Sample ID	, ;	Sam	ple Date	)	Receipt	Date	Sample Ag	e Clier	t Name	Р	roject	
IOSN 2019 AT3-098		13-4648-81 07-1559-49			ar-23 eb-23 13		08 Mar- 09 Feb-		12h 27d 23h	Eco-	Analysts,	Inc. D	redged Se	diment Evalu
Sample Code	<del></del>	Material Ty	ype			Sample	Source	9	Sta	tion Locati	on	Lat/Long	]	
IOSN 2019		Reference	sedime	ent	,	Yachtsn	nan Mar	rina NAE-20	04-00 103	SN Reference	е			
AT3-098		Marine Sec	diment		`	Yachtsn	nan Mar	rina NAE-20	04-00 10	Stations at 4	Marinas	Mu		
Data Transfor	rm		Alt Hy	ур					Comparis	on Result				PMSD
Untransformed	d		C < T						AT3-098	oassed toxap	hene end	dpoint		1.88%
0	· · ·	Sample II		df	Toot St	tat Cri	itical	MSD	P-Type	P-Value	Decisio	n(α:5%)		
Reference Sec	d	AT3-098		8	-33.7	1.8		0.0297	CDF	1.0000		nificant Effec	et	
Reference Sec  Auxiliary Test  Attribute	d	-							CDF	1.0000 P-Value	Non-Sig		et	
Reference Sec	d	AT3-098	xtreme '	8	-33.7			0.0297	CDF		Non-Sig	nificant Effec		
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Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	d ts	Test Grubbs Ex  Sum Squa 0.72361 0.0051000	ıres	8	-33.7 e Test	1.8		0.0297  Test Stat 2.06  DF 1 8	Critical 2.29	<b>P-Value</b> 0.1808	Decisio No Outli Decisio	nificant Effection (α:5%) iers Detected		
Reference Sec  Auxiliary Test  Attribute  Outlier  ANOVA Table  Source  Between  Error  Total	d ts	Test Grubbs Ex  Sum Squa 0.72361 0.0051000 0.72871	ıres	8	-33.7 e Test  Mean \$ 0.7236	1.8		0.0297  Test Stat 2.06  DF 1	Critical 2.29  F Stat	P-Value 0.1808 P-Value	Decisio No Outli Decisio	nificant Effection (α:5%) iers Detected (α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur	d ts	Test Grubbs Ex  Sum Squa 0.72361 0.0051000 0.72871  Dons Tests	ıres	8	-33.7 e Test  Mean \$ 0.7236	1.8		0.0297  Test Stat 2.06  DF 1 8 9	CDF  Critical 2.29  F Stat 1140	P-Value 0.1808 P-Value <1.0E-05	Decisio No Outli  Decisio Significa	nificant Effection(α:5%) iers Detected on(α:5%) ant Effect		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute	d ts	Test Grubbs Ex  Sum Squa 0.72361 0.0051000 0.72871	nres	8 Valu	-33.7 e Test  Mean \$ 0.7236	1.8		0.0297  Test Stat 2.06  DF 1 8	CDF  Critical 2.29  F Stat 1140	P-Value 0.1808 P-Value	Decisio No Outli Decisio Significa	nificant Effection (α:5%) iers Detected (α:5%)		
Reference Sec  Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute  Variance	d ts	Test Grubbs Ex  Sum Squa 0.72361 0.0051000 0.72871  Dons Tests Test	ares	8 Valu	-33.7 e Test  Mean \$ 0.7236 0.00063	1.8 Square 1 375		0.0297  Test Stat 2.06  DF 1 8 9  Test Stat	Critical 2.29  F Stat 1140  Critical	P-Value 0.1808  P-Value <1.0E-05	Decisio No Outli Decisio Significa  Decisio Equal V	nificant Effection(α:5%) iers Detected on(α:5%) ant Effect		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution	ts mptic	Test Grubbs Ex  Sum Squa 0.72361 0.0051000 0.72871  Dons Tests Test Variance R Shapiro-Wi	ares	8 Valu	-33.7 e Test  Mean \$ 0.7236 0.00063	1.8 Square 1 375		0.0297  Test Stat 2.06  DF 1 8 9  Test Stat 2.13	Critical 2.29  F Stat 1140  Critical 23.2	P-Value 0.1808  P-Value <1.0E-05  P-Value 0.4823	Decisio No Outli Decisio Significa  Decisio Equal V	on(α:5%) iers Detected on(α:5%) ant Effect on(α:1%) ariances		
Reference Sec Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution	ts mptic	Test Grubbs Ex  Sum Squa 0.72361 0.0051000 0.72871  Dons Tests Test Variance R Shapiro-Wi	ares	8 Valu	-33.7 e Test  Mean \$ 0.7236 0.00063	1.8 <b>Square</b> 1 375		0.0297  Test Stat 2.06  DF 1 8 9  Test Stat 2.13	Critical 2.29  F Stat 1140  Critical 23.2 0.741	P-Value 0.1808  P-Value <1.0E-05  P-Value 0.4823	Decisio No Outli Decisio Significa  Decisio Equal V	on(α:5%) iers Detected on(α:5%) ant Effect on(α:1%) ariances		%Effect
Reference Sec Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution toxaphene Su Sample	ts mptic	Test Grubbs Ex  Sum Squa 0.72361 0.0051000 0.72871 ons Tests Test Variance R Shapiro-Wi	ares Ratio F I	8 Valu	-33.7  e Test  Mean \$ 0.7236 0.0006	1.8 <b>Square</b> 1 375	% LCL	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	P-Value 0.1808  P-Value <1.0E-05  P-Value 0.4823 0.1002	Decisio No Outli Decisio Significa  Decisio Equal V Normal	on(α:5%) iers Detected on(α:5%) ant Effect on(α:1%) fariances Distribution		%Effect 0.00%
Reference Sec Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution toxaphene Su Sample	ts mptic	Test Grubbs Ex  Sum Squa 0.72361 0.0051000 0.72871  Day Tests Test Variance R Shapiro-Wiary Code	Ratio F Till W N	8 Valu	-33.7  e Test  Mean \$ 0.7236 0.00066  Mean	1.8 Square 1 375	% LCL	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  Median	P-Value 0.1808  P-Value <1.0E-05  P-Value 0.4823 0.1002  Min	Decisio No Outli Decisio Significa  Decisio Equal V Normal	en(α:5%) iers Detected en(α:5%) ant Effect en(α:1%) fariances Distribution  Std Err	CV%	
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur	ts mptio	Test Grubbs Ex  Sum Squa 0.72361 0.0051000 0.72871  Day Tests Test Variance R Shapiro-Wiary Code	Ratio F ilk W N	8 Valu	-33.7  e Test  Mean \$ 0.7236 0.00063  ality Test  Mean  1.58	1.8 Square 1 375 95°	% LCL	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	P-Value 0.1808  P-Value <1.0E-05  P-Value 0.4823 0.1002  Min 1.55	Decisio Significa  Decisio Significa  Max 1.63	en(α:5%) iers Detected en(α:5%) ant Effect en(α:1%) fariances Distribution  Std Err 0.0132	<b>CV%</b> 1.87%	0.00%
Reference Sec  Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution toxaphene Su Sample IOSN 2019 AT3-098 toxaphene De	ts mptio	Test Grubbs Ex  Sum Squa 0.72361 0.0051000 0.72871  Day Tests Test Variance R Shapiro-Wiary Code	Ratio F ilk W N	8  Value	-33.7  e Test  Mean \$ 0.7236 0.00063  ality Test  Mean  1.58	1.8 Square 1 375 1.5 1.5	% LCL	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	P-Value 0.1808  P-Value <1.0E-05  P-Value 0.4823 0.1002  Min 1.55	Decisio Significa  Decisio Significa  Max 1.63	en(α:5%) iers Detected en(α:5%) ant Effect en(α:1%) fariances Distribution  Std Err 0.0132	<b>CV%</b> 1.87%	0.00%
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution toxaphene Su Sample IOSN 2019 AT3-098	ts mptio	Test Grubbs Ex  Sum Squa 0.72361 0.0051000 0.72871  Ons Tests Test Variance R Shapiro-Wi	Ratio F ilk W N  Count 5	8  Value	-33.7  e Test  Mean \$ 0.7236 0.00063  hility Test  Mean 1.58 1.04	1.8 Square 1 375 1.5 1.5	% LCL 54 01	0.0297  Test Stat 2.06  DF 1 8 9  Test Stat 2.13 0.87  95% UCL 1.61 1.06	Critical 2.29  F Stat 1140  Critical 23.2 0.741  Median 1.57 1.03	P-Value 0.1808  P-Value <1.0E-05  P-Value 0.4823 0.1002  Min 1.55	Decisio Significa  Decisio Significa  Max 1.63	en(α:5%) iers Detected en(α:5%) ant Effect en(α:1%) fariances Distribution  Std Err 0.0132	<b>CV%</b> 1.87%	0.00%

Report Date: 19 Aug-23 07:00 (p 19 of 19)
Test Code/ID: TN-23-302NvPest / 04-3042-6729

Bioaccumulati	on Evaluation	- Pesticide	s - Nereis							EA-ES	T, Inc. PBC
Analyzed:	02-9910-1821 19 Aug-23 6:59	An	alysis: N	rans-nonachlo	-Two Sample		Statu	S Version	: CETISv2. 1	1.1	
Edit Date:	08 May-23 22:5	53 MD	9 <b>5 Hash</b> : 4	1665718E1BF	-27DB31610	0050171D2/	A19 Edito	or ID:			
Batch ID:	08-2970-4074	Tes	st Type: E	ioaccumulatio	n - Pesticide	es	Analy	<b>/st:</b> Na	ncy Roka		
	08 Mar-23 11:3		otocol: L	IS ACE NED F	RIM (2004)		Dilue		t Applicable		
Ending Date:	•	•		lereis virens			Brine	,	stal Sea		
Test Length:	27d 23h	Tax	on: P	olychaeta			Sour	ce: AR	O - Aquatic R	esearch C	Or <b>Age:</b>
Sample Code	Sample I		nple Date	Receip	t Date	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		S	ample Sourc	е	Sta	tion Location	on	Lat/Long		
IOSN 2019		e sediment		achtsman Ma			SN Referenc	е			
AT3-098	Marine Se	ediment	Y	achtsman Ma	rina NAE-20	04-00 10	Stations at 4	Marinas N	Лu		
Data Transforr	n	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									
				4 0-4-1	Ties	P-Type	P-Value	Decision	ι(α:5%)		
Sample I v	s Sample II	ď	r Test Sta	at Critical	1100						
Sample I v	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  Test		40		0	Exact	1.0000	Non-Sign  Decision	ificant Effect		
Reference Sed  Auxiliary Tests  Attribute	AT3-098  Test	8	40		0 Test Stat	Exact  Critical	1.0000 P-Value	Non-Sign  Decision	ificant Effect		
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Reference Sed  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	ificant Effect  (α:5%)  ers Detected  (α:5%)		
Reference Sed  Auxiliary Tests  Attribute  Outlier  ANOVA Table  Source	AT3-098  Test  Grubbs I	Extreme Valuares	40 lue Test Mean S	quare	Test Stat 1.9  DF	Critical 2.29  F Stat	1.0000  P-Value  0.3433  P-Value	Decision No Outlie	ificant Effect  (α:5%)  ers Detected  (α:5%)		
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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	ificant Effect  (α:5%)  ers Detected  (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%)  In (α:5%)  In (α:5%)  In (α:5%)  In (α:5%)  In (α:5%)		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum	AT3-098  Test  Grubbs I  Sum Squ 7.453E-0 3.97E-07 7.493E-0  nptions Tests  Test	Extreme Valueres	40 ue Test Mean S 7.453E- 4.962E-	quare	0 Test Stat 1.9  DF 1 8 9	Critical 2.29  F Stat 1500	1.0000  P-Value 0.3433  P-Value <1.0E-05	Decision No Outlie  Decision Significan	n(α:5%)  In (α:5%)  In (α:5%)  In (α:5%)  In (α:5%)  In (α:1%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assum 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%)  In (α:5%)  In (α:5%)  In (α:5%)  In (α:5%)  In (α:1%)	ın	
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum 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	ificant Effect  (α:5%)  ars Detected  (α:5%)  at Effect  (α:1%)  riances	n	
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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 mality 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	ificant Effect  (α:5%)  ors Detected  (α:5%)  ont Effect  (α:1%)  riances  onal 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	ificant Effect  (α:5%)  If Detected  (α:5%)  If Effect  (α:1%)  If an an an an an an an an an an an an an	<b>CV%</b> 1.39%	0.00%
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  trans-nonachlo 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	ificant Effect  (α:5%)  If Detected  (α:5%)  If Effect  (α:1%)  If an an an an an an an an an an an an an	<b>CV%</b> 1.39%	0.00%
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum 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	ificant Effect  (α:5%)  If Detected  (α:5%)  If Effect  (α:1%)  If an an an an an an an an an an an an an	<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		

^{* =} 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

^{* =} 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 J	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

^{* =} 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	ls - Macoma					EA-ES	, Inc. PBC
Batch ID:	09-1240-8281		Bioaccumulation - Metals			•	y Roka	
Start Date:	29 Mar-23 13:46		US ACE NED RIM (2004)	)			pplicable	
	26 Apr-23 12:46		Macoma nasuta				pplicable	_
Test Length:	27d 23h	Taxon:	Bivalvia		So	urce: ARO	- Aquatic Research C	r Age:
Sample ID:	10-1907-8970	Code:	AT3-191		Pro	oject: Dredg	ged Sediment Evaluat	ion
Sample Date:	20 Mar-23	Material:	Laboratory Control Sedim	ent	So	urce: Yacht	tsman Marina NAE-20	04-00319 (
Receipt Date:	20 Mar-23 16:00	CAS (PC):			Sta	<b>ition:</b> Labor	ratory Control	
Sample Age:	9d 14h	Client:	Eco-Analysts, Inc.					
Sample Code	Sample ID	Sample Date	Receipt Date	Sample	Age Cli	ent Name	Project	
IOSN 2019	13-4648-8170	08 Mar-23	08 Mar-23	21d 14l	h Ec	o-Analysts, Inc.	Dredged Sed	ment Evalu
AT3-098	07-1559-4974	08 Feb-23 13	3:00 09 Feb-23 16:30	49d 1h				
Sample Code	Material Type	;	Sample Source		Station Loca	ition	Lat/Long	
IOSN 2019	Reference sedin	nent	Yachtsman Marina NAE-2	2004-00	IOSN Refere	nce		
AT3-098	Marine Sedimer	it '	Yachtsman Marina NAE-2	2004-00	10 Stations a	t 4 Marinas Mu		
Single Compa	arison Summary							
Analysis ID	Endpoint	Compa	arison Method		P-Value	Compariso	n Result	S
03-4962-0856	Arsenic	Equal \	/ariance t Two-Sample T	est	0.9947	AT3-098 pa	ssed arsenic	1
18-5050-5224	Cadmium	Equal \	/ariance t Two-Sample T	est	0.7481	AT3-098 pa	ssed cadmium	1
08-7081-7384	Chromium	Equal \	/ariance t Two-Sample T	est	0.0570	AT3-098 pa	ssed chromium	1
13-3639-8676	Copper	Equal \	/ariance t Two-Sample T	est	0.0022	AT3-098 fai	led copper	1
00-6439-9040	Lead	Equal \	/ariance t Two-Sample T	est	0.0054	AT3-098 fai	led lead	1
03-3555-2818	Mercury	Equal \	/ariance t Two-Sample T	est	0.0087	AT3-098 fai	led mercury	1
11-4066-2552	Nickel	Equal \	/ariance t Two-Sample T	est	0.0012	AT3-098 fai	led nickel	1
02-4404-1166	Nickel	Wilcox	on Rank Sum Two-Samp	le Test	0.0754	AT3-098 pa	ssed nickel	1
			/ariance t Two-Sample T			AT3-098 pa		

## **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	ary										
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 Sumi	mary										
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	nmary										
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	ıry										
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 Summ	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 Summar	у										
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	Γ					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							

Report Date: 19 Aug-23 06:43 (p 4 of 8)
Test Code/ID: TN-23-303MnMet / 11-3134-1920

								Test C	oae/ID:	114-23-30	3MnMet / 1	1-3 134-192
Bioaccumulat	ion Evaluation	- Metals	- Ma	coma							EA-ES	Γ, Inc. PBC
Analysis ID: Analyzed: Edit Date:	13-3639-8676 19 Aug-23 6:42 08 May-23 22:4	2 4	Analy	sis: P	opper arametric-Tw 5F9F1B65D6	vo Sample 65EF9A525F	-A03996B28	Stat	IS Versior us Level: or ID:	n: CETISv2 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>F</b>	Test 1 Proto Speci Taxor	col: U ies: M	ioaccumulati S ACE NED lacoma nasu ivalvia	RIM (2004)			ent: No	ancy Roka ot Applicable ot Applicable RO - Aquatic	Research C	r <b>Age</b> :
Sample Code	Sample	ID S	Samp	le Date	Receip	ot Date	Sample Ag	e Clie	nt Name	P	roject	
IOSN 2019 AT3-098	13-4648- 07-1559-		08 Ma 08 Fe	ar-23 b-23 13:	08 Mai 00 09 Feb	r-23 o-23 16:30	21d 14h 49d 1h	Eco	-Analysts, I	nc. D	redged Sed	iment Evalı
Sample Code	Material	Туре		S	ample Sour	ce	Sta	tion Locat	ion	Lat/Long	l	
IOSN 2019	Referenc	e sedime	ent	Y	achtsman Ma	arina NAE-20	004-00 108	SN Referen	се			
AT3-098	Marine S	ediment		Y	achtsman Ma	arina NAE-20	004-00 10	Stations at	4 Marinas	Mu		
Data Transfor	m	Alt Hy	ур				Comparis	on Result				PMSD
Untransformed		C < T					AT3-098 f	ailed coppe	r endpoint			24.99%
	e t Two-Sampl vs Sample II		df	Test Sta	t Critical	MSD	P-Type	P-Value	Decisio	•		
Reference Sed	I AT3-098*		8	3.92	1.86	0.443	CDF	0.0022	Significa	int Effect		
Auxiliary Test	s		8	3.92	1.86							
Auxiliary Test Attribute	s Test	Evtrama \			1.86	Test Stat	Critical	P-Value	Decisio	n(α:5%)		
Auxiliary Test Attribute Outlier	s Test Grubbs	Extreme \			1.86				Decisio			
Auxiliary Test Attribute Outlier ANOVA Table	s Test Grubbs		Value	Test		Test Stat 2.02	Critical 2.29	<b>P-Value</b> 0.2123	Decisio No Outli	n(α:5%) ers Detected		
Auxiliary Test Attribute Outlier ANOVA Table Source	s Test Grubbs Sum Squ		Value	Test  Mean S	quare	Test Stat 2.02	Critical 2.29	P-Value 0.2123 P-Value	Decisio No Outli Decisio	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between	Sum Squ 2.18089		Value	Test  Mean Sec. 2.18089	quare	Test Stat 2.02  DF 1	Critical 2.29	<b>P-Value</b> 0.2123	Decisio No Outli Decisio	n(α:5%) ers Detected		
Auxiliary Test Attribute Outlier ANOVA Table Source	Sum Squ 2.18089 1.134		Value	Test  Mean S	quare	Test Stat 2.02	Critical 2.29	P-Value 0.2123 P-Value	Decisio No Outli Decisio	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total	Sum Squ 2.18089 1.134 3.31489		Value	Test  Mean Sec. 2.18089	quare	Test Stat 2.02  DF 1 8	Critical 2.29	P-Value 0.2123 P-Value	Decisio No Outli Decisio	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur	Sum Squ 2.18089 1.134 3.31489 mptions Tests		Value	Test  Mean Sec. 2.18089	quare	Test Stat 2.02  DF 1 8 9	Critical 2.29  F Stat 15.4	P-Value 0.2123 P-Value 0.0044	Decisio No Outli  Decisio Significa	n(α:5%) ers Detected n(α:5%) int Effect		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute	Sum Squ 2.18089 1.134 3.31489 mptions Tests Test	uares	Value	Test  Mean Sec. 2.18089	quare	Test Stat 2.02  DF 1 8 9  Test Stat	Critical 2.29  F Stat 15.4  Critical	P-Value 0.2123  P-Value 0.0044  P-Value	Decisio No Outli  Decisio Significa	n(a:5%) ers Detected n(a:5%) int Effect		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur	Sum Squ 2.18089 1.134 3.31489 mptions Tests Test Variance		Value Test	Mean So 2.18089 0.14175	quare	Test Stat 2.02  DF 1 8 9	Critical 2.29  F Stat 15.4	P-Value 0.2123 P-Value 0.0044	Decisio No Outli  Decisio Significa  Decisio Equal Va	n(a:5%) ers Detected n(a:5%) int Effect		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	Sum Squ 2.18089 1.134 3.31489 mptions Tests Test Variance Shapiro-N	uares Ratio F T	Value Test	Mean So 2.18089 0.14175	quare	Test Stat 2.02  DF 1 8 9  Test Stat 1.51	Critical 2.29  F Stat 15.4  Critical 23.2	P-Value 0.2123  P-Value 0.0044  P-Value 0.7002	Decisio No Outli  Decisio Significa  Decisio Equal Va	n(α:5%) ers Detected n(α:5%) ant Effect n(α:1%) ariances		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution Copper Summ	Sum Squ 2.18089 1.134 3.31489 mptions Tests Test Variance Shapiro-N	uares Ratio F T	Value Fest ormal	Mean So 2.18089 0.14175	quare	Test Stat 2.02  DF 1 8 9  Test Stat 1.51	Critical 2.29  F Stat 15.4  Critical 23.2 0.741	P-Value 0.2123  P-Value 0.0044  P-Value 0.7002	Decisio No Outli  Decisio Significa  Decisio Equal Va	n(α:5%) ers Detected n(α:5%) ant Effect n(α:1%) ariances	CV%	%Effect
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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 Squ 2.18089 1.134 3.31489  mptions Tests Test Variance Shapiro-Variance Code RS	Ratio F T Wilk W No Count 5	Value Fest ormal	Mean So 2.18089 0.14175 iity Test  Mean 1.77	95% LCL	Test Stat 2.02  DF 1 8 9  Test Stat 1.51 0.851  95% UCL 2.28	Critical 2.29  F Stat 15.4  Critical 23.2 0.741  Median 1.65	P-Value 0.2123  P-Value 0.0044  P-Value 0.7002 0.0604  Min 1.48	Decisio No Outli  Decisio Significa  Decisio Equal Va Normal I	n(a:5%) ers Detected n(a:5%) int Effect n(a:1%) ariances Distribution  Std Err 0.185	<b>CV%</b> 23.30%	0.00%
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Report Date: 19 Aug-23 06:43 (p 5 of 8)
Test Code/ID: TN-23-303MnMet / 11-3134-1920

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Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assurattribute Variance Distribution  Lead Summa Sample IOSN 2019	ts mptic	Test Grubbs E:  Sum Squa 0.0263169 0.0193352 0.0456521 cons Tests Test Variance F Shapiro-W Code	Ratio F Tilk W N	Value Test	3.3  e Test  Mean 0.026 0.0024  ality Tes  Mean 0.349	<b>Squ</b> :31694169	1.86  are  95% LCL 0.298	Test Stat 1.95  DF 1 8 9  Test Stat 1.88 0.956  95% UCL 0.4	Critical 2.29  F Stat 10.9  Critical 23.2 0.741  Median 0.332	P-Valu 0.2825  P-Valu 0.0109  P-Valu 0.5565 0.7435  Min 0.319	e Dec No Sign	Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision	x:5%) s Detected α:5%) Effect α:1%) ances stribution Std Err 0.0183	<b>CV</b>	.74%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assurattribute Variance Distribution  Lead Summa Sample IOSN 2019 AT3-098	ts mptic	Test Grubbs E:  Sum Squa 0.0263169 0.0193352 0.0456521 cons Tests Test Variance F Shapiro-W Code	Ratio F Tilk W N	Value Test lorma	3.3  e Test  Mean 0.026 0.0024  ality Tes  Mean 0.349	<b>Squ</b> ; 3169 4169	1.86  are  95% LCL 0.298	Test Stat 1.95  DF 1 8 9  Test Stat 1.88 0.956  95% UCL 0.4	Critical 2.29  F Stat 10.9  Critical 23.2 0.741  Median 0.332	P-Valu 0.2825  P-Valu 0.0109  P-Valu 0.5565 0.7435  Min 0.319	e Dec No Sign	Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision	x:5%) s Detected α:5%) Effect α:1%) ances stribution Std Err 0.0183	<b>CV</b>	.74%	0.00%
Auxiliary Test Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Lead Summa Sample IOSN 2019 AT3-098  Lead Detail	ts mptic	Test Grubbs E:  Sum Squa 0.0263169 0.0193352 0.0456521 cons Tests Test Variance F Shapiro-W  Code RS	Ratio F 7	Value Test Idorma	Mean 0.026: 0.0024  Mean 0.349 0.452	<b>Squ</b> : 3169 4169	95% LCL 0.298 0.382	Test Stat 1.95  DF 1 8 9  Test Stat 1.88 0.956  95% UCL 0.4 0.521	Critical 2.29  F Stat 10.9  Critical 23.2 0.741  Median 0.332 0.456	P-Valu 0.2825  P-Valu 0.0109  P-Valu 0.5565 0.7435  Min 0.319	e Dec No Sign	Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision(onificant Cision	x:5%) s Detected α:5%) Effect α:1%) ances stribution Std Err 0.0183	<b>CV</b>	.74%	0.00%

Report Date: Test Code/ID: 19 Aug-23 06:43 (p 6 of 8) TN-23-303MnMet / 11-3134-1920

											1-3134-1920
Bioaccumula	tion Evaluati	on - Metals -	Macoma							EA-ES	Γ, Inc. PBC
Analysis ID: Analyzed: Edit Date:	03-3555-281 19 Aug-23 6 08 May-23 2	:42 <b>A</b> r	ndpoint: nalysis: D5 Hash:	Mercury Parametric-Tw 8041063A2B3	•	9C0502C3F	Statu	IS Version: us Level: or ID:	CETISv2. 1	1.1	
Batch ID: Start Date: Ending Date: Test Length:	•	3:46 <b>Pr</b> 2:46 <b>S</b> p		Bioaccumulation US ACE NED Macoma nasut Bivalvia	RIM (2004)		Anal Dilue Brine Soui	ent: Not e: Not	ncy Roka Applicable Applicable O - Aquatic R	Research O	r <b>Age</b> :
Sample Code	Sampl	e ID Sa	mple Dat	e Receip	t Date	Sample Ag	je Clier	nt Name	Pro	oject	
IOSN 2019 AT3-098			Mar-23 Feb-23 1	08 Mar 3:00 09 Feb		21d 14h 49d 1h	Eco-	Analysts, In	c. Dre	edged Sed	iment Evalu
Sample Code	Materi	al Type		Sample Source	e	Sta	ation Locati	on	Lat/Long		
IOSN 2019	Refere	nce sediment		Yachtsman Ma	rina NAE-20	004-00 IO	SN Referenc	е			
AT3-098	Marine	Sediment		Yachtsman Ma	rina NAE-20	004-00 10	Stations at	4 Marinas M	1u		
Data Transfor	rm	Alt Hyp				Compari	son Result				PMSD
Untransformed	b	C < T				AT3-098	failed mercu	ry endpoint			13.77%
Equal Varian	ce t Two-San	ple Test									
Sample I	vs Sample	ell d	df Test S	Stat Critical	MSD	P-Type	P-Value	Decision	(α:5%)		
Reference Sec	d AT3-09	8* 8	3 2.99	1.86	0.000234	CDF	0.0087	Significan	t Effect		
Auxiliary Test	ts										
Attribute	Test				Test Stat	Critical	P-Value	Decision	(α:5%)		
Outlier	Grubb	s Extreme Va	alue Test		1.6	2.29	0.9106	No Outlier	rs Detected		
ANOVA Table	)										
Source	Sum S	quares	Mean	Square	DF	F Stat	P-Value	Decision	(α:5%)		
Between	3.534E	. 07					r-value				
Error		<b>-</b> -0 <i>1</i>	3.534	<b>Ξ-07</b>	1	8.92	0.0174	Significan	t Effect		
I <del></del>	3.169E	-07	3.534E 3.962E		8	8.92			t Effect		
Total	3.169E 6.704E	-07			-	8.92			t Effect		
ANOVA Assu	6.704E	E-07 E-07			9		0.0174	Significan			
ANOVA Assu Attribute	6.704E mptions Test Test	E-07 E-07	3.962		8 9 Test Stat	Critical	0.0174 P-Value	Significan  Decision	(α:1%)		
ANOVA Assu Attribute Variance	6.704E mptions Test  Varian	E-07 E-07 Es	3.962E	Ξ-08	8 9 <b>Test Stat</b> 17.7	Critical 23.2	0.0174 <b>P-Value</b> 0.0165	Significan  Decision  Equal Var	(α:1%) riances		
ANOVA Assu Attribute Variance Distribution	6.704E  mptions Test  Varian  Shapir	E-07 E-07	3.962E	Ξ-08	8 9 Test Stat	Critical	0.0174 P-Value	Significan  Decision	(α:1%) riances		
ANOVA Assu Attribute Variance Distribution Mercury Sum	6.704E  mptions Test  Varian  Shapir	E-07 E-07 Es	3.962f	=-08	8 9 <b>Test Stat</b> 17.7 0.877	Critical 23.2 0.741	0.0174 P-Value 0.0165 0.1199	Decision Equal Var Normal Di	(α:1%) riances istribution	CV%	%Effect
ANOVA Assu Attribute Variance Distribution  Mercury Sum Sample	6.704E  mptions Test  Varian Shapir  mary  Code	E-07 E-07 Es Ce Ratio F Te o-Wilk W Nor	3.962f st mality Tes	E-08	8 9 <b>Test Stat</b> 17.7 0.877	Critical 23.2 0.741	0.0174  P-Value 0.0165 0.1199  Min	Decision Equal Var Normal Di	(α:1%) riances istribution  Std Err	<b>CV%</b> 16.11%	%Effect 0.00%
ANOVA Assu Attribute Variance Distribution Mercury Sum	6.704E  mptions Test  Varian  Shapir	E-07 E-07 E-07 Ce Ratio F Te o-Wilk W Nor	3.962f	95% LCL 7 0.00136	8 9 <b>Test Stat</b> 17.7 0.877	Critical 23.2 0.741	0.0174 P-Value 0.0165 0.1199	Decision Equal Var Normal Di	(α:1%) riances istribution	16.11%	%Effect 0.00% -22.12%
ANOVA Assu Attribute Variance Distribution  Mercury Sum Sample IOSN 2019	6.704E  mptions Test  Varian Shapir  mary  Code  RS	E-07 E-07 Es  ce Ratio F Te  c-Wilk W Nor  Count  5	st mality Tes	95% LCL 7 0.00136	8 9 <b>Test Stat</b> 17.7 0.877 <b>95% UCL</b> 0.00204	23.2 0.741 Median 0.0015	0.0174  P-Value 0.0165 0.1199  Min 0.0015	Decision Equal Var Normal Di  Max 0.002	(α:1%) riances istribution  Std Err 0.000122	16.11%	0.00%
ANOVA Assu Attribute Variance Distribution  Mercury Sum Sample IOSN 2019 AT3-098	6.704E  mptions Test  Varian Shapir  mary  Code  RS	E-07 E-07 Es  ce Ratio F Te  c-Wilk W Nor  Count  5	st mality Tes	95% LCL 7 0.00136 08 0.002	8 9 <b>Test Stat</b> 17.7 0.877 <b>95% UCL</b> 0.00204	23.2 0.741 Median 0.0015	0.0174  P-Value 0.0165 0.1199  Min 0.0015	Decision Equal Var Normal Di  Max 0.002	(α:1%) riances istribution  Std Err 0.000122	16.11%	0.00%
ANOVA Assu Attribute Variance Distribution  Mercury Sum Sample IOSN 2019 AT3-098  Mercury Deta	mptions Test  Varian Shapir  mary  Code  RS	ce Ratio F Te o-Wilk W Nor Count 5	st mality Tes Mean 0.0017 0.0020	95% LCL 7 0.00136 08 0.002	8 9 <b>Test Stat</b> 17.7 0.877 <b>95% UCL</b> 0.00204 0.00216	Critical 23.2 0.741  Median 0.0015 0.0021	0.0174  P-Value 0.0165 0.1199  Min 0.0015	Decision Equal Var Normal Di  Max 0.002	(α:1%) riances istribution  Std Err 0.000122	16.11%	0.00%

**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)

			Pre-Assay		
CONTAMINANT	REP1	REP2	REP3	REP4 *	REP5 *
PAHs (ng/g wet weight)					
Acenaphthene	0.610 <mark>U</mark>	0.620 U	1.98 <mark>J</mark>		
Acenaphthylene	0.376 U	0.382 <mark>U</mark>	0.376 U		
Anthracene	0.408 <mark>U</mark>	0.922 J	1.23 <mark>J</mark>		
Benzo(a)anthracene	0.765 <mark>U</mark>	1.57 <mark>J</mark>	1.61 <mark>J</mark>		
Benzo(a)pyrene	0.800 <del>U</del>	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 U		
Benzo(g,h,i)perylene	0.341 <mark>U</mark>	0.346 U	0.341 U		
Chrysene	2.25 J	1.82 <mark>J</mark>	1.96 J		
Dibenzo(a,h)anthracene	0.395 <mark>U</mark>	0.401 U	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 <del>U</del>	0.810 <mark>U</mark>	0.800 U		
Naphthalene	4.11 <b>J</b>	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		

^{* =} 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

^{* =} 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

^{* =} 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	8000.0	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%   CI	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
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019											
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	nmary		0.001	0.070	0.000	0.07 1	0.000	0.00200	0.00040	1.0070	-50.7070
	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Sample											
IOSN 2019 AT3-098	RS	5 5	0.302 2.69	0.291 1.79	0.314 3.59	0.294 1.69	0.315 3.4	0.00406 0.325	0.00908 0.726	3.00% 27.00%	0.00% -789.84%
	0		2.09	1.79	3.39	1.09	3.4	0.323	0.720	27.0076	-709.047
Benzo(a)anthra		•			/			A =			0/===
Sample	Code	Count	Mean	95% LCL		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	marv									
` ,	Code	Count	Mean	95% I CI	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Sample										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%	-174.21%
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	NO			14.6	38.7	14.8	36.8	4.35	9.73	36.54%	

### **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:

19 Aug-23 06:45 (p 5 of 5)

**Test Code/ID:** TN-23-303MnPAH / 13-3685-4237

Rinaccumulation Evaluation - PAHs -	Masama

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	0.999998	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

19 Aug-23 06:45 (p 1 of 16) TN-23-303MnPAH / 13-3685-4237

											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			1ar-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	ina NAE-20	04-00	IOSN Re	eferenc	е			
AT3-098		Marine Se	diment			Yac	htsman Mai	ina NAE-20	04-00	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	Test Grubbs E	vtromo	Volu	ıo 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

19 Aug-23 06:45 (p 2 of 16) TN-23-303MnPAH / 13-3685-4237

Bioaccumulati	ion Evaluation	- PAHs - N	lacoma							EA-ES	T, Inc. PBC
	11-6416-3760		-	Acenaphthylen				S Version		.1.1	
•	19 Aug-23 6:45		•	Parametric-Tw	•	NEEE00D00		s Level:	1		
Edit Date:	08 May-23 22:	44 ML	)5 Hash:	5C3DB5F62B5	59D82EAE(	FE53CB0C	21E2 Edito	r ID:			
Batch ID:	07-2064-6975	Te	st Type:	Bioaccumulation	on - PAHs		Analy	<b>/st:</b> Na	incy Roka		
Start Date:	29 Mar-23 13:4	17 <b>Pr</b>	otocol:	US ACE NED I	RIM (2004)		Dilue	nt: No	t Applicable		
Ending Date:	•	7 <b>S</b> p	ecies:	Macoma nasut	а		Brine		t Applicable		
Test Length:	27d 23h	Ta	kon:	Bivalvia			Sour	ce: AF	RO - Aquatic I	Research (	Or <b>Age:</b>
Sample Code	Sample	ID Sa	mple Dat	e Receip	t Date	Sample Ag	e Clien	t Name	Pı	oject	
IOSN 2019	13-4648-	8170 08	Mar-23	08 Mar	-23	21d 14h	Eco-A	Analysts, I	nc. Di	edged Sec	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 Source	е	Sta	tion Location	on	Lat/Long		
IOSN 2019	Reference	e sediment		Yachtsman Ma			SN Referenc	е			
AT3-098	Marine S	ediment		Yachtsman Ma	rina 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 (	endpoint		3.17%
Equal Varianc	e t Two-Samp	le Test									
	ra Campla II		f Test S	tat Critical	MSD	P-Type	P-Value	Decision	n(α:5%)		
Sample I v	/s Sample II										
Reference Sed		8	21.6	1.86	0.00883	CDF	<1.0E-05	Significa	nt Effect		
•	AT3-098*		21.6	1.86	0.00883	CDF	<1.0E-05	Significa	nt Effect		
Reference Sed	AT3-098*		21.6	1.86	0.00883  Test Stat		<1.0E-05 P-Value	Significa			
Reference Sed  Auxiliary Tests	AT3-098* s Test			1.86				Decision			
Reference Sed  Auxiliary Tests  Attribute	AT3-098* s Test	8		1.86	Test Stat	Critical	P-Value	Decision	n(α:5%)		
Reference Sed  Auxiliary Tests  Attribute  Outlier	AT3-098* s Test	8 Extreme Va	lue Test	1.86 Square	Test Stat	Critical	P-Value	Decision	n(α:5%) ers Detected		
Auxiliary Tests Attribute Outlier ANOVA Table	AT3-098* s Test Grubbs	8 Extreme V <i>a</i> uares	lue Test	Square	Test Stat 1.67	Critical 2.29	<b>P-Value</b> 0.7506	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source	AT3-098* s Test Grubbs Sum Sq	Extreme Va	lue Test Mean	Square 2656	Test Stat 1.67	Critical 2.29	<b>P-Value</b> 0.7506 <b>P-Value</b>	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  Sum Sqi  0.026265	Extreme Vauares	lue Test  Mean  0.0262	Square 2656	<b>Test Stat</b> 1.67 <b>DF</b> 1	Critical 2.29	<b>P-Value</b> 0.7506 <b>P-Value</b>	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  Sum Sqi  0.026265  0.000450  0.026716	Extreme Vauares	lue Test  Mean  0.0262	Square 2656	Test Stat 1.67  DF 1 8	Critical 2.29	<b>P-Value</b> 0.7506 <b>P-Value</b>	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  Sum Sqi  0.026265  0.000450  0.026716	Extreme Vauares	lue Test  Mean  0.0262	Square 2656	Test Stat 1.67  DF 1 8	Critical 2.29  F Stat 466	<b>P-Value</b> 0.7506 <b>P-Value</b>	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  Sum Sqi  0.026265 0.000450 0.026716  nptions Tests Test	Extreme Vauares	Mean 0.0262 5.6338	Square 2656	Test Stat 1.67  DF 1 8 9	Critical 2.29  F Stat 466	P-Value 0.7506 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 Assun Attribute	AT3-098*  Test Grubbs  Sum Sqi 0.026265 0.000450 0.026716  Inptions Tests Test Variance	Extreme Valuares 56 66 52	Mean 0.0262 5.633E	<b>Square</b> 2656 E-05	Test Stat 1.67  DF 1 8 9	Critical 2.29  F Stat 466  Critical	P-Value	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 Assun Attribute Variance	AT3-098*  Test Grubbs  Sum Sqi 0.026265 0.000450 0.026716  Inptions Tests Test Variance Shapiro-1	Extreme Valuares 56 56 52  Ratio F Tes	Mean 0.0262 5.633E	<b>Square</b> 2656 E-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 Sqi 0.026265 0.000450 0.026716  Inptions Tests Test Variance Shapiro-	Extreme Valuares 56 56 52  Ratio F Tes	Mean 0.0262 5.633E	<b>Square</b> 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	Decision Significa  Decision Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances	CV%	%Effect
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution  Acenaphthyler	AT3-098*  Test Grubbs  Sum Sqi 0.026265 0.000450 0.026716  nptions Tests Test Variance Shapiro- ne Summary	Extreme Va  uares  66  66  52  Ratio F Tee  Wilk W Norn	Mean 0.0262 5.633E	<b>Square</b> 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	Decision Significa  Decision Equal Va Normal [	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution	CV% 3.02%	%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 Sqi 0.026265 0.000450 0.026716  Inptions Tests Test Variance Shapiro- The Summary Code	Extreme Valuares 56 56 52  Ratio F Ter Wilk W Norr	Mean 0.0262 5.633E	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  Median	P-Value	Decision Significa  Decision Equal Va Normal [	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) eriances Distribution		
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- The Summary Code RS	Extreme Valuares 56 56 52 Ratio F Tea Wilk W Norn Count 5	Mean 0.0262 5.633E st mality Tes Mean 0.279	Square 2656 E-05	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	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- The Summary Code RS	Extreme Valuares 56 56 52 Ratio F Tea Wilk W Norn Count 5	Mean 0.0262 5.633E st mality Tes Mean 0.279	Square 2656 E-05	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	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  Acenaphthyler	AT3-098*  Test Grubbs  Sum Sqi 0.026265 0.000450 0.026716  Inptions Tests Test Variance Shapiro- Ine Summary Code RS	Extreme Valuares 56 56 52  Ratio F Tea Wilk W Norn  Count 5 5	Mean 0.0262 5.633E st mality Tes  Mean 0.279 0.381	Square 2656 E-05 et 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	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 Co				
Bioaccumula	tion l	Evaluation -	PAHs ·	- Mac	oma								EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 <i>A</i>	9439-4057 Aug-23 6:45 May-23 22:44		Analy		Paran	netric-Two	o Sample DECF606B	32A763491	Stat	IS Versionus Level: or ID:	n: CETISv: 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	29 N	•	' I	Test ⁻ Proto Speci Taxor	ocol: ies:	US A	ma nasuta	RIM (2004)		Ana Dilu Brin Sou	ent: N	ancy Roka ot Applicable ot Applicable RO - Aquatic		or <b>Age:</b>
Sample Code	)	Sample ID	) ;	Samp	ole Date	9	Receipt	t Date	Sample Ag	je Clie	nt Name	P	roject	
IOSN 2019 AT3-098		13-4648-8 07-1559-4		08 Ma 08 Fe	ar-23 eb-23 13	3:00	08 Mar- 09 Feb-		21d 14h 49d 1h	Eco-	Analysts,	Inc. D	redged Sed	iment Evalu
Sample Code	)	Material T	ype		;	Samp	le Sourc	е	St	ation Locat	on	Lat/Long	]	
IOSN 2019		Reference	sedime	ent	,	Yacht	sman Ma	rina NAE-20	004-00 IO	SN Referen	се			
AT3-098		Marine Se	diment		,	Yacht	sman Ma	rina NAE-20	004-00 10	Stations at	4 Marinas	Mu		
Data Transfor	rm		Alt Hy	ур					Compari	son Result				PMSD
Untransformed	d		C < T			Comparison R AT3-098 failed					cene end	point		229.04%
Unequal Varia	ance vs	t Two-Sam	ple Test		Test S	tat (	Critical	MSD	P-Type	P-Value	Decisio	on(α:5%)		
		-		4	7.35	2	2.13	0.692	CDF	0.0009	Significa	ant Effect		
Reference Sec  Auxiliary Test  Attribute	d	AT3-098*		4	7.35	2	2.13	0.692 Test Stat	CDF Critical	0.0009 P-Value		ant Effect		
Reference Sec Auxiliary Test	d	AT3-098*	xtreme \			2	2.13				Decisio	ent Effect en(α:5%) iers Detected		
Reference Sec Auxiliary Test Attribute	d ts	AT3-098*	xtreme \			2	2.13	Test Stat	Critical	P-Value	Decisio	on(α:5%)		
Auxiliary Test Attribute Outlier	d ts	AT3-098*		Value				Test Stat	Critical	P-Value	Decisio No Outl	on(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table	d ts	AT3-098*  Test  Grubbs E		Value	e Test	Squar		Test Stat	Critical 2.29	<b>P-Value</b> 0.1751	Decision No Outl	en(α:5%) iers Detected		
Auxiliary Test Attribute Outlier ANOVA Table Source	d ts	Test Grubbs E		Value	e Test Mean (	Squar 8		Test Stat 2.07	Critical 2.29	P-Value 0.1751 P-Value	Decision No Outl	on(α:5%) iers Detected on(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between	d ts	Test Grubbs E  Sum Squa 14.2528		Value	Mean \$	Squar 8		<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%) iers Detected on(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	d ts	Test Grubbs E  Sum Squa 14.2528 2.10973 16.3625		Value	Mean \$	Squar 8		<b>Test Stat</b> 2.07 <b>DF</b> 1 8	Critical 2.29	P-Value 0.1751 P-Value	Decision No Outl	on(α:5%) iers Detected on(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total	d ts	Test Grubbs E  Sum Squa 14.2528 2.10973 16.3625		Value	Mean \$	Squar 8		<b>Test Stat</b> 2.07 <b>DF</b> 1 8	Critical 2.29  F Stat 54	P-Value 0.1751 P-Value	Decision No Outl  Decision Signification	on(α:5%) iers Detected on(α:5%)		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	d ts	Test Grubbs E  Sum Squa 14.2528 2.10973 16.3625 cons Tests Test Variance F	ares	Value	Mean \$ 14.252 0.2637	Squar 8 16		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  Decision  Signification  Decision  Unequal	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 Attribute	d ts	Test Grubbs E  Sum Squa 14.2528 2.10973 16.3625 cons Tests Test	ares	Value	Mean \$ 14.252 0.2637	Squar 8 16		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  Decision  Signification  Decision  Unequal	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 Attribute Variance	d tts	Test Grubbs E  Sum Squa 14.2528 2.10973 16.3625 ons Tests Test Variance F Shapiro-W	ares	Value	Mean \$ 14.252 0.2637	Squar 8 16		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  Decision  Signification  Decision  Unequal	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 Attribute Variance Distribution	d tts	Test Grubbs E  Sum Squa 14.2528 2.10973 16.3625 ons Tests Test Variance F Shapiro-W mary Code	ares	Value Test ormal	Mean \$ 14.252 0.2637	<b>Squar</b> 8 16		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  Decision  Signification  Decision  Unequal	on(α:5%) iers Detected on(α:5%) ant Effect on(α:1%)	CV%	%Effect
Auxiliary Test Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assurattribute Variance Distribution  Anthracene S Sample IOSN 2019	d tts	Test Grubbs E  Sum Squa 14.2528 2.10973 16.3625 cons Tests Test Variance F Shapiro-W	ares Ratio F T	Value Test ormal	Mean 9 14.252 0.2637	<b>Squar</b> 8 116 t	95% LCL	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 0.3	P-Value 0.1751  P-Value 8.0E-05  P-Value <1.0E-05 0.0636	Decision No Outl  Decision Significat  Decision Unequal Normal  Max 0.315	on(α:5%) iers Detected on(α:5%) ant Effect on(α:1%) Il 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 Assurattribute Variance Distribution  Anthracene S Sample	d tts	Test Grubbs E  Sum Squa 14.2528 2.10973 16.3625 ons Tests Test Variance F Shapiro-W mary Code	ares Ratio F∃ ⁄ilk W N	Value Test ormal	Mean \$14.252 0.2637	<b>Squar</b> 8 116 t	re 95% LCL	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 0.0636  Min	Decision No Outl  Decision Significat  Decision Unequal Normal	on(α:5%) iers Detected on(α:5%) ant Effect on(α:1%) Il Variances Distribution	CV%	
Auxiliary Test Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assurattribute Variance Distribution  Anthracene S Sample IOSN 2019	d ts mptic	Test Grubbs E  Sum Squa 14.2528 2.10973 16.3625 cons Tests Test Variance F Shapiro-W mary Code RS	Ratio F 7/ilk W N	Value Test ormal	Mean 9 14.252 0.2637	<b>Squar</b> 8 116 t	95% LCL	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 No Outl  Decision Significat  Decision Unequal Normal  Max 0.315	on(α:5%) iers Detected on(α:5%) ant Effect on(α:1%) Il Variances Distribution Std Err 0.00406	<b>CV%</b> 3.00%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assurattribute Variance Distribution  Anthracene S Sample IOSN 2019 AT3-098	d ts mptic	Test Grubbs E  Sum Squa 14.2528 2.10973 16.3625 cons Tests Test Variance F Shapiro-W mary Code RS	Ratio F 7/ilk W N	Value  Test ormal	Mean 9 14.252 0.2637	<b>Squar</b> 8 16 t	95% LCL	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 No Outl  Decision Significat  Decision Unequal Normal  Max 0.315	on(α:5%) iers Detected on(α:5%) ant Effect on(α:1%) Il Variances Distribution Std Err 0.00406	<b>CV%</b> 3.00%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Anthracene S Sample IOSN 2019 AT3-098  Anthracene D	d ts mptic	Test Grubbs E  Sum Squa 14.2528 2.10973 16.3625 cons Tests Test Variance F Shapiro-W mary Code RS	Ratio F 7 /ilk W N/ Count 5	Value Test ormal	Mean 9 14.252 0.2637 Mean 0.302 2.69	<b>Squar</b> 8 16 t	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 No Outl  Decision Significat  Decision Unequal Normal  Max 0.315	on(α:5%) iers Detected on(α:5%) ant Effect on(α:1%) Il Variances Distribution Std Err 0.00406	<b>CV%</b> 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 C	Juerib.			3-3685-423
Bioaccumula	tion I	Evaluation -	PAHs -	Мас	oma								EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 A	6989-9668 Aug-23 6:45 Иау-23 22:44	Α	naly	sis: P	arame		icene o Sample 122B474A7	2A1DF292E	Stat	IS Versionus Level: or ID:	n: CETISv2 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	29 N 26 A	•	P S	est T roto peci axon	col: L es: N	JS ACE	NED F a nasuta	on - PAHs RIM (2004) a		Ana Dilu Brin Sou	ent: No	ancy Roka ot Applicable ot Applicable RO - Aquatic	Research C	Or <b>Age:</b>
Sample Code	)	Sample ID	s	amp	le Date	ı	Receip	t Date	Sample Ag	e Clie	nt Name	P	roject	
IOSN 2019 AT3-098		13-4648-81 07-1559-49		8 Ma 8 Fel	ır-23 b-23 13:		08 Mar- 09 Feb-		21d 14h 49d 1h	Eco	Analysts,	Inc. D	redged Sed	iment Evalı
Sample Code	)	Material Ty	ре		S	ample	Sourc	e	Sta	ation Locat	ion	Lat/Long		
IOSN 2019		Reference	sedimer	nt	Υ	′achtsn	nan Ma	rina NAE-20	004-00 10	SN Referen	се			
AT3-098		Marine Sed	iment		Y	′achtsn	nan Ma	rina NAE-20	004-00 10	Stations at	4 Marinas	Mu		
Data Transfo	rm		Alt Hy	р					Comparis	son Result				PMSD
Untransforme	d		C < T						AT3-098 1	failed benzo	(a)anthrac	ene endpoint		127.20%
Unequal Variant Sample I Reference See	vs	Sample II AT3-098*		df '	Test Sta			MSD	P-Type	P-Value		n(α:5%)		
Reference Se	u	7110 000		4	14.3	2.1	3	0.719	CDF	6.9E-05	Significa	ant Effect		
Auxiliary Tes		Test		4	14.3	2.1	3	0.719 Test Stat		P-Value		en(α:5%)		
Auxiliary Tes						2.1	3				Decisio			
Auxiliary Tes Attribute	ts	Test				2.1	3	Test Stat	Critical	P-Value	Decisio	n(α:5%)		
Auxiliary Tes Attribute Outlier	ts	Test	treme V	/alue			3	Test Stat	Critical	P-Value	<b>Decisio</b> No Outli	n(α:5%)		
Auxiliary Tes Attribute Outlier ANOVA Table	ts	Test Grubbs Ex	treme V	/alue	Test	quare	3	Test Stat	Critical 2.29	<b>P-Value</b> 0.1534	Decisio No Outli	n(α:5%) iers Detected		
Auxiliary Tes Attribute Outlier ANOVA Table Source Between Error	ts	Test Grubbs Ex  Sum Squar 58.3947 2.27308	treme V	/alue	Test Mean S	quare	3	<b>Test Stat</b> 2.09 <b>DF</b> 1 8	Critical 2.29	P-Value 0.1534 P-Value	Decisio No Outli	n(α:5%) iers Detected n(α:5%)		
Auxiliary Tes Attribute Outlier ANOVA Table Source Between	ts	Test Grubbs Ex Sum Squar 58.3947	treme V	/alue	Test  Mean S 58.3947	quare	3	<b>Test Stat</b> 2.09 <b>DF</b> 1	Critical 2.29	P-Value 0.1534 P-Value	Decisio No Outli	n(α:5%) iers Detected n(α:5%)		
Auxiliary Tes Attribute Outlier ANOVA Table Source Between Error	ts	Test Grubbs Ex  Sum Squar 58.3947 2.27308 60.6678	treme V	/alue	Test  Mean S 58.3947	quare	3	<b>Test Stat</b> 2.09 <b>DF</b> 1 8	Critical 2.29	P-Value 0.1534 P-Value <1.0E-05	Decisio No Outli	n(α:5%) iers Detected n(α:5%)		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute	ts	Test Grubbs Ex  Sum Squar 58.3947 2.27308 60.6678 ons Tests Test	res	/alue	Test  Mean S 58.3947	quare	3	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	in(α:5%) iers Detected in(α:5%) ant Effect		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance	ts	Test Grubbs Ex  Sum Squar 58.3947 2.27308 60.6678 ons Tests Test Variance Ra	res	/alue	Test  Mean S 58.3947 0.28413	<b>quare</b> ,	3	Test Stat 2.09  DF 1 8 9  Test Stat 1890	Critical 2.29  F Stat 206  Critical 23.2	P-Value 0.1534  P-Value <1.0E-05  P-Value <1.0E-05	Decisio No Outli Decisio Significa  Decisio Unequa	in(α:5%) iers Detected in(α:5%) ant Effect in(α:1%)		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution	mptic	Test Grubbs Ex  Sum Squar 58.3947 2.27308 60.6678 Dons Tests Test Variance Ra Shapiro-Wil	res atio F Te	/alue	Test  Mean S 58.3947 0.28413	<b>quare</b> ,	3	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 Unequa	in(α:5%) iers Detected in(α:5%) ant Effect		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(a)anth	mptic	Test Grubbs Ex  Sum Squal 58.3947 2.27308 60.6678 ons Tests Test Variance Ray Shapiro-Will one Summary	res atio F Telk W No	/alue	Test  Mean S 58.3947 0.28413	quare 55		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 0.1534  P-Value <1.0E-05  P-Value <1.0E-05 0.0214	Decisio No Outli Decisio Significa  Decisio Unequa Normal	en(α:5%) iers Detected en(α:5%) ant Effect en(α:1%) I Variances Distribution		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(a)anth Sample	mptic	Test Grubbs Ex  Sum Squal 58.3947 2.27308 60.6678 ons Tests Test Variance Ray Shapiro-Will ne Summary Code	res atio F Tellk W No	est	Test  Mean S 58.3947 0.28413	quare 35 95°	% 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 Unequa Normal	iers Detected in(α:5%) ant Effect in(α:1%) I 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	mptic	Test Grubbs Ex  Sum Squal 58.3947 2.27308 60.6678 ons Tests Test Variance Ray Shapiro-Will one Summary	res atio F Tolk W No Count 5	est	Test  Mean S 58.3947 0.28413  ity Test  Mean 0.565	<b>quare</b> 35 <b>95</b> 9 0.5	% LCL	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 Unequa Normal  Max 0.59	iers Detected in(α:5%) ant Effect in(α:1%) I Variances Distribution  Std Err 0.00775	<b>CV%</b> 3.07%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(a)anth Sample	mptic	Test Grubbs Ex  Sum Squal 58.3947 2.27308 60.6678 ons Tests Test Variance Ray Shapiro-Will ne Summary Code	res atio F Tellk W No	est	Test  Mean S 58.3947 0.28413	quare 35 95°	% 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 Unequa Normal	iers Detected in(α:5%) ant Effect in(α:1%) I Variances Distribution	CV%	
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(a)anth Sample IOSN 2019	mptic	Test Grubbs Ex  Sum Squal 58.3947 2.27308 60.6678 Data Tests Test Variance Ray Shapiro-Will The Summary Code RS	res atio F Tolk W No Count 5	est	Test  Mean S 58.3947 0.28413  ity Test  Mean 0.565	<b>quare</b> 35 <b>95</b> 9 0.5	% LCL	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 Unequa Normal  Max 0.59	iers Detected in(α:5%) ant Effect in(α:1%) I Variances Distribution  Std Err 0.00775	<b>CV%</b> 3.07%	0.00%
Auxiliary Tesi Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(a)anth Sample IOSN 2019 AT3-098  Benzo(a)anth Sample	mptic	Test Grubbs Ex  Sum Squal 58.3947 2.27308 60.6678 ons Tests Test Variance R: Shapiro-Wil me Summary Code RS	res atio F Telk W No Count 5 5	est rmali	Test  Mean S 58.3947 0.28413  ity Test  Mean 0.565 5.4  Rep 2	<b>quare</b> 7 85 <b>95</b> 0.5 4.4 <b>Re</b>	% LCL 443 6 p 3	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 Unequa Normal  Max 0.59	iers Detected in(α:5%) ant Effect in(α:1%) I Variances Distribution  Std Err 0.00775	<b>CV%</b> 3.07%	0.00%
Auxiliary Tesi Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(a)anth Sample IOSN 2019 AT3-098  Benzo(a)anth	mptic	Test Grubbs Ex  Sum Squal 58.3947 2.27308 60.6678  Ons Tests Test Variance Res Shapiro-Will The Summary Code RS	res atio F Telk W No Count 5 5	est est	Test  Mean S 58.3947 0.28413  ity Test  Mean 0.565 5.4	<b>quare</b> 7.35 <b>95</b> 9 0.5 4.4	% LCL 443 6 p 3	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 Unequa Normal  Max 0.59	iers Detected in(α:5%) ant Effect in(α:1%) I Variances Distribution  Std Err 0.00775	<b>CV%</b> 3.07%	0.00%

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	<b>,</b>		-							Т	est Co	de/ID:	TN-23-3	03MnPAH / 13	3-3685-423
Bioaccumula	tion	Evaluation -	PAHs	- Ma	coma									EA-ES	Γ, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19	9784-4906 Aug-23 6:45 May-23 22:44		Anal	point: ysis: Hash:	Parar	o(a)pyrene netric-Two CC872CB		EC64FF0	C492DF	Statu	S Version us Level: or ID:	: CETIS	v2.1.1	
Batch ID:		2064-6975					cumulatio				Anal	-	incy Roka		
Start Date:		Mar-23 13:47			ocol:			RIM (2004)			Dilue		t Applicabl		
Ending Date:		•		Spec			ma nasuta	3			Brine		t Applicabl		
Test Length:	2/0	1 23n		Taxo	on:	Bivalv	/ia				Sour	ce: AR	RO - Aquati	c Research O	r Age:
Sample Code	9	Sample ID			ple Da	te	Receipt		Sample	_	Clier	nt Name		Project	
IOSN 2019		13-4648-81	70	08 M	lar-23		08 Mar-	23	21d 14h	1	Eco-	Analysts, I	nc.	Dredged Sedi	ment Evalu
AT3-098		07-1559-49	74	08 F	eb-23 1	13:00	09 Feb-	23 16:30	49d 1h						
Sample Code	)	Material Ty	/pe			Samp	ole Source	е		Station	Locati	on	Lat/Lor	ıg	
IOSN 2019		Reference	sedim	ent		Yacht	tsman Mar	rina NAE-20	004-00	IOSN Re	eferenc	e			
AT3-098		Marine Sed	liment			Yacht	tsman Mar	rina NAE-20	004-00	10 Statio	ns at 4	1 Marinas I	Mu		
Data Transfo	rm		Alt H	јур					Compa	arison R	esult				PMSD
Untransforme	d		C < T						AT3-09	98 failed	benzo(	(a)pyrene e	endpoint		96.96%
Unequal Vari	iance	t Two-Samp	le Tes	st .											
Sample I	vs	Sample II		df	Test S	Stat (	Critical	MSD	P-Type	P-V	'alue	Decision	n(α:5%)		
Reference Se	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	ıl P-V	'alue	Decision	n(α:5%)		
Outlier		Grubbs Ex	treme	Valu	e Test			2.29	2.29	0.0	502		ers Detecte	-d	
ANOVA Table	9														
Source		Sum Squa	res		Mean	Squa	re	DF	F Stat	P-V	'alue	Decision	n(α:5%)		
Between		3.26612			3.266			1	17.9	0.0	029	Significa	• •		
Error		1.45985			0.182	481		8				· ·			
Total		4.72597						9							
ANOVA Assu	ımpti	ons Tests													
Attribute		Test						Test Stat	Critica	ıl P-V	'alue	Decision	n(α:1%)		
Variance		Variance R	atio F	Test				1060	23.2	<1.	0E-05	Unequal	Variances		
Distribution		Shapiro-Wi	lk W N	lorma	ality Te	st		0.81	0.741	0.0	193	Normal [	Distribution		
Benzo(a)pyre	ene S	ummary													
Sample		Code	Coun	it	Mean	9	95% LCL	95% UCL	Media	n Mir	1	Max	Std Err	CV%	%Effect
IOSN 2019	_	RS	5	_	0.594	(	0.571	0.617	0.59	0.5	75	0.62	0.00828	3.12%	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	ene D	etail													
Sample		Code	Rep '	1	Rep 2	2 1	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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								Test Co				
Bioaccumula	tion Evaluatio	n - PAHs -	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>	indpoint: analysis: ID5 Hash:	Parame	ric-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 12:4 27d 23h	47 P 47 S	est Type: rotocol: pecies: axon:		NED R	IM (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	ite F	Receipt	Date	Sample Age	e Clier	nt Name	Pi	roject	
IOSN 2019 AT3-098	13-4648 07-1559	-8170 0	8 Mar-23 8 Feb-23		08 Mar-2 09 Feb-2	23	21d 14h 49d 1h		Analysts, I	nc. D	redged Sed	iment Evalu
Sample Code	Materia	Туре		Sample	Source	)	Sta	tion Locati	on	Lat/Long		
IOSN 2019	Referen	ce sedimer	nt	Yachtsm	nan Mari	ina NAE-20	04-00 IOS	N Referenc	е			
AT3-098	Marine S	Sediment		Yachtsm	nan Mari	ina NAE-20	04-00 10	Stations at 4	l Marinas I	Mu		
Data Transfor	rm	Alt Hy	р				Comparis	on Result				PMSD
Untransformed	d	C < T					AT3-098 fa	ailed benzo	b)fluoranth	nene endpoir	nt	127.31%
	ance t Two-Sa vs Sample l			Stat Cri	tical	MSD	P-Type	P-Value	Decision	n(α:5%)		
	.I ATO 000°		4 770	0.4	^	4	ODE	0.0000	0::6:			
Reference Sec	d AT3-098	k .	4 7.72	2.1	3	1	CDF	0.0008	Significa	nt Effect		
Reference Sec	ts	k	4 7.72	2.1	3				Significa	nt Effect		
Reference Sec Auxiliary Test Attribute	ts Test			2.1	3	Test Stat	Critical	P-Value	Decision	n(α:5%)		
Reference Sec	ts Test	Extreme V		2.1	3				Decision			
Reference Sec Auxiliary Test Attribute	ts Test Grubbs			2.1	3	Test Stat	Critical	P-Value	Decision	n(α:5%)		
Auxiliary Test Attribute Outlier	ts Test Grubbs	Extreme \	/alue Test	2.1	3	Test Stat	Critical	P-Value	Decision	n(a:5%) ers Detected		
Auxiliary Test Attribute Outlier ANOVA Table	ts Test Grubbs	Extreme \(\cdot\)	/alue Test	ı Square	3	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 Sq 32.8334 4.40667	Extreme \	/alue Test Mean	ı Square	3	<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 Sq 32.8334	Extreme \	/alue Test  Mean 32.83	ı Square	3	Test Stat 1.6  DF 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 Sq 32.8334 4.40667	Extreme \	/alue Test  Mean 32.83	ı Square	3	<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 Sq 32.8334 4.40667 37.2401	Extreme \	/alue Test  Mean 32.83	ı Square	3	<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 Sq 32.8334 4.40667 37.2401 mptions Tests Test Variance	Extreme V	/alue Test  Mean 32.83 0.550	1 <b>Square</b> 134 1834	3	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 Attribute	Test Grubbs Sum Sq 32.8334 4.40667 37.2401 mptions Tests Test Variance	Extreme \	/alue Test  Mean 32.83 0.550	1 <b>Square</b> 134 1834	3	Test Stat  1.6  DF  1  8  9  Test Stat	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	Test Grubbs Sum Sq 32.8334 4.40667 37.2401 mptions Tests Variance Shapiro-	Extreme V quares e Ratio F T -Wilk W No	Mean 32.83 0.550 est	s Square 134 1834 1834		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 Significa  Decision Unequal Normal [	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) Variances Distribution		
Auxiliary Test Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution Benzo(b)fluor Sample	Test Grubbs Sum Sq 32.8334 4.40667 37.2401 mptions Tests Test Variance Shapiro- ranthene Sumi	Extreme Volumes  Ratio F T Wilk W No	/alue Test  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 Assur Attribute Variance Distribution Benzo(b)fluor Sample IOSN 2019	Test Grubbs Sum Sq 32.8334 4.40667 37.2401 mptions Tests Variance Shapiro-	Extreme Volumes  Ratio F Townik W Normary  Count 5	Mean 32.83 0.550 est ormality Te  Mean 0.786	st 95%	% <b>LCL</b> 56	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 5.6E-05  P-Value <1.0E-05 0.1599  Min 0.765	Decision Significa  Decision Unequal Normal I  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 Assur Attribute Variance Distribution Benzo(b)fluor Sample	Test Grubbs Sum Sq 32.8334 4.40667 37.2401 mptions Tests Test Variance Shapiro- ranthene Sumi	Extreme Volumes  Ratio F T Wilk W No	/alue Test  Mean 32.83 0.550  est  rmality Te	st 95%	% <b>LCL</b> 56	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 Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution Benzo(b)fluor Sample IOSN 2019 AT3-098	Test Grubbs Sum Sq 32.8334 4.40667 37.2401 mptions Tests Test Variance Shapiro- ranthene Sumi	Extreme Volumes  Ratio F T Wilk W No	Mean 32.83 0.550 est ormality Te  Mean 0.786	st 95%	% <b>LCL</b> 56	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 5.6E-05  P-Value <1.0E-05 0.1599  Min 0.765	Decision Significa  Decision Unequal Normal I  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 Assur Attribute Variance Distribution Benzo(b)fluor Sample IOSN 2019 AT3-098	Test Grubbs Sum Sq 32.8334 4.40667 37.2401 mptions Tests Test Variance Shapiro- ranthene Sumi Code RS	Extreme Volumes  Ratio F T Wilk W No	Mean 32.83 0.550 est ormality Te  Mean 0.786	st 95%	% <b>LCL</b> 56	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 5.6E-05  P-Value <1.0E-05 0.1599  Min 0.765	Decision Significa  Decision Unequal Normal I  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 Assur Attribute Variance Distribution  Benzo(b)fluor Sample IOSN 2019 AT3-098  Benzo(b)fluor	Test Grubbs Sum Sq 32.8334 4.40667 37.2401 mptions Tests Variance Shapiro- ranthene Sumi Code RS	Extreme Volumes  Ratio F T Wilk W Note  mary  Count 5 5	Mean 32.83 0.550 est brmality Te  Mean 0.786 4.41	st 95%	% <b>LCL</b> 56 1	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 5.6E-05  P-Value <1.0E-05 0.1599  Min 0.765	Decision Significa  Decision Unequal Normal I  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%	

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	<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	9	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 Co				3-3685-423
Bioaccumulat	tion Evaluation	- PAHs - M	lacoma							EA-ES	Γ, Inc. PBC
Analysis ID: Analyzed: Edit Date:	18-6572-8367 19 Aug-23 6:45 08 May-23 22:4	An	alysis:	Benzo(k)fluorar Parametric-Two 5C2EE81F8C8	o Sample	F2421269DI	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 13:47 26 Apr-23 12:47 27d 23h	7 Pro	otocol: ecies:	Bioaccumulatio US ACE NED F Macoma nasuta Bivalvia	RIM (2004)		Anal Dilue Brine Sour	ent: No e: No	nncy Roka ot Applicable ot Applicable RO - Aquatic	Research C	r <b>Age</b> :
Sample Code	Sample II	) Sa	mple Date	e Receip	t Date	Sample Ag	e Clier	nt Name	Pı	roject	
IOSN 2019 AT3-098	13-4648-8 07-1559-4		Mar-23 Feb-23 1	08 Mar- 3:00 09 Feb-		21d 14h 49d 1h	Eco-	Analysts, I	nc. Di	redged Sed	ment Evalu
Sample Code	Material 1	Гуре		Sample Sourc	e	Sta	tion Locati	on	Lat/Long		
IOSN 2019	Reference	sediment		Yachtsman Ma	rina NAE-20	04-00 105	SN Reference	e			
AT3-098	Marine Se	diment		Yachtsman Ma	rina NAE-20	04-00 10	Stations at 4	1 Marinas I	Mu		
Data Transfor	rm	Alt Hyp				Comparis	on Result				PMSD
Untransformed	d	C < T				AT3-098 f	ailed benzo	k)fluoranth	nene endpoin	nt	118.39%
	ce t Two-Sample vs Sample II		f Test S	tat Critical	MSD	P-Type	P-Value	Decisio	n(α:5%)		
Reference Sec	d AT3-098*	8	2.74	1.86	0.538	CDF	0.0128	Significa	nt Effect		
Auxiliary Test	ts										
					Test Stat	Critical	D 1/-1	Daalala	a/av.E0/ \		
Attribute	Test				i est otat	Cittical	P-Value	Decisio	1(α:5%)		
Outlier		xtreme Va	lue Test		2.07	2.29	0.1724		ers Detected		
	Grubbs E	extreme Va	lue Test						<u> </u>		
Outlier	Grubbs E			Square					ers Detected		
Outlier  ANOVA Table	Grubbs E				2.07	2.29	0.1724	No Outlie	ers Detected		
Outlier  ANOVA Table Source	Grubbs E Sum Squ		Mean	35	2.07 <b>DF</b> 1	2.29 F Stat	0.1724 P-Value	No Outlie	ers Detected		
Outlier  ANOVA Table Source Between	Grubbs E  Sum Squ  1.56935		<b>Mean</b> 1.5693	35	2.07 <b>DF</b>	2.29 F Stat	0.1724 P-Value	No Outlie	ers Detected		
Outlier  ANOVA Table Source Between Error Total	Sum Squ 1.56935 1.67676		<b>Mean</b> 1.5693	35	2.07 <b>DF</b> 1	2.29 F Stat	0.1724 P-Value	No Outlie	ers Detected		
Outlier  ANOVA Table Source Between Error Total	Sum Squ 1.56935 1.67676 3.24611		<b>Mean</b> 1.5693	35	2.07 <b>DF</b> 1	F Stat 7.49 Critical	0.1724 P-Value	No Outlie	n(α:5%) nt Effect		
Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	Sum Squ 1.56935 1.67676 3.24611 mptions Tests Test Variance I	ares	Mean 1.5693 0.2095	95 95	2.07  DF  1 8 9  Test Stat 7.85	2.29  F Stat 7.49  Critical 23.2	P-Value 0.0256  P-Value 0.0709	Decision  Decision  Decision  Equal Va	n(α:5%) nt Effect n(α:1%) ariances		
Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute	Sum Squ 1.56935 1.67676 3.24611 mptions Tests Test Variance I	ares	Mean 1.5693 0.2095	95 95	2.07  DF  1 8 9	F Stat 7.49 Critical	0.1724  P-Value 0.0256  P-Value	Decision  Decision  Decision  Equal Va	n(α:5%) nt Effect		
Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution	Sum Squ 1.56935 1.67676 3.24611 mptions Tests Test Variance I	ares Ratio F Tes /ilk W Norr	Mean 1.5693 0.2095	95 95	2.07  DF  1 8 9  Test Stat 7.85	2.29  F Stat 7.49  Critical 23.2 0.741	P-Value 0.0256  P-Value 0.0709	Decision  Decision  Decision  Equal Va	n(α:5%) nt Effect n(α:1%) ariances Distribution		
Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Benzo(k)fluor Sample	Sum Squ 1.56935 1.67676 3.24611  mptions Tests Test Variance I Shapiro-W	ares  Ratio F Tes  /ilk W Norr  ary  Count	Mean 1.5693 0.2095	t 95% LCL	2.07  DF  1 8 9  Test Stat 7.85 0.899  95% UCL	2.29  F Stat 7.49  Critical 23.2 0.741  Median	P-Value 0.0256  P-Value 0.0709 0.2138	Decision Significa  Decision Equal Va Normal I	n(α:5%) nt Effect n(α:1%) ariances Distribution Std Err	CV%	%Effect
Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Benzo(k)fluor Sample IOSN 2019	Sum Squ 1.56935 1.67676 3.24611  mptions Tests Test Variance I Shapiro-W	ares  Ratio F Tes  /ilk W Norr  ary  Count  5	Mean 1.5693 0.2095  st mality Tes  Mean 0.455	95% LCL 0.185	2.07  DF  1 8 9  Test Stat 7.85 0.899  95% UCL 0.725	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	Decision Significa  Decision Equal Va Normal I	n(a:5%) nt Effect  n(a:1%) ariances Distribution  Std Err  0.0973	<b>CV%</b> 47.86%	0.00%
Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Benzo(k)fluor Sample	Sum Squ 1.56935 1.67676 3.24611  mptions Tests Test Variance I Shapiro-W	ares  Ratio F Tes  /ilk W Norr  ary  Count	Mean 1.5693 0.2095	t 95% LCL	2.07  DF  1 8 9  Test Stat 7.85 0.899  95% UCL	2.29  F Stat 7.49  Critical 23.2 0.741  Median	P-Value 0.0256  P-Value 0.0709 0.2138	Decision Significa  Decision Equal Va Normal I	n(α:5%) nt Effect n(α:1%) ariances Distribution Std Err	CV%	0.00%
Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Benzo(k)fluor Sample IOSN 2019 AT3-098	Sum Squ 1.56935 1.67676 3.24611  mptions Tests Test Variance I Shapiro-W	ares  Ratio F Tes  /ilk W Norr  ary  Count  5	Mean 1.5693 0.2095  st mality Tes  Mean 0.455	95% LCL 0.185	2.07  DF  1 8 9  Test Stat 7.85 0.899  95% UCL 0.725	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	Decision Significa  Decision Equal Va Normal I	n(a:5%) nt Effect  n(a:1%) ariances Distribution  Std Err  0.0973	<b>CV%</b> 47.86%	0.00%
Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute  Variance Distribution  Benzo(k)fluor Sample IOSN 2019 AT3-098	Sum Squ 1.56935 1.67676 3.24611  mptions Tests	ares  Ratio F Tes  /ilk W Norr  ary  Count  5	Mean 1.5693 0.2095  st mality Tes  Mean 0.455	95% LCL 0.185	2.07  DF  1 8 9  Test Stat 7.85 0.899  95% UCL 0.725	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	Decision Significa  Decision Equal Va Normal I	n(a:5%) nt Effect  n(a:1%) ariances Distribution  Std Err  0.0973	<b>CV%</b> 47.86%	0.00%
Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Benzo(k)fluor Sample IOSN 2019 AT3-098  Benzo(k)fluor	Sum Squ 1.56935 1.67676 3.24611  mptions Tests	ares  Ratio F Tes /ilk W Norr  ary  Count 5 5	Mean 3 1.5693 0.2095 st mality Tes Mean 0.455 1.25	95% LCL 0.185 0.49	2.07  DF  1 8 9  Test Stat 7.85 0.899  95% UCL 0.725 2	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	Decision Significa  Decision Equal Va Normal I	n(a:5%) nt Effect  n(a:1%) ariances Distribution  Std Err  0.0973	<b>CV%</b> 47.86%	

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	, , , , , ,						Test Co	de/ID:	TN-23-303	MnPAH / 1	3-3685-4237
Bioaccumula	tion Evaluation	n - PAHs - I	Macoma							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> ı	ndpoint: nalysis: 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: 26 Apr-23 12:4 27d 23h	47 <b>P</b> ı 17 <b>S</b> ı	est Type: rotocol: pecies: axon:	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	ample Dat	e Receipt	t Date	Sample Ag	e Clier	nt Name	Pı	oject	
IOSN 2019 AT3-098	13-4648 07-1559		3 Mar-23 3 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 Location	on	Lat/Long		
IOSN 2019 AT3-098		ce sedimen Sediment	t	Yachtsman Ma Yachtsman Ma			SN Referenc 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	mple Test									
Sample I	vs Sample I	Ι (	df Test S	Stat Critical	MSD	P-Type	P-Value	Decision	(α:5%)		
Reference Sec	d AT3-098*	· ;	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											
AT3-098  Chrysene Det	tail										
	tail Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
Chrysene Det		<b>Rep 1</b> 0.545	Rep 2 0.56 2.49	<b>Rep 3</b> 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

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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	alysis:	Fluorene Parametric-Tw 50355D2D139		2D52468F3	State	IS Versionus Level:	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	st Type: otocol: ecies: xon:	Bioaccumulation US ACE NED I Macoma nasut Bivalvia	RIM (2004)		Anal Dilu Brin Sou	ent: No	ancy Roka ot Applicable ot Applicable RO - Aquatic	Research C	or <b>Age:</b>
Sample Code IOSN 2019 AT3-098	<b>Sample I</b> 13-4648-6 07-1559-6	3170 08	mple Date Mar-23 Feb-23 1	08 Mar	-23	<b>Sample Ag</b> 21d 14h 49d 1h		nt Name Analysts,		roject redged Sed	iment Evalu
Sample Code IOSN 2019 AT3-098	Material Reference Marine Se	e sediment		Sample Source Yachtsman Ma Yachtsman Ma	rina NAE-20	004-00 108	ation Location Reference	е	<b>Lat/Long</b> Mu		
Data Transfor	m	Alt Hyp				Comparis	son Result				PMSD
Untransformed		C < T				AT3-098 f	ailed fluorer	ne endpoir	nt		374.23%
	vs Sample II AT3-098*			Stat Critical 2.13	<b>MSD</b> 0.945	<b>P-Type</b> CDF	<b>P-Value</b> 0.0143	<b>Decisio</b> Significa	n(α:5%) ant Effect		
Auxiliary Test Attribute	Test		bee Teek		Test Stat		P-Value		n(α:5%)		
Outlier  ANOVA Table	Grubbs i	Extreme Va	liue l'est		1.91	2.29	0.3362	No Outil	ers Detected		
Source	Sum Sqւ	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		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	<u> </u>										
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					

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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 nasut	a		Brine		ot Applicable		
Test Length:	27d 23h	Ta	xon:	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, l	Inc. D	redged Sed	iment 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	Reference	e sediment		Yachtsman Ma			SN Referenc	е			
AT3-098	Marine Se	ediment		Yachtsman Ma	ırina 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									
	s Sample II	•	f Test S	tat Critical	Ties	P-Type	P-Value	Decisio	n(a:5%)		
						, , , , ,			(4 70)		
Reference Sed		8	40		0	Exact	1.0000	Non-Sig	nificant Effect	t	
Reference Sed	AT3-098	8	40		0	Exact	1.0000	Non-Sig	nificant Effec	t	
•	AT3-098	8	40		0 Test Stat		1.0000 P-Value		nificant Effect	t	
Reference Sed  Auxiliary Tests	AT3-098  Test	8 Extreme Va							n(α:5%)	t	
Reference Sed  Auxiliary Tests  Attribute	AT3-098  Test				Test Stat	Critical	P-Value	Decisio	n(α:5%)	t	
Reference Sed  Auxiliary Tests  Attribute  Outlier	AT3-098  Test	Extreme Va	lue Test	 Square	Test Stat	Critical	P-Value	Decisio	n(α:5%) Detected	t	
Reference Sed  Auxiliary Tests  Attribute  Outlier  ANOVA Table	AT3-098  Test  Grubbs I	Extreme Va	lue Test	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	Extreme Va	lue Test	Square 56	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	Extreme Va	lue Test  Mean  16.345	Square 56	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	Extreme Va	lue Test  Mean  16.345	Square 56	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	Extreme Va	lue Test  Mean  16.345	Square 56	Test Stat 2.32  DF 1 8	Critical 2.29  F Stat 153	P-Value 0.0405 P-Value	Decisio Outlier I  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 I  Sum Squ  16.3456 0.85448 17.2001  Inptions Tests  Test	Extreme Va	Mean 16.348 0.1068	Square 56	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 I  Sum Squ 16.3456 0.85448 17.2001  Inptions Tests Test Variance	Extreme Va	Mean 16.345 0.1068	Square 56 31	Test Stat 2.32  DF 1 8 9  Test Stat	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	AT3-098  Test  Grubbs I  Sum Squ  16.3456 0.85448 17.2001  Inptions Tests  Test  Variance Shapiro-V	Extreme Va	Mean 16.345 0.1068	Square 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	AT3-098  Test  Grubbs I  Sum Squ  16.3456 0.85448 17.2001  Inptions Tests  Test  Variance Shapiro-V	Extreme Va	Mean 16.345 0.1068	Square 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	AT3-098  Test Grubbs I  Sum Squ  16.3456 0.85448 17.2001  Inptions Tests Test Variance Shapiro-V  d)pyrene Sumi	Extreme Valares  Ratio F Tee Vilk W Norr	Mean 16.345 0.1068	Square 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 0.0007	Decisio Significa  Decisio Equal Vanon-Nor	n(α:5%) Detected  n(α:5%) ant Effect  n(α:1%) ariances rmal Distributi	ion	%Effect 0.00%
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 Sumi	Extreme Valares  Ratio F Tes Vilk W Norr  mary  Count	Mean 16.345 0.1066	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 Vanon-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 Sumi	Extreme Valueres  Ratio F Tee Vilk W Norre mary Count 5 5	Mean 16.345 0.1068 st mality Tes  Mean 3.54	Square 56 31 st  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 Outlier E  Decisio Significa  Decisio Equal Vanon-Nore  Max 3.93	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 Sumi	Extreme Valueres  Ratio F Tee Vilk W Norre mary Count 5 5	Mean 16.345 0.1068 st mality Tes  Mean 3.54	Square 56 31 5t 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 Outlier E  Decisio Significa  Decisio Equal Vanon-Nore  Max 3.93	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	Extreme Valuares  Ratio F Tes Vilk W Norr  mary  Count  5 5	Mean 16.345 0.1068 st mality Tes  Mean 3.54 0.985	Square 56 31 5t 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 Outlier E  Decisio Significa  Decisio Equal Vanon-Nore  Max 3.93	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 - M	acoma							EA-ES	Γ, Inc. PBC
	12-2133-3190			Naphthalene			CETI	S Version	ı: CETISv2	2.1.1	
•	19 Aug-23 6:45		•	Parametric-Tw	•			ıs Level:	1		
Edit Date:	08 May-23 22:4	14 <b>M</b> C	5 Hash:	18048F756F90	4A0CF0BB	10D204271	968 Edito	or ID:			
Batch ID:	07-2064-6975	Tes	st Type:	Bioaccumulation	n - PAHs		Analy	yst: Na	ancy Roka		
Start Date:	29 Mar-23 13:4	7 <b>Pr</b>	otocol:	US ACE NED I	RIM (2004)		Dilue	ent: No	ot Applicable		
Ending Date:	•	7 <b>Sp</b>	ecies:	Macoma nasut	а		Brine	e: No	ot Applicable		
Test Length:	27d 23h	Tax	con:	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 Sourc	е	Sta	tion Location	on	Lat/Long		
IOSN 2019	Reference	e sediment		Yachtsman Ma			SN Referenc	е			
AT3-098	Marine Se	ediment		Yachtsman Ma	rina NAE-20	004-00 10	Stations at 4	Marinas I	Mu		
Data Transforr	m	Alt Hyp				Comparis	on Result				PMSD
Untransformed		C < T				AT3-098 f	ailed naphth	alene end	point		53.20%
Unequal Varia	nce t Two-Sam	nple Test									
					MSD	P-Type	P-Value	Decisio	n(a:5%)		
Sample I v	s Sample II	d	f TestS	tat Critical							
Sample I v Reference Sed	AT3-098*	d		tat Critical 2.13	0.207	CDF	7.2E-05	Significa	nt Effect		
Reference Sed	AT3-098*				_			Significa	,		
•	AT3-098*				_	CDF		Significa	int Effect		
Reference Sed  Auxiliary Tests	AT3-098*		14.2		0.207	CDF	7.2E-05	Decision	int Effect		
Reference Sed  Auxiliary Tests  Attribute	AT3-098*	4	14.2		0.207 Test Stat	CDF  Critical	7.2E-05 <b>P-Value</b>	Decision	nt Effect n(α:5%)		
Reference Sed  Auxiliary Tests  Attribute  Outlier	AT3-098*	4 Extreme Va	14.2		0.207 Test Stat	CDF  Critical	7.2E-05 <b>P-Value</b>	Decision	nt Effect n(α:5%) ers Detected		
Auxiliary Tests Attribute Outlier ANOVA Table	AT3-098*  Test  Grubbs I	4 Extreme Va	14.2	2.13 Square	0.207  Test Stat 2.18	CDF  Critical 2.29	7.2E-05  P-Value 0.0978	Decision No Outlie	nt Effect n(α:5%) ers Detected		
Auxiliary Tests Attribute Outlier ANOVA Table Source	AT3-098*  Test  Grubbs I	Extreme Va	14.2	2.13  Square  9	0.207  Test Stat 2.18  DF	Critical 2.29  F Stat	7.2E-05  P-Value 0.0978  P-Value	Decision No Outlie	n(a:5%) ers Detected n(a:5%)		
Reference Sed  Auxiliary Tests  Attribute  Outlier  ANOVA Table  Source  Between	AT3-098*  Test  Grubbs I  Sum Squ  4.73619	Extreme Va	14.2 lue Test  Mean 4.7361	2.13  Square  9	0.207  Test Stat 2.18  DF 1	Critical 2.29  F Stat	7.2E-05  P-Value 0.0978  P-Value	Decision No Outlie	n(a:5%) ers Detected n(a:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error	AT3-098*  Test  Grubbs I  Sum Squ  4.73619  0.189077  4.92527	Extreme Va	14.2 lue Test  Mean 4.7361	2.13  Square  9	0.207  Test Stat 2.18  DF 1 8	Critical 2.29  F Stat	7.2E-05  P-Value 0.0978  P-Value	Decision No Outlie	n(a:5%) ers Detected n(a:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total	AT3-098*  Test  Grubbs I  Sum Squ  4.73619  0.189077  4.92527	Extreme Va	14.2 lue Test  Mean 4.7361	2.13  Square  9	0.207  Test Stat 2.18  DF 1 8	CDF  Critical 2.29  F Stat 200	7.2E-05  P-Value 0.0978  P-Value	Decision No Outlie	n(a:5%) ers Detected n(a:5%) unt Effect		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assum	AT3-098*  Test  Grubbs I  Sum Squ  4.73619  0.189077  4.92527  Inptions Tests  Test	Extreme Va	14.2 lue Test  Mean 4.7361 0.0236	2.13  Square  9	0.207  Test Stat 2.18  DF 1 8 9	CDF  Critical 2.29  F Stat 200	7.2E-05  P-Value 0.0978  P-Value <1.0E-05	Decision  Decision  Significa	n(a:5%) ers Detected n(a:5%) unt Effect		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute	AT3-098*  Test  Grubbs B  Sum Squ  4.73619  0.189077  4.92527  Inptions Tests  Test  Variance	Extreme Va	14.2  lue Test  Mean  4.7361  0.0236	2.13  Square 9 3347	0.207  Test Stat 2.18  DF 1 8 9	CDF  Critical 2.29  F Stat 200  Critical	7.2E-05  P-Value 0.0978  P-Value <1.0E-05	Decision Significa  Decision Unequal	n(a:5%) ers Detected n(a:5%) int Effect		
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  4.7361  0.0236	2.13  Square 9 3347	0.207  Test Stat 2.18  DF 1 8 9  Test Stat 338	Critical 2.29  F Stat 200  Critical 23.2	7.2E-05  P-Value 0.0978  P-Value <1.0E-05  P-Value 5.2E-05	Decision Significa  Decision Unequal	n(a:5%) ers Detected n(a:5%) int Effect n(a: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  4.7361  0.0236	2.13  Square 9 3347	0.207  Test Stat 2.18  DF 1 8 9  Test Stat 338	CDF  Critical 2.29  F Stat 200  Critical 23.2 0.741	7.2E-05  P-Value 0.0978  P-Value <1.0E-05  P-Value 5.2E-05	Decision Significa  Decision Unequal	n(a:5%) ers Detected n(a:5%) int Effect n(a:1%) Variances	CV%	%Effect
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  Naphthalene S	AT3-098*  Test  Grubbs I  Sum Squ  4.73619  0.189077  4.92527  Inptions Tests  Test  Variance Shapiro-V  Summary	Extreme Va	Mean 4.7361 0.0236	2.13  Square 9 3347	0.207  Test Stat 2.18  DF 1 8 9  Test Stat 338 0.903	CDF  Critical 2.29  F Stat 200  Critical 23.2 0.741	7.2E-05  P-Value 0.0978  P-Value <1.0E-05  P-Value 5.2E-05 0.2387	Decision Significa  Decision Unequal Normal I	n(a:5%) ers Detected n(a:5%) ent Effect n(a:1%) Variances Distribution		%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*  Test  Grubbs I  Sum Squ  4.73619  0.189077  4.92527  Inptions Tests  Test  Variance Shapiro-V  Summary  Code	Extreme Va  Jares  Ratio F Tes  Vilk W Norr	Mean 4.7361 0.0236	2.13  Square 9 6347	0.207  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	7.2E-05  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 [	n(a:5%) ers Detected n(a:5%) ant Effect  n(a:1%) Variances Distribution	CV%	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*  Test  Grubbs I  Sum Squ  4.73619  0.189077  4.92527  Inptions Tests  Test  Variance Shapiro-V  Summary  Code  RS	Extreme Va	Mean 4.7361 0.0236 st nality Tes  Mean 0.39	2.13  Square 9 6347  t  95% LCL 0.375	0.207  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	7.2E-05  P-Value 0.0978  P-Value <1.0E-05  P-Value 5.2E-05 0.2387  Min 0.378	Decision Significa  Decision Unequal Normal I  Max 0.406	n(a:5%) ers Detected n(a:5%) int Effect  n(a:1%) Variances Distribution  Std Err 0.00528	CV% 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*  Test  Grubbs I  Sum Squ  4.73619  0.189077  4.92527  Inptions Tests  Test  Variance Shapiro-V  Summary  Code  RS	Extreme Va	Mean 4.7361 0.0236 st nality Tes  Mean 0.39	2.13  Square 9 6347  t  95% LCL 0.375	0.207  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	7.2E-05  P-Value 0.0978  P-Value <1.0E-05  P-Value 5.2E-05 0.2387  Min 0.378	Decision Significa  Decision Unequal Normal I  Max 0.406	n(a:5%) ers Detected n(a:5%) int Effect  n(a:1%) Variances Distribution  Std Err 0.00528	CV% 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*  Test  Grubbs B  Sum Squ  4.73619  0.189077  4.92527  Inptions Tests  Test  Variance Shapiro-V  Code  RS  Detail	Extreme Va  uares  Ratio F Tes  Vilk W Norr  Count  5  5	14.2    Mean	2.13  Square 9 3347  t  95% LCL 0.375 1.5	0.207  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	7.2E-05  P-Value 0.0978  P-Value <1.0E-05  P-Value 5.2E-05 0.2387  Min 0.378	Decision Significa  Decision Unequal Normal I  Max 0.406	n(a:5%) ers Detected n(a:5%) int Effect  n(a:1%) Variances Distribution  Std Err 0.00528	CV% 3.03%	

Report Date: Test Code/ID:

19 Aug-23 06:45 (p 15 of 16) TN-23-303MnPAH / 13-3685-4237

	Endpo Analy: MD5 H Test 1 Proto: Speci Taxon Samp 08 Ma 08 Fel	oint: Phesis: Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Paragrams Pa	nenanthrene arametric-Two AB9E6A0C2E Daccumulatio S ACE NED F acoma nasuta valvia  Receipt 08 Mar- 00 09 Feb-	5AB41C2FA on - PAHs RIM (2004) a t Date 23 23 16:30	<b>Sample Ag</b> 21d 14h 49d 1h	Statu A4D2 Edito Anal Dilue Brind Sour	ent: No e: No	1 ancy Roka ot Applicable ot Applicable RO - Aquatic	2.1.1 Research C	or Age:
Mar-23 13:47 Apr-23 12:47 I 23h  Sample ID 13-4648-8170 07-1559-4974  Material Type Reference sedir Marine Sedimer  Alt	Proto- Speci Taxon Samp 08 Ma 08 Fel	icol: US ies: Ma i: Biv ble Date ar-23 b-23 13:0 Sa Ya	Receipt 08 Mar- 00 09 Feb-	t Date 23 23 16:30	21d 14h 49d 1h	Dilue Brine Sour e Clier	ent: No e: No rce: AF	ot Applicable ot Applicable RO - Aquatic	roject	
13-4648-8170 07-1559-4974 Material Type Reference sedir Marine Sedimer	08 Ma 08 Fel	ar-23 b-23 13:0 <b>Sa</b> Ya	08 Mar- 00 09 Feb- umple Source	23 23 16:30	21d 14h 49d 1h				•	ment Evalu
Reference sedir Marine Sedimer	nt	Ya	•	е	C+c					
Reference sedir Marine Sedimer	nt	Ya	•		Sid	tion Locati	on	Lat/Long		
	Нур		achtsman Ma		04-00 105	SN Reference	е			
					Comparis	on Result				PMSD
C \					•		nthrene en	ıdpoint		155.52%
Sample II	df			MSD	P-Type	P-Value		• •		
A13-098*	4 .	3.44	2.13	3.07	CDF	0.0132	Significa	пт Епест		
Test				Test Stat	Critical	P-Value	Decisio	n(α:5%)		
Grubbs Extrem	ie Value	Test		1.76	2.29	0.5686	No Outli	ers Detected		
Sum Squares		Mean Sq	uare	DF	F Stat	P-Value	Decision	n(α:5%)		
61.2563		61.2563		1	11.8	0.0089	Significa	int Effect		
41.475	;	5.18438		8	_					
102.731				9						
ons Tests										
Test				Test Stat	Critical	P-Value	Decisio	n(α:1%)		
Variance Ratio	F Test			50.9	23.2	0.0022	Unequal	Variances		
Shapiro-Wilk W	Normal	ity Test		0.908	0.741	0.2657	Normal [	Distribution		
mmary										
Code Cou	unt	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
RS 5		1.97	1.42	2.53	2.23	1.3	2.31	0.2	22.63%	0.00%
5	(	6.92	2.96	10.9	4.86	4.23	10.7	1.43	46.06%	-250.76%
tail										
	1	Rep 2	Rep 3	Rep 4	Rep 5					
					_					
	C < Total Two-Sample Total Sample II  AT3-098*  Test  Grubbs Extrem  Sum Squares 61.2563 41.475 102.731  ons Tests  Test  Variance Ratio Shapiro-Wilk W  mmary  Code  Cou  RS  5  5  tail  Code  Rep  RS  1.73	Test Grubbs Extreme Value  Sum Squares 61.2563 41.475 102.731  ons Tests  Test  Variance Ratio F Test Shapiro-Wilk W Normal  mmary  Code Count  RS 5 5  tail  Code Rep 1  RS 1.73	C < T	C < T   Sample II	C < T         At Two-Sample Test         Sample II       df       Test Stat       Critical       MSD         AT3-098*       4       3.44       2.13       3.07         Test       Test Stat         Grubbs Extreme Value Test       1.76         Sum Squares       Mean Square       DF         61.2563       61.2563       1         41.475       5.18438       8         102.731       9         ons Tests         Test       Test Stat         Variance Ratio F Test       50.9         Shapiro-Wilk W Normality Test       50.9         Shapiro-Wilk W Normality Test       95% LCL       95% UCL         RS       5       1.97       1.42       2.53         5       6.92       2.96       10.9         tail         Code       Rep 1       Rep 2       Rep 3       Rep 4         RS       1.73       2.3       2.31       2.23	C < T	C < T	C < T	Transparse   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fraction   Fract	C < T   AT3-098 failed phenauthrene endpoint

**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)

#### 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 U	0.0466 <mark>U</mark>	0.0458 <mark>U</mark>		
PCB 28	0.0780 U	0.0790 <b>U</b>	0.0780 U		
PCB 44	0.0870 U	0.0880 <del>U</del>	0.0870 U		
PCB 52	1.83	2.74	1.71		
PCB 66	0.0455 U	0.0462 <mark>U</mark>	0.0455 <mark>U</mark>		
PCB 101	0.0740 U	0.0755 <mark>U</mark>	0.0740 U		
PCB 105	0.0665 <mark>U</mark>	0.0675 <mark>U</mark>	0.0665 <mark>U</mark>		
PCB 118	0.0705 U	0.0715 <b>U</b>	0.0705 <mark>U</mark>		
PCB 128	0.0830 U	0.0845 <mark>U</mark>	0.0830 U		
PCB 138	1.07	0.0540 <b>U</b>	0.0530 U		
PCB 153	0.111 <mark>U</mark>	0.113 <mark>U</mark>	0.111 <mark>U</mark>		
PCB 170	0.0408 U	0.0414 <b>U</b>	0.0408 <mark>U</mark>		
PCB 180	0.0417 U	0.0424 U	0.0417 <mark>U</mark>		
PCB 187	0.0600 U	0.0610 U	0.0600 <mark>U</mark>		
PCB 195	0.0785 U	0.0795 <b>U</b>	0.0780 U		
PCB 206	0.0800 <b>U</b>	0.0810 U	0.0800 U		
PCB 209	0.0915 <mark>U</mark>	0.0930 <mark>U</mark>	0.0915 <mark>U</mark>		
Total PCBs	8.03	7.85	5.76		

^{* =} 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)

			IOSN Reference		
CONTAMINANT	REP1	REP2	REP3	REP4	REP5
PCB Congeners (ng/g wet wt					
PCB 8	0.0465 U	0.0475 U	0.0455 <mark>U</mark>	0.0485 <mark>U</mark>	0.0455 <mark>U</mark>
PCB 18	0.0340 U	0.0345 U	0.0330 <mark>U</mark>	0.0355 U	0.0330 <mark>U</mark>
PCB 28	0.0575 U	0.0590 U	0.0565 <mark>U</mark>	0.0600 U	0.0560 <mark>U</mark>
PCB 44	0.0640 U	0.0655 U	0.0630 U	0.0670 U	0.0625 <mark>U</mark>
PCB 52	0.0355 U	0.0365 <mark>U</mark>	0.0350 <del>U</del>	0.0375 U	0.0350 <mark>U</mark>
PCB 66	0.0335 U	0.0345 U	0.0330 <mark>U</mark>	0.0350 U	0.0330 <mark>U</mark>
PCB 101	0.0545 U	0.0560 U	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 <mark>U</mark>
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 U	0.0800 <del>U</del>	0.0855 U	0.0795 <mark>U</mark>
PCB 170	0.0300 U	0.0310 U	0.0295 U	0.0315 U	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 <mark>U</mark>	0.0605 <mark>U</mark>	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 U	0.0690 U	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

^{* =} Qualifiers

U Analyte not detected; belov

J Analyte estimated; detectio

NA Not Analyzed

#### 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 <mark>U</mark>	0.0635 U	0.0650 U
PCB 18	0.0453 <mark>U</mark>	0.0467 <mark>U</mark>	0.0469 <mark>U</mark>	0.0464 U	0.0475 U
PCB 28	0.0770 U	0.0795 <mark>U</mark>	0.0795 <mark>U</mark>	0.0790 U	0.0805 <mark>U</mark>
PCB 44	0.0860 U	0.0885 <mark>U</mark>	0.0890 <mark>U</mark>	0.0880 <del>U</del>	0.0900 U
PCB 52	0.0479 U	0.0492 <mark>U</mark>	0.0495 <mark>U</mark>	0.662	0.0500 U
PCB 66	0.0450 U	0.0463 U	0.0465 <mark>U</mark>	0.0460 U	0.0471 <b>U</b>
PCB 101	0.0735 <mark>U</mark>	0.0755 <mark>U</mark>	0.0760 U	0.0750 U	0.0770 U
PCB 105	0.0660 U	0.0675 U	0.0680 <mark>U</mark>	0.0670 U	0.0690 U
PCB 118	0.0695 <mark>U</mark>	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 <mark>U</mark>	0.0545 <mark>U</mark>	0.0535 <mark>U</mark>	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 <mark>U</mark>	0.0415 <mark>U</mark>	0.0416 <mark>U</mark>	0.0412 <mark>U</mark>	0.0422 U
PCB 180	0.0412 U	0.0424 <mark>U</mark>	0.0426 U	0.0422 U	0.0432 U
PCB 187	0.0590 U	0.0610 <mark>U</mark>	0.0610 U	0.0605 U	0.0620 U
PCB 195	0.0775 U	0.0795 <mark>U</mark>	0.0800 <mark>U</mark>	0.0790 <mark>U</mark>	0.0810 <mark>U</mark>
PCB 206	0.0790 U	0.0810 U	0.0815 <mark>U</mark>	0.0810 U	0.0825 <mark>U</mark>
PCB 209	0.0905 <mark>U</mark>	0.0930 U	0.0935 <mark>U</mark>	0.0925 <mark>U</mark>	0.0950 U
Total PCBs	2.41	3.18	2.49	3.98	2.52

^{* =} Qualifiers

U Analyte not detected; belov

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 Dato: 20 mai 20 maionain Dato dato, Coming Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common C					Campio Canoni Lassiani, Como																				
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	

19 Aug-23 06:48 (p 1 of 5) Report Date: TN-23-303MnPCB / 17-0778-2871 Test Code/ID:

#### **Bioaccumulation Evaluation - PCB Congeners - Macoma**

EA-EST, Inc. PBC

Batch ID: Start Date: Ending Date: Test Length:	14-7703-1847 29 Mar-23 13:48 26 Apr-23 12:48 27d 23h	Test Type: Protocol: Species: Taxon:	Bioaccumulation - PCBs US ACE NED RIM (2006 Macoma nasuta Bivalvia	Analyst: Diluent: Brine: Source:	Nancy Roka Not Applica Not Applica ARO - Aqua	ble	
Sample ID: Sample Date: Receipt Date: Sample Age:	20 Mar-23 16:00	Code: Material: CAS (PC): Client:	AT3-191 Laboratory Control Sedi Eco-Analysts, Inc.	Project: Source: Station:	J	ediment Evaluation Marina NAE-2004-00319 ( Control	
Sample Code	Sample ID	Sample Da	te Receipt Date	Sample Age	Client Nan	ne	Project
IOSN 2019	13-4648-8170	08 Mar-23	08 Mar-23	21d 14h	Eco-Analys	sts, Inc.	Dredged Sediment Evalu

AT3-098	07-1559-4974 0	08 Feb-23 13:00	09 Feb-23 16:30	49d 1h			
Sample Code	Material Type	Samp	le Source		Station Location	Lat/Long	
IOSN 2019	Reference sedime	nt Yacht	sman Marina NAE-20	04-00	IOSN Reference		
AT3-098	Marine Sediment	Yachts	sman Marina NAE-20	04-00	10 Stations at 4 Marinas Mu	J	

Single Compa	Single Comparison 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	1						
16-3276-0407	PCB 018	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 018	1						
13-9608-7387	PCB 028	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 028	1						
19-3839-9687	PCB 044	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 044	1						
05-0591-9058	PCB 052	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 052	1						
09-3696-3646	PCB 052	Wilcoxon Rank Sum Two-Sample Test	0.0040	AT3-098 failed pcb 052	1						
14-5817-1474	PCB 066	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 066	1						
14-9269-7357	PCB 101	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 101	1						
04-1507-5714	PCB 105	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 105	1						
20-1325-5525	PCB 118	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 118	1						
11-1662-6316	PCB 118	Wilcoxon Rank Sum Two-Sample Test	0.0040	AT3-098 failed pcb 118	1						
11-7225-5352	PCB 128	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 128	1						
09-9129-8390	PCB 138	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 138	1						
10-1176-5480	PCB 153	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 153	1						
08-1735-4110	PCB 153	Wilcoxon Rank Sum Two-Sample Test	0.0040	AT3-098 failed pcb 153	1						
12-8292-6359	PCB 170	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 170	1						
15-8865-0666	PCB 180	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 180	1						
01-5676-1440	PCB 187	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 187	1						
02-4694-1435	PCB 195	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 195	1						
03-3708-3472	PCB 206	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 206	1						
08-3719-0550	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 06:48 (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

Bioaccamalatic			9								, 1 20
PCB 153 Summ	nary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.082	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	nary										
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	nary										
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	nary										
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	nary										
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	nary										
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	nary										
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

Bloaccumulation Evaluation - PCB Congeners - Macoma EA-E51, Inc. PBC	Bioaccumulation Evaluation - PCB Congeners - Macoma	EA-EST, Inc. PBC
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PCB 008 Detail							MD5: 9C603D30B16A57D426E738700F73B519
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.0465	0.0475	0.0455	0.0485	0.0455	
AT3-098		0.0625	0.064	0.0645	0.0635	0.065	
PCB 018 Detail							MD5: DD9BEDC40F682A4349BA0136904F97C7
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.034	0.0345	0.033	0.0355	0.033	
AT3-098		0.0453	0.0466	0.0468	0.0463	0.0474	
PCB 028 Detail							MD5: 786773990FB8BBB1B08C3594EEA9CE4D
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.0575	0.059	0.0565	0.06	0.056	
AT3-098		0.077	0.0795	0.0795	0.079	0.0805	
PCB 044 Detail							MD5: D2EFAD9773BDE40510B0CEAEF31B9A2I
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.064	0.0655	0.063	0.067	0.0625	
AT3-098		0.086	0.0885	0.089	0.088	0.09	
PCB 052 Detail							MD5: 936FDE147307595B0DD61AD9E6253183
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.0355	0.0365	0.035	0.0375	0.035	
AT3-098		0.0479	0.0492	0.0494	0.662	0.05	
PCB 066 Detail							MD5: 7A24F9E788E803B4DB65AED846AE44FA
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	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
Sample	Code	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
Sample	Code	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
Sample	Code	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	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	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	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	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**

Report Date: Test Code/ID: 19 Aug-23 06:48 (p 5 of 5) TN-23-303MnPCB / 17-0778-2871

Bioaccumulation	Evaluation	n - 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: 4BD0DE09D74BAE601C1618D06FEEEE3D
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	

MD5: 927A5DA40F4466C5BFC0586882D4BFFD

AT3-098

Sample

AT3-098

IOSN 2019

PCB 209 Detail

0.079

Rep 1

0.0675

0.0905

Code

RS

0.081

Rep 2

0.069

0.093

0.0815

Rep 3

0.0665

0.0935

0.081

Rep 4

0.071

0.0925

0.0825

Rep 5

0.066

0.095

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	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  Signification  Decisio  Equal Value  Signification	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  Signification  Decisio  Equal Value  Signification	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	M 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	8 23  MM 0. 1.	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 Detection(α:5%) cant Effect ion(α:1%) Variances al Distribution	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		n(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			0.0014 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  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  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 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 Euro	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					

**Report Date:** 19 Aug-23 06:48 (p 7 of 18) **Test Code/ID:** TN-23-303MnPCB / 17-0778-2871

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  Test Stat	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  squares  404 187 591 ss  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 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 Significa  Decision Equal Va Normal E	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 Significa  Decision Equal Va Normal E	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 Significa  Decision Equal Va Normal E	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  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  ers Detected  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 0.0000138 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%) ent Effect  a(α:1%) riances distribution  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 0.0000138 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%) ent Effect  a(α:1%) riances distribution  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%) ent Effect  a(α:1%) riances distribution  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 1.7256  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%) ent Effect  a(α:1%) riances distribution  Std Err  0.000663	3.01%	0.00%

Report Date: Test Code/ID: TN-23

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		-					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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Bioaccumulat	ion Evaluation	- PCB Cor	igeners - N	lacoma						EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	11-7225-5352 19 Aug-23 6:48 08 May-23 22:	B An	•	CB 128 Parametric-Two 5B5447611C0		6548680698	Statu	S Version is Level: or ID:	ı: CETISv2. 1	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	14-7703-1847 29 Mar-23 13:4 26 Apr-23 12:4 27d 23h	18 <b>Pr</b> 8 <b>Sp</b>	otocol: l ecies: M	lioaccumulatio IS ACE NED F Iacoma nasuti ivalvia	RIM (2004)	Иn	Analy Dilue Brine Sour	ent: No e: No	ncy Roka ot Applicable ot Applicable RO - Aquatic F	Research (	Or <b>Age:</b>
Sample Code	Sample	ID Sa	mple Date	Receip	t Date	Sample Age	e Clien	t Name	Pr	oject	
IOSN 2019 AT3-098	13-4648- 07-1559-	8170 08	Mar-23 Feb-23 13	08 Mar-	23	21d 14h 49d 1h		Analysts, I		•	liment Evalu
Sample Code	Material	Туре	5	ample Sourc	е	Sta	tion Location	on	Lat/Long		
IOSN 2019	Reference	e sediment	١	achtsman Ma	rina NAE-20	04-00 IOS	N Referenc	е			
AT3-098	Marine S	ediment	١	achtsman Ma	rina NAE-20	04-00 10	Stations at 4	Marinas I	Mu		
Data Transfor	m	Alt Hyp				Comparis	on Result				PMSD
Untransformed	I	C < T				AT3-098 fa	ailed pcb 12	8 endpoin	t		3.17%
<b>Equal Variance</b>	e t Two-Samp	le Test				D. T	P-Value	Decision	a/a: <b>5</b> 9/ )		
Sample I Reference Sed	Sample II		f Test St 21.6	1.86	<b>MSD</b> 0.00195	P-Type CDF	<1.0E-05	Significa	` '		
Reference Sed Auxiliary Test Attribute	AT3-098* s Test	8	21.6		0.00195  Test Stat	CDF  Critical	<1.0E-05	Significa	nt Effect n(α:5%)		
Reference Sed  Auxiliary Test  Attribute  Outlier	AT3-098*  S  Test  Grubbs		21.6		0.00195	CDF	<1.0E-05	Significa	nt Effect		
Reference Sed Auxiliary Test Attribute	AT3-098*  S  Test  Grubbs	8 Extreme Va	21.6	1.86	0.00195  Test Stat	CDF  Critical	<1.0E-05  P-Value 1.0000  P-Value	Significa	nt Effect n(α:5%) ers Detected		
Auxiliary Test Attribute Outlier ANOVA Table	AT3-098*  S  Test  Grubbs	Extreme Vaures 32	21.6	1.86 quare	0.00195  Test Stat 1.54	CDF  Critical 2.29	<1.0E-05  P-Value 1.0000	Decision No Outlie	nt Effect n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	Sum Sqi 0.001288 0.0001210	Extreme Vaures 32	21.6  lue Test  Mean S  0.00128	1.86 quare	0.00195  Test Stat 1.54  DF 1 8	Critical 2.29  F Stat	<1.0E-05  P-Value 1.0000  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	Sum Sqi 0.001288 0.0001210	Extreme Vaures 32	21.6  lue Test  Mean S  0.00128	1.86 quare	0.00195  Test Stat 1.54  DF 1 8	CDF  Critical 2.29  F Stat 468	<1.0E-05  P-Value 1.0000  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	S Test Grubbs Sum Sqi 0.001288 0.000022 0.001310 mptions Tests Test	Extreme Vaures 32	21.6 lue Test  Mean S 0.00128 2.75E-0	1.86 quare	0.00195  Test Stat 1.54  DF 1 8 9	CDF  Critical 2.29  F Stat 468	<1.0E-05  P-Value 1.0000  P-Value <1.0E-05	Decision No Outlie  Decision Significa	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	S Test Grubbs  Sum Sqi 0.001288 0.000022 0.001310  mptions Tests Test Variance	Extreme Valuares 32 2	21.6  lue Test  Mean S 0.00128 2.75E-0	1.86 quare	0.00195  Test Stat 1.54  DF 1 8 9	Critical 2.29  F Stat 468  Critical	P-Value 1.0000 P-Value <1.0E-05	Decision Significa  Decision Significa  Decision 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	s Test Grubbs Sum Sqi 0.001288 0.000022 0.001310 mptions Tests Test Variance Shapiro-	Extreme Valuares 32 2 02 Ratio F Tes	21.6  lue Test  Mean S 0.00128 2.75E-0	1.86 quare	0.00195  Test Stat 1.54  DF 1 8 9  Test Stat 1.5	Critical 2.29  F Stat 468  Critical 23.2	P-Value 1.0000 P-Value <1.0E-05 P-Value 0.7040	Decision Significa  Decision Significa  Decision Equal Va	nt Effect  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	s Test Grubbs Sum Sqi 0.001288 0.000022 0.001310 mptions Tests Test Variance Shapiro-	Extreme Valuares 32 2 02 Ratio F Tes	21.6  lue Test  Mean S 0.00128 2.75E-0	1.86 quare	0.00195  Test Stat 1.54  DF 1 8 9  Test Stat 1.5 0.964	Critical 2.29  F Stat 468  Critical 23.2 0.741	P-Value 1.0000 P-Value <1.0E-05 P-Value 0.7040	Decision Significa  Decision Significa  Decision Equal Va	nt Effect  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 PCB 128 Sum	s Test Grubbs Sum Sqi 0.001288 0.000022 0.001310 mptions Tests Test Variance Shapiro-	Extreme Va  uares 32 2 02 Ratio F Tes Wilk W Norr	21.6  Nean S 0.00128 2.75E-0	1.86 quare .82 6	0.00195  Test Stat 1.54  DF 1 8 9  Test Stat 1.5 0.964	Critical 2.29  F Stat 468  Critical 23.2 0.741	P-Value 1.0000 P-Value <1.0E-05  P-Value 0.7040 0.8284	Decision  Decision  Significa  Decision  Equal Va  Normal [	nt Effect  n(α:5%) ers Detected  n(α:5%) nt Effect  n(α:1%) ariances Distribution	<b>CV%</b> 2.95%	%Effect 0.00%
Reference Sed Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 128 Sum Sample	s Test Grubbs Sum Sqi 0.001288 0.000022 0.001310 mptions Tests Test Variance Shapiro- mary Code	Extreme Va  uares 32 2 D2 Ratio F Tes Wilk W Norr	21.6  Iue Test  Mean S 0.00128 2.75E-0	1.86 quare .82 6	0.00195  Test Stat 1.54  DF 1 8 9  Test Stat 1.5 0.964	Critical 2.29  F Stat 468  Critical 23.2 0.741  Median	P-Value 1.0000 P-Value <1.0E-05  P-Value 0.7040 0.8284  Min	Decision No Outlie Decision Significa  Decision Equal Va Normal [	nt Effect  n(α:5%) ers Detected  n(α:5%) nt Effect  n(α:1%) eriances Distribution  Std Err		
Reference Sed Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 128 Sum Sample IOSN 2019	S Test Grubbs  Sum Squ 0.001288 0.000022 0.001310  mptions Tests Test Variance Shapiro- mary Code RS	Extreme Va  uares 32 2 02 Ratio F Tes Wilk W Norr  Count 5	21.6    Mean S	1.86  quare 82 6  95% LCL 0.0593	0.00195  Test Stat 1.54  DF 1 8 9  Test Stat 1.5 0.964  95% UCL 0.0639	Critical 2.29  F Stat 468  Critical 23.2 0.741  Median 0.061	P-Value 1.0000 P-Value <1.0E-05  P-Value 0.7040 0.8284  Min 0.06	Decision Significa  Decision Significa  Decision Equal Va Normal I  Max 0.064	nt Effect  n(a:5%) ers Detected  n(a:5%) nt Effect  n(a:1%) eriances Distribution  Std Err  0.000812	2.95%	0.00%
Auxiliary Test Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 128 Sum Sample IOSN 2019 AT3-098	S Test Grubbs  Sum Squ 0.001288 0.000022 0.001310  mptions Tests Test Variance Shapiro- mary Code RS	Extreme Va  uares 32 2 02 Ratio F Tes Wilk W Norr  Count 5	21.6    Mean S	1.86  quare 82 6  95% LCL 0.0593	0.00195  Test Stat 1.54  DF 1 8 9  Test Stat 1.5 0.964  95% UCL 0.0639	Critical 2.29  F Stat 468  Critical 23.2 0.741  Median 0.061	P-Value 1.0000 P-Value <1.0E-05  P-Value 0.7040 0.8284  Min 0.06	Decision Significa  Decision Significa  Decision Equal Va Normal I  Max 0.064	nt Effect  n(a:5%) ers Detected  n(a:5%) nt Effect  n(a:1%) eriances Distribution  Std Err  0.000812	2.95%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 128 Sum Sample IOSN 2019 AT3-098  PCB 128 Deta	s Test Grubbs Sum Sqi 0.001288 0.000022 0.001310 mptions Tests Test Variance Shapiro-I mary Code RS	Extreme Valuares 32 22 32 Wilk W Norr Count 5	21.6    Mean S	95% LCL 0.0593 0.0825	0.00195  Test Stat 1.54  DF 1 8 9  Test Stat 1.5 0.964  95% UCL 0.0639 0.0861	Critical 2.29  F Stat 468  Critical 23.2 0.741  Median 0.061 0.0845	P-Value 1.0000 P-Value <1.0E-05  P-Value 0.7040 0.8284  Min 0.06	Decision Significa  Decision Significa  Decision Equal Va Normal I  Max 0.064	nt Effect  n(a:5%) ers Detected  n(a:5%) nt Effect  n(a:1%) eriances Distribution  Std Err  0.000812	2.95%	0.00%

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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				- M -				1651	ode/ID:	114-20-000		7-0778-2871
Bioaccumula	tion Evaluation	1 - PCB C	ongen	ers - Ma	icoma						EA-ES	T, Inc. PBC
Analysis ID:	08-1735-4110		-	nt: PC		<b>T</b> 0 1			TIS Version		2.1.1	
Analyzed: Edit Date:	19 Aug-23 6:4 08 May-23 22:		Analysi MD5 Ha		nparametric ECE76B49D	•			tus Level: tor ID:	1		
Euit Date.								94LO EU				
Batch ID:	14-7703-1847		•	•	accumulatio		Mn		-	ncy Roka		
Start Date:	29 Mar-23 13:4 26 Apr-23 12:4		Protoco		ACE NED F	, ,		Dili Bri		ot Applicable		
Test Length:	•		Specie: Taxon:		alvia	a				ot Applicable RO - Aquatic	Research C	)r Δαe·
			Taxon.	DIV	aivia				arce. A			Age.
Sample Code			Sample		Receip		Sample Aç		ent Name		roject	
IOSN 2019	13-4648		08 Mar-		08 Mar-		21d 14h	Eco	o-Analysts, I	nc. D	redged Sed	iment Evalu
AT3-098	07-1559	-4974	08 Feb-	23 13:00	0 09 Feb-	-23 16:30	49d 1h					
Sample Code	Material	Туре		Sa	mple Sourc	е	St	ation Loca	tion	Lat/Long		
IOSN 2019		ce sedime	ent		chtsman Ma			SN Referer				
AT3-098	Marine S	Sediment		Ya	chtsman Ma	rina NAE-20	004-00 10	Stations a	t 4 Marinas	Mu		
Data Transfor	m	Alt H	ур				Compari	son Resul	t			PMSD
Untransformed	d	C < T					AT3-098	failed pcb ²	153 endpoin	t		67.03%
Wilcoxon Rai	nk Sum Two-S	ample Te	st									
	vs Sample I	•		net Stat	Critical	Ties	P-Type	P-Value	Decisio	n(a:5%)		
Reference Sec	-		8 15			0	Exact	0.0040		nt Effect		
			- 10				Exact	0.0010	- Olgriillou			
Auxiliary Test	ts											
Attribute	Test					Test Stat		P-Value				
Outlier	Grubbs	Extreme	Value T	est		2.68	2.29	0.0005	Outlier D	etected		
ANOVA Table	١											
Source	Sum Sq	uares	М	ean Sqı	uare	DF	F Stat	P-Value	Decisio	n(α:5%)		
Between	0.00897	00	0.	008970	0	1	4.11	0.0773	Non-Sig	nificant Effec	t	
Error	0.01747		0.	002184	1	8	_					
Total	0.02644	27				9						
ANOVA Assu	mptions Tests											
Attribute	Test					Test Stat	Critical	P-Value	Decisio	n(α:1%)		
Variance	Variance	Ratio F	Test			698	23.2	1.2E-05	Unequal	Variances		
Distribution	Shapiro-	Wilk W N	lormality	/ Test		0.655	0.741	0.0003	Non-Nor	mal Distribut	ion	
PCB 153 Sum	ımary											
	Code	Coun	t M	ean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Sample		5	0.	082	0.0789	0.0851	0.0815	0.0795	0.0855	0.00112	3.05%	0.00%
Sample IOSN 2019	RS	U			0.0500	0.224	0.113	0.11	0.26	0.0295	46.54%	-73.05%
•	RS	5	0.	142	0.0599	0.224	0.110			0.0200		
IOSN 2019			0.	142	0.0599	0.224				0.0200		
IOSN 2019 AT3-098				142 ep 2	Rep 3	Rep 4	Rep 5			0.0200		
IOSN 2019 AT3-098 PCB 153 Deta	nil	5	R							0.0200		

Report Date: Test Code/ID:

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Bioaccumulat	tion Evaluatio	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> ı	ndpoint: nalysis: D5 Hash:	PCB 170 Parametric-Two 67E462D9ADC	•	C55A068B00	Statu	S Version is Level: or ID:	: CETISv2. 1	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	•	48 <b>P</b> ı 48 <b>S</b> ı	est Type: rotocol: pecies: axon:	Bioaccumulation 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	Sample	ID Sa	ample Dat	e Receip	t Date	Sample Age	e Clien	t Name	Pre	oject	
IOSN 2019 AT3-098	13-4648 07-1559		3 Mar-23 3 Feb-23 1	08 Mar- 3:00 09 Feb-		21d 14h 49d 1h	Eco-A	Analysts, Ir	nc. Dr	edged Sed	liment Evalu
Sample Code	Materia	I Туре		Sample Sourc	е	Sta	tion Location	on	Lat/Long		
IOSN 2019	Referen	ce sedimen	t	Yachtsman Ma	rina NAE-20	04-00 IOS	N Referenc	е			
AT3-098	Marine	Sediment		Yachtsman Ma	rina NAE-20	04-00 10	Stations at 4	Marinas N	Лu		
Data Transfor	m	Alt Hyp	)			Comparis	on Result				PMSD
Untransformed	i	C < T				AT3-098 fa	ailed pcb 17	0 endpoint			3.14%
<b>Equal Variance</b>	ce t Two-Sam	ole Test				D Tymo	P-Value	Decision	\(\alpha\)		
Sample I Reference Sed	vs Sample d AT3-098		df Test \$ 8 21.6	1.86	<b>MSD</b> 0.00095	P-Type CDF	<1.0E-05	Significar	• •		
•	AT3-098					CDF			nt Effect		
Reference Sed	AT3-098		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	* Extreme V	8 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	8 21.6	1.86 Square 3053	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 Sc 0.00030	* Extreme Vi juares 53	8 21.6  alue Test  Mean 0.0003	1.86 Square 3053	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 Sc 0.00030 5.22E-0 0.00031	Extreme Valuares  53 6 05	8 21.6  alue Test  Mean 0.0003	1.86 Square 3053	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 Sc 0.00030 5.22E-0 0.00031	Extreme Valuares  53 6 05	8 21.6  alue Test  Mean 0.0003	1.86 Square 3053	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 Sc 0.00030 5.22E-0 0.00031 mptions Tests Test	Extreme Valuares  53 6 05	8 21.6  alue Test  Mean 0.000: 6.525	1.86 Square 3053	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	AT3-098	Extreme Vi	Mean 0.000: 6.525	1.86  Square  3053 =-07	0.00095  Test Stat 1.58  DF 1 8 9	Critical 2.29  F Stat 468  Critical	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 Sc 0.00030 5.22E-0 0.00031 mptions Tests Variance Shapiro	Extreme Vi	Mean 0.000: 6.525	1.86  Square  3053 =-07	0.00095  Test Stat 1.58  DF 1 8 9  Test Stat 1.72	Critical 2.29  F Stat 468  Critical 23.2	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 Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution	Test Grubbs Sum Sc 0.00030 5.22E-0 0.00031 mptions Tests Variance Shapiro	Extreme Vi	Mean 0.000: 6.525	1.86  Square  3053 =-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	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
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 170 Sum	Sum So  0.00030 5.22E-0 0.00031 mptions Tests Variance Shapiro	Extreme Volumes  153 6 05 e Ratio F Te	Mean 0.000 6.525	1.86  Square 8053 E-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	P-Value 0.9685  P-Value <1.0E-05  P-Value 0.6127 0.7278	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> 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	Sum So 0.00030 5.22E-0 0.00031 mptions Tests Variance Shapiro	Extreme Volumes  53 6 05 e Ratio F Te -Wilk W Nor	Mean 0.0003 6.525	1.86  Square  8053 E-07  st  95% LCL  3 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 Sc 0.00030 5.22E-0 0.00031 mptions Tests Variance Shapiro mary Code RS	Extreme Volumes  53 6 05 e Ratio F Te Wilk W Not  Count 5	Mean 0.0303 Mean 0.0303	1.86  Square  8053 E-07  st  95% LCL  3 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%) eriances 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 Sc 0.00030 5.22E-0 0.00031 mptions Tests Variance Shapiro mary Code RS	Extreme Volumes  53 6 05 e Ratio F Te Wilk W Not  Count 5	Mean 0.0303 Mean 0.0303	1.86  Square  3053 E-07  St  95% LCL 3 0.0292 4 0.0405	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 So  Code RS  Test  Grubbs  Sum So  0.00030 5.22E-0 0.00031  Test  Variance Shapiro	Extreme Valuares  53 6 05 e Ratio F Te -Wilk W Nor  Count 5 5	Mean 0.000: 6.525  Mean 0.030: 0.0414	1.86  Square  3053 E-07  St  95% LCL 3 0.0292 4 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%

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Test Code/ID: TN-23-303MnPCB / 17-0778-2871

	, .									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>	3865-0666 \ug-23 6:48 Иау-23 22:45	5	Ana	point: lysis: i Hash:	Para	metric-Two	Sample D1E4DFD5	SACE341	1B1943A	Statu	S Version is Level: or ID:	: CETISv2 1	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	29 M 26 A	•		Prot	ocol: cies:	US A	CE NED Forma nasuta	` '	Mn		Analy Dilue Brine Sour	ent: No e: No	ncy Roka t Applicable t Applicable O - 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			lar-23 eb-23 1	3:00	08 Mar- 09 Feb-		21d 14 49d 1h		Eco-A	Analysts, Ir	nc. Dr	edged Sed	liment Evalu
Sample Code		Material T	уре			Sam	ple Source	•		Station	Locatio	on	Lat/Long		
IOSN 2019		Reference		ent		Yach	tsman Mar	ina NAE-20	004-00	IOSN Re	ferenc	е	<u>_</u>		
AT3-098		Marine Se	dimen	t		Yach	tsman Mar	ina NAE-20	004-00	10 Static	ns at 4	Marinas N	Лu		
Data Transfor	m		Alt I	Нур					Comp	arison R	esult				PMSD
Untransformed	t		C < 7	Γ					AT3-0	98 failed	pcb 18	0 endpoint			3.50%
Equal Variand Sample I Reference Sed	vs	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> Significan	` '		
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	ares		Mean	Squa	re	DF	F Stat	P-V	alue	Decision	η(α:5%)		
Between Error		0.0003249 6.755E-06	i		0.000 8.444			1 8	385 —	<1.0	0E-05	Significa	nt Effect		
Total		0.0003317						9							
ANOVA Assu	mpti														
Attribute		Test						Test Stat			alue	Decision	` '		
Variance Distribution		Variance F Shapiro-W				st		2.29 0.957	23.2 0.741	0.44 0.74		Equal Va Normal D	riances Distribution		
PCB 180 Sum	mar	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	112	0.0432	0.000321	1.69%	-36.89%
PCB 180 Deta	il														
Sample		Code	Rep	1	Rep 2	2	Rep 3	Rep 4	Rep 5	i					
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 Ser	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 Std Err	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 Std Err		
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%

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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 quare	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%) eriances 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%

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										Т	est Co	ae/ID:	TN-23-30	SIVINPCB /	17-0778-287 ⁻
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						

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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 ² 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 ☐  N 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	/alue ☐  N 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	/alue ☐  N 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 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 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 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 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	No o	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)

#### APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (M. nasuta)

			Due Access		
			Pre-Assay		
CONTAMINANT	REP1	REP2	REP3	REP4 *	REP5 *
Pesticides (ng/g wet weight)					
Aldrin	0.0199 <mark>U</mark>	0.0202 U	0.0199 U		
cis-Chlordane	0.0430 U	0.0437 U	0.0430 U		
trans-Chlordane	0.0121 <mark>U</mark>	0.0123 <mark>U</mark>	0.0121 <mark>U</mark>		
cis-Nonachlor	0.00580 U	0.00585 U	0.00580 U		
trans-Nonachlor	0.00530 U	0.00540 U	0.00530 U		
Oxychlordane	0.0247 U	0.0251 U	0.0247 <mark>U</mark>		
Total Chlordanes	0.0908	0.0923	0.0908		
4,4'-DDT	0.00785 U	0.00795 U	0.00785 U		
4,4'-DDD	0.00595 U	0.00605 U	0.00595 U		
4,4'-DDE	0.00363 <mark>U</mark>	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 U		
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 U	0.0125 <mark>U</mark>		
Heptachlor epoxide	0.0256 U	0.0260 U	0.0256 U		
Hexachlorobenzene	0.107 <mark>U</mark>	0.109 U	0.107 <mark>U</mark>		
Lindane	0.0180 U	0.0183 <mark>U</mark>	0.0180 <mark>U</mark>		
Methoxychlor	0.0284 <mark>U</mark>	0.0288 U	0.0283 <mark>U</mark>		
Toxaphene	0.515 <mark>U</mark>	0.525 <mark>U</mark>	0.515 <mark>U</mark>		

^{* =} 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)

			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 U	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 U	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 U
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>

^{* =} Qualifiers

U Analyte not detected; belowJ Analyte estimated; detection

NA Not Analyzed

#### 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 U	0.0122 <mark>U</mark>	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 U	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 U	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 U	0.0126 U	0.0129 <mark>U</mark>
Heptachlor epoxide	0.0254 U	0.0261 <mark>U</mark>	0.0262 U	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>

^{* =} 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: End Date:

29 Mar-23 13:49 26 Apr-23 12:49

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

							-										-												
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	8.0	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**

EA-EST, Inc. PBC

Dioaccamaia	ion Evaluation 1 cot	ioiaco inaci	oma					~ LO1, IIIO. 1 DO
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 - Pestic US ACE NED RIM (2004 Macoma nasuta Bivalvia		Dil Bri	uent: Not	ncy Roka t Applicable t Applicable O - Aquatic Resea	rch 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 Sedin Eco-Analysts, Inc.	nent	So	urce: Yad	edged Sediment Ev chtsman Marina Na poratory Control	
Sample Code	Sample ID	Sample Da	ite Receipt Date	Sample	Age Cli	ent 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 16:30	21d 14l 49d 1h		o-Analysts, Ir	nc. Dredged	l Sediment Evalu
Sample Code IOSN 2019 AT3-098	Material Type Reference sedin Marine Sedimer		Sample Source Yachtsman Marina NAE- Yachtsman Marina NAE-		Station Loca IOSN Referent 10 Stations a	nce	<b>Lat/Long</b> /lu	
Single Compa	arison Summary							
Analysis ID	Endpoint	Com	parison Method		P-Value	Compari	son Result	s
04-1300-9223	4-4'-DDD	Uneq	ual Variance t Two-Sample	e Test	0.0001	AT3-098	failed 4-4'-ddd	1
19-1389-8615	4-4'-DDE	Equal	l Variance t Two-Sample T	est	<1.0E-0	5 AT3-098	failed 4-4'-dde	1
13-4412-8912	4-4'-DDT	Faual	I Variance t Two-Sample T	ect	1 0000	$\Delta$ T3_008	nassed A_A'_ddt	1

Single Comparison Summary									
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S				
04-1300-9223	4-4'-DDD	Unequal Variance t Two-Sample Test	0.0001	AT3-098 failed 4-4'-ddd	1				
19-1389-8615	4-4'-DDE	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed 4-4'-dde	1				
13-4412-8912	4-4'-DDT	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed 4-4'-ddt	1				
11-0747-7870	aldrin	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed aldrin	1				
09-4761-2761	alpha chlordane	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed alpha chlordane	1				
12-1877-4562	cis-Nonachlor	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed cis-nonachlor	1				
07-6660-5254	Dieldrin	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed dieldrin	1				
03-9121-3921	endosulfan I	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed endosulfan i	1				
00-9261-3119	endosulfan II	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed endosulfan ii	1				
12-3923-0051	endrin	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed endrin	1				
06-4834-6007	gamma-BHC (Lindane)	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed gamma-bhc (lindane)	1				
00-5738-4808	gamma-chlordane	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed gamma-chlordane	1				
16-1399-3357	heptachlor	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed heptachlor	1				
15-0976-0545	heptachlor epoxide	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed heptachlor epoxide	1				
17-3869-7799	hexachlorobenzene	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed hexachlorobenzene	1				
20-4435-9159	Methoxychlor	Unequal Variance t Two-Sample Test	1.0000	AT3-098 passed methoxychlor	1				
06-1250-5714	oxychlordane	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed oxychlordane	1				
20-3031-3246	toxaphene	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed toxaphene	1				
21-2045-5284	trans-nonachlor	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed trans-nonachlor	1				

## **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** 

EA-EST, Inc. PBC

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** 

EA-EST, Inc. PBC

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	8.0	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	Evalliation	- Pesticines :	- wacoma

EA-EST, Inc. PBC

<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 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 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 0.0201 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 in the commendation in the	RIM (2004)	es	Dilue Brine	Analyst: Nancy Roka  Diluent: Not Applicable  Brine: Not Applicable  Source: ARO - Aquatic Research C				
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  No Outlie  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  No Outlie  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  No Outlie  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 est	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 Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //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  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 Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //alue Tes  //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  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  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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		•								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:	Bioaccumulation - Pesticides US ACE NED RIM (2004) Macoma nasuta Bivalvia					Analyst: Nancy Roka  Diluent: Not Applicable  Brine: Not Applicable  Source: ARO - Aquatic Re			Research (	Or <b>Age:</b>
Sample Code		Sample ID	)	Sam	ple Da	ate 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		

Report Date: 19 Aug-23 06:51 (p 4 of 19)
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 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	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 ² 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 F	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		Test S		ritical .86	MSD 0.000245	P-Typ	<b>e P-V</b>	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	ue/ib.	TN-23-303N		
Bioaccumulat	tion Evaluation	n - Pesticio	des - Mac	oma							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	03-9121-3921 19 Aug-23 6:5 08 May-23 22	0 <b>A</b>	ndpoint: nalysis: ID5 Hash	Parame	etric-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>P</b> 49 <b>S</b>	est Type: rotocol: pecies: axon:	US AC	E NED F na nasuta	n - Pesticide RIM (2004) a	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	ample Da	ate	Receipt	Date	Sample Ag	e Clier	t Name	Pro	oject	
IOSN 2019 AT3-098	13-4648 07-1559		8 Mar-23 8 Feb-23	13:00	08 Mar- 09 Feb-		21d 14h 49d 1h	Eco-	Analysts, Ir	nc. Dre	edged Sed	liment Eval
Sample Code	Materia	Туре		Sample	e Source	e	Sta	tion Locati	on	Lat/Long		
IOSN 2019	Referen	ce sedimen	nt	Yachts	man Mar	rina NAE-20	004-00 108	SN Referenc	е			
AT3-098	Marine S	Sediment		Yachts	man Mar	rina NAE-20	004-00 10	Stations at 4	Marinas N	Лu		
Data Transfor	rm	Alt Hy	p				Comparis	on Result				PMSD
Untransformed	d	C < T					AT3-098 p	passed endo	sulfan i en	dpoint		2.51%
	ce t Two-Samp vs Sample l		df Test	Stat Cı	ritical	MSD	P-Type	P-Value	Decision	η(α:5%)		
•			8 -23 6	1	86	0 000409	CDF	1 0000	Non-Sign	ificant Effect		
Reference Sec	d AT3-098		8 -23.6	1.	86	0.000409	CDF	1.0000	Non-Sign	nificant Effect		
•	d AT3-098		8 -23.6	1.	86	0.000409  Test Stat		1.0000 P-Value	Non-Sign  Decision			
Reference Sec	d AT3-098 ts Test	Extreme V			86				Decision			
Reference Sec Auxiliary Test Attribute	ts Test Grubbs				86	Test Stat	Critical	P-Value	Decision	n(α:5%)		
Reference Sec Auxiliary Test Attribute Outlier	ts Test Grubbs	Extreme V	′alue Test			Test Stat	Critical	P-Value	Decision	n(α:5%) ers Detected		
Reference Sec  Auxiliary Test Attribute Outlier  ANOVA Table	ts Test Grubbs	Extreme V	′alue Test <b>Mea</b> r			Test Stat	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	d AT3-098  ts  Test  Grubbs  Sum Sq	Extreme V	'alue Test Mear 6.734	n Square		Test Stat 2.14	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 Sq  6.734E-	Extreme V uares 05 7	'alue Test Mear 6.734	n Square		Test Stat 2.14  DF 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	d AT3-098  ts  Test  Grubbs  Sum Sq 6.734E-9.67E-0	Extreme V uares 05 7	'alue Test Mear 6.734	n Square		<b>Test Stat</b> 2.14 <b>DF</b> 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 Error Total ANOVA Assur	ts  Test  Grubbs  Sum Sq 6.734E- 9.67E-0 6.831E-  mptions Tests Test	Extreme V uares 05 7 05	Mear 6.734 1.209	n Square		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	ts Test Grubbs Sum Sq 6.734E- 9.67E-0 6.831E- mptions Tests Test Variance	Extreme V  uares  05  7  05	Mear 6.734 1.209	n <b>Square</b> HE-05 HE-07		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 Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution	ts Test Grubbs Sum Sq 6.734E- 9.67E-0 6.831E- mptions Tests Variance Shapiro-	Extreme V uares 05 7 05	Mear 6.734 1.209	n <b>Square</b> HE-05 HE-07		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 Sq 6.734E- 9.67E-0 6.831E- mptions Tests Variance Shapiro-	Extreme V  uares  05  7  05  e Ratio F Te	Mear 6.734 1.209 est rmality Te	n Square HE-05 DE-07	)	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		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution endosulfan I S	ts Test Grubbs Sum Sq 6.734E- 9.67E-0 6.831E- mptions Tests Test Variance Shapiro- Summary Code	Extreme V  uares  05  7  05  Ratio F Te  Wilk W No  Count	Mear 6.734 1.209 est rmality Te	n Square 4E-05 9E-07	5% 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 Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution endosulfan I S Sample IOSN 2019	ts Test Grubbs Sum Sq 6.734E- 9.67E-0 6.831E- mptions Tests Variance Shapiro-	Extreme V  uares  05  7  05  Ratio F To Wilk W No  Count  5	Mear 6.734 1.209 est rmality Te	n Square 4E-05 9E-07 Pest n 95	5% LCL 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 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	ts Test Grubbs Sum Sq 6.734E- 9.67E-0 6.831E- mptions Tests Test Variance Shapiro- Summary Code	Extreme V  uares  05  7  05  Ratio F Te  Wilk W No  Count	Mear 6.734 1.209 est rmality Te	n Square 4E-05 9E-07 Pest n 95	5% 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 Sq 6.734E- 9.67E-0 6.831E- mptions Tests Variance Shapiro- Summary Code RS	Extreme V  uares  05  7  05  Ratio F To Wilk W No  Count  5	Mear 6.734 1.209 est rmality Te	n Square 4E-05 9E-07 Pest n 95	5% LCL 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 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 II Sample	ts Test Grubbs Sum Sq 6.734E- 9.67E-0 6.831E- mptions Tests Variance Shapiro- Summary Code RS  Detail Code	Extreme V  uares  05  7  05  e Ratio F Te  Wilk W No  Count  5  5	Mear 6.734 1.209 est rmality Te  Mear 0.016 0.011	n Square HE-05 DE-07 Pest n 95 33 0. 11 0.	5% LCL 0157 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 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 I	ts Test Grubbs Sum Sq 6.734E- 9.67E-0 6.831E- mptions Tests Variance Shapiro- Summary Code RS	Extreme V  uares  05  7  05  Ratio F To  Wilk W No  Count  5  5	Mear 6.734 1.209 est rmality Te  Mear 0.016 0.011	n Square HE-05 DE-07 Pest n 95 33 0. 11 0.	5% LCL 0157 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 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%

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		-								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 ⁻	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 LIICCI		
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

Report Date: 19 Aug-23 06:51 (p 12 of 19)
Test Code/ID: TN-23-303MnPest / 17-4167-8246

Bioaccumulat	ion Evaluation	- Pesticid	es - Macoi	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	ι(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 value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value value 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 Values  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 Assun 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 nptions Tests Test Variance Shapiro-\ dane Summary 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 Assun 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

**Report Date:** 19 Aug-23 06:51 (p 13 of 19) **Test Code/ID:** TN-23-303MnPest / 17-4167-8246

Bioaccumulat	tion	Evaluation	- Pestic	cides	- Macoma	1							EA-ES	T, Inc. PB
Analysis ID: Analyzed: Edit Date:	19 <i>A</i>	0976-0545 Aug-23 6:50 May-23 22:4		Anal	ysis: Pa	ptachlor epo rametric-Two A5EA41BA8	o Sample	35F2F725	5DCAE1	Statu	S Version: is Level: or ID:	: CETISv2 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	29 M	•			ocol: US cies: Ma	paccumulations ACE NED for acoma nasuta	RIM (2004)	es		Analy Dilue Brine Sour	ent: Not e: Not	ncy Roka : Applicable : Applicable O - Aquatic l	Research (	Or <b>Age:</b>
Sample Code IOSN 2019 AT3-098	)	Sample I 13-4648-6 07-1559-4	3170	08 M	<b>ple Date</b> lar-23 eb-23 13:0	Receip 08 Mar- 0 09 Feb-	-23	<b>Sample /</b> 21d 14h 49d 1h			<b>It Name</b> Analysts, In		roject redged Sed	diment Eval
Sample Code IOSN 2019 AT3-098	1	Material Reference	e sedim		Ya	imple Sourc ichtsman Ma ichtsman Ma	rina NAE-20	04-00 I	Station I OSN Re I 0 Statio	ferenc		<b>Lat/Long</b> ⁄lu		
Data Transfor	rm		Alt H	lyp				Compa	rison R	esult				PMSD
Untransformed	t		C < T	-				AT3-09	8 passe	d hepta	achlor epox	ide endpoin	t	2.66%
Sample I Reference Sec Auxiliary Test Attribute		Sample II AT3-098		df 8	Test Stat	1.86	MSD 0.00101 Test Stat	P-Type CDF	1.00	alue 000 alue	Decision Non-Sign Decision	ificant Effect	t	
Outlier		Grubbs I	Extreme	Valu	e Test		1.73	2.29	0.63			rs Detected		
ANOVA Table Source Between Error Total	•	Sum Squ 0.000366 5.925E-0 0.000372	0 6		Mean Sq 0.000366 7.406E-0	60	<b>DF</b> 1 8	<b>F Stat</b> 494		alue )E-05	<b>Decision</b> Significar	• •		
ANOVA Assur	mpti	ons Tests												
Attribute Variance Distribution		Test Variance Shapiro-V	Vilk W N		ality Test		7.17 0.957	23.2 0.741	<b>P-V</b> 0.08 0.75		Decision Equal Val Normal D	<u> </u>		
heptachlor ep Sample	oxio	le Summar Code	y Cour	ıt	Mean	95% LCL	95% UCL	Median	ı 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	0.03 0.02		0.0395 0.0265	0.00051 0.00019	2.99% 1.64%	0.00% 31.76%
heptachlor ep	ooxic	le Detail												
Sample IOSN 2019		<b>Code</b> RS	<b>Rep</b> 0.038		<b>Rep 2</b> 0.039	<b>Rep 3</b> 0.037	<b>Rep 4</b> 0.0395	<b>Rep 5</b> 0.037						
A TO 000														

0.0259

0.0265

Report Date: Test Code/ID: 19 Aug-23 06:51 (p 14 of 19) TN-23-303MnPest / 17-4167-8246

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

Report Date: 19 Aug-23 06:51 (p 15 of 19)
Test Code/ID: TN-23-303MnPest / 17-4167-8246

									-	est Co					
Bioaccumula	tion Eva	luation - Pest	ticides -	Масо	ma								E	A-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	Ū	9-7799 -23 6:50 -23 22:45	Endpo Analy MD5 I	sis:	hexachlo Parametr F0E4A64	ic-Two		9480030	475F0		S Versio s Level: r ID:		v2.1.1		
Batch ID: Start Date: Ending Date: Test Length:	26 Apr-	-23 13:49 23 12:49	Test T Proto Speci Taxon	col: es:	Bioaccun US ACE Macoma Bivalvia	NED RI	- Pesticide M (2004)	es		Analy Dilue Brine Source	nt: N : N	ancy Roka ot Applicable ot Applicable RO - Aquatio	е	rch C	er <b>Age:</b>
Sample Code	e S	ample ID	Samp	le Date	e R	eceipt l	Date :	Sample	Age	Clien	t Name		Project		
IOSN 2019 AT3-098		3-4648-8170 7-1559-4974	08 Ma 08 Fel	ar-23 b-23 10		8 Mar-2 9 Feb-2		21d 14h 49d 1h		Eco-A	Analysts,	Inc.	Dredged	d Sed	iment Evalu
Sample Code	e M	laterial Type			Sample S	Source		(	Station I	ocatio	n	Lat/Lon	ıg		
IOSN 2019		eference sedi			Yachtsma	an Marir	na NAE-20	04-00 I	OSN Re	ference	Э				
AT3-098	M	larine Sedimei	nt		Yachtsma	an Marir	na NAE-20	04-00 ′	10 Statio	ns at 4	Marinas	Mu			
Data Transfor	rm	Alt	Нур					Compa	rison R	esult					PMSD
Untransformed	d	C <	Т					AT3-09	8 passe	d hexad	chlorober	nzene endpo	int		2.71%
Equal Variand Sample I Reference Sec	vs Sa	-Sample Test ample II T3-098	df	<b>Test S</b> -21.7	tat Criti		MSD 0.0043	P-Type CDF	<b>P-V</b>			on(α:5%) gnificant Effe	ect		
Auxiliary Test	ts.														
Attribute		Гest					Test Stat	Critica	l P-V	alue	Decisio	on(α:5%)			
O															
Outlier	(	Grubbs Extrem	ne Value	Test			1.91	2.29	0.33	310		iers Detecte	d		
Outlier  ANOVA Table		Grubbs Extrem	ne Value	Test			1.91	2.29	0.33	310		iers Detecte	d		
	)	Grubbs Extremusers			Square		1.91 <b>DF</b>	2.29 <b>F Stat</b>		310 alue	No Outl	iers Detecte on(α:5%)	d		
ANOVA Table	s	-			-				P-V		No Outl		d		
ANOVA Table Source Between Error	<b>S</b> 0.	um Squares .0063001 .000107		Mean :	3001		<b>DF</b> 1	F Stat	P-V	alue	No Outl	on(α:5%)	d		
ANOVA Table Source Between Error Total	<b>S</b> 0.00	um Squares .0063001 .000107 .0064071		<b>Mean</b> 3	3001		<b>DF</b>	F Stat	P-V	alue	No Outl	on(α:5%)	d		
ANOVA Table Source Between Error Total ANOVA Assur	S 0 0 0	um Squares .0063001 .000107 .0064071		<b>Mean</b> 3	3001		<b>DF</b> 1 8 9	<b>F Stat</b> 471	<b>P-V</b> <1.(	alue DE-05	Decision Signification	on(α:5%) ant Effect	d		
ANOVA Table Source Between Error Total ANOVA Assur	9 S 0. 0. 0. mptions	um Squares .0063001 .000107 .0064071 .Tests		<b>Mean</b> 3	3001		<b>DF</b> 1 8 9	F Stat 471 Critica	P-V <1.(	alue DE-05	Decision Decision	on(α:5%) ant Effect on(α:1%)	d		
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> 3 0.0063 1.338E	8001 E-05		DF 1 8 9  Test Stat 6.75	F Stat 471  Critical 23.2	P-V <1.0	alue DE-05 alue	Decision Signification Decision Equal V	on(α:5%) ant Effect on(α:1%) dariances	d		
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> 3 0.0063 1.338E	8001 E-05		<b>DF</b> 1 8 9	F Stat 471 Critica	P-V <1.(	alue DE-05 alue	Decision Signification Decision Equal V	on(α:5%) ant Effect on(α:1%)	d		
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 / Normali	<b>Mean</b> 3 0.0063 1.338E	8001 E-05		DF 1 8 9  Test Stat 6.75	F Stat 471 	P-V <1.0	alue DE-05 alue 012 128	Decision Signification Decision Equal V	on(α:5%) ant Effect on(α:1%) dariances			%Effect
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Dutransforme   C < T   Fat Stat   Critical   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   Fat Stat   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   Decision(α:5%)   P-Value   Decision(α:5%)   P-Value   Decision(α:5%)   P-Value   Decision(α:5%)   P-Value   Decision(α:5%)   P-Value   Decision(α:5%)   P-Value   Decision(α:5%)   P-Value   Decision(α:5%)   P-Value   Decision(α:5%)   P-Value   Decision(α:5%)   P-Value   Decision(α:5%)   P-Value   Decision(α:5%)   P-Value   Decision(α:5%)   P-Value   Decision(α:5%)   P-Value   Decision(α:5%)   P-Value   Decision(α:5%)   P-Value   Decision(α:5%)   P-Value   Decision(α:5%)   P-Value   Decision(α:5%)   P-Value   Decision(α:5%)   P-Value   Decision(α:5%)   P-Value	AT3-098	I	Marine Sedir	ment		Yach	ntsman Mai	rina NAE-20	04-00	10 Statio	ns at 4	Marinas N	∕lu		
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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	t	C	C < T					AT3-0	98 passe	d meth	oxychlor e	ndpoint		2.87%
Attribute   Test   Test   Stat   Critical   P-Value   Decision(α:5%)					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		
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First   0.0006112   7.640E-05   8   9	Source		Sum Square	es	Mean	Squa	are	DF	F Stat	P-V	alue		• •		
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           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 IOSN 2019 RS 0.408 0.419 0.401 0.428 0.399	ΛΝΟΥΛ Λεειι														
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 Count Mean Post LCL Post LCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL Post UCL P		•						Test Stat	Critics	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   0.293   0.426   0.408   0.399   0.428   0.00552   3.01%   0.00%   AT3-098   S   5   0.421   0.293   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   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   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep 8   Rep				tio 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	0.25	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	Count	Mean		95% LCL	95% UCL	Media	n Min	1	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	5	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	0.028	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		C	0.028	0.028	8	0.029	0.0287	0.0293	3					

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	,	•								Te	st Co	de/ID:	TN-23-30	SivinPes	1/1/-41	67-8246
Bioaccumulati	ion Ev	/aluation -	Pestici	ides	- Maco	ma								EA-	EST, In	c. PBC
Analyzed:	19 Au	50-5714 Ig-23 6:50 Iy-23 22:45		Anal	ysis:		etric-Two	Sample F223B0DAI	D46500D2	D3437		S Version s Level: r ID:	n: CETISv 1	2.1.1		
	29 Ma 26 Ap		! ;		ocol: ies:	US ACI	E NED F a nasuta	n - Pesticide RIM (2004) a	es		Analy Dilue Brine Source	nt: No	ancy Roka ot Applicable ot Applicable RO - Aquatic		ch Or <b>Ag</b>	je:
Sample Code		Sample ID	) ;	Sam	ple Date	е	Receipt	Date	Sample A	ge	Clien	t Name	F	roject		
IOSN 2019 AT3-098		13-4648-8 ² 07-1559-49			ar-23 eb-23 13	3:00	08 Mar- 09 Feb-		21d 14h 49d 1h		Eco-A	Analysts, I	nc. [	redged	Sedimer	nt Evalu
Sample Code		Material T	уре		;	Sample	Source	<del></del>	S	tation L	ocatio	n	Lat/Long	3		
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 I	Mu			
Data Transform	m		Alt Hy	ур					Compar	ison Re	sult				Р	MSD
Untransformed			C < T						AT3-098	passed	loxych	nlordane e	endpoint		2.	76%
Earrel Veriens	e t Tw	o-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-Sigi	nificant Effe	ot		
Sample I v Reference Sed Auxiliary Tests Attribute	P	AT3-098  Test		8	-21.3			0.00101  Test Stat	Critical	1.00	alue	Decision	n(α:5%)			
Sample I v Reference Sed Auxiliary Tests	P	AT3-098	xtreme \	8	-21.3			0.00101		1.00	alue	Decision				
Sample I v Reference Sed Auxiliary Tests Attribute	P	AT3-098  Test	xtreme '	8	-21.3			0.00101  Test Stat	Critical	1.00	alue	Decision	n(α:5%)			
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	Decision	n(α:5%) ers Detected			
Sample I v Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error	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	Decision  No Outlie  Decision	n(α:5%) ers Detected			
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	Decision  No Outlie  Decision	n(a:5%) ers Detected n(a:5%)			
Sample I v Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum	s s mption	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	Decision No Outlie  Decision Significa	n(α:5%) ers Detected n(α:5%) int 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 ns Tests Test	nres	8 Value	-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	Decision  Decision  Significa	n(a:5%) ers Detected n(a:5%) int Effect n(a: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	1.6 <b>Square</b> 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	Decision Significa  Decision Equal Va	n(a:5%) ers Detected n(a:5%) int Effect n(a:1%)			
Sample I v Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance	s	Test Grubbs Ex  Sum Squa 0.0003341 5.907E-06 0.00034 ns Tests Test Variance R Shapiro-W	ares	8 Value	-21.3 e Test Mean 3 0.0003 7.384E	1.6 <b>Square</b> 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	Decision Significa  Decision Equal Va	n(α:5%) ers Detected n(α:5%) ent Effect n(α:1%) ariances			
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute  Variance Distribution	s mption	Test Grubbs Ex  Sum Squa 0.0003341 5.907E-06 0.00034 ns Tests 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	Decision Significa  Decision Equal Va	n(α:5%) ers Detected n(α:5%) ent Effect n(α:1%) ariances		%6	≡ffect
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute  Variance Distribution  oxychlordane	nption	Test Grubbs Ex  Sum Squa 0.0003341 5.907E-06 0.00034  Ins Tests Test Variance R Shapiro-W	ares 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	Decision Significa  Decision Equal Va Normal [	n(a:5%) ers Detected n(a:5%) ent Effect n(a:1%) ariances Distribution	ı		Effect
Sample I v Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  oxychlordane Sample	nption	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	Decision Significa  Decision Equal Va Normal [	n(a:5%) ers Detected n(a:5%) int Effect n(a:1%) ariances Distribution Std Err	CV% 3.129	% 0.0	
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 ns Tests 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	Decision Significat  Decision Equal Va Normal I  Max 0.038	n(a:5%) ers Detected n(a:5%) int Effect n(a:1%) ariances Distribution  Std Err 0.00051	CV% 3.129	% 0.0	00%
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  oxychlordane Sample IOSN 2019 AT3-098	s nption Sumn	Test Grubbs Ex  Sum Squa 0.0003341 5.907E-06 0.00034 ns Tests 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	Decision Significat  Decision Equal Va Normal I  Max 0.038	n(a:5%) ers Detected n(a:5%) int Effect n(a:1%) ariances Distribution  Std Err 0.00051	CV% 3.129	% 0.0	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	s Sumn	Test Grubbs Ex  Sum Squa 0.0003341 5.907E-06 0.00034  Ins Tests 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	Decision Significat  Decision Equal Va Normal I  Max 0.038	n(a:5%) ers Detected n(a:5%) int Effect n(a:1%) ariances Distribution  Std Err 0.00051	CV% 3.129	% 0.0	00%

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		•								Т	est Co	de/ID:	TN-23-30	)3MnPest / 1	17-4167-8246
Bioaccumula	tion	Evaluation -	- Pesti	cides	- Mac	oma								EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 <i>A</i>	3031-3246 Aug-23 6:50 Лау-23 22:4	5	Anal	point: lysis: i Hash:	Parar	netric-Two	o Sample 98257BBB	6938376	667970		S Versions S Level: Or ID:		v2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	29 N 26 A	•		Prot	ocol: cies:	US A	CE NED F ma nasuta	n - Pesticid RIM (2004) a	es		Analy Dilue Brine Sour	ent: N e: N	lancy Roka lot Applicabl lot Applicabl ARO - Aquati	Э	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	_	Eco-/	Analysts,	Inc.	Dredged Sed	diment Evalu
Sample Code		Material T	уре			Samp	ole Source	Э		Station	Location	on	Lat/Lon	g	
IOSN 2019		Reference	sedim	ent		Yach	tsman Maı	rina NAE-20	04-00	IOSN Re	eferenc	е			
AT3-098		Marine Se	dimen	t		Yach	tsman Maı	rina NAE-20	004-00	10 Static	ons at 4	Marinas	s Mu		
Data Transfor	m		Alt I	Нур					Comp	arison R	esult				PMSD
Untransformed	d		C < 1	Γ					AT3-0	98 passe	d toxap	hene en	dpoint		2.68%
Sample I Reference Sec	vs	Sample II AT3-098	Test	df 8	<b>Test 9</b>		Critical 1.86	MSD 0.0206	P-Typ CDF	e P-V	<b>/alue</b> 000		on(α:5%) gnificant Effe	ect	
Auxiliary Test Attribute Outlier	ts	<b>Test</b> Grubbs E	xtreme	e Valu	e Test			Test Stat	Critica 2.29	al <b>P-V</b>	<b>/alue</b> 341		on(α:5%) :liers Detecte	d	
ANOVA Table	,														
Source		Sum Squ	ares		Mean	Squa	re	DF	F Stat	P-V	'alue	Decision	on(α:5%)		
Between Error Total		0.147623 0.00245 0.150073			0.147 0.000			1 8 9	482 —	<1.0	0E-05	Signific	cant Effect		
ANOVA Assu	mpti	ons Tests													
Attribute		Test						Test Stat	Critica	al P-V	'alue	Decision	on(α:1%)		
Variance Distribution		Variance F Shapiro-W				st		5.62 0.963	23.2 0.741	0.12 0.82		•	Variances I Distribution		
toxaphene Su	ımma	ary													
Sample		Code	Cou	nt	Mean	9	95% LCL	95% UCL	Media	ın Min	1	Max	Std Err	CV%	%Effect
IOSN 2019		RS	5		0.767	(	0.739	0.795	0.76	0.74	45	0.8	0.0102	2.97%	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	: I	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						

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Test Code/ID: TN-23-303MnPest / 17-4167-8246

										est Co	ae/ID:	114-23-3031	VIIIF EST /	7-4167-824
Bioaccumula	tion Eva	uation - Pes	ticides	- Macc	ma								EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	21-2045 19 Aug- 08 May-		Anal	ysis:	Paran	nonachlo netric-Two AD219B0l		DF2B2I	F538B16	Statu	S Version: s Level: or ID:	: CETISv2. 1	1.1	
Batch ID: Start Date: Ending Date: Test Length:	26 Apr-2	23 13:49 23 12:49	Prot	ocol: cies:	US A	CE NED F ma nasuta	on - Pesticido RIM (2004) a	es		Analy Dilue Brine Sour	nt: Not : Not	ncy Roka t Applicable t Applicable O - Aquatic R	lesearch (	Or <b>Age</b> :
Sample Code	s Sa	mple ID	Sam	ple Dat	te	Receipt	t Date	Sample	Age	Clien	t Name	Pro	oject	
IOSN 2019 AT3-098		-4648-8170 -1559-4974		1ar-23 eb-23 1	3:00	08 Mar- 09 Feb-		21d 14l 49d 1h	h	Eco-A	Analysts, Ir	nc. Dre	edged Sed	diment Evalu
Sample Code	e M	aterial Type			Samp	le Sourc	<u></u> е		Station I	ocatio	on	Lat/Long		
IOSN 2019	Re	eference sedi	ment		Yacht	sman Ma	rina NAE-20	004-00	IOSN Re	ference	e			
AT3-098	M	arine Sedime	nt		Yacht	sman Ma	rina NAE-20	004-00	10 Statio	ns at 4	Marinas N	⁄lu		
Data Transfor	rm	Alt	Нур					Comp	arison R	esult				PMSD
Untransformed	d	C <	Т					AT3-0	98 passe	d trans	-nonachlor	endpoint		3.08%
Sample I Reference Sec	vs Sa	Sample Tes mple II 3-098	t df 8	<b>Test 5</b>		Critical	<b>MSD</b> 0.00024	P-Typ	e P-V	alue 000	<b>Decision</b> Non-Sign	i(α:5%)		
Auxiliary Test	ts													
Attribute		est					Test Stat	Critica	al P-V	alue	Decision	ι(α:5%)		
Outlier	G	rubbs Extren	ne Valu	e Test			1.56	2.29	1.00	000		ers Detected		
ANOVA Table	)													
Source	Sı	ım Squares		Mean	Squai	re	DF	F Stat	P-V	alue	Decision	ι(α:5%)		
Between	1.	464E-05		1.464	E-05		1	352	<1.0	E-05	Significar	• •		
Error		330E-07		4.163	E-08		8	_						
Total	1.4	497E-05					9							
ANOVA Assu	mptions	Tests												
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Variance Distribution		ariance Ratio napiro-Wilk W		ality Tes	et.		9.09 0.877	23.2 0.741	0.05 0.12		Equal Va	riances Distribution		
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trans-nonach		nary ode Coi	4	Maan		NE0/ I CI	059/ 1101	Madia	n Min		May	Std Err	C)/0/	0/ <b>Eff</b> ort
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IOSN 2019 AT3-098	R	5 5		0.0078 0.0053		0.00527	0.00549	0.0054	1 0.00	)525	0.0055	0.0000406	1.69%	31.03%
IOSN 2019 AT3-098 trans-nonach	R:	5 5		0.005	38 (	0.00527	0.00549			)525	0.0055	0.0000406	1.69%	31.03%
IOSN 2019 AT3-098 trans-nonach Sample	R: lor Detai	5 5 5 I ode Rej	o 1	0.0053 Rep 2	38 (	0.00527 Rep 3	0.00549 Rep 4	Rep 5		)525	0.0055	0.0000406	1.69%	31.03%
IOSN 2019 AT3-098 trans-nonach	R:	5 5 5 1 Dode Rep 6 0.00	o 1	0.005	38 (	0.00527	0.00549		5	)525	0.0055	0.0000406	1.69%	31.03%

## ATTACHMENT XII

Report Quality Assurance Record (2 pages)



## REPORT QUALITY ASSURANCE RECORD

Clie	ent: Eco Analyst	Project Number:	EA.TOX
Aut	hor:	EA Report Number:	9/80
	REPOR	T CHECKLIST	
	OA/OC ITEM	REVIEWER	DATE
1.	Samples collected, transported, and received according to study plan requirements.	Mele	9/5/2
2.	Samples prepared and processed according to study plan requirements.	- Mefle	
3.	Data collected using calibrated instruments and equipment.	Sufr	9/5/2
4.	Calculations checked: - Hand calculations checked	MIL	9/5/2
	<ul> <li>Documented and verified statistical procedure used.</li> </ul>	Mall	9/5/w
5.	Data input/statistical analyses complete and correct.	los medd =	<u>9/6/2023</u>
6.	Reported results and facts checked against original sources.	fus medific	9/6/2023
7.	Data presented in figures and tables correct and in agreement with text.	Los m Redil 5	_ 916h <del>023</del>
8.	Results reviewed for compliance with study plan requirements.	Juli	9/5/23
<u>-</u>			
	Commentary reviewed and resolved.	<u>AUTHOR</u>	<u>DATE</u> 9/6/2>
10. 1	All study plan and quality assurance/control requirements have been met and the report is approved	i lastes —	//->
		PROJECT MANAGER	
		Cus medilas	9/6/2023
		QUALITY CONTROL OFFICER	DATE
		SENIOR TECHNICAL OFFICER	916123

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	Les/Mot 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
3. 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	(Retained at Lab or in
			data report)	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

^{*} 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:

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

https://mail.google.cor

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 (NH₄Cl).

## 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 (NH₄Cl). 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 (NH₄Cl). The results of this ammonia study are summarized in Table 6. The 48-hour LC50 value for *Mytilus* sp. was 7.6 mg/L NH₃-N, while the corresponding EC50 was 5.6 mg/L NH₃-N. The ammonia 96-hour LC50 value for *Americamysis bahia* was 31.2 mg/L NH₃-N, while the 96-hour LC50 value for *Menidia beryllina* was 19.7 mg/L NH₃-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

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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 ₃ -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		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-23-214	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 ₃ -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 ₃ -N							
Test Organism	Test Number	Lab Control	ab 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		

			9					
						96-hour LC50		
Test Organism	Test Number	Lab Control	150 mg/L	87 mg/L	$(mg/L NH_3-N)$			
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		riate	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-Hour Normal Embryo Development (%)					
	EA Accession			Percent Elutriate		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

			96-Hour Survival (%)					
	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

			96-Hour Survival (%)					
	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 ^(a)			>100	

⁽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 ₅₀	Statistical Difference	48-hour EC ₅₀	Statistical Difference	96-hour LC ₅₀	Statistical Difference	96-hour LC ₅₀	Statistical Difference
	(% elutriate)	100% vs. Control	(% elutriate)	100% vs. Control	(% elutriate)	100% vs. Control	(% 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 ₂ )	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		41/3 @ 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:		EA.TOX	XO			TEST	ORC	TEST ORGANISM	<b>×</b>							Begin	Beginning Date:	Date:	$\sim$	2115123	23	. 7	Time: 1620	<u>_</u>	g
Client: Eco Analysts	llysts					_	Comm	Common Name:	ne:	BLU	BLUE MUSSEL	JSSEI				Endi	Ending Date:	ূর 	2	2117123	23		Time:	1630	30
QC Test Number:T	TN-23-209	)9				TO.	cienti	Scientific Name:	ne: _	M)	Mytilus sp.	p.				_	TEST	TEST TYPE:	***	Statio	Static / Flowthrough	Flowt	hroug		
Test Material:ELU	<u>ELUTRIATE</u>	(1)				TAR	GET \	TARGET VALUES	Š										Rei	newal	Renewal / Non-renewal	Von-re	enewa	<b>I</b>	
Accession Number:		AT3-098					Temp: _	16		ြို	П	DO: _	>4.0	0		mg/L		Test	Test Container:	iner:	w	30 ml vial	/ial		
Dilution Water:30	30 PPT C.S	,				'ਹ	Ĥ: 	pH: <u>6.0 - 9.0</u>	.0		50	Salinity:	y: <u>30±3</u>	30±3		ppt		Test	Test Volume:	ne: _		10 ml	m _l		
Accession Number: LD3- 180	<u>LD3-</u>	80				Photo	perio	Photoperiod: 16 l, 8 d	, 8 <i>d</i>		Ę	.ight I	Light Intensity: <u>50 - 100</u> fc	y: <u>50 -</u>	100 f	o,		Test	Test Duration:	tion: _	48	48 hours	8		
	T	Live	Number of Live Organisms	r of nisms			Te	Temperature (°C)	ure				μH				Dissol	Dissolved Oxygen (mg/L)	xygen			Sali	nity (	opt)	
Concentration Rep	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	24 48 72	72	96
Control						15.6	16.4	165			~	2.8	7.7		j	2.8	08	18			880	797 747	247		
10%						156	les	lbite			8)	28	77			5.5	8.1	80			29.2	24.3	286		
50%						15.9	16.7	891			~	28	77			P8	28	7.9			30.7	30.9	2919		
100%						S.dll	16.9	8.41			0,0	28	77			84	99	7,0			32.6	329	31.8		
													.												
												_												_	
Meter Number						682	687	(BA)		6	682 682	180	68	_		139 289 289	280	000		_	139 289 289	280	150		
Time						1.201	1231				1237 JUSS	133	28			)XZ7	Sh LE21	ক্তি			CSH LEZI 1201	737	র্ভ		
Initials	-	-				£	7	P			21	4 4 A	4			<del>14</del>	T	P.			F	£€	=1		

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: <u>EA.TOX</u>	<u>Test Species</u>
Client: <u>Eco Analysts</u>	Scientific Name: Mytilus sp.
QC Test Number: TN-23-209	Elutriate:
Initial number of embryos: 229	Accession Number: AT3-098
Embryos counted (date, initials):	Lot#: ME- 097

		Total #		
Test		Total # Surviving/	#	
Concentration	Replicate	Counted	Normal	# Abnormal
Control	A	210	7 / À	
Control	<del>-</del>	010	<i>d</i> 10	6
	В	1901	1203	4
	C	207	200	7
	D	901	195	Ce
	E	223	214	9
10%	A	216	204	19-
	В	794	210	14
	С	318	209	9
	D	219	217	7
	Е	227	217	10
50%	A	241	236	5
	В	236	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	900	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:	EA.TOX	
Client: Eco Analysts		
QC Test Number:TN-23	-209	

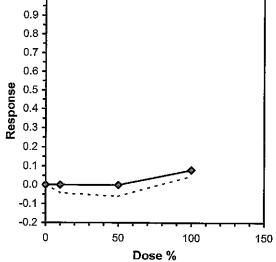
			T	1
Day	<b>Testing Location</b>	Date	Time	Initials
0	51 51 51	Z115123 Z116123 Z117123	1620 1600 1454	Po
1	51	2116123	1600	TP TP
2	51	2117123	1454	TP
3				
4				
5				
6				,
7				
8				
9				
10				
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12	· -			,
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22				
23				
24				
25				
26				
27				
28				
29				
30			1	

			Bivalve L	_arval Sur	vival and Dev	elopment Test-Prope	ortion 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	· .	
Control	0.9732	0.9241	0.9241	0.8973	0.9955	<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	ansform:	Arcsin Sc	uare Root		Rank	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	0.01)		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 <del>-</del>	
IC50	>100				
	·			0.6	
				ø o 5 1	



		t	Sivalve La	<u>arval Surv</u>	<u>iva</u> l and Deve	elopment 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
mal distribu	ition (p > 0	0.01)		0.98103					0.0741
iances (p =	0.50)	•		2.3588		11.3449		0.20121	0.07 41
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
	iances (p = NOEC	iances (p = 0.50)  NOEC LOEC	NOEC LOEC ChV	iances (p = 0.50)  NOEC LOEC ChV TU	mal distribution (p > 0.01)       0.98103         iances (p = 0.50)       2.3588         NOEC LOEC ChV TU MSDu	mal distribution (p > 0.01)       0.98103         iances (p = 0.50)       2.3588         NOEC LOEC ChV TU MSDu MSDp	mal distribution (p > 0.01)       0.98103       0.868         iances (p = 0.50)       2.3588       11.3449         NOEC LOEC ChV       TU MSDu MSDp MSB	mal distribution (p > 0.01)       0.98103       0.868         iances (p = 0.50)       2.3588       11.3449         NOEC LOEC ChV       TU MSDu MSDp MSB MSE	mal distribution (p > 0.01)       0.98103       0.868       0.26127         iances (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	ž			LNHL	ากหล	TEST ORGANISM	ς							Reginning Date:	nina T	ato.	۲	\$21/SI1/C		<del>.</del> j	<u>,</u>	£	
Client: Eco Analysts						0	omm	Common Name:	ne:	BLI	JE M	BLUE MUSSEL				Endir	Ending Date:	;; 	211	2117123		Ti	me:	Time: 1630	
QC Test Number: TN-23-210	3-210					S	cienti	Scientific Name:	ne: _	M	Mytilus sp.	sp.				. 1	TEST	TEST TYPE:		Static	. / I	Static / Flowthrough	rough		
Test Material: SITE WATER	ATER				ł	TAR(	ET V	TARGET VALUES	S										Ren	ewal	_   <u>N</u>	Renewal / Non-renewal	ıewa]		
Accession Number:	SEI	SEE BENCH SHEET	CH S	THEET	1	ï	emp:	Temp:16	5,	ိုင		DO: _	>4.0	Ö		mg/L		Test (	Test Container:	ner:	30	30 ml vial	al		
Dilution Water:30 PPT C.S	C.S.					q	H:	pH: 6.0 - 9.0	.0			Salinity:	1	30±3		ppt		Test	Test Volume:	<u>.</u>		10 ml			
Accession Number: LD3- 180	3- 16	οζ				Photo	perio	Photoperiod: 16 l, 8 d	8 d		٠	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	165			0.8	8-2	78			98	18	90			288 29.5		27.4		
City Wiston						*	= اد	7			0	07	2			01	٩	2/2			92 5		C. C.		
(AT3-099)						4	•	•																	
	:																								
Meter Number						289	299	130			289	U	189			139	682 682 681	189		3	] 289	9 180)	(8)		
Time						8201	ma	ИSS			8201	Ina	SSAL			8291	55hl (M21	5Sh		}	1 8201	124) 1453	83		
Initials						Z	7	P			4	A	4			A.	70	Á			7	4	<u></u>		

EPA Test Method: EPA 821-R-02-012 (CHECK ONE)

Ceriodaphnia: 2002.0 Magna/pulex: 2021.0

Americanysis: 2007. Cyprinodon: 2004.0

Menidia: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:	Accession Number: AT3-099
Embryos counted (date, initials): \(\frac{11073}{1073}\)	Lot#: <u>ME-</u> <u>097</u>

		Total #		
Test		Surviving/	#	#
Concentration	Replicate	Counted	Normal	Abnormal
Control	A	208	200	8
	В	217	701	i /
	С	214	205	9
	D	27.0	213	7
	Е	143	187	6
Site Water	A	198	188	10
AT3-099	В	206	190	16
	C	215	211	4
	D	230	214	13
	E	209	199	10
			. •	
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			*.	
		l.,	1	



# 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				
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9				
10				
11				
12				
13				
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23				
24	1 111111111			
25				
26				
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30				

Bivalve Larval Survival and Development Test-Proportion 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				

		_	Transform: Arcsin Square Root				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		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 %	

Bivalve Larval Survival and Development Test-Proportion Normal									
Start Date: End Date: Sample Date: Comments:	2/15/2023 2/17/2023	!	Test ID: ∟ab ID: Protocol:	TN-23-210	)	Sample ID: Sample Type: Test Species:	Eco Analysts Site Water MS-Mytilis species		
Conc-%	1	2	3	4	5	<u>".                                    </u>	· · · · · · · · · · · · · · · · · · ·		
Control	0.8929	0.8973	0.9152	0.9509	0.8348				
100	0.8393	0.8482	0.9420	0.9688	0.8884				

		_	Transform: Arcsin Square Root				·	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 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4 - 0.4			
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					0.2			
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					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: <u>Mytilus sp.</u>	Neonates Pulled & Fed (Time, Date):								
Lot Number: <u>ME- 097</u>	Acclimation: <4hr Age: <4hr								
Source: ARO	Culture Water (T/S): 16-0 °C 29-0 ppt								

		TEST INITIATION	N
<u>Date</u>	Time	<u>Initials</u>	Activity
2112123	0910	To	Dilutions Made
	J		Test Vessels Filled
	1620	$\boldsymbol{\psi}$	Organisms Transferred
$\nu$	1700		Head Counts

TEST SET-UP						
ample Number: SP3-0  SP3-0  SP3-0  SP3-0		00 mg DI)				
Test Concentration	Volume Test Material	Final Volume				
CONTROL	0 ml	200 ml				
0.65 mg/L	0.13 ml					
1.5 mg/L	0.30 ml					
3.7 mg/L	0.74 ml					
$10.0~\mathrm{mg/L}$	2.0 ml					
50.0 mg/L	10.0 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		16) 15.6	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 ₃ -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>	Test Species
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

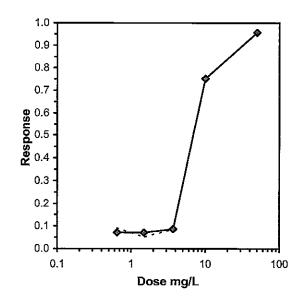
Day	Testing Location	Date	Time	Initials
0	<i>5</i> 1	2115123	1620 1244	To
1	51	2116123	1244	76
2	5(	2117123	1457	76
3				
4				
5				
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8	·			
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			Bivalve L	.arval Sur	vival and Dev	elopment Test-Propo	ortion Alive
	2/15/2023 2/17/2023		Test ID: Lab 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	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	ansform:	Arcsin Sc	uare Roo	t		1-Tailed		Number	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	mal distribu	ition (p > 0	0.01)	-	0.96664		0.9		-0.6622	1.23727
Bartlett's Test indicates equal var	riances (p =	0.14)			8.28922		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	4
	Auto-7.1%	7.6248	7.2938	7.9709	

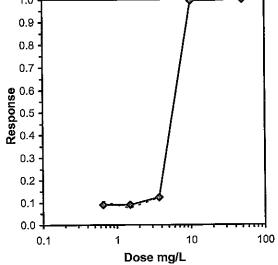


		E	Bivalve La	rval Survi	val and Dev	elopment Test-Propor	tion Normal	
Start Date: End Date: Sample Date: Comments:	2/15/2023 2/17/2023	1	Test ID: _ab ID: Protocol:	TN-23-211		Sample ID: Sample Type: Test Species:	Eco Analysts Ammonia MS-Mytilis species	
Conc-mg/L	1	2	3	4	5			
Control	1.0000	1.0000	0.9554	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	ansform:	Arcsin So	uare Root		Rank	1-Tailed	Number	Total
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Resp	Number
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	TU				
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	ed (Time, Date):
Scientific Name: _	Americamysis bahia	Neonates Pull	led & 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 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: 2/5/23	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	/ Flc
Cest 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	,	5	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						8	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
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

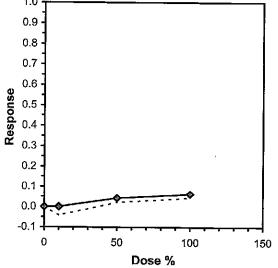
<u> </u>		<del></del>		
Day	Testing Location	Date	Time	Initials
0	513	2/15/23	0905	50
1	5B	2116123	0957	76
2	56	2116123 2117123	0959	GC
3	5B	418/23	0957	5C 6 6C J2
4	58	2/18/23	0737	JL
5		- <del>* % -</del> f		
6				<del> </del>
7				<del></del>
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12		_		
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21			_	_
22				
23			_	
24				
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26				
27		_	_	
28				
29				
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		

		_	<u>T</u> ra	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	1.0000
50	0.9200	0.9787	1.2859	1.1071	1.4120	10.026	5	0.440	2.230	0.1437	0.9200	0.9583
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			).01)	·	0.96751		0.868		-0.1392	-0.5638
Bartlett's Test indicates equal var	iances (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	
	*		·		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

Project Number:	·		EA.TOX	X		l H	EST (	TEST ORGANISM	T ORGANISM		) ! }		}	}		Begi	Beginning Date: 215	Date:	100	2/15/23	23	] ] ]]	Time: 025%	Time: 0258	100
QC Test Number:	r: TN-23	TN-23-213					Sci	entific	Scientific Name:		Amer	Americamysis bahia	is bah	ia			TEST	TEST TYPE:	•••	Static	/ F	/ Flowthrough	dguo		
Test Material: ELUTRIATE	TRIAT	Œ				 	ARGI	TARGET VALUES	LUES										Ren	Renewal /		Non-renewal	ewal		
Accession Number:	ber:	L	AT3-099			]	Tei	Temp: _	20±1		ပို	DO:		<u>&gt;4.0</u>		_mg/L		Test	Test Container:	ner: _	<u></u>	1-L BEAKER	KER		Ì
Dilution Water:	30 PPT C.S	TCS.					pH;		6.0 - 9.0			Sali	Salinity: _	30±	ω	ppt		Test	Test Volume:	র 		200 ml			
Accession Number: LD346	ber:	[JD34]	8			I	Pho	otoperi	od: <u>1</u> 6	Photoperiod: 16 l, 8 d	1	Ligh	ıt Inter	1sity: <u>5</u>	Light Intensity: <u>50 - 100</u> fc	fc		Test	Test Duration:	ion: _	96	96 hours			1
	ı																								1
			Nu Live	Number of Live Organisms	of isms			Tem _l	Temperature (°C)	Ç			pН	Щ			Disso	Dissolved Oxygen (mg/L)	xygen			Salin	ity (pp	t)	
Concentration	Rep	0	24	48	72	96	0	24	$\vdash$	72 96	0 9	) 24		8 72	96	0	24	48	72	96	0	24 48 72	48	1	96
CONTROL	Α	10	0]	0)	10)	01	1910 Bl		ા હિક્	P.8   19.91	98	8,079	19.T	0.3	7.4	7.	7.773	6,9	7.)	7.0 .	É.	0 8 h	18:42	776248 BRY 278774	7.4
	В	10	0	Õ	<i>*</i> 0	<b></b> ≎																			
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	ם	10	5	වි	V	2																		_	
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	:					<b>}</b>		_		$\vdash$			1								*	_		-	1
AT3-099	Α	10	6	۵	-0		7,0	2.75	10 1	9,619419,9 M. 4 100 8.6 79	<u>с</u>	7,0		7,9 8.0	74	77.	769	ري. ک	5,96.867	١	<i>S</i> ² <i>S</i> ²	3 2 3		35,0384 31.7 320 32.5	
	В	10	70	6	10	õ							l												
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	Ħ	10	5	Ō	8	10		_	-		-		+										-	-	
- NT - 1 -					_		3	2		}   `	1	<u>5</u>	5 - 0	7	+	-	\$	(2)			3	3		1	
MICROI FIGHTION							200	00 00 00	0	199 700	2	20000	_	3	160 700 001	Ş	000	900	790		200	100		0x 90 00 00 00 00 00 000 000 000 000 000	] =
Time		1	1002	N N N	9601 (2001 GHB) LEGA 4.250 WOOL	58.70		)) (Sec	) Se Se	026 023 NYD 1100	33  }}	100	0,60	6 073	0 093	700	tw	Ş	0936	055	Ale "	<u>S</u>	8	0739 0757 020 1000 1036 0878 0875 1840 1100 1036 0900 0833	133
Initials		4	4	65	60 02	72	35	4	(K)	JU JU	2	1, C	(A)	, J.	<u>ا</u> ایخ	2	9	5	JL JL 66	77		27	(C)	2	\Z₽
EPA Test Method: EPA 821-R-02-012 (CHECK ONE)	PA 821-	R-02-0	12 (CH	ECKC	NE)	cff																		ATS-T01	) [01
																								12/03	Š

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	2115123 2116123	0940 100 1018 10135	A C
2	<u> </u>	2/17/23	1148	<del></del>
3		2118/13	1935	GC
4	64 64 6A	2115113	 ৩ ^৭ 3ধ	な な
5		0,11,01	0,10	
6				
7	<u> </u>		-	
8				
9		-		
10			,	
11				
12			<del></del>	
13	<del></del>		<del></del>	
14				
15				
16			<u>.</u>	
17	<u> </u>			
18				
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20	<u> </u>			
21				
22	<del></del> -			
23				
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25				
26				
27				
28				
29				
30				

Ctort Data	0/45/0000				Acute Test-9	6 Hr Survival	
	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		
Control	1.0000	0.9000	0.9000	0.9000	1.0000	<del></del> _	<del></del>
100	0.9000	1.0000	0.9000	1.0000	1.0000		

• •				ansform:	Arcsin Sc	uare Root			1-Tailed		leat	onic
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	_	
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 (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)	
Point	%	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> _{0.3} ]	
					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		_?	0	0	9	ļο	72	of nisms	,							
	J1. K	1074 1010 1000 1014 1019 1040 1040 1040 104		-		<b>E</b>	0	_0	رک	Δ		۵	0	6	<u>ر</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
֝֞֝֞֝֟֝֓֞֝֟֝֓֓֓֓֓֓֞֟֝֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֡֓֡֓֓֓֡֡֡֡֓֓֓֡֡֡֓֓֡֡֡֡	なな	<b>3</b>	, 8	200			_		_	7.5.7					-	1 17	96		j I	a	İ	င်္ဂ		Mer		
1	4	S S	1	2/0	682	_	_	_	_	7.8 7.9	-		$\dashv$			2772	0		į	<u>.</u>	Sa	DO:		Menidia beryllina	INLAND SILVERSIDE	
			2	127 237 28/1	2			_		21.0	_			+		777	24 2	<del></del>		tht Int	Salinity:	بر 		eryllin	SILVE	
	<u>ا</u> چ	101/9/10/1	5	Ž 2						20	_			+		ر ا		pΗ	- Criotity	ancitu	30±3	>4.0		a	RSID	
ŀ	, L	70 g						_		7.9		$\dashv$			-↓	3	72   9		70 - 1	<b>₹</b> 0 _ 1	5				Œ	
Ş	T	<u>0</u> B	0	`       	_	_						_	+			7	96 0	_	00 10	00 fr :	ppt	mg/L		!	E	В
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>	<u>,</u>		Dissolved Oxygen	<b>—</b>	<del>.</del>	Ţ	T		TEST TYPE:	)ate:	Beginning Date:
ľ	7	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	ू र		+			00.0	18	24 48 72		Ir.S		200 ml	1-L BEAKER	renew	vthrou	Time	2115/23 Time: 1122
	ম :	2	286	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 May			_			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
OTHER:



# TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: <u>EA.TOX</u>											
Client: <u>Eco Analysts</u>											
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: <u>EA.TOX</u>
Client: <u>Eco Analysts</u>
QC Test Number: TN-23-214

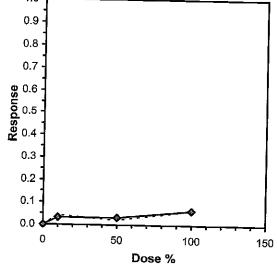
				_ <del></del>
Day	Togting I	-		
<del> </del>	Testing Location	Date	Time	Initials
0	5A	2/15/23	0905	32
1	54 5A 54	2116123	1055	7
2	5A	2/17/23	1152	Ge
3	5/4	2/18/23	1013	
4	S#	2119/23	1048	105
5		1 10	,0,,,	02
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7				
8				
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10		-		<del>                                     </del>
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22			<del>_</del>	
23				<del></del>
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25				
26				<del></del>
27				
28				
29				
30				

					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 ( $p > 0$	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				<del></del>
IC10	>100				
IC15	>100				
IC20	>100			1.0	
IC25	>100			0.9 -	İ
IC40	>100			4	
IC50	>100			0.8 -	ĺ
				<del></del> 0.7 ]	
				{	
				9 0.6 <del>-</del>	ŀ





### TOXICITY TEST SET-UP BENCH SHEET

Project Number:	EA.TOX		
Client: <u>Eco Anal</u>	vsts		
QC Test Number:			
		TEST ORGANISM INFORMA	ATION
Common Name: _	INLAND SILVER	SIDE Adults Isolated	l (Time, Date):
	Menidia beryllina	Neonates Pulle	ed & Fed (Time, Date):
Lot Number: <u>N</u>	1S- 330	Acclimation:	24h Age: 120ays
Source: ABS		Culture Water	24h Age: 12098 (T/S): 19.0 °C 27.4 ppt
		TEST INITIATION	
<u>Date</u>	Time	Initials	Activity
2115/23	09.28	X	Dilutions Made
	4		Test Vessels Filled
/	1103	87	Organisms Transferred
V	1151	GC-	Head Counts
· .		TEST SET-UP	
Sample Number:	AT3-099		
Dilution Number:			
Test Concentra	ation	Volume Test Material	<u>Final Volume</u>
Control		0 ml	1,000 ml
			1
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	A		Е	מ	C	В	Α	Rep			ımber:	30 P	ar:	TE WAT		Eco Analysts	
R-02-0	05 0	1154	<b>P</b> E			10	10	10	10	10		10	10	10	10	10	0			LD3	30 PPT C.S	АТЗ	ER	TN-23-215	/sts	
12 (CI	ج ا	4	1024			00		10	9	<u>_</u>		c	01	0	0	70	24	Liv		8		AT3-099		15		EA.
ECK (	<u>5</u>		10/4			8	٩	OP.	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>	Q		13	S	10	16	d)	72	r of nisms								
(Z)	1	30	1027		_	~	۵	۵		50		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	B						$0^{i}$		ï				191	0			ы	שי	Temp:	TAR	7.0	_	TEST
		7	(2)	682						56 0'b						193	24	Ter		hotope	pH:		3ET V	cientii	ommo	ORG
$\mathcal{Z}$		<u>E</u>	2	682 683 683 642 641						1.8/8.0						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						19.7				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						26.280.30						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					-	5,0 7,9				_		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						✓						82	96	į		. 100 f						
		Z	<u> </u>	289/289	_					77						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	261 heo)	1589					-	2			-			6,8 29 1	48	lved Ox (mg/L)		Test	Test	Test		ТҮРЕ	[a	ate:
		2	190	978					_	75		_				20		суgen		Test Duration:	Test Volume:	Test Container:	Ren		Ending Date: 4/14/12	Beginning Date: 215/23
		4	1024 0906	1/8						2						$\mathbb{Z}$	96			ion: L	<u>.</u>	ner:	Renewal /	Static	W	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)		-	_			777267757575757757777					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>						7.7			_			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 (Red absenced



# TOXICOLOGY LABORATORY BENCH SHEET - TESTING LOCATION

Project Number:	EA.TOX	
Client: <u>Eco Ar</u>	nalysts	
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				
17				
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19				
20				
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	0.8000		

			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)			

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 communici	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>			
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## 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.	fund in Redefit	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 8/9/23
:	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:

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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.