

## **Appendix H: Construction Impacts**

### **H-7 HARS Suitability**



**DEPARTMENT OF THE ARMY**  
**NEW YORK DISTRICT, CORPS OF ENGINEERS**  
**JACOB K. JAVITS FEDERAL BUILDING**  
**NEW YORK, N.Y. 10278-0090**

REPLY TO  
ATTENTION OF:

**JUN 22 2012**

Regulatory Branch

SUBJECT: Permit Application Number NAN-2012-00090-WSC  
by the New York State Thruway Authority (Tappan Zee  
Hudson River Crossing Project)

Daniel P. Hitt, RLA  
New York State Department of Transportation  
50 Wolf Road  
Albany, NY 12232

Dear Mr. Hitt:

Reference is made to the enclosed copies of the following:

- a. United States Environmental Protection Agency (EPA) Region-2  
letter dated June 6, 2012.
- b. U.S. Army Corps of Engineers, New York District (USACE)  
letter dated June 4, 2012.

The dredged material sampling and testing results you submitted have been reviewed by EPA and USACE. The dredged material was found to be suitable for placement in the Historic Area Remediation Site (HARS). A letter dated June 6, 2012 from EPA (Reference (a)), provided a Quality Assurance Review Record. As requested by EPA, you should provide a copy of EPA's June 6, 2012 correspondence to your laboratories performing the work so they can receive feedback on the data quality, in order to facilitate quality improvement.

At this time, we are awaiting receipt of the information stated in our June 4, 2012 letter (Reference (b)), so that the application can be considered complete and the required public notice can be issued.

You may contact Christopher S. Mallery, Chief, Western Section at (917) 790-8418 if you have any questions.

Sincerely,

Richard L. Tomer  
Chief, Regulatory Branch

Enclosures

Copies furnished (w/Enclosures):  
Melissa Toni, FHWA  
Michael Anderson, NYSDOT

# **Aqua Survey, Inc.**

## **VOLUME I**

### **Technical Report on the Sampling and Testing of Material from the Tappan Zee Hudson River Crossing Proposed for Dredging and HARS Placement**

**Prepared for**

**AKRF, Inc.  
440 Park Avenue South  
7<sup>th</sup> Floor  
New York, NY 10016**

**May 23, 2012**

**ASI Job # 32-012**

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### **Statistical Analysis of Tissue Samples: *N. virens***



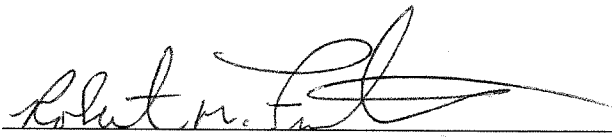
## Signature Page

### Technical Report on the Sampling and Testing of Material from the Tappan Zee Hudson River Crossing Proposed for Dredging and HARS Placement

Prepared for

**AKRF, Inc.**  
**440 Park Avenue South**  
**7<sup>th</sup> Floor**  
**New York, NY 10016**

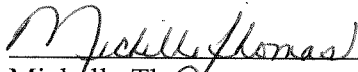
This report, as well as all records and raw data were audited and found to be an accurate reflection of the study. Copies of raw data will be maintained by Aqua Survey, Inc, 469 Point Breeze Road, Flemington, New Jersey, 08822.



Robert M. Fristrom  
Quality Assurance Officer

5/23/12

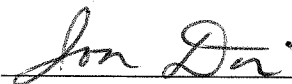
Date



Michelle Thomas  
Laboratory Manager

5/23/12

Date



Jon Doi, Ph.D.  
Executive Vice President

5-23-12

Date

## **Summary Page**

### **Technical Report on the Sampling and Testing of Material from the Tappan Zee Hudson River Crossing Proposed for Dredging and HARS Placement**

#### **Study Initiation Date**

January 30, 2012

#### **Study Completion Date**

May 23, 2012

#### **Performing Laboratory**

Aqua Survey, Inc.  
469 Point Breeze Road  
Flemington, New Jersey 08822

#### **Sponsor**

AKRF, Inc.  
440 Park Avenue South  
7th Floor  
New York, NY 10016

#### **Laboratory Project ID**

32-012

## I. INTRODUCTION

### A. Project Overview

The objective of this study was to perform sampling, compositing, physical characterization and biological testing of sediment proposed for dredging from the Hudson River, near the Tappan Zee Bridge. Testing was performed in accordance with USEPA and USACOE, 1991 Green Book, Evaluation of Dredged Material Proposed for Ocean Disposal – Testing Manual, EPA-503/8-91/001; and USACOE New York District, Guidance for Performing Tests on Dredged Material Proposed for Ocean Disposal, December 1992 [USEPA/USACE, 1991; USEPA/NYACE, 1992].

Aqua Survey, Inc. (ASI) performed all sampling, biological testing and physical analyses (grain size, percent moisture, TOC, bulk density, specific gravity and Atterberg Limits).

Whole sediment toxicity was assessed through 10-day exposures with the mysid shrimp, *Americamysis bahia*, and the amphipod, *Ampelisca abdita* in solid phase tests.

Toxicity of elutriate prepared from the composite was assessed through 96-hour suspended particulate phase toxicity bioassays with the inland silverside, *Menidia beryllina* and the mysid shrimp, *Americamysis bahia*. A 48-hour embryo development test was performed using the blue mussel, *Mytilus edulis*.

Bioaccumulation of metals, pesticides, PCB congeners, semivolatiles (1,4 dichlorobenzene), PAHs, and dioxin/furans was assessed using 28-day exposures of the clam, *Macoma nasuta* and the sand worm, *Nereis virens* to the four composite sediment samples.

## **B. Relevant Correspondence**

Regulatory Branch

JAN 06 2012

SUBJECT: Pre-Application File For New York State Department of Transportation and New York State Thruway Authority For The Department of the Army Regulated Transport of Dredged Material Into The Atlantic Ocean For Placement In The Historic Area Remediation Site (HARS) For The Replacement Of The Existing Governor Malcolm Wilson Tappan Zee Bridge In The Hudson River between Tarrytown, Westchester County, New York; and Nyack, Rockland County, New York

3. Enclosed, please find the requested sediment sampling layout [four sheets], testing and analysis [One 2-page checklist] plan for your agency's proposed 1.51 million cubic yards [permit applicant's Stage 1 and Stage 2] Section 103 of MPRSA permit application. Sediment sample locations and testing and analysis requirements for ocean disposal of your agency's proposed dredged material were jointly developed by the U.S. Army Corps of Engineers New York District and the U.S. Environmental Protection Agency-Region 2.
4. Sediment sampling and testing and analysis plan is valid for only 6 months from today.
5. Your agency should contact New York State Department of Environmental Conservation (NYSDEC) for any additional sampling and/or testing that would be required by the State for issuance of a Water Quality Certificate pursuant to Section 401 of the Clean Water Act.
6. All sampling Cores shall be taken to the maximum dredging depth of -17 feet Mean Lower Low Water [MLLW] Datum.
7. As depicted on the enclosed four sampling location plan sheets, the permit applicant's areas to be dredged have been divided into four separate sediment-sample composites for purposes of the Section 103 MPRSA HARS testing and analysis. Composite Areas 1A, 1B and 1C encompass permit applicant's dredging Stage 1 (2013), and Composite Area 2 encompasses permit applicant's dredging Stage 2 (2014). (*i.e.*, four separate composites will be tested). Again, all cores must be taken to project depth plus 1' (*i.e.*, to -17' MLLW).

Composite Area 1A: 12 sediment core locations (Samples Numbers 1 – 12)

Composite Area 1B: 12 sediment core locations (Samples Numbers 13 – 24)

Composite Area 1C: 11 sediment core locations (Samples Numbers 25 – 35)

Composite Area 2: 12 sediment core locations (Samples Numbers 36 – 47)

8. If stratification is not observed in any of the core samples collected within an area, all sediment cores must be homogenized into the defined composited sample for purposes of bioassay/bioaccumulation testing and analysis.

Regulatory Branch

JAN 06 2012

SUBJECT: Pre-Application File For New York State Department of Transportation and New York State Thruway Authority For The Department of the Army Regulated Transport of Dredged Material Into The Atlantic Ocean For Placement In The Historic Area Remediation Site (HARS) For The Replacement Of The Existing Governor Malcolm Wilson Tappan Zee Bridge In The Hudson River between Tarrytown, Westchester County, New York; and Nyack, Rockland County, New York

9. If there is any evidence of stratification within any core samples, the make-up of the composites may need to be adjusted, or separate strata within each core may actually need to be tested separately. If there is any evidence of stratification in core samples, the permit applicant's sampling contractor shall immediately contact New York District technical manager prior to compositing Ms. Oksana Yaremko, 917-790-8539, [Oksana.S.Yaremko@usace.army.mil](mailto:Oksana.S.Yaremko@usace.army.mil) and/or Mr. Monte Greges, 917-790-8428, [Monte.Greges@usace.army.mil](mailto:Monte.Greges@usace.army.mil)

10. All contractors and laboratories performing sampling, storing and testing of the sediment must follow procedures described in the current New York and New Jersey Harbor regional guidance manual titled U.S. Army Corps of Engineers-New York District / U.S. Environmental Protection Agency-Region 2 Guidance for Performing Tests on Dredged Material Proposed For Ocean Disposal [copy available upon written request.] and must have demonstrated to U.S. Environmental Protection Agency-Region 2 that they are capable of performing the required work. If a contract laboratory has never submitted data under this dredged material testing program, they would need to obtain a prior acceptability statement from U.S. Environmental Protection Agency-Region 2.

11. The permit applicant shall submit the names of all laboratories that they will be using for this effort prior to initiation of sediment sampling and receive written approval prior to initiating the sampling. This can be done by letter or email to the technical manager Ms. Oksana Yaremko, 917-790-8539, [Oksana.S.Yaremko@usace.army.mil](mailto:Oksana.S.Yaremko@usace.army.mil) and/or Mr. Monte Greges, 917-790-8428, [Monte.Greges@usace.army.mil](mailto:Monte.Greges@usace.army.mil)

12. If your agency has any questions regarding any aspect of this letter you may contact Mr. Richard Tomer, Chief of Regulatory Branch, at 917-790-8510.



Enclosures (2)

Thomas M. Creamer

6 JAN 2012

Chief of Operations, Readiness

and Regulatory Functions Division

Deputy Supervisor of New York & New Jersey Harbor

Copies furnished (w/o encls):

USEPA Region 2 (Mr. Doug Pabst)

NYSTA (Mr. D. Capobianco)

AECOM (Mr. James Mansky)

USDOT/FHWA/NYD (Mr. John Burns)

Sive, Paget & Riesel, P.C. (Mr. David Paget)

**SAMPLING SCHEME and LIST of REQUIRED TESTING as OUTLINED in  
the 1992 ACENYD/EPA REGION II REGIONAL IMPLEMENTATION MANUAL on  
Dredged Material Proposed for Ocean Disposal and the 1991 GREEN BOOK**

Applicant NYS DEPARTMENT OF TRANSPORTATION – TAPPAN ZEE HUDSON RIVER CROSSING (TZHRC)

Applicant No. Preapplication

Address NEW YORK STATE

Waterway HUDSON RIVER

Proposed Volume: 1,510,000 cubic yards (based on 4/12/2006 bathymetric survey)

Project Depth in feet: -16 MLLW

(NOTE: The applicant is required to collect cores from each sampling location to project depth plus 1 ft)

A preapplication meeting x was held on 1/5/2012 at the applicant's office

       was not held at the NY District Offices in New York.

The applicant has indicated that testing will be performed by the following laboratories:

Biological:       ? Analytical:       ? Dioxin:       ?

The sampling scheme and required testing described on the reverse side was approved for the proposed project area based upon the information contained in the attached map.

Sample dredging sites are indicated on attached map.

The proposed dredging area is subdivided into       4       reaches for sampling and testing purposes:

AREA 1A:       12       locations (Samples 1 – 12)  
 AREA 1B:       12       locations (Samples 13 – 24)  
 AREA 1C:       11       locations (Samples 25 – 35)  
 AREA 2:       12       locations (Samples 36 – 47)

The applicant is required to collect cores from each sampling location to project depth plus 1 ft. (i.e., -17 ft MLLW)

- The District reserves the right to require additional sampling and testing at any time.

**COMMENTS:**

1. If there is any evidence of stratification in core samples, the composites may need to be adjusted, or separate strata within each core may need to be tested separately. If there is any evidence in stratification in core samples contact NYD prior to compositing.
2. Additional cores may have to be taken from each station in order to ensure adequate volumes of sediment to meet testing requirements. If so, the same number of cores must be taken and composited from each location.
3. Core locations may have to be moved if shoaling patterns have changed. If so, contact NYD during sampling to confirm new locations.

\* If you have any questions regarding sampling, test protocols, test species, qa/qc, etc. please contact the Dredged Material Management Section of the USACE/NYD at (917)-790-8428 or extension of person completing this form.

PREPARED BY: OKSANA YAREMKO DATE: 5 Jan 2012 PHONE: 917-790-8539

\*SEE REVERSE SIDE FOR SAMPLING AND TESTING REQUIREMENTS\*

Any Box Checked Off Indicates an Analysis or Assay that is Required for a Given Project.  
Archiving requires saving a sample for possible analysis at a later time pending further instruction.

X=Per Homogenized Sediment Core + Reference (Composited Grabs) + Control

C=Per Bioassay Sediment Composite

A=Archive

W=Site Water and Elutriate

T=Per Tissue Replicate (Ref, Test, Pre-test, A=Archive Ctl and any remaining tissue from Ref, Test, Pre-test)

1. SEDIMENT PHYSICAL ANALYSIS (If stratification is observed, each stratum within a core must be analyzed separately)

- a. ☒ Grain Size Analysis (% sand, % silt, & % clay)
- b. ☒ % Moisture
- c. ☒ Specific Gravity
- d. ☒ Bulk Density
- e. ☒ Plastic and Liquid limits (Atterberg limits)

2. SEDIMENT CHEMICAL ANALYSIS

REQUIRED

- a. ☒ % Total Organic Carbon

CASE BY CASE BASIS

- a. ☒ Metals (Ag, As, Cd, Cr, Cu, Hg, Ni, Pb, Zn)
- b. ☒ PAHs (LMWs: acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, phenanthrene)
- c. ☒ PAHs (HMWs: benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthrene, indeno(1,2,3-c,d)pyrene, pyrene)
- d. ☒ Semi-volatiles (1,4 dichlorobenzene)
- e. ☒ Pesticides (aldrin, alpha chlordane, trans nonachlor, dieldrin, p,p' and o,p' DDT/DDD/DDE, endosulfans(I,II, and sulfate), heptachlor, heptachlor epoxide)
- f. ☒ PCBs (#8,18,28,44,49,52,66,87,101,105,118,128,138,153,170,180,183,184,187,195,206,209)
- g. ☒ PCB coplanar (#77,126,156,169)
- h. ☒ Dioxins/Furans (2,3,7,8 - substituted isomers, n=17)
- i. ☐ Other:
- j. ☐ LIS pesticides
- k. ☐ LIS PAHS

3. CHEMICAL ANALYSIS OF SITE WATER AND ELUTRIATE

REQUIRED

- a. ☒ Metals (Ag, Cd, Cr, Cu, Hg, Ni, Pb, Zn)
- b. ☒ PCBs (#8,18,28,44,49,52,66,87,101,105,118,128,138,153,170,180,183,184,187,195,206,209)
- c. ☒ Pesticides (aldrin, alpha chlordane, trans nonachlor, dieldrin, p,p' and o,p' DDT/DDD/DDE, endosulfans(I,II, and sulfate), heptachlor, heptachlor epoxide)
- d. ☐ Other:

CASE BY CASE BASIS

- a. ☐ PAHs (all 16, LMW, HMW, as specified)
- b. ☐ 2,3,7,8-TCDD
- c. ☐ 2,3,7,8-TCDF
- d. ☐ PCB coplanar (#77,126,156,169)
- e. ☐ LIS pesticides
- f. ☐ Other:

4. BIOASSAYS (species listed in guidance manual)

- a. ☒ Water Column Acute Tox. (bivalve larvae, M. bahia, Menidia sp.)
- b. ☒ 10-Day Benthic Acute Tox. (A. abdita, R. abronius, E. estuarius, or L. plumulosus)
- c. ☒ 10-Day Benthic Acute Tox. (M. bahia)
- d. ☒ 28-Day Bioaccumulation (N. virens, and Macoma secta or M. nasuta) - INCLUDING DIOXIN,
- e. ☐ 28-Day Bioaccumulation (N. virens and Macoma secta or M. nasuta): DIOXIN ONLY

5. 28-DAY WHOLE-SEDIMENT BIOACCUMULATION TISSUE ANALYSIS

REQUIRED

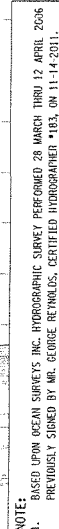
- a. ☒ Metals (Ag, As, Cd, Cr, Cu, Hg, Ni, Pb, Zn)
- b. ☒ Pesticides (aldrin, alpha chlordane, trans nonachlor, dieldrin, p,p' and o,p' DDT/DDD/DDE, endosulfans(I,II, and sulfate), heptachlor, heptachlor epoxide)
- c. ☒ PCBs (#8,18,28,44,49,52,66,87,101,105,118,128,138,153,170,180,183,184,187,195,206,209)
- d. ☒ Semi-volatiles (1,4 dichlorobenzene)
- e. ☒ PAHs (LMWs: acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, phenanthrene)
- f. ☒ PAHs (HMWs: benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthrene, indeno(1,2,3-c,d)pyrene, pyrene)

CASE BY CASE BASIS

- a. ☒ Dioxins/Furans (2,3,7,8 - substituted isomers, n=17)
- b. ☐ LIS pesticides
- c. ☐ LIS PAHS
- d. ☐ PCB coplanar (#77,126,156,169)
- e. ☐ Other:

\*REFER TO COMMENT SECTION ON REVERSE SIDE FOR ADDITIONAL INFORMATION\*





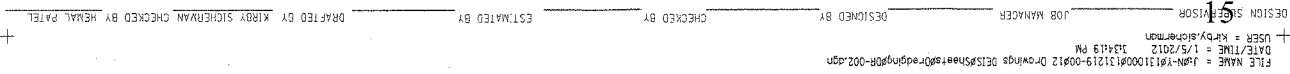


PROPOSED PROJECT DREDGING STAGES	DREDGING QUANTITIES (MILLIONS OF CUBIC YARDS)
STAGE 1 - 9/15/2013 to 12/15/2013	1.01
STAGE 2 - 9/15/2014 to 12/15/2014	0.32
STAGE 3 - 9/15/2016 to 12/15/2018 SUBJECT OF A SEPARATE APPLICATION IN THE FUTURE	0.22
DREDGING OVERDEPTH (1FT ALLOWANCE)	0.21
	4.4

CRITICAL PROJECT DEPTHS	PROPOSED PROJECT				TOTAL
	ORDERING DEPTHS (MEAN LOWER-LEVEL WATER DRAINAGE) (MILW)	STAGE 1 (M CY)	STAGE 2 (M CY)	STAGE 3 (M CY)	
PROPOSED PROJECT DREDGING DEPTHS	-16.00 (16.89)	1.01	0.32	0.12	1.45
DREDGING OVERDEPTH DEPTHS (IFT ALLOWANCE)	-17.00	0.12	0.06	0.03	0.21
TOTAL MAXIMUM DREDGING DEPTHS	-17.00	1.13	0.38	0.15	1.66

SEDIMENT SAMPLING POINTS  
SHEETS 2, 3, 4:

<div>ARUP</div> <div>ARUP USA, INC. 150 Avenue of the Americas New York, NY 10013-2098 Tel: (212) 200-2000 Fax: (212) 200-2000 www.arup.com</div>	<div></div> <div>Thruway Authority</div>	AS BUILT REVISIONS DESCRIPTION OF WORK:										CONTRACT NUMBER: 131219		<div></div> <div>DRAWING NO. DR-001 SHEET 1 NO.</div>				
		<div>SIGNATURE _____ DATE _____</div>										PIN			CULVERTS		ALL DIMENSIONS IN FT UNLESS OTHERWISE NOTED	
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DOCUMENT NAME: NEW YORK STATE DEPARTMENT OF TRANSPORTATION REGION										SHEET 1 OF 8								



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+ USER = Kirby.Sicherman  
DESIGN SUPERVISOR 15

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155 Avenue of the Americas  
New York, NY 10013  
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**Thruway Authority**

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DESCRIPTION OF WORK:

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F	01/05/12	REVISED
E	01/04/12	REVISED
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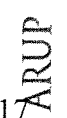

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NEW YORK STATE DEPARTMENT OF TRANSPORTATION REGION

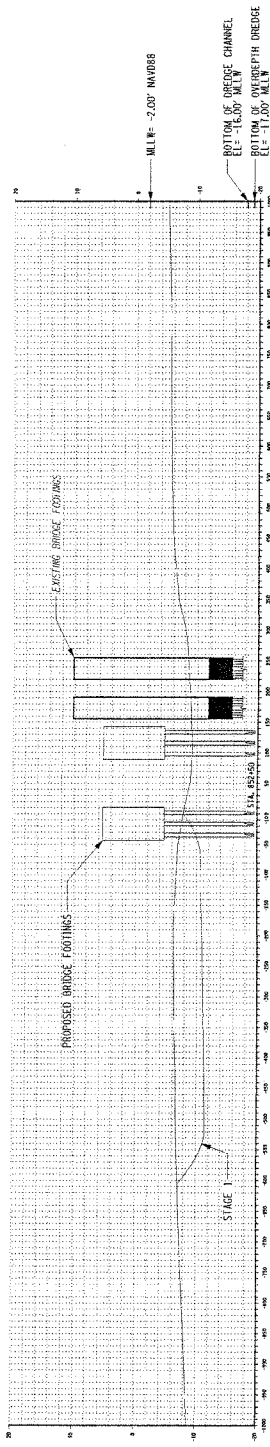




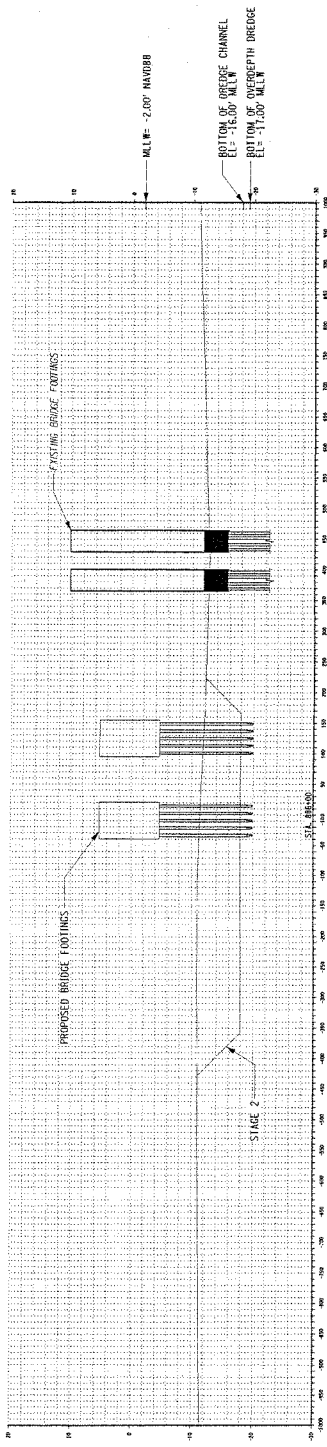
NOTE:  
 1. BASED UPON OCEAN SURVEY'S INC. HYDROGRAPHIC SURVEY PERFORMED 20 MARCH THRU 12 APRIL 2006  
 PREVIOUSLY SIGNED BY MR. GEORGE REYNOLDS, CERTIFIED HYDROGRAPHER #183, ON 11-14-2011.

 ARUP 100 Hudson Street New York, NY 10013 Tel: 212 512 2000 Fax: 212 512 2001 www.arup.com	 <b>Thruway Authority</b>	AS BUILT REVISIONS DESCRIPTION OF WORKS		DATE _____		SIGNATURE _____ DOCUMENT NAME		ALL DIMENSIONS IN 1" UNLESS OTHERWISE NOTED TAPPAN ZEE HUDSON RIVER CROSSING PROJECT HUDSON RIVER BRIDGE CROSSING PLAN SHEET 4 OF 8		CONTRACT NUMBER 131219	DRAWING NO. DR-004 SHEET NO.
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NEW YORK STATE DEPARTMENT OF TRANSPORTATION REGION





CROSS SECTION A



CROSS SECTION B

NOTE:  
 1. FOR LOCATION CROSS-SECTIONS, REFER TO Dwg. NO. DR-004.  
 2. BASED UPON OCEAN SURVEYS, INC. HYDROGRAPHIC SURVEY PERFORMED 28 MARCH THRU 12 APRIL 2006.  
 3. PREVIOUSLY SIGNED BY MR. GEORGE REMOLDS, CERTIFIED HYDROGRAPHER #183, ON 11-14-2011.

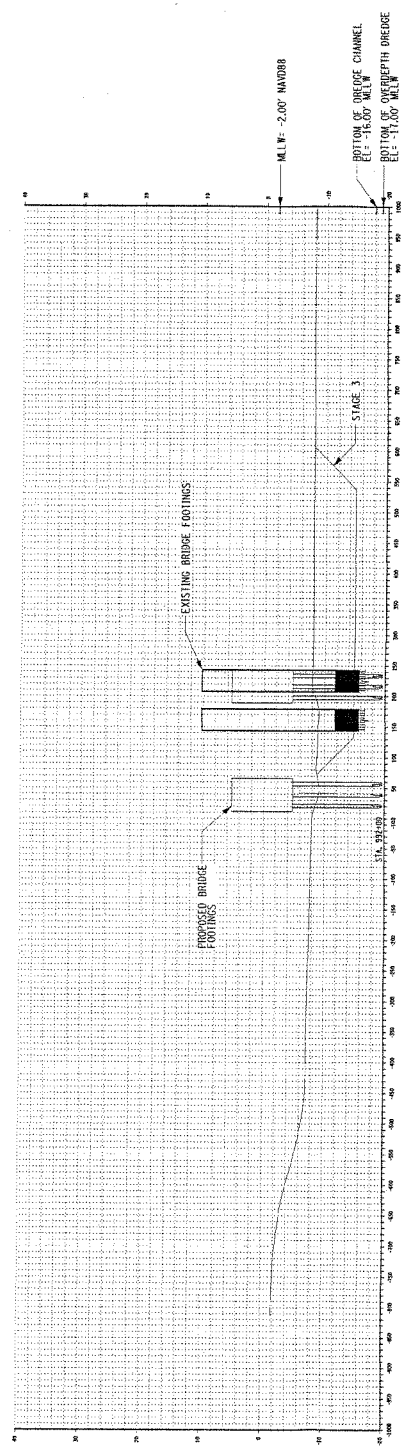
 ARUP 1000 10th Avenue, Suite 1000 New York, NY 10018 Tel: 212 904 4000 Fax: 212 904 4001 www.arup.com		 Thruway Authority		AS BUILT REVISIONS DESCRIPTION OF WORK: _____ DATE: _____ SIGNATURE: _____ DOCUMENT NAME: _____		F. 01/05/12 REVISED E. 01/04/12 REVISED D. 11/28/11 REVISED C. 11/17/11 DRAINAGE OUTFALL AND SLOPES ADDED REV. DATE DESCRIPTION K.S. PSAC DATE K.S. BY		BRIDGES CULVERTS ALL DIMENSIONS IN FT UNLESS OTHERWISE NOTED TAPPAN ZEE HUDSON RIVER CROSSING PROJECT HUDSON RIVER CROSS SECTIONS SHEET 5 OF 8		CONTRACT NUMBER 131219 DRAWING NO. DR-005 SHEET NO.	
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





NOTE:  
 1. FOR LOCATION CROSS-SECTIONS, REFER TO DWG. NO. DR-004.  
 2. BASED UPON OCEAN SURVEYS, INC. HYDROGRAPHIC SURVEY PERFORMED 28 MARCH THRU 12 APRIL 2006.  
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CROSS SECTION G

 ARUP <small>100 Avenue of the Americas          New York, NY 10013-2078          Tel: (212) 200-2000 Fax: (212) 200-2000</small>		 <b>Thruway Authority</b>		AS BUILT REVISIONS DESCRIPTION OF WORKS:  SIGNATURE _____ DATE _____ DOCUMENT NAME: _____		<table border="1"> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION</th> <th>KS</th> <th>BY</th> </tr> <tr> <td>F</td> <td>01/09/12</td> <td>REVISED</td> <td>KS</td> <td></td> </tr> <tr> <td>E</td> <td>01/04/12</td> <td>REVISED</td> <td>KS</td> <td></td> </tr> <tr> <td>D</td> <td>11/28/11</td> <td>REVISED</td> <td>KS</td> <td></td> </tr> <tr> <td>C</td> <td>11/17/11</td> <td>DRAINAGE OUTFALL AND SLOPES ADDED</td> <td>KS</td> <td></td> </tr> </table>		REV	DATE	DESCRIPTION	KS	BY	F	01/09/12	REVISED	KS		E	01/04/12	REVISED	KS		D	11/28/11	REVISED	KS		C	11/17/11	DRAINAGE OUTFALL AND SLOPES ADDED	KS		<table border="1"> <tr> <th>BRIDGES</th> <th>CULVERTS</th> <th>ALL DIMENSIONS IN FT UNLESS OTHERWISE NOTED</th> </tr> <tr> <td></td> <td></td> <td>TAPPAN ZEE HUDSON RIVER CROSSING PROJECT</td> </tr> <tr> <td></td> <td></td> <td>HUDSON RIVER</td> </tr> <tr> <td></td> <td></td> <td>CROSS SECTIONS</td> </tr> <tr> <td></td> <td></td> <td>SHEET 8 OF 8</td> </tr> </table>		BRIDGES	CULVERTS	ALL DIMENSIONS IN FT UNLESS OTHERWISE NOTED			TAPPAN ZEE HUDSON RIVER CROSSING PROJECT			HUDSON RIVER			CROSS SECTIONS			SHEET 8 OF 8	<table border="1"> <tr> <th>CONTRACT NUMBER</th> <th>DRAWING NO.</th> </tr> <tr> <td>131219</td> <td>DR-008</td> </tr> <tr> <td></td> <td>SHEET NO.</td> </tr> </table>		CONTRACT NUMBER	DRAWING NO.	131219	DR-008		SHEET NO.
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NEW YORK STATE DEPARTMENT OF TRANSPORTATION REGION



## **C. Project Deviations Summary**

1. Due to the low salinity of the interstitial water in each test sediment, the salinity fell below the 28 ppt minimum requirement for much of the 10-day *A. bahia* static solid phase bioassay. Please refer to Table 15 for a summary of the 10-day salinities.
2. There were minor temperature excursions in the 28 day *M. nasuta* bioassay. Please refer to Table 47 for the summary of the 28-day temperatures.

## **II. TEST ADMINISTRATION**

### **A. Sponsor**

AKRF, Inc.  
440 Park Avenue South  
7th Floor  
New York, NY 10016

### **B. Testing Facilities**

Aqua Survey, Inc.  
469 Point Breeze Road  
Flemington, NJ 08822

Battelle  
Applied Coastal and Environmental Services (ACES)  
397 Washington Road  
Duxbury, MA 02332-4505

Battelle Marine Sciences Laboratory  
1529 West Sequim Bay Road  
Sequim, WA 98382-9099

Battelle  
505 King Avenue  
Columbus, OH 43201-2693

### **C. Dates of Experiment**

Date of Study Initiation: January 30, 2012  
Date of Study Completion: May 23, 2012

### **D. Study Participants**

Jon Doi, Ph.D.	Executive Vice President and Project Manager
Thomas Dolce	Field Operations Manager
Robert Fristrom	Quality Assurance Officer
Elizabeth Horn	Staff Scientist
G. Stephen Hornberger	Senior Scientist
Mark Padover	Field Operations Specialist
York Terrell	Staff Scientist
Michelle Thomas	Laboratory Manager

### III. MATERIALS AND METHODS

All sampling and testing was performed according to the sediment sampling and testing plan on file with the NYD/USACE.

#### A. Sampling

Test sediment from 47 locations and site water from four locations were collected from the Hudson River near the Tappan Zee Bridge by ASI personnel over a total of four days, starting on January 30, 2012 and finishing on February 2, 2012. Please refer to the core logs in Appendix A for specific dates of sampling. Figures 1 and 2 provide Site Maps of all sampling locations.

The vessel used for sampling, the R/V Raritan, was positioned using a Trimble NT200D Differential Global Positioning Receiver (DGPR). Collection of sediment was performed using a Rossfelder P-3 vibracore with flexible plastic core liners. Each core taken was inspected and its characteristics were recorded on a sediment core log. Photographs were taken of each core; photographs are provided in Appendix B.

Upon arrival at ASI, all samples were logged in and assigned a unique sample number (Table 1). Samples were received in good condition at ASI in Flemington, NJ and stored at 2°C to 4°C. All supporting documentation, including chains-of-custody and sample use forms can be found in Volume II (Appendices A-H).

There were three control sediment samples and one reference sediment used in the biological bioassays. The Sandy Hook Control sediment (ASI ID # 20120081) was obtained from the Gateway National Recreation Area, Atlantic Highlands, NJ, on February 7, 2012. The Tuckerton Control sediment (ASI ID # 20120080) was obtained from Tuckerton Creek at the third bridge, Tuckerton, NJ, on February 6, 2012. The Mud Dump Reference sediment (ASI ID # 20120079) was obtained from the ACOE-designated area six miles off of the coast of Sandy Hook, NJ on February 3, 2012 (Geodetic coordinates 40° 20.240 N, 73° 52.148 W). Amp Control Sediment (ASI ID # 20120177) was supplied by the organism supplier, Brezina and Associates.

The Amp Control was used for the *A. abdita* solid phase bioassay. The Sandy Hook Control was used for the *A. bahia* solid phase bioassay and the *N. virens* bioaccumulation bioassay. The Tuckerton Control was used for the *M. nasuta* bioaccumulation bioassay. The Mud Dump reference was used for the *A. abdita* and the *A. bahia* solid phase bioassays and the *M. nasuta* and *N. virens* bioaccumulation bioassays.

Prior to the initiation of testing, all control and reference sediments were sieved using a 1-mm Nytex screen (reference) or a 0.5-mm Nytex screen (control). For the *A. abdita* solid phase test, the reference sediment was

first sieved through a 1-mm Nytex screen and then press-sieved through a 0.5 Nytex screen to be certain no indigenous organisms were present. Test sediment was used unaltered.

Manasquan water, obtained from Manasquan Inlet, NJ, was used as the overlay water and dilution water for all testing. This water was tested according to ASTM guidelines to ensure purity. The results of the latest water analysis and Sample Receiving Logs for both are included in Volume II (Appendix E).

## **B. Homogenizing and Compositing**

Each sediment sample was carefully homogenized using a stainless steel mixer following specific guidelines found on pages 9-11 and Appendix A of the Dredging Manual and according to ASI's standard operating procedure SOP/PRP/008. Samples were mixed until uniform in color and texture. These homogenized core samples were then combined using the same methodology to form the HARS composite samples. Sample identification numbers and the compositing scheme for the composites are provided in Table 1.

## **C. Chemical Analyses**

A subsample of each of the composites were shipped to Battelle, Duxbury, MA, and Battelle Marine Sciences Laboratory, Sequim, WA, along with the site water sample for chemical analysis as required by the NYD/USACE. Following chain-of-custody procedures, samples were placed in glass jars and shipped by overnight courier in coolers with ice packs.

## **D. Physical Analysis and Total Organic Carbon**

Sub-samples of all sediments were analyzed by ASI personnel for physical analyses. These sediments include the following: each homogenized core, the HARS composite samples, the Sandy Hook, Tuckerton, and Brezina Controls, and the Mud Dump Reference sediments. Percent moisture and grain size distribution analyses were performed in accordance with the *Standard Test Method for Particle-Size Analysis of Soils*, Designation: D422-63, Re-approved 2002 [ASTM, 2002].

Total Organic Carbon (TOC) was determined based on the guidance from EPA Office of Solids Waste and Emergency Response SW-846 Method No. 9060 (Volume IC, Chapter 5, Revision 0, 9/86) [EPA, 1986]. The instrument used for this analysis was the Dohrmann TOC Boat Sampler, Model 183 (serial number 98202003), which was connected to the Dohrmann Apollo 9000 TOC Analyzer.

Additionally, ASI analyzed the composite samples for Bulk Density [Blake, 1986], Specific Gravity [APHA, 1995] and Atterberg Limits (plastic and liquid limits) [ASTM, 1995]. The elutriate used in the *A. bahia* and *M. beryllina* suspended particulate phase bioassays was analyzed for total suspended solids (Table 5).

Results of the percent moisture, grain size distribution and TOC analyses are provided in Tables 4a and 4b. Results of the bulk density, specific gravity, Atterberg limits and total suspended solids are provided in Table 5.

#### **E. Solid Phase Testing**

Whole sediment toxicity of the composite sediments was assessed through 10-day exposures with the amphipod, *A. abdita* and Mysid shrimp, *A. bahia* in solid phase bioassays [ASTM, 1999].

After ten days of exposure to the composite, live count data from the solid phase tests for both species were entered into a spreadsheet, sorted and tabulated. Water quality and physical parameters were also monitored. Final live counts and water quality parameter tables can be found at the end of this report.

Standard reference toxicant tests were performed for both *A. bahia* and *A. abdita* and reference toxicant data were entered into a program based on currently accepted methods for calculating an LC<sub>50</sub>. The LC<sub>50</sub> for each species fell within the 95% confidence limits of their respective control charts. Control charts can be found in Volume III (Biological Raw Data) along with SRT raw data.

#### **Ampelisca abdita**

The *A. abdita* used in testing were obtained from Brezina and Associates, Inc. Dillon Beach, California. Organisms were held for 8 days prior to testing; during this time they were acclimated to test temperature and salinity.

The initial pore water ammonia readings for the composites was 33.6 mg/L for the Area 1A composite, 29.7 mg/L for Area 1B composite, 28.5 for Area 1C composite and 35.3 for the Area 2 composite. These values exceed the 20.0 mg/L threshold established by Davies et al, [Davies, 1993]. The exposure chambers for all four composites underwent pretest purging for eight days to reduce the total ammonia in the pore water to 19.3 mg/L for Area 1A, 18.0 for Reach 1B, 16.9 for Area 1C and 17.1 for Area 2.

### *Americamysis bahia*

The *A. bahia* used in testing were 5-day-old juveniles, and were obtained from Aquatic Research Organisms, Hampton, NH.

The unionized ammonia values in the overlay water of the composites were calculated for day 0 of the 10-day solid phase tests with *A. bahia*. The average initial unionized ammonia in the overlay water was 0.06 mg/L (Area 1A), 0.04 mg/L (Area 1B), 0.04 mg/L (Area 1C), and 0.05 mg/L (Area 2). None of these values exceeded the 0.6 mg/L threshold established by the USEPA for a pH of 7.9-8.0, and 0.3 mg/L for a pH of 7.5 [Southerland, 1994]. A static renewal toxicity test was also set up and run at the same time as the static test.

## **F. Suspended Particulate Phase Testing**

### *Menidia beryllina*, *Americamysis bahia* and *Mytilus edulis*

Toxicity of elutriates prepared from the composites were assessed through 48- and 96-hour suspended particulate phase toxicity tests using three test species, the inland silverside, *M. beryllina*, the Mysid shrimp, *A. bahia*, and the blue mussel, *M. edulis*.

The *M. beryllina* used for testing were 14 days old, and were obtained from Aquatic Research Organisms, Hampton, NH.

The *A. bahia* used for testing were 5-day-old juveniles obtained from Aquatic Research Organisms, Hampton, NH.

The *M. edulis* used for testing were fertile adults of various ages, and were obtained from Carlsbad Aquafarm, Carlsbad, CA.

All four area composite elutriates needed to be centrifuged in order to observe organisms in solution. Before determining centrifuging was necessary, the mixed elutriate was allowed to settle for greater than 60 minutes. For further detail please see the mix out specifics as well as photo documentation to support this decision in Appendix K.

After 96 hours of exposure to elutriate concentrates, final live count data were transferred into a spreadsheet, sorted and tabulated for *M. beryllina* and *A. bahia*. After 48 hours of exposure to elutriate concentrations, final live count and embryo development data for *M. edulis* were transferred into a spreadsheet and tabulated. LC<sub>50</sub> and EC<sub>50</sub> values were calculated using ToxCalc™ software or visual inspection of the data, as appropriate.

Standard reference toxicant tests were performed for *M. beryllina*, *A. bahia*, and *M. edulis* as cited in the work plan. Reference toxicant data were entered into ToxCalc™ and an LC<sub>50</sub> was calculated. Control charts for each species as well as all supporting bioassay documentation can be found in Volume III (Biological Raw Data).

#### **G. Bioaccumulation Testing**

##### **Macoma nasuta, Nereis virens**

The bioaccumulation of metals, pesticides, PCB congeners, semi volatiles, (1-4 dichlorobenzene), PAHs and dioxin/furans from the composites were assessed using 28-day exposures of the clam, *M. nasuta* and the sand worm, *N. virens*. Bioaccumulation testing was performed in accordance with the work plan.

The *M. nasuta* used in testing were adults of various ages and were obtained from J & G Gunstone Clams, Inc., Port Townsend, WA.

The *N. virens* used for testing were adults of various sizes, and were obtained from Aquatic Research Organisms, Hampton, NH.

After 28-days of exposure to the composites, organisms were depurated overnight in clean Manasquan water. Tissue from each exposure chamber was placed in individual glass jars, weighed and frozen before sending to Battelle by overnight courier for chemical analysis. Tissue samples were archived by Battelle.

Standard reference toxicant tests were performed for both species as cited in the work plan. Water quality and physical parameters were also monitored as per the work plan. The LC<sub>50</sub> for both species fell within the 95% confidence limits of their respective control charts. A control chart for each species, as well as all supporting bioassay documentation data can be found in Volume III (Biological Raw Data).



#### IV. RESULTS AND DISCUSSION

Test results of all the bioassays as well as water quality parameters are summarized in the tables at the end of this volume. Raw data for physical characteristics are presented in Volume II and raw data for biological effects and water quality parameters are presented in Volume III.

##### A. Solid Phase Testing

###### *Ampelisca abdita*

After 10 days, survival of *A. abdita* organisms exposed to the composites was as follows:

<i>A. abdita</i> Survival					
Control	Reference	Area 1A	Area 1B	Area 1C	Area 2
91%	91%	84%	87%	90%	95%

In accordance with the 1991 Federal Guidance [USEPA, 1991], samples are considered toxic if survival of animals exposed to test sediment are at least 20% less than the survival observed in the reference sediment and this difference is statistically significant ( $p = 0.05$ ) after a ten-day test period.

These results indicate that the composites are not acutely toxic to *A. abdita*.

###### *Americamysis bahia*

##### Static Non-renewal Bioassay

After the 10-day static test, the survival of organisms exposed to Area 1A showed a statistically significant reduction in survival when compared to the organisms in the reference sediment. The unionized ammonias reached a high of 0.6 mg/L in the static test, therefore the static-renewal results are reported and thus do not show a statistically significant reduction in survival when compared to the organisms in the reference sediment.

After 10 days, survival of *A. bahia* organisms exposed to the composites was as follows:

#### Static Non-renewal Bioassay

<i>A. bahia</i> Survival					
Control	Reference	Area 1A	Area 1B	Area 1C	Area 2
99%	98%	84% *	96%	94%	91%

#### Static Renewal Bioassay

<i>A. bahia</i> Survival					
Control	Reference	Area 1A	Area 1B	Area 1C	Area 2
99%	96%	97%	99%	96%	96%

In accordance with the 1991 Federal Guidance [USEPA, 1991], samples are considered toxic if survival of animals exposed to test sediment are at least 10% less than the survival observed in the reference sediment and this difference is statistically significant ( $p = 0.05$ ) after a ten-day test period.

These results indicate that the composites are not acutely toxic to *A. bahia*.

## B. Suspended Particulate Phase Testing

Our technical people made the determination to centrifuge all the elutriate samples because it was clear that the solids were not going to settle out during the test and therefore would remain suspended in the water column making observation of the test organisms impossible. The pictures in Appendices K and L support our beliefs.

### *Menidia beryllina*

After 96 hours, *M. beryllina* exposed to the suspended particulate phase elutriates resulted in the following survival and LC<sub>50</sub> results:

<i>M. beryllina</i> Survival				
Concentration	Area 1A	Area 1B	Area 1C	Area 2
Control	90%			
10 %	92%	91%	94%	93%
50 %	86%	92%	88%	96%
100 %	86%	82%	93%	88%
LC <sub>50</sub>	>100%	>100%	>100%	>100%

**Americamysis bahia**

After 96 hours, *A. bahia* exposed to the suspended particulate phase elutriates resulted in the following survival and LC<sub>50</sub> results:

<i>A. bahia</i> Survival				
Concentration	Area 1A	Area 1B	Area 1C	Area 2
Control	96%			
10 %	96%	92%	89%	94%
50 %	88%	95%	93%	96%
100 %	96%	93%	93%	97%
LC <sub>50</sub>	>100%	>100%	>100%	>100%

**Mytilus edulis**

The LC<sub>50</sub> for survival and EC<sub>50</sub> for development for the composites are as follows:

<i>M. edulis</i> Survival				
Concentration	Area 1A	Area 1B	Area 1C	Area 2
Control	93.13%			
10 %	92.94%	93.73%	95.12%	97.91%
50 %	86.07%	98.41%	89.25%	89.55%
100 %	69.25%	76.52%	70.95%	77.71%
LC <sub>50</sub> (survival)	>100%	>100%	>100%	>100%
EC <sub>50</sub> (development)	57.3%	70.7%	70.1%	68.2%

Control survival was 90% or greater for both *M. beryllina* and *A. bahia*. The number of *M. edulis* control embryos that resulted in live larvae with completely developed shells at the end of the test was greater than 70%. Therefore, the SPP tests for all three organisms passed the criteria for control survival.

**C. Bioaccumulation Testing**

**Macoma nasuta**

After 28 days, *M. nasuta* exposed to the composites resulted in the following survival:

<i>M. nasuta</i> Survival					
Control	Reference	Area 1A	Area 1B	Area 1C	Area 2
95%	99%	98%	99%	100%	97%

**Nereis virens**

After 28 days, *N. virens* exposed to the composites resulted in the following survival:

<i>N. virens</i> Survival					
Control	Reference	Area 1A	Area 1B	Area 1C	Area 2
97%	98%	96%	100%	99%	96%

## V. REFERENCES

1. USEPA/USACE, 1991. *Evaluation of Dredged Material Proposed for Ocean Disposal*, USEPA/ACOE, Washington, DC. EPA-503/8-91/001.
2. USEPA/NYACE, 1992. *Draft Guidance for Performing Tests on Dredged Material Proposed for Ocean Disposal*. EPA Region II/ACOE New York District (Water Quality Compliance Section), New York, NY.
3. ASTM D422-63, *Standard Test Method for Particle-Size Analysis of Soils*, ASTM 1963, (reapproved 2002).
4. EPA Office of Solid Wastes & Emergency Response SW-846 Method No. 9060, Volume IC, Chapter 5, Revision 0, 9/86.
5. Blake G.R. and K. H. Hartge. 1986. Bulk Density. In Klute, A. (ed) 1986. Methods of Soil Analysis Part I. Physical and Mineralogical Methods Bulk Density. 2nd ed. American Society of Agronomy, pp 363-375.
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8. ASTM, 1999. Standard Guide for Conducting 10-Day Sediment Toxicity Tests with Marine and Estuarine Amphipods, E1367-99. American Society of Testing and Materials, Philadelphia, PA.
9. T. Davies, D. Davis, and J. Elmore to EPA Regional Ocean Dumping Coordinators, EPA Regional Wetland Coordinators, and Corps of Engineers Regulatory and Civil Works Elements, 1993. "Technical Panel Recommendations Concerning Use of Acute Amphipod Tests in Evaluation of Dredged Material". Draft Letter. [Photocopy]. New York District, Army Corps of Engineers, New York, NY.
10. Southerland, Elizabeth to Mario P. Del Vicario, June 14, 1994. "Recommendations for Conducting Sediment Toxicity Test with *Mysidopsis bahia* when Ammonia may be Present at Toxic Levels". [Photocopy]. New York, NY.

**Figure 1 Site Map**

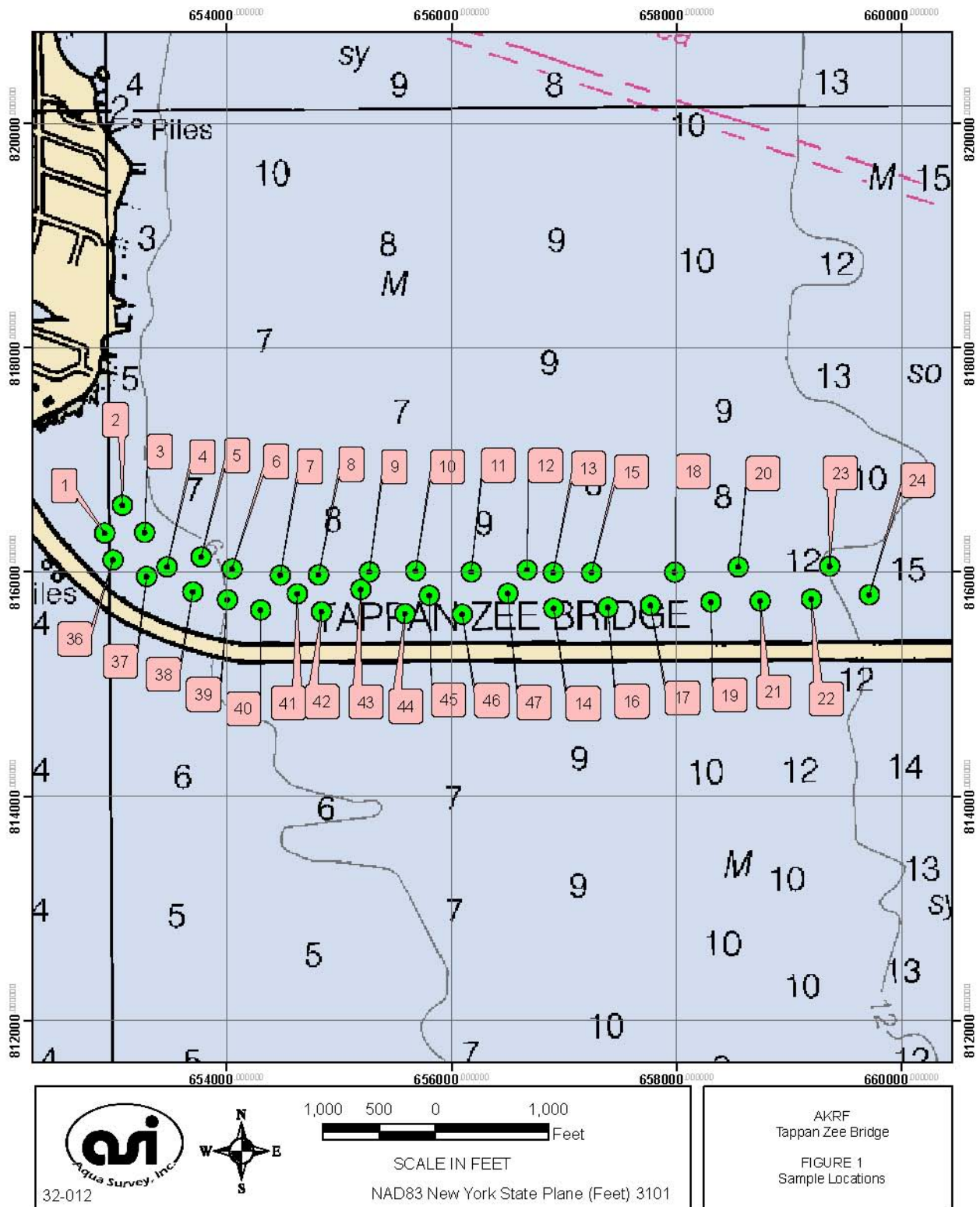
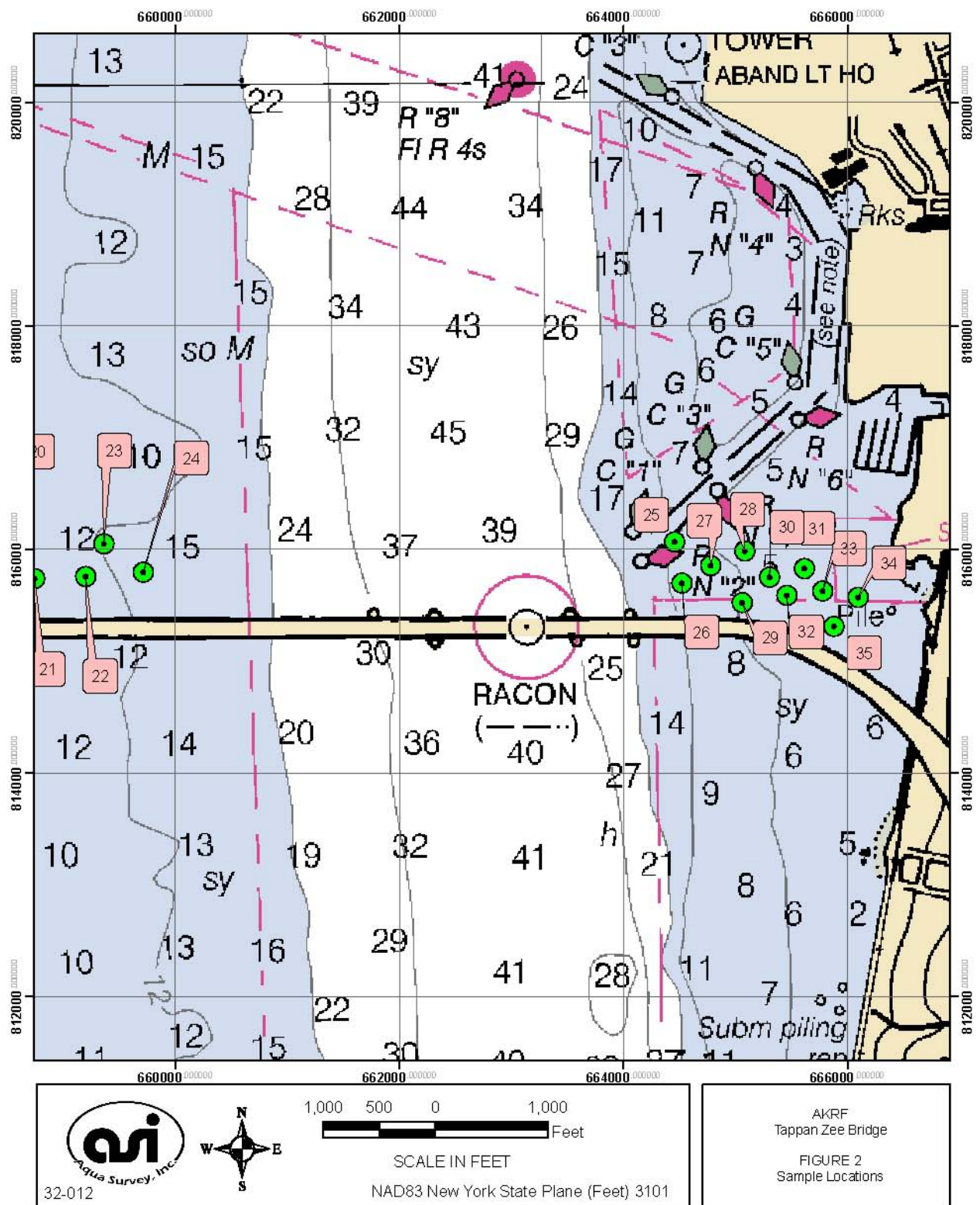


Figure 2 Site Map



**Table 1                  Sample Identification and Compositing Scheme**

<b>Core Location</b>	<b>ASI ID #</b>	<b>Composite</b>
TZ-1	20120006	Area 1A Composite 20120057
TZ-2	20120007	
TZ-3	20120008	
TZ-4	20120009	
TZ-5	20120010	
TZ-6	20120011	
TZ-7	20120012	
TZ-8	20120013	
TZ-9	20120014	
TZ-10	20120015	
TZ-11	20120016	
TZ-12	20120017	
TZ-13	20120018	Area 1B Composite 20120058
TZ-14	20120019	
TZ-15	20120020	
TZ-16	20120021	
TZ-17	20120022	
TZ-18	20120023	
TZ-19	20120024	
TZ-20	20120025	
TZ-21	20120026	
TZ-22	20120027	
TZ-23	20120028	
TZ-24	20120029	





**Table 1                      Sample Identification and Compositing Scheme**  
**(cont)**

Core Location	ASI ID #	Composite
TZ-25	20120030	Area 1C Composite 20120059
TZ-26	20120031	
TZ-27	20120032	
TZ-28	20120033	
TZ-29	20120034	
TZ-30	20120035	
TZ-31	20120036	
TZ-32	20120037	
TZ-33	20120038	
TZ-34	20120039	
TZ-35	20120040	
TZ-36	20120041	Area 2 Composite 20120060
TZ-37	20120042	
TZ-38	20120043	
TZ-39	20120044	
TZ-40	20120045	
TZ-41	20120046	
TZ-42	20120047	
TZ-43	20120048	
TZ-44	20120049	
TZ-45	20120050	
TZ-46	20120051	
TZ-47	20120052	



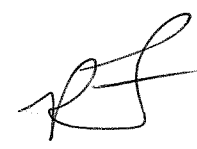
**Table 2                      DGPS Coordinates, Core Locations**

<b>Core Location</b>	<b>Northings</b>	<b>Eastings</b>
TZ-1	816347.4	652912.6
TZ-2	816596.2	653071.4
TZ-3	816355.3	653269.7
TZ-4	816044.8	653467.5
TZ-5	816135.5	653773.4
TZ-6	816027.5	654047.3
TZ-7	815972.3	654473.9
TZ-8	815974.9	654813.5
TZ-9	816002.9	655269.1
TZ-10	816011.8	655680.1
TZ-11	816001.7	656173.1
TZ-12	816021.1	656669.4
TZ-13	815996.1	656902.2
TZ-14	815678.4	656907.2
TZ-15	815995.3	657243.0
TZ-16	815686.1	657387.1
TZ-17	815704.0	657765.2
TZ-18	815999.2	657981.3
TZ-19	815732.5	658305.8
TZ-20	816047.2	658547.7
TZ-21	815741.1	658742.5
TZ-22	815758.2	659196.5
TZ-23	816050.9	659361.4
TZ-24	815799.2	659713.3



**Table 2**                      **DGPS Coordinates, Core Locations**  
(cont)

<b>Core Location</b>	<b>Northings</b>	<b>Eastings</b>
TZ-25	816070.3	664454.5
TZ-26	815701.0	664521.5
TZ-27	815856.8	664779.3
TZ-28	815987.2	665082.2
TZ-29	815526.6	665060.2
TZ-30	815753.7	665304.7
TZ-31	815828.8	665614.2
TZ-32	815591.6	665459.0
TZ-33	815628.9	665777.9
TZ-34	815572.9	666093.1
TZ-35	815312.8	665878.0
TZ-36	816108.7	652988.5
TZ-37	815960.4	653288.1
TZ-38	815824.2	653699.1
TZ-39	815754.2	654005.1
TZ-40	815662.0	654301.6
TZ-41	815807.1	654624.7
TZ-42	815648.3	654840.8
TZ-43	815845.6	655190.2
TZ-44	815628.8	655583.2
TZ-45	815791.7	655800.6
TZ-46	815621.5	656093.9
TZ-47	815810.9	656496.8



**Table 3**                      **Test Performance Summary (% Survival)**

Test	Organism	Control	Reference	Area 1A	Area 1B	Area 1C	Area 2
<b>Solid Phase</b>	<i>A. abdita</i>	91%	91%	84%	87%	90%	95%
	<i>A. bahia</i> (static)	97%	98%	84%*	96%	94%	91%
	<i>A. bahia</i> (static renewal)	99%	99%	97%%			
		<b>Conc. %</b>		<b>Area 1A</b>	<b>Area 1B</b>	<b>Area 1C</b>	<b>Area 2</b>
<b>Suspended Particulate</b>	<i>M. beryllina</i>	0		90%			
		10		92%	91%	94%	93%
		50		86%	92%	88%	96%
		100		86%	82%	93%	88%
	<i>A. bahia</i>	0		96%			
		10		96%	92%	89%	94%
		50		88%	95%	93%	96%
		100		96%	93%	93%	97%
	<i>M. edulis</i>	0		93.13%			
		10		92.94%	93.73%	95.12%	97.91%
		50		86.07%	98.41%	89.25%	89.55%
		100		69.25%	76.52%	70.95%	77.71%
		<b>Control</b>	<b>Reference</b>	<b>Area 1A</b>	<b>Area 1B</b>	<b>Area 1C</b>	<b>Area 2</b>
<b>Bioaccumulation</b>	<i>M. nasuta</i>	95%	99%	98%	99%	100%	97%
	<i>N. virens</i>	97%	98%	96%	100%	99%	96%

\* Statistically significant as compared to reference

**Table 4a Particle Size Distribution, Percent Moisture, and TOC Values of HARS Samples**

Sample ID	ASI #	% Sand ≥2 mm + Gravel	% Sand <2 mm	% Silt	% Clay	% Moisture	TOC ppm	% TOC of Dry Weight
TZ-1	20120006	0.0	4.5	63.4	32.1	46.8	19,798	1.98
TZ-2	20120007	0.0	3.9	63.2	32.9	46.8	19,877	1.99
TZ-3	20120008	0.0	3.9	63.7	32.4	46.7	19,941	1.99
TZ-4	20120009	0.0	3.2	64.1	32.7	45.8	18,563	1.86
TZ-5	20120010	0.0	2.6	67.0	30.4	44.5	17,860	1.79
TZ-6	20120011	0.0	3.3	65.2	31.5	43.3	17,140	1.71
TZ-7	20120012	0.0	4.9	67.8	27.3	35.5	17,391	1.74
TZ-8	20120013	0.3	6.2	66.8	26.7	40.9	15,497	1.55
TZ-9	20120014	0.0	7.6	67.8	24.6	39.1	14,435	1.44
TZ-10	20120015	0.0	9.0	66.6	24.4	37.6	15,572	1.56
TZ-11	20120016	0.0	12.7	65.0	22.3	35.7	13,214	1.32
TZ-12	20120017	0.0	12.7	67.2	20.1	36.6	12,902	1.29
Area 1A Comp	20120057	0.0	5.3	64.9	29.8	43.0	16,610	1.66
TZ-13	20120018	0.0	12.0	65.9	22.1	36.7	12,933	1.29
TZ-14	20120019	0.0	12.0	68.2	19.8	36.3	11,936	1.19
TZ-15	20120020	0.0	14.1	64.6	21.3	36.3	11,620	1.16
TZ-15	20120020 dup	0.0	13.4	66.7	19.9	35.3		
TZ-15	20120020 trip	0.0	13.4	65.5	21.1	36.3		
TZ-16	20120021	0.0	12.0	63.9	24.1	35.5	12,775	1.28
TZ-17	20120022	1.3	9.0	66.3	23.4	34.0	12,405	1.24
TZ-18	20120023	0.0	10.5	65.4	24.1	36.8	13,414	1.34
TZ-19	20120024	1.4	10.4	62.9	25.3	37.1	13,698	1.37
TZ-20	20120025	0.0	9.0	62.7	28.3	37.1	13,882	1.39
TZ-21	20120026	0.4	10.4	61.3	27.9	38.0	15,088	1.51
TZ-22	20120027	0.0	11.1	58.8	30.1	39.0	15,714	1.57
TZ-23	20120028	0.8	11.0	59.2	29.0	38.2	14,653	1.47
TZ-24	20120029	0.5	15.4	57.3	26.8	38.2	15,358	1.54
Area 1B Comp	20120058	0.0	12.4	62.9	24.7	36.7	13,868	1.39

**Table 4a Particle Size Distribution, Percent Moisture, and TOC Values of HARS Samples (continued)**

Sample ID	ASI #	% Sand ≥2 mm + Gravel	% Sand <2 mm	% Silt	% Clay	% Moisture	TOC ppm	% TOC of Dry Weight
TZ-25	20120030	0.2	14.1	58.8	26.9	41.4	17,652	1.77
TZ-26	20120031	0.3	15.5	56.6	27.6	39.7	18,005	1.80
TZ-27	20120032	0.0	21.4	56.1	22.5	37.0	13,344	1.33
TZ-28	20120033	0.1	21.5	57.4	21.0	34.3	13,060	1.31
TZ-29	20120034	0.0	24.4	54.4	21.2	35.6	13,713	1.37
TZ-30	20120035	0.1	23.0	54.7	22.2	35.9	13,936	1.39
TZ-30	20120035 dup	0.0	21.4	56.1	22.5	35.5		
TZ-30	20120035 trip	0.0	21.4	56.3	22.3	35.7		
TZ-31	20120036	0.1	18.2	57.4	24.3	35.2	12,460	1.25
TZ-32	20120037	0.0	16.7	57.6	25.7	35.7	13,582	1.36
TZ-33	20120038	0.3	14.8	58.0	26.9	37.5	13,777	1.38
TZ-34	20120039	2.5	14.1	57.8	25.6	38.8	14,061	1.41
TZ-35	20120040	18.4	19.7	40.5	21.4	34.8	15,265	1.53
Area 1C Comp	20120059	4.8	18.2	53.2	23.8	36.0	12,835	1.28
TZ-36	20120041	0.3	4.6	61.7	33.4	46.5	20,526	2.05
TZ-37	20120042	0.0	3.3	64.0	32.7	46.1	20,470	2.05
TZ-38	20120043	0.0	3.3	64.5	32.2	45.1	19,852	1.99
TZ-38	20120043 dup	0.0	4.7	64.6	30.7			
TZ-38	20120043 trip	0.0	3.3	65.6	31.1			
TZ-39	20120044	0.0	4.0	65.2	30.8	44.4	19,155	1.92
TZ-40	20120045	0.0	3.4	66.6	30.0	42.6	16,941	1.69
TZ-41	20120046	0.0	5.5	66.2	28.3	41.1	17,082	1.71
TZ-42	20120047	0.2	5.0	65.6	29.2	41.8	15,562	1.56
TZ-43	20120048	0.0	9.0	65.5	25.5	39.5	15,083	1.51
TZ-44	20120049	0.0	10.5	65.0	24.5	37.9	13,874	1.39
TZ-45	20120050	0.0	10.5	66.5	23.0	37.5	12,422	1.24
TZ-45	20120050 dup					37.2		
TZ-45	20120050 trip					36.6		
TZ-46	20120051	0.0	11.0	66.2	22.8	37.1	12,977	1.30
TZ-47	20120052	0.0	12.5	65.5	22.0	35.8	12,809	1.28
Area 2 Comp	20120060	0.1	8.9	64.1	26.9	39.9	15,472	1.55
Area 2 Comp	20120060 dup	0.0	7.4	64.3	28.3			
Area 2 Comp	20120060 trip	0.0	6.7	65.5	27.8			

**Table 4b****Particle Size Distribution, Percent Moisture, and TOC Values of  
Reference and Control Sediments**

<b>Sample ID</b>	<b>ASI #</b>	<b>% Sand ≥2 mm + Gravel</b>	<b>% Sand &lt;2 mm</b>	<b>% Silt</b>	<b>% Clay</b>	<b>% Moisture</b>	<b>TOC ppm</b>	<b>% TOC of Dry Weight</b>
Brezina	20120177	0.0	6.4	39.7	53.9	67.4	16,418	1.64
Mud Dump	20120079	0.0	90.6	6.1	3.3	21.5	344	3.4
Sandy Hook	20120081	0.0	90.6	6.1	3.3	21.0	369	3.7
Tuckerton	20120080	0.0	11.0	48.2	40.8	65.1	37,472	3.74



**Table 5      Specific Gravity, Bulk Density, Atterberg Limits, and Total Suspended Solids**

	<b>Area 1A 20120057</b>	<b>Area 1B 20120058</b>	<b>Area 1C 20120059</b>	<b>Area 2 20120060</b>
Specific Gravity (g)	2.57	2.62	2.60	2.61
Specific Gravity Duplicate (g)				2.64
Specific Gravity Triplicate (g)				2.61
<b>Mean</b>				<b>2.62</b>
Bulk Density (g/wet ml) / (g/dry ml)	0.87 / 1.53	1.07 / 1.66	1.05 / 1.65	0.96 / 1.60
Bulk Density Duplicate (g/wet ml) / (g/dry ml)				0.94 / 1.59
Bulk Density Triplicate (g/wet ml) / (g/dry ml)				0.95 / 1.59
<b>Mean (g/wet ml) / (g/dry ml)</b>				<b>0.95 / 1.59</b>
Atterberg Limits (Liquid Limit Moisture Content)	0.58	0.47	0.51	0.56
Atterberg Limits (Liquid Limit % Moisture)	36.7	31.8	33.5	35.4
Atterberg Limits (Liquid Limit Moisture Content) Dup.				0.54
Atterberg Limits (Liquid Limit % Moisture) Dup.				35.1
Atterberg Limits (Liquid Limit Moisture Content) Trip.				0.56
Atterberg Limits (Liquid Limit % Moisture) Trip.				36.0
<b>Mean (Moisture Content)</b>	<b>0.58</b>	<b>0.47</b>	<b>0.51</b>	<b>0.55</b>
<b>Mean (% Moisture)</b>	<b>36.7</b>	<b>31.8</b>	<b>33.5</b>	<b>35.5</b>
Atterberg Limits (Plastic Limit Moisture Content)	0.32	0.29	0.29	0.30
Atterberg Limits (Plastic Limit % Moisture)	24.4	22.2	22.2	23.1
<b>Mean (Moisture Content)</b>				
<b>Elutriate used in SPP (mysid and beryllina)</b>	<b>Area 1A</b>	<b>Area 1B</b>	<b>Area 1C</b>	<b>Area 2</b>
Total Suspended Solids (mg/l)	28	142	26	46
Total Suspended Solids Duplicate (mg/l)	34	142	32	40
<b>Mean</b>	<b>31</b>	<b>142</b>	<b>29</b>	<b>43</b>



**Table 6                  Sampling Summary and Holding Times**

Sample	ASI #	Sampling Date	Dates Used	Holding Time
Amp Control Sediment	20120177	2/15/2012*	2/24/2012, <i>A. abdita</i> solid phase	9 days
Mud Dump Reference	20120079	2/3/2012	2/24/2012, <i>A. abdita</i> solid phase	21 days
			2/13/2012, <i>A. bahia</i> solid phase (static/static renewal)	10 days
			2/14/2012, <i>M. nasuta</i> bioaccumulation	11 days
			2/17/2012, <i>N. virens</i> bioaccumulation	14 days
Sandy Hook Control	20120081	2/7/2012	2/13/2012, <i>A. bahia</i> solid phase (static/static renewal)	6 days
			2/17/2012, <i>N. virens</i> bioaccumulation	10 days
Tuckerton Control	20120080	2/6/2012	2/14/2012, <i>M. nasuta</i> bioaccumulation	8 days
Reach Area 1A	20120057	1/30/2012	2/24/2012, <i>A. abdita</i> solid phase	25 days
			2/13/2012, <i>A. bahia</i> solid phase (static/static renewal)	14 days
			2/29/2012, <i>M. edulis</i> suspended particulate phase	30 days
			3/1/2012, <i>A. bahia</i> suspended particulate phase	31 days
			3/1/2012, <i>M. beryllina</i> suspended particulate phase	31 days
			2/14/2012, <i>M. nasuta</i> bioaccumulation	15 days
			2/17/2012, <i>N. virens</i> bioaccumulation	18 days
Reach Area 1B	20120058	2/1/2012	2/24/2012, <i>A. abdita</i> solid phase	23 days
			2/13/2012, <i>A. bahia</i> solid phase (static/static renewal)	12 days
			2/29/2012, <i>M. edulis</i> suspended particulate phase	28 days
			3/1/2012, <i>A. bahia</i> suspended particulate phase	29 days
			3/1/2012, <i>M. beryllina</i> suspended particulate phase	29 days
			2/14/2012, <i>M. nasuta</i> bioaccumulation	13 days
			2/17/2012, <i>N. virens</i> bioaccumulation	16 days

\*Received from organism supplier on 2/16/2012

*RF*

**Table 6      Sampling Summary and Holding Times**  
**continued**

Reach Area 1C	20120059	2/2/2012	2/24/2012, <i>A. abdita</i> solid phase	22 days
			2/13/2012, <i>A. bahia</i> solid phase (static/static renewal)	11 days
			2/29/2012, <i>M. edulis</i> suspended particulate phase	27 days
			3/1/2012, <i>A. bahia</i> suspended particulate phase	28 days
			3/1/2012, <i>M. beryllina</i> suspended particulate phase	28 days
			2/14/2012, <i>M. nasuta</i> bioaccumulation	12 days
			2/17/2012, <i>N. virens</i> bioaccumulation	15 days
Reach Area 2	20120060	1/30/2012	2/24/2012, <i>A. abdita</i> solid phase	25 days
			2/13/2012, <i>A. bahia</i> solid phase (static/static renewal)	14 days
			2/29/2012, <i>M. edulis</i> suspended particulate phase	30 days
			3/1/2012, <i>A. bahia</i> suspended particulate phase	31 days
			3/1/2012, <i>M. beryllina</i> suspended particulate phase	31 days
			2/14/2012, <i>M. nasuta</i> bioaccumulation	12 days
			2/17/2012, <i>N. virens</i> bioaccumulation	15 days
Site Water, Area 1A	20120053	2/3/2012	2/29/2012, <i>M. edulis</i> suspended particulate phase	26 days
			3/1/2012, <i>A. bahia</i> suspended particulate phase	27 days
			3/1/2012, <i>M. beryllina</i> suspended particulate phase	27 days
Site Water, Area 1B	20120054	2/3/2012	2/29/2012, <i>M. edulis</i> suspended particulate phase	26 days
			3/1/2012, <i>A. bahia</i> suspended particulate phase	27 days
			3/1/2012, <i>M. beryllina</i> suspended particulate phase	27 days
Site Water, Area 1C	20120055	2/3/2012	2/29/2012, <i>M. edulis</i> suspended particulate phase	26 days
			3/1/2012, <i>A. bahia</i> suspended particulate phase	27 days
			3/1/2012, <i>M. beryllina</i> suspended particulate phase	27 days
Site Water, Area 2	20120056	2/3/2012	2/29/2012, <i>M. edulis</i> suspended particulate phase	26 days
			3/1/2012, <i>A. bahia</i> suspended particulate phase	27 days
			3/1/2102, <i>M. beryllina</i> suspended particulate phase	27 days

**Table 7 10-Day Solid Phase Bioassay (Static Renewal)**  
**Tappan Zee**  
**Initial Live Count: 20**

**Species: *A. abdita***  
**Job #: 32-012**

Position #	Code	Sample	Final Live Count	Percent Survival
19	1.1	Atlantic Highlands Contro	20	
8	1.2	20120177	15	
4	1.3		20	
23	1.4		17	
21	1.5		19	91%
2	2.1	Mud Dump Reference	20	
29	2.2	20120079	18	
17	2.3		16	
18	2.4		18	
1	2.5		19	91%
25	3.1	Area 1A Composite	18	
30	3.2	20120057	18	
7	3.3		17	
6	3.4		15	
16	3.5		16	84%
24	4.1	Area 1B Composite	14	
28	4.2	20120058	16	
15	4.3		18	
12	4.4		19	
26	4.5		20	87%
27	5.1	Area 1C Composite	17	
14	5.2	20120059	16	
13	5.3		19	
22	5.4		20	
3	5.5		18	90%
20	6.1	Area 2 Composite	18	
10	6.2	20120060	19	
5	6.3		19	
9	6.4		19	
11	6.5		20	95%

Table 8

10 Day Solid Phase Readings  
Tappan Zee  
Temperature (° C)

(Static Renewal)

Species: *A. abdita*  
Job #: 32-012

Position #	Code #	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
19	1.1	Atlantic Highlands Control 20120177	19.7	19.4	19.2	19.2	19.7	19.8	19.9	20.1	20.0	19.8	19.5	19.0	20.2
8	1.2		19.8	19.5	19.0	19.0	19.7	19.9	19.9	20.2	20.0	19.7	19.5		
4	1.3		19.9	19.5	19.1	19.1	19.6	19.8	19.8	20.0	19.8	19.6	19.5		
23	1.4		19.7	19.4	19.1	19.1	19.6	19.7	19.8	20.1	20.0	19.7	19.3		
21	1.5		20.0	19.5	19.1	19.1	19.6	19.7	19.8	20.0	20.0	19.7	19.3		
2	2.1	Mud Dump Reference 20120079	20.0	19.6	18.9	18.9	19.5	19.8	19.9	20.3	19.9	19.7	19.4	18.7	20.3
29	2.2		20.0	19.4	18.9	19.0	19.5	19.7	19.8	20.0	19.9	19.7	19.3		
17	2.3		19.9	19.6	19.1	19.1	19.6	19.8	19.9	20.1	20.0	19.8	19.4		
18	2.4		19.9	19.7	19.1	19.1	19.6	19.8	19.9	20.1	20.0	19.8	19.4		
1	2.5		20.0	19.6	18.8	18.7	19.6	19.8	19.9	20.2	19.9	19.7	19.5		
25	3.1	Area 1A Composite 20120057	19.8	19.3	19.2	19.2	19.6	19.8	19.9	20.1	20.0	19.7	19.4	18.7	20.4
30	3.2		19.9	19.4	18.9	19.0	19.5	19.6	19.8	20.0	19.9	19.7	19.3		
7	3.3		19.9	19.6	19.0	19.1	19.7	19.9	19.9	20.4	20.1	19.7	19.5		
6	3.4		19.7	19.5	18.7	18.9	19.6	19.8	19.9	20.2	20.0	19.7	19.4		
16	3.5		19.8	19.5	19.2	19.2	19.7	19.8	19.9	20.2	20.1	19.8	19.5		
24	4.1	Area 1B Composite 20120058	19.8	19.4	19.1	19.0	19.5	19.6	19.8	20.0	19.9	19.6	19.3	18.7	20.2
28	4.2		19.8	19.6	19.2	19.1	19.6	19.8	19.9	20.1	20.0	19.8	19.4		
15	4.3		19.7	19.4	18.7	18.7	19.5	19.7	19.8	20.1	20.0	19.7	19.4		
12	4.4		19.8	19.5	18.7	18.7	19.6	19.7	19.9	20.2	20.0	19.6	19.3		
26	4.5		19.9	19.5	19.1	19.0	19.5	19.6	19.8	20.0	19.9	19.6	19.3		
27	5.1	Area 1C Composite 20120059	19.8	19.5	19.1	19.0	19.5	19.7	19.8	20.0	19.9	19.6	19.3	18.8	20.4
14	5.2		19.9	19.6	18.8	19.0	19.7	19.9	20.0	20.3	20.1	19.7	19.5		
13	5.3		20.0	19.6	18.9	19.1	19.8	19.9	20.1	20.4	20.1	19.7	19.6		
22	5.4		19.8	19.7	19.3	19.2	19.7	19.8	19.9	20.2	20.0	19.7	19.4		
3	5.5		19.8	19.6	18.8	18.9	19.6	19.7	19.9	20.3	20.0	19.6	19.4		
20	6.1	Area 2 Composite 20120060	19.8	19.7	19.2	19.1	19.6	19.7	19.8	20.1	20.0	19.7	19.4	18.7	20.4
10	6.2		19.9	19.5	18.9	19.0	19.7	19.9	20.0	20.4	20.0	19.7	19.6		
5	6.3		20.0	19.6	18.7	18.8	19.7	19.7	19.9	20.2	19.9	19.6	19.4		
9	6.4		20.0	19.7	18.8	18.9	19.7	19.9	20.0	20.3	20.1	19.7	19.4		
11	6.5		19.9	19.6	18.8	19.0	19.7	19.9	20.0	20.3	20.1	19.7	19.5		
Range														18.7	20.4

Table 9

10 Day Solid Phase Readings  
Tappan Zee  
Salinity (ppt)

(Static Renewal)

Species:

*A. abdita*

Job # :

32-012

Position #	Code #	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
19	1.1	Atlantic Highlands Control	29.4	29.6	29.7	30.3	30.2	29.4	29.2	28.6	29.1	29.3	28.7		
8	1.2	20120177	28.8	29.5	29.8	30.2	30.6	29.0	28.8	29.1	29.2	29.3	28.5		
4	1.3		28.8	29.5	30.0	30.2	30.1	28.9	29.3	29.0	29.3	29.2	28.2		
23	1.4		29.4	29.5	29.7	30.1	30.0	29.4	29.1	28.6	29.1	29.1	28.6		
21	1.5		29.2	29.3	29.6	30.0	30.2	29.4	29.2	28.6	29.1	29.2	28.7	28.2	30.6
2	2.1	Mud Dump Reference	29.1	29.4	29.6	29.4	30.5	29.2	29.2	29.1	29.2	29.0	28.6		
29	2.2	20120079	29.2	29.5	29.7	30.0	30.2	29.5	29.2	28.7	29.2	29.3	28.8		
17	2.3		29.2	29.3	29.6	29.9	30.1	29.3	29.2	28.6	29.2	29.2	28.6		
18	2.4		29.2	29.3	29.6	30.1	30.1	29.3	29.2	28.6	29.1	29.2	28.7		
1	2.5		29.2	29.4	29.8	30.1	30.4	29.1	29.1	29.1	29.2	29.3	28.6	28.6	30.5
25	3.1	Area 1A Composite	29.4	29.8	29.6	30.1	30.1	29.3	29.2	28.7	29.2	29.2	28.7		
30	3.2	20120057	29.2	29.4	29.6	29.8	30.1	29.3	29.2	28.7	29.1	29.3	28.6		
7	3.3		29.2	29.3	29.6	30.0	30.5	29.1	29.3	29.1	29.2	29.3	28.5		
6	3.4		29.5	29.4	29.6	30.1	30.5	29.2	28.7	29.1	29.3	29.2	28.6		
16	3.5		29.4	29.4	29.6	29.9	30.1	29.3	29.1	28.6	29.2	29.3	28.6	28.5	30.5
24	4.1	Area 1B Composite	29.3	29.2	29.5	30.1	30.1	29.3	29.3	28.7	29.2	29.3	28.6		
28	4.2	20120058	29.2	29.2	29.5	30.1	30.1	29.3	29.2	28.7	29.2	29.2	28.6		
15	4.3		29.3	29.5	29.7	30.3	30.3	29.0	29.1	29.2	29.2	29.0	28.6		
12	4.4		29.3	29.3	29.5	30.0	30.4	29.0	29.2	29.1	29.2	29.3	28.6		
26	4.5		29.2	29.2	29.5	30.1	30.1	29.3	28.9	28.7	29.2	29.3	28.7	28.6	30.4
27	5.1	Area 1C Composite	29.2	29.3	29.6	30.1	30.1	29.3	29.3	28.7	29.2	29.3	28.7		
14	5.2	20120059	29.2	29.3	29.6	30.1	30.5	29.1	29.2	29.2	29.3	29.3	28.6		
13	5.3		29.2	29.3	29.6	30.1	30.2	29.0	29.2	29.2	29.3	29.3	28.5		
22	5.4		29.3	29.4	29.6	30.1	30.0	29.3	29.1	28.7	29.2	29.3	28.8		
3	5.5		29.2	29.2	29.4	30.0	30.4	29.0	29.1	29.1	29.2	29.2	28.4	28.4	30.5
20	6.1	Area 2 Composite	29.4	29.5	29.6	30.2	30.1	29.3	29.3	28.7	29.2	29.3	28.7		
10	6.2	20120060	29.4	29.6	29.7	30.1	30.6	29.0	29.1	29.2	29.3	29.2	28.5		
5	6.3		29.5	29.7	29.7	30.1	30.6	29.0	29.3	29.1	29.3	29.3	28.6		
9	6.4		29.5	29.6	29.5	30.1	30.3	28.7	29.1	29.1	29.3	29.1	28.5		
11	6.5		29.3	29.5	29.6	30.1	30.5	29.0	29.0	29.2	29.3	29.2	28.5	28.5	30.6
Range														28.2	30.6

Table 10

10 Day Solid Phase Readings  
Tappan Zee  
DO (mg/L)

(Static Renewal)

Species:

*A. abdita*

Job # :

32-012

Position #	Code #	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
19	1.1	Atlantic Highlands Control	7.09	6.87	7.83	7.43	8.14	6.66	7.05	6.91	6.86	7.05	7.33	6.59	8.26
8	1.2	20120177	7.10	6.87	7.91	7.48	8.14	6.66	6.97	6.78	6.74	7.01	7.26		
4	1.3		7.16	6.93	8.05	7.70	8.26	6.59	6.97	6.79	6.73	7.10	7.27		
23	1.4		7.00	6.80	7.83	7.41	8.08	6.88	7.04	6.94	6.79	7.01	7.34		
21	1.5		7.01	6.72	7.82	7.42	8.11	6.77	7.05	6.90	6.80	7.04	7.36		
2	2.1	Mud Dump Reference	7.00	6.67	7.82	7.51	7.81	6.81	6.90	6.70	6.48	6.87	7.17	6.43	8.08
29	2.2	20120079	6.92	6.75	7.68	7.38	7.55	6.49	6.92	6.75	6.49	6.84	7.18		
17	2.3		7.01	6.71	7.75	7.39	7.76	6.80	6.89	6.76	6.46	6.92	7.17		
18	2.4		6.76	6.59	7.70	7.35	7.61	6.81	6.88	6.73	6.43	6.86	7.16		
1	2.5		7.01	6.75	7.91	7.58	8.08	6.74	6.95	6.73	6.47	6.90	7.22		
25	3.1	Area 1A Composite	6.98	6.59	7.65	7.38	7.08	6.96	6.91	6.80	6.50	6.87	7.81	6.39	7.89
30	3.2	20120057	6.96	6.61	7.66	7.40	7.18	6.71	6.92	6.80	6.50	6.88	7.26		
7	3.3		6.97	6.68	7.75	7.43	7.30	6.94	7.01	6.70	6.41	6.87	7.19		
6	3.4		7.01	6.74	7.89	7.50	7.43	7.02	6.94	6.75	6.39	6.88	7.22		
16	3.5		6.98	6.73	7.69	7.39	7.26	6.79	6.73	6.77	6.46	6.86	7.19		
24	4.1	Area 1B Composite	6.87	6.61	7.62	7.26	6.94	7.06	6.93	6.20	6.56	6.86	7.23	6.20	7.78
28	4.2	20120058	6.80	6.50	7.50	7.14	6.81	6.95	6.90	6.26	6.46	6.83	7.22		
15	4.3		6.94	6.60	7.72	7.35	7.01	7.11	6.94	6.77	6.47	6.87	7.22		
12	4.4		6.96	6.61	7.78	7.45	7.09	6.91	6.91	6.79	6.54	6.85	7.25		
26	4.5		6.85	6.52	7.56	7.23	6.88	7.09	6.94	6.26	6.55	6.85	7.23		
27	5.1	Area 1C Composite	6.77	6.44	7.43	6.94	6.67	7.11	6.90	6.40	6.42	6.84	7.25	6.11	7.55
14	5.2	20120059	6.77	6.45	7.51	7.01	6.67	7.02	6.82	6.27	6.31	6.83	7.28		
13	5.3		6.79	6.50	7.52	7.05	6.72	6.94	6.81	6.15	6.28	6.71	7.23		
22	5.4		6.79	6.41	7.42	6.97	6.68	7.07	6.87	6.35	6.39	6.86	7.28		
3	5.5		6.84	6.45	7.55	7.17	6.77	6.88	6.84	6.11	6.28	6.79	7.22		
20	6.1	Area 2 Composite	6.71	6.42	7.34	6.74	6.75	7.11	6.91	6.40	6.36	6.87	7.16	6.22	7.48
10	6.2	20120060	6.70	6.44	7.41	6.90	6.89	7.13	6.87	6.29	6.29	6.78	7.19		
5	6.3		6.68	6.46	7.48	6.96	6.80	6.98	6.92	6.24	6.27	6.81	7.20		
9	6.4		6.70	6.41	7.46	6.88	6.74	7.13	6.88	6.25	6.22	6.79	7.22		
11	6.5		6.65	6.42	7.41	6.81	6.77	7.09	6.86	6.30	6.28	6.87	7.17		
Range														6.11	8.26

Table 11

10 Day Solid Phase Readings  
Tappan Zee  
pH (SU)

(Static Renewal)

Species: *A. abdita*  
Job #: 32-012

Position #	Code #	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
19	1.1	Atlantic Highlands Control	7.72	7.87	7.75	7.80	6.96	7.45	7.62	8.01	8.01	7.54	8.00	6.22	8.01
8	1.2	20120177	7.71	7.85	7.76	7.81	6.74	7.35	7.49	7.94	7.96	7.36	7.92		
4	1.3		7.66	7.83	7.75	7.83	6.22	7.21	7.39	7.90	7.96	7.04	7.86		
23	1.4		7.73	7.81	7.80	7.81	7.19	7.53	7.68	7.94	8.01	7.61	7.99		
21	1.5		7.72	7.80	7.75	7.79	7.07	7.46	7.62	7.93	7.97	7.56	7.99		
2	2.1	Mud Dump Reference	7.76	7.85	7.83	7.84	7.59	7.63	7.69	7.83	7.93	7.58	7.86	7.35	7.96
29	2.2	20120079	7.77	7.88	7.87	7.84	7.67	7.72	7.76	7.84	7.96	7.70	7.89		
17	2.3		7.76	7.86	7.85	7.84	7.61	7.67	7.72	7.84	7.94	7.64	7.88		
18	2.4		7.76	7.84	7.83	7.83	7.62	7.66	7.71	7.83	7.94	7.66	7.90		
1	2.5		7.75	7.86	7.86	7.84	7.35	7.61	7.69	7.85	7.95	7.58	7.89		
25	3.1	Area 1A Composite	7.80	7.93	7.92	7.85	7.74	7.85	7.81	7.84	7.97	7.81	7.96	7.69	7.97
30	3.2	20120057	7.80	7.93	7.91	7.85	7.74	7.85	7.82	7.82	7.96	7.80	7.91		
7	3.3		7.78	7.90	7.91	7.85	7.71	7.83	7.77	7.81	7.94	7.76	7.90		
6	3.4		7.78	7.90	7.92	7.85	7.69	7.85	7.76	7.81	7.92	7.74	7.87		
16	3.5		7.78	7.90	7.92	7.85	7.73	7.85	7.80	7.83	7.96	7.78	7.90		
24	4.1	Area 1B Composite	7.79	7.92	7.92	7.85	7.77	7.82	7.86	7.84	7.97	7.84	7.91	7.75	7.97
28	4.2	20120058	7.81	7.91	7.91	7.86	7.77	7.85	7.84	7.82	7.95	7.84	7.93		
15	4.3		7.80	7.94	7.93	7.85	7.77	7.86	7.86	7.83	7.96	7.83	7.89		
12	4.4		7.79	7.92	7.92	7.85	7.75	7.86	7.84	7.83	7.96	7.81	7.89		
26	4.5		7.80	7.90	7.93	7.86	7.78	7.85	7.86	7.84	7.97	7.85	7.91		
27	5.1	Area 1C Composite	7.80	7.92	7.92	7.85	7.80	7.87	7.88	7.84	7.96	7.87	7.92	7.75	7.98
14	5.2	20120059	7.81	7.92	7.91	7.85	7.78	7.86	7.86	7.84	7.97	7.88	7.97		
13	5.3		7.80	7.91	7.90	7.84	7.75	7.84	7.82	7.81	7.93	7.84	7.98		
22	5.4		7.80	7.91	7.92	7.86	7.80	7.87	7.88	7.85	7.98	7.88	7.95		
3	5.5		7.80	7.89	7.88	7.84	7.75	7.82	7.82	7.79	7.90	7.80	7.89		
20	6.1	Area 2 Composite	7.80	7.93	7.91	7.85	7.83	7.87	7.88	7.83	7.96	7.87	7.91	7.80	7.96
10	6.2	20120060	7.81	7.90	7.91	7.85	7.86	7.87	7.87	7.83	7.95	7.86	7.90		
5	6.3		7.81	7.94	7.93	7.85	7.81	7.88	7.88	7.83	7.96	7.86	7.89		
9	6.4		7.81	7.90	7.91	7.85	7.80	7.87	7.86	7.82	7.94	7.86	7.90		
11	6.5		7.81	7.92	7.91	7.85	7.84	7.86	7.87	7.82	7.95	7.86	7.91		
Range														6.22	8.01

Table 12

10 Day Solid Phase Readings  
Tappan Zee  
Total Ammonia (mg/L)

(Static Renewal)

Species:

*A. abdita*

Job #:

32-012

Position #	Code #	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
19	1.1	Atlantic Highlands Control	<0.60			<0.6					<0.6		<0.60		
8	1.2	20120177	<0.60		<0.6								<0.60		
4	1.3		<0.60	<0.60					<0.60				<0.60		
23	1.4		<0.60					<0.6					<0.60		
21	1.5		<0.60				<0.6					<0.6	<0.60	<0.6	<0.6
2	2.1	Mud Dump Reference	<0.60		<0.60					<0.60			<0.60		
29	2.2	20120079	<0.60					<0.6					<0.60		
17	2.3		<0.60			<0.6					<0.6		<0.60		
18	2.4		<0.60				<0.6					<0.6	<0.60		
1	2.5		<0.60	<0.60					<0.60				<0.60	<0.6	<0.6
25	3.1	Area 1A Composite	<0.60				0.60					<0.6	<0.60		
30	3.2	20120057	<0.60					<0.6					<0.60		
7	3.3		<0.60		0.68								<0.60		
6	3.4		<0.60	0.75									<0.60		
16	3.5		<0.60			<0.6					<0.6		<0.60	<0.6	0.75
24	4.1	Area 1B Composite	<0.60			<0.6					<0.6		<0.60		
28	4.2	20120058	<0.60					<0.6					<0.60		
15	4.3		<0.60		<0.6								<0.60		
12	4.4		<0.60	0.61									<0.60		
26	4.5		<0.60				<0.6					<0.6	<0.60	<0.6	0.61
27	5.1	Area 1C Composite	<0.60					<0.6					<0.60		
14	5.2	20120059	<0.60			<0.6					<0.6		<0.60		
13	5.3		<0.60		<0.6								<0.60		
22	5.4		<0.60				<0.6					<0.6	<0.60		
3	5.5		<0.60	<0.60					<0.60				<0.60	<0.6	<0.6
20	6.1	Area 2 Composite	<0.60					<0.6					<0.60		
10	6.2	20120060	<0.60			0.62					<0.6		<0.60		
5	6.3		<0.60	0.66					<0.60				<0.60		
9	6.4		<0.60		0.66								<0.60		
11	6.5		<0.60				0.63					<0.6	<0.60	<0.6	0.66
Range														0.60	0.75



**Table 13     10-Day Solid Phase Bioassay (Static)**  
**AKRF, Tappan Zee**  
**Initial Live Count: 20**

**Species: *A. bahia***  
**Job #: 32-012**

Position #	Code	Sample	Final Live Count	Percent Survival
19	1.1	Sandy Hook Control	20	
8	1.2	20120081	20	
4	1.3		19	
23	1.4		20	
21	1.5		20	99%
2	2.1	Mud Dump Reference	19	
29	2.2	20120079	20	
17	2.3		20	
18	2.4		20	
1	2.5		19	98%
25	3.1	Area 1A Composite	17	
30	3.2	20120057	15	
7	3.3		16	
6	3.4		19	
16	3.5		17	84% *
24	4.1	Area 1B Composite	20	
28	4.2	20120058	18	
15	4.3		20	
12	4.4		18	
26	4.5		20	96%
27	5.1	Area 1C Composite	19	
14	5.2	20120059	19	
13	5.3		20	
22	5.4		16	
3	5.5		20	94%
20	6.1	Area 2 Composite	16	
10	6.2	20120060	20	
5	6.3		19	
9	6.4		18	
11	6.5		18	91%

\* Statistically significant as compared to Reference

Table 14

10 Day Solid Phase Readings  
AKRF, Tappan Zee  
Temperature (° C)

(Static)

Species: *A. bahia*  
Job #: 32-012

Position #	Code #	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
19	1.1	Sandy Hook Control	20.7	19.5	19.2	18.9	19.6	18.9	19.3	19.1	18.9	19.4	19.5	18.6	21.1
8	1.2	20120081	20.7	19.3	19.1	19.0	19.5	18.9	19.3	19.1	18.9	19.4	19.4		
4	1.3		20.7	18.6	19.0	18.9	19.5	18.8	19.4	19.0	18.8	19.4	19.4		
23	1.4		20.9	19.7	19.3	19.1	19.6	19.0	19.4	19.1	18.9	19.4	19.5		
21	1.5		21.1	19.9	19.5	19.1	19.4	18.9	19.2	19.1	18.8	19.4	19.4		
2	2.1	Mud Dump Reference	21.0	19.7	19.4	19.1	19.6	19.0	19.3	19.3	18.9	19.5	19.6	18.8	21.0
29	2.2	20120079	20.7	19.8	19.3	19.1	19.4	18.9	19.2	19.1	18.8	19.3	19.6		
17	2.3		20.7	19.7	19.3	19.0	19.4	18.9	19.2	19.1	18.8	19.4	19.4		
18	2.4		20.7	19.7	19.3	19.0	19.4	18.9	19.2	19.1	18.8	19.4	19.4		
1	2.5		20.9	19.6	19.4	19.1	19.6	18.9	19.3	19.1	18.9	19.5	19.5		
25	3.1	Area 1A Composite	20.8	19.7	19.2	19.0	19.4	18.9	19.2	19.1	18.8	19.3	19.4	18.7	20.9
30	3.2	20120057	20.9	19.9	19.3	19.0	19.4	18.8	19.2	19.1	18.7	19.3	19.4		
7	3.3		20.8	19.7	19.3	19.1	19.7	18.9	19.4	19.2	19.0	19.5	19.5		
6	3.4		20.9	19.8	19.4	19.1	19.5	18.8	19.3	19.2	18.8	19.4	19.5		
16	3.5		20.8	19.8	19.4	19.1	19.5	18.9	19.2	19.2	18.9	19.4	19.5		
24	4.1	Area 1B Composite	20.6	19.5	19.2	18.8	19.4	18.8	19.1	19.2	18.7	19.3	19.4	18.6	20.8
28	4.2	20120058	20.6	19.8	19.4	19.0	19.5	18.9	19.2	19.1	18.8	19.4	19.5		
15	4.3		20.6	19.4	19.2	19.0	19.6	18.9	19.3	19.2	18.9	19.4	19.5		
12	4.4		20.6	19.1	19.2	18.9	19.5	18.8	19.2	19.2	18.8	19.3	19.4		
26	4.5		20.8	19.9	19.5	19.1	19.4	18.8	19.2	19.1	18.6	19.3	19.3		
27	5.1	Area 1C Composite	21.0	20.0	19.4	19.1	19.6	18.9	19.3	19.2	18.8	19.4	19.5	18.7	21.0
14	5.2	20120059	20.5	19.4	19.2	19.0	19.5	18.9	19.3	19.2	18.8	19.4	19.4		
13	5.3		20.6	19.6	19.2	19.0	19.5	18.9	19.3	19.2	18.8	19.4	19.5		
22	5.4		20.8	19.7	19.3	19.0	19.4	18.8	19.2	19.2	18.7	19.4	19.4		
3	5.5		20.5	19.4	19.3	19.0	19.6	18.9	19.4	19.2	18.8	19.5	19.5		
20	6.1	Area 2 Composite	20.8	19.6	19.3	19.0	19.5	18.9	19.2	19.2	18.8	19.4	19.3	18.8	20.9
10	6.2	20120060	20.6	19.5	19.2	19.0	19.6	18.9	19.3	19.2	18.8	19.5	19.4		
5	6.3		20.5	19.4	19.1	18.9	19.6	18.9	19.3	19.2	18.8	19.5	19.5		
9	6.4		20.5	19.5	19.2	19.0	19.5	18.9	19.3	19.2	18.8	19.5	19.4		
11	6.5		20.9	19.9	19.4	19.1	19.6	18.9	19.3	19.0	18.9	19.5	19.4		
Range														18.6	21.1

Table 15

10 Day Solid Phase Readings  
AKRF, Tappan Zee  
Salinity (ppt)

(Static)

Species: *A. bahia*  
Job #: 32-012

Position #	Code #	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
19	1.1	Sandy Hook Control	28.9	28.6	29.0	28.8	28.8	29.0	29.1	29.2	29.3	29.3	29.5	28.4	29.5
8	1.2	20120081	28.8	28.4	29.0	28.8	28.8	29.0	29.0	29.1	29.1	29.2	29.3		
4	1.3		28.5	28.4	29.2	28.7	29.0	29.1	29.2	29.2	29.1	29.3	29.5		
23	1.4		28.9	28.7	29.1	28.9	28.8	28.9	28.9	29.1	29.0	29.1	29.1		
21	1.5		28.8	28.7	29.0	28.8	28.7	28.9	28.8	28.9	28.8	28.8	28.9		
2	2.1	Mud Dump Reference	28.9	28.9	29.3	29.2	29.3	29.4	29.4	29.5	29.5	29.5	29.5	28.8	30.1
29	2.2	20120079	29.0	29.0	29.3	29.0	28.9	29.0	29.0	29.1	29.1	29.1	29.1		
17	2.3		29.3	29.2	29.6	29.5	29.5	29.7	29.7	29.9	29.9	29.9	30.1		
18	2.4		29.0	29.0	29.3	29.0	29.0	29.1	29.1	29.2	29.1	29.0	29.3		
1	2.5		29.0	28.8	29.3	29.1	29.1	29.3	29.5	29.7	29.7	29.8	29.9		
25	3.1	Area 1A Composite	27.7	27.5	27.3	26.8	26.6	26.6	26.5	26.5	26.4	26.3	26.3	26.1	28.0
30	3.2	20120057	27.6	27.4	27.2	26.8	26.6	26.6	26.5	26.6	26.5	26.4	26.5		
7	3.3		27.7	27.4	27.2	26.7	26.5	26.4	26.3	26.3	26.2	26.1	26.1		
6	3.4		27.7	27.4	27.4	26.9	26.6	26.6	26.4	26.3	26.4	26.2	26.3		
16	3.5		28.0	27.7	27.5	27.0	26.8	26.7	26.6	26.6	26.5	26.4	26.5		
24	4.1	Area 1B Composite	27.9	27.5	27.5	27.0	26.9	27.0	27.1	26.6	27.3	27.4	27.6	26.5	27.9
28	4.2	20120058	27.9	27.6	27.6	27.1	26.9	26.8	26.7	26.9	26.6	26.5	26.5		
15	4.3		27.9	27.5	27.5	27.0	26.8	26.7	26.6	26.6	26.6	26.5	26.6		
12	4.4		27.9	27.6	27.6	27.2	27.0	27.0	26.9	26.7	27.0	26.9	27.0		
26	4.5		27.9	27.5	27.5	27.0	26.8	26.8	26.6	26.9	26.5	26.5	26.6		
27	5.1	Area 1C Composite	27.8	27.6	27.6	27.2	27.0	27.0	26.8	26.3	26.8	26.7	26.7	26.0	28.0
14	5.2	20120059	27.8	27.7	27.5	27.0	26.8	26.8	26.7	26.0	26.5	26.4	26.3		
13	5.3		27.9	27.7	27.6	27.1	26.9	26.8	26.6	26.1	26.5	26.4	26.3		
22	5.4		27.7	27.6	27.5	27.1	26.9	26.9	26.9	26.5	26.7	26.6	26.6		
3	5.5		28.0	27.6	27.7	27.1	26.9	26.9	26.7	26.1	26.6	26.4	26.4		
20	6.1	Area 2 Composite	27.5	27.3	27.1	26.6	26.4	26.4	26.3	26.9	26.2	26.0	26.3	25.6	27.6
10	6.2	20120060	27.5	27.3	27.0	26.5	26.2	26.2	26.0	26.6	25.7	25.6	25.7		
5	6.3		27.6	27.3	27.1	26.6	26.3	26.2	26.1	26.6	25.9	25.8	25.9		
9	6.4		27.6	27.3	27.1	26.6	26.4	26.3	26.1	26.6	25.9	25.8	25.8		
11	6.5		27.6	27.3	27.2	26.7	26.5	26.5	26.5	27.0	26.3	26.2	26.2		
Range														25.6	30.1

Table 16

10 Day Solid Phase Readings  
AKRF, Tappan Zee  
DO (mg/L)

(Static)

Species: *A. bahia*  
Job #: 32-012

Position #	Code #	Sample	0	1 *	2	3	4	5	6	7	8	9	10	Low	High
19	1.1	Sandy Hook Control	6.45	5.89	7.08	7.32	6.75	6.75	6.77	7.09	7.30	7.09	6.58	4.79	8.51
8	1.2	20120081	6.52	5.98	7.18	7.32	6.56	6.67	6.62	7.20	8.51	7.04	6.47		
4	1.3		6.67	5.92	7.20	7.29	6.18	6.87	5.39	7.40	7.15	6.85	6.42		
23	1.4		6.45	6.16	6.89	7.24	5.95	6.60	4.79	7.00	7.16	7.04	6.60		
21	1.5		6.38	5.96	6.97	7.29	6.70	6.77	6.70	7.12	7.26	7.13	6.63		
2	2.1	Mud Dump Reference	6.79	6.40	7.10	7.31	6.75	6.80	6.68	7.15	7.20	7.09	6.67	6.32	7.36
29	2.2	20120079	6.70	6.32	7.01	7.22	6.49	6.86	6.57	7.11	7.25	7.22	6.58		
17	2.3		6.73	6.43	7.07	7.29	6.87	6.75	6.81	7.14	7.23	7.11	6.61		
18	2.4		6.72	6.33	7.07	7.27	6.76	6.73	6.76	7.14	7.25	7.20	6.70		
1	2.5		6.95	6.46	7.14	7.36	6.64	6.86	6.54	7.21	7.33	7.27	6.61		
25	3.1	Area 1A Composite	5.22	4.65	7.14	7.37	6.88	6.77	6.54	7.12	7.08	7.09	6.14	4.47	7.43
30	3.2	20120057	4.89	4.49	7.11	7.34	6.87	6.77	6.77	7.14	7.19	7.31	6.43		
7	3.3		5.25	4.91	7.31	7.33	6.67	6.69	6.57	6.95	7.23	6.98	6.51		
6	3.4		5.83	5.39	7.14	7.34	6.49	6.81	6.45	6.97	7.43	7.14	6.65		
16	3.5		5.20	4.47	7.14	7.34	6.82	6.72	6.70	6.93	7.18	7.11	6.56		
24	4.1	Area 1B Composite	5.45	4.66	7.05	7.42	6.85	6.87	6.87	7.02	7.34	7.29	6.65	4.50	7.56
28	4.2	20120058	6.59	4.50	7.03	7.37	6.77	6.84	6.70	7.07	7.33	7.24	6.62		
15	4.3		5.64	5.01	7.11	7.41	6.90	6.90	6.89	7.10	7.40	7.31	6.65		
12	4.4		6.04	6.35	7.24	7.47	6.89	6.98	6.89	7.24	7.56	7.38	6.54		
26	4.5		5.31	4.55	7.02	7.38	6.87	6.88	6.81	7.15	7.28	7.33	6.72		
27	5.1	Area 1C Composite	4.58	4.15	7.10	7.31	6.77	6.75	6.62	7.01	7.13	6.92	5.46	4.15	7.42
14	5.2	20120059	4.81	4.22	7.10	7.19	6.78	6.73	6.52	7.08	7.11	7.04	6.34		
13	5.3		5.33	4.94	7.35	7.22	6.75	6.75	6.60	7.22	7.21	7.01	6.27		
22	5.4		4.75	4.42	7.17	7.27	6.95	6.78	6.86	6.94	7.02	7.07	6.16		
3	5.5		5.72	5.36	6.90	7.42	6.70	6.87	6.62	7.34	7.38	7.02	6.44		
20	6.1	Area 2 Composite	4.75	4.29	7.11	7.37	6.86	6.76	6.84	7.23	7.22	7.06	6.91	3.90	8.44
10	6.2	20120060	4.74	3.92	7.02	7.36	6.49	6.80	6.36	7.20	7.32	7.04	6.30		
5	6.3		5.47	5.42	7.19	7.54	6.87	6.98	6.83	8.44	7.45	7.31	5.49		
9	6.4		5.05	4.28	7.06	7.46	6.97	6.89	6.86	7.36	7.34	7.20	6.16		
11	6.5		4.73	3.90	6.99	7.26	6.52	6.68	6.73	7.31	7.18	6.83	6.33		
Range														4.47	8.51

\* Aeration initiated.

KF

Table 17

10 Day Solid Phase Readings  
AKRF, Tappan Zee  
pH (SU)

(Static)

Species: *A. bahia*  
Job #: 32-012

Position #	Code #	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
19	1.1	Sandy Hook Control	7.71	7.75	7.72	7.79	7.87	7.98	7.94	7.84	7.88	7.81	7.79	7.62	7.98
8	1.2	20120081	7.69	7.78	7.72	7.80	7.84	7.95	7.91	7.85	7.87	7.78	7.77		
4	1.3		7.62	7.76	7.68	7.75	7.78	7.94	7.74	7.77	7.81	7.69	7.70		
23	1.4		7.73	7.79	7.71	7.76	7.69	7.85	7.68	7.79	7.84	7.78	7.77		
21	1.5		7.73	7.76	7.68	7.77	7.80	7.92	7.85	7.81	7.85	7.76	7.75		
2	2.1	Mud Dump Reference	7.81	7.82	7.76	7.84	7.84	7.95	7.88	7.82	7.85	7.80	7.79	7.70	7.95
29	2.2	20120079	7.81	7.78	7.70	7.77	7.71	7.87	7.79	7.77	7.79	7.72	7.73		
17	2.3		7.80	7.79	7.76	7.84	7.84	7.95	7.94	7.82	7.85	7.81	7.79		
18	2.4		7.81	7.80	7.74	7.81	7.80	7.92	7.91	7.82	7.84	7.77	7.75		
1	2.5		7.80	7.81	7.75	7.81	7.82	7.91	7.90	7.82	7.86	7.80	7.80		
25	3.1	Area 1A Composite	7.65	7.59	7.86	7.93	7.98	8.04	8.03	7.93	7.96	7.89	7.88	7.59	8.05
30	3.2	20120057	7.64	7.60	7.88	7.96	7.96	8.05	8.04	7.94	7.97	7.92	7.89		
7	3.3		7.66	7.61	7.84	7.92	7.89	7.98	7.99	7.89	7.90	7.84	7.81		
6	3.4		7.69	7.65	7.83	7.90	7.82	7.90	7.87	7.82	7.83	7.77	7.76		
16	3.5		7.65	7.59	7.89	7.96	7.96	8.04	8.02	7.92	7.92	7.91	7.89		
24	4.1	Area 1B Composite	7.66	7.61	7.82	7.90	8.00	8.09	8.06	7.88	7.99	7.96	7.94	7.60	8.09
28	4.2	20120058	7.69	7.62	7.84	7.89	7.92	8.04	7.99	7.94	7.95	7.87	7.88		
15	4.3		7.66	7.60	7.82	7.89	7.98	8.09	8.07	7.88	7.99	7.96	7.93		
12	4.4		7.67	7.63	7.89	7.96	7.97	8.09	8.08	7.88	7.99	7.95	7.91		
26	4.5		7.66	7.62	7.87	7.94	7.97	8.06	8.02	7.93	7.99	7.96	7.93		
27	5.1	Area 1C Composite	7.68	7.61	7.87	7.95	7.91	7.95	7.96	8.00	7.92	7.83	7.82	7.59	8.06
14	5.2	20120059	7.68	7.59	7.82	7.87	7.90	8.01	7.92	7.96	7.90	7.84	7.82		
13	5.3		7.68	7.63	7.80	7.84	7.87	7.98	7.93	7.99	7.89	7.83	7.83		
22	5.4		7.67	7.61	7.87	7.93	7.98	8.05	8.06	7.98	7.90	7.81	7.79		
3	5.5		7.69	7.63	7.77	7.84	7.87	7.97	7.92	7.97	7.89	7.81	7.82		
20	6.1	Area 2 Composite	7.63	7.55	7.91	7.99	8.02	8.12	8.10	7.94	7.97	7.93	7.99	7.55	8.12
10	6.2	20120060	7.63	7.56	7.82	7.91	7.87	8.00	7.90	7.89	7.98	7.84	7.90		
5	6.3		7.64	7.61	7.81	7.93	8.00	8.07	8.05	7.89	7.99	7.94	7.89		
9	6.4		7.63	7.57	7.87	7.99	8.01	8.10	8.08	7.90	8.00	7.95	7.94		
11	6.5		7.63	7.57	7.92	7.98	7.99	8.10	8.10	7.92	7.93	7.83	7.93		
Range														7.55	8.12

Table 18

10 Day Solid Phase Readings  
AKRF, Tappan Zee  
Total Ammonia (mg/L)

(Static)

Species: *A. bahia*  
Job #: 32-012

Position #	Code #	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
19	1.1	Sandy Hook Control	<0.6										4.88		
8	1.2	20120081	<0.6										7.05		
4	1.3		<0.6	<0.6	<0.6	0.82	1.47	2.57	2.33	4.42	5.16	5.53	7.73		
23	1.4		<0.6										7.18		
21	1.5		<0.6										6.81	<0.6	7.73
2	2.1	Mud Dump Reference	<0.6										3.92		
29	2.2	20120079	<0.6										5.26		
17	2.3		<0.6										3.02		
18	2.4		<0.6										4.37		
1	2.5		<0.6	<0.6	<0.6	0.76	0.87	1.60	1.52	2.57	3.10	3.71	4.14	<0.6	5.26
25	3.1	Area 1A Composite	3.34	10.2	8.07	9.82	10.8	13.2	15.4	16.3	19.1	21.3	21.8		
30	3.2	20120057	3.31	10.6	8.62	9.94	10.9	13.0	15.7	16.2	19.1	21.3	22.5		
7	3.3		4.41	10.1	8.16	10.2	11.0	13.6	16.0	16.8	20.0	22.2	21.2		
6	3.4		4.15	8.40	7.57	8.82	10.3	12.3	13.4	16.0	19.1	21.5	22.0		
16	3.5		3.77	10.9	9.33	11.1	11.8	14.5	17.7	18.3	21.2	23.0	21.8	3.31	23.0
24	4.1	Area 1B Composite	2.61	8.79	6.89	7.13	8.79	11.4	12.1	14.0	15.2	17.7	21.0		
28	4.2	20120058	2.76	8.89	6.92	7.21	8.85	11.3	12.4	15.0	15.8	18.5	21.0		
15	4.3		2.76	8.95	6.89	6.88	8.65	11.0	11.8	14.1	15.2	17.5	20.0		
12	4.4		2.93	6.64	5.91	5.99	8.26	10.4	11.6	13.8	14.9	17.3	19.5		
26	4.5		2.79	8.79	6.73	6.46	8.42	10.8	11.8	14.6	15.6	17.9	20.5	2.61	21.0
27	5.1	Area 1C Composite	2.51	8.40	6.29	5.95	8.04	10.2	11.4	13.6	14.4	16.8	20.0		
14	5.2	20120059	<0.6	8.56	6.42	6.06	8.29	10.4	11.4	13.7	14.5	17.0	19.9		
13	5.3		2.59	8.19	5.52	5.37	7.41	9.45	10.2	13.0	13.4	16.5	18.2		
22	5.4		2.65	8.99	7.05	7.57	8.55	10.9	11.7	13.8	15.2	17.7	20.8		
3	5.5		3.31	6.23	5.68	5.37	7.55	9.70	11.0	13.3	13.4	16.8	19.0	<0.6	20.8
20	6.1	Area 2 Composite	3.09	9.54	7.91	8.72	9.64	12.1	13.4	15.4	16.4	18.9	20.6		
10	6.2	20120060	3.95	9.83	7.97	9.22	10.2	12.4	13.7	15.8	16.9	19.2	22.2		
5	6.3		4.32	8.56	7.97	9.63	10.8	13.3	15.7	16.1	19.1	21.6	21.8		
9	6.4		3.94	9.50	7.88	8.19	10.1	12.5	14.9	16.3	19.5	21.5	22.1		
11	6.5		3.84	9.87	8.00	9.48	10.4	12.5	14.0	15.9	16.8	19.1	22.2	3.09	22.2
Range														<0.6	23.0

Table 19

10 Day Solid Phase Readings (Static)  
 AKRF, Tappan Zee  
 Unionized Ammonia (mg/L - calculated)

Species: *A. bahia*  
 Job #: 32-012

Position #	Code #	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
19	1.1	Sandy Hook Control													
8	1.2	20120081													
4	1.3		0.00	0.00	0.00	0.01	0.03	0.06	0.04	0.08	0.10	0.08	0.12		
23	1.4														
21	1.5													0.00	0.12
2	2.1	Mud Dump Reference													
29	2.2	20120079													
17	2.3														
18	2.4														
1	2.5		0.00	0.00	0.00	0.01	0.02	0.04	0.04	0.05	0.06	0.07	0.08	0.00	0.08
25	3.1	Area 1A Composite	0.05	0.13	0.18	0.25	0.32	0.43	0.50	0.42	0.51	0.50	0.51		
30	3.2	20120057	0.05	0.14	0.20	0.27	0.30	0.43	0.52	0.42	0.52	0.54	0.54		
7	3.3		0.07	0.13	0.17	0.25	0.27	0.38	0.48	0.40	0.47	0.48	0.43		
6	3.4		0.07	0.12	0.16	0.21	0.21	0.29	0.30	0.32	0.38	0.39	0.39		
16	3.5		0.06	0.13	0.22	0.30	0.33	0.47	0.56	0.46	0.52	0.57	0.52	0.05	0.57
24	4.1	Area 1B Composite	0.04	0.11	0.14	0.17	0.27	0.41	0.41	0.32	0.43	0.49	0.56		
28	4.2	20120058	0.04	0.12	0.14	0.17	0.23	0.36	0.37	0.39	0.41	0.42	0.49		
15	4.3		0.04	0.11	0.14	0.16	0.26	0.40	0.42	0.32	0.44	0.49	0.53		
12	4.4		0.05	0.08	0.14	0.16	0.24	0.37	0.42	0.32	0.42	0.47	0.49		
26	4.5		0.04	0.12	0.15	0.17	0.24	0.36	0.37	0.37	0.44	0.50	0.53	0.04	0.56
27	5.1	Area 1C Composite	0.04	0.11	0.14	0.16	0.20	0.27	0.32	0.41	0.35	0.35	0.41		
14	5.2	20120059	0.00	0.10	0.13	0.13	0.20	0.31	0.29	0.38	0.34	0.36	0.41		
13	5.3		0.04	0.11	0.11	0.11	0.17	0.27	0.26	0.38	0.31	0.35	0.38		
22	5.4		0.04	0.12	0.16	0.19	0.25	0.36	0.40	0.40	0.35	0.35	0.40		
3	5.5		0.05	0.08	0.10	0.11	0.17	0.27	0.28	0.37	0.31	0.34	0.39	0.00	0.41
20	6.1	Area 2 Composite	0.04	0.11	0.20	0.25	0.31	0.47	0.50	0.40	0.45	0.49	0.61		
10	6.2	20120060	0.06	0.11	0.16	0.22	0.24	0.37	0.33	0.37	0.47	0.41	0.54		
5	6.3		0.06	0.11	0.16	0.24	0.33	0.46	0.53	0.38	0.55	0.58	0.52		
9	6.4		0.06	0.11	0.18	0.24	0.32	0.46	0.54	0.39	0.57	0.59	0.59		
11	6.5		0.06	0.12	0.20	0.27	0.32	0.46	0.53	0.40	0.42	0.40	0.58	0.04	0.61
Range														0.01	0.61

**Table 20 10-Day Solid Phase Bioassay (Static Renewal)**  
**AKRF, Tappan Zee**  
**Initial Live Count: 20**

**Species: *A. bahia***  
**Job #: 32-012**

Position #	Code	Sample	Final Live Count	Percent Survival
19	1.1	Sandy Hook Control	20	
8	1.2	20120081	20	
4	1.3		19	
23	1.4		20	
21	1.5		20	99%
2	2.1	Mud Dump Reference	19	
29	2.2	20120079	18	
17	2.3		19	
18	2.4		20	
1	2.5		20	96%
25	3.1	Area 1A Composite	20	
30	3.2	20120057	19	
7	3.3		20	
6	3.4		20	
16	3.5		18	97%
24	4.1	Area 1B Composite	20	
28	4.2	20120058	20	
15	4.3		20	
12	4.4		20	
26	4.5		19	99%
27	5.1	Area 1C Composite	20	
14	5.2	20120059	20	
13	5.3		19	
22	5.4		18	
3	5.5		19	96%
20	6.1	Area 2 Composite	19	
10	6.2	20120060	18	
5	6.3		20	
9	6.4		20	
11	6.5		19	96%



Table 21

10 Day Solid Phase Readings  
AKRF, Tappan Zee  
Temperature (° C)

(Static Renewal)

Species: *A. bahia*  
Job #: 32-012

Position #	Code #	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
19	1.1	Sandy Hook Control	20.1	19.1	19.4	18.8	19.1	18.8	19.1	19.0	18.8	19.5	19.3	18.7	20.3
8	1.2	20120081	20.0	19.1	19.4	18.9	19.0	18.8	19.1	19.1	18.9	19.5	19.3		
4	1.3		20.1	19.2	19.5	18.8	19.0	18.7	19.2	19.0	19.1	19.5	19.3		
23	1.4		20.2	19.2	19.4	18.9	19.1	18.8	19.1	19.1	18.8	19.4	19.3		
21	1.5		20.3	19.4	19.6	19.0	19.2	18.8	19.1	19.1	18.8	19.5	19.4		
2	2.1	Mud Dump Reference	20.3	19.4	19.4	19.0	19.2	18.9	19.1	19.1	18.9	19.5	19.3	18.8	20.5
29	2.2	20120079	20.2	19.3	19.4	18.8	19.1	18.8	19.1	19.1	18.8	19.4	19.3		
17	2.3		20.2	19.4	19.6	19.0	19.2	18.9	19.1	19.1	18.8	19.5	19.3		
18	2.4		20.2	19.3	19.5	19.0	19.2	18.8	19.1	19.1	18.8	19.4	19.3		
1	2.5		20.5	19.6	19.5	19.1	19.3	18.9	19.1	19.0	19.0	19.5	19.4		
25	3.1	Area 1A Composite	20.2	19.2	19.4	18.9	19.1	18.8	19.2	19.0	18.8	19.4	19.3	18.8	20.3
30	3.2	20120057	20.3	19.1	19.4	18.9	19.1	18.8	19.1	19.1	18.8	19.4	19.3		
7	3.3		20.2	19.2	19.4	19.0	19.2	18.9	19.1	19.1	18.9	19.5	19.3		
6	3.4		20.3	19.3	19.5	19.0	19.2	18.8	19.1	19.1	18.8	19.5	19.4		
16	3.5		20.3	19.4	19.5	19.1	19.2	18.9	19.2	19.1	18.8	19.5	19.4		
24	4.1	Area 1B Composite	20.3	19.2	19.4	18.8	19.1	18.8	19.1	19.0	18.8	19.4	19.3	18.7	20.4
28	4.2	20120058	20.4	19.3	19.5	18.9	19.2	18.8	19.1	19.1	18.7	19.4	19.4		
15	4.3		20.3	19.3	19.4	18.9	19.1	18.9	19.1	19.1	18.8	19.5	19.4		
12	4.4		20.2	19.3	19.5	19.0	19.1	18.8	19.0	19.0	18.8	19.4	19.3		
26	4.5		20.3	19.5	19.6	19.0	19.2	18.8	19.1	19.2	18.7	19.4	19.4		
27	5.1	Area 1C Composite	20.3	19.3	19.6	19.0	19.2	18.8	19.1	19.1	18.7	19.4	19.4	18.7	20.4
14	5.2	20120059	20.1	19.2	19.4	18.9	19.2	18.9	19.1	19.1	18.8	19.5	19.3		
13	5.3		20.2	19.3	19.4	19.0	19.2	18.8	19.1	19.0	18.7	19.4	19.3		
22	5.4		20.4	19.4	19.6	19.0	19.2	18.8	19.1	19.1	18.7	19.4	19.4		
3	5.5		20.1	19.2	19.3	18.9	19.2	18.8	19.0	19.0	18.7	19.4	19.3		
20	6.1	Area 2 Composite	20.3	19.3	19.5	18.9	19.1	18.8	19.1	19.1	18.8	19.5	19.4	18.7	20.4
10	6.2	20120060	20.4	19.5	19.6	19.0	19.2	18.9	19.1	19.1	18.9	19.5	19.3		
5	6.3		20.3	19.5	19.5	18.8	19.1	18.8	19.0	19.0	18.7	19.4	19.3		
9	6.4		20.3	19.2	19.4	18.9	19.2	18.9	19.1	19.0	18.8	19.4	19.3		
11	6.5		20.0	19.4	19.6	19.1	19.2	18.9	19.2	19.1	18.9	19.6	19.4		
Range														18.7	20.5

Table 22

10 Day Solid Phase Readings  
AKRF, Tappan Zee  
Salinity (ppt)

(Static Renewal)

Species:

*A. bahia*

Job # :

32-012

Position #	Code #	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
19	1.1	Sandy Hook Control 20120081	28.9	29.1	29.3	29.0	28.9	29.5	29.8	30.0	30.1	29.5	29.5	28.2	30.2
8	1.2		28.9	29.1	29.3	28.9	29.0	29.5	29.9	30.0	30.2	29.7	29.6		
4	1.3		28.2	29.0	29.3	28.6	28.5	29.6	30.1	30.0	29.7	29.6	29.7		
23	1.4		29.0	29.2	29.4	29.0	29.0	29.6	29.8	30.1	30.1	29.7	29.6		
21	1.5		29.0	29.1	29.3	29.0	29.0	29.5	29.8	30.0	30.1	29.7	29.5		
2	2.1	Mud Dump Reference 20120079	29.0	29.1	29.3	28.9	29.0	29.5	29.8	30.0	30.0	29.6	29.5	28.8	30.0
29	2.2		29.0	22.8 *	29.2	29.0	29.0	29.5	29.7	30.0	30.0	29.6	29.5		
17	2.3		29.0	29.1	29.3	29.1	29.0	29.6	29.7	30.0	30.0	29.6	29.5		
18	2.4		29.0	29.1	29.3	29.0	29.0	29.5	29.7	30.0	30.0	29.6	29.5		
1	2.5		28.8	29.0	29.3	28.9	28.9	29.5	29.9	30.0	30.0	29.7	29.6		
25	3.1	Area 1A Composite 20120057	28.6	28.6	28.9	28.6	28.8	29.3	29.5	29.9	29.9	29.6	29.5	28.4	30.0
30	3.2		28.4	28.7	28.9	28.7	28.8	29.3	29.5	29.8	29.8	29.5	29.4		
7	3.3		28.6	28.6	29.0	28.7	28.8	29.4	29.7	29.9	30.0	29.6	29.5		
6	3.4		28.6	28.6	28.9	28.7	28.8	29.4	29.7	29.8	29.9	29.6	29.5		
16	3.5		28.6	28.6	28.9	28.7	28.8	29.4	29.6	29.9	30.0	29.6	29.5		
24	4.1	Area 1B Composite 20120058	28.6	28.6	29.0	28.7	28.7	29.3	29.6	29.6	29.9	29.3	29.5	28.0	30.0
28	4.2		28.6	28.6	29.0	28.7	28.8	29.4	29.6	29.8	29.9	29.5	29.4		
15	4.3		28.6	28.6	28.9	28.7	28.8	29.3	29.6	29.6	30.0	28.0	29.5		
12	4.4		28.6	28.7	28.9	28.8	28.8	29.3	29.6	29.8	29.9	29.5	29.6		
26	4.5		28.5	28.6	29.0	28.7	28.8	29.4	29.6	29.9	29.9	29.6	29.5		
27	5.1	Area 1C Composite 20120059	28.6	28.7	29.0	28.7	28.8	29.4	29.6	29.9	29.9	29.5	29.5	28.6	30.0
14	5.2		28.6	28.6	28.9	28.7	28.8	29.3	29.5	29.8	29.8	28.8	29.4		
13	5.3		28.6	28.7	29.0	28.7	28.8	29.3	29.5	29.8	29.9	29.6	29.6		
22	5.4		28.6	28.6	29.0	28.7	28.8	29.4	29.6	29.9	30.0	29.6	29.5		
3	5.5		28.6	28.7	29.0	28.7	28.8	29.4	29.6	29.9	29.9	29.5	29.5		
20	6.1	Area 2 Composite 20120060	28.5	28.5	28.8	28.7	28.8	29.3	29.5	29.8	29.9	29.4	29.4	28.5	30.0
10	6.2		28.5	28.6	28.9	28.6	28.7	29.3	29.5	29.8	29.9	29.3	29.4		
5	6.3		28.6	28.5	28.9	28.7	28.8	29.5	29.6	30.0	30.0	29.6	29.6		
9	6.4		28.6	28.6	28.9	28.7	28.8	29.4	29.5	29.9	29.9	29.5	29.4		
11	6.5		28.7	28.7	28.9	28.7	28.8	29.3	29.5	29.8	29.8	29.5	29.5		
Range														28.0	30.2

\* Probe apparently not fully submerged.

Table 23

10 Day Solid Phase Readings  
AKRF, Tappan Zee  
DO (mg/L)

(Static Renewal)

Species:

*A. bahia*

Job #:

32-012

Position #	Code #	Sample	0	1	2 *	3	4	5	6	7	8	9	10	Low	High
19	1.1	Sandy Hook Control	6.80	6.05	6.33	7.34	6.99	6.78	6.66	7.33	7.20	7.05	7.17	4.90	7.55
8	1.2	20120081	6.86	6.33	6.77	7.38	7.05	6.80	6.80	7.28	7.16	6.96	7.55		
4	1.3		6.90	4.90	6.59	7.32	7.01	6.78	6.72	7.34	7.24	6.99	7.20		
23	1.4		6.78	5.72	5.88	7.35	6.97	6.79	6.72	7.26	7.22	7.11	7.05		
21	1.5		6.78	5.51	5.94	7.32	6.97	6.78	6.70	7.27	7.21	7.00	7.11		
2	2.1	Mud Dump Reference	6.80	5.80	5.43	7.30	6.96	6.77	6.70	7.25	7.15	7.17	7.10	5.43	7.34
29	2.2	20120079	6.80	6.24	5.81	7.34	6.97	6.75	6.62	7.23	7.22	7.15	7.05		
17	2.3		6.81	6.33	5.73	7.30	6.95	6.77	6.71	7.22	7.20	7.15	7.08		
18	2.4		6.80	6.15	6.03	7.30	6.94	6.76	6.66	7.20	7.18	7.13	7.04		
1	2.5		6.85	6.16	5.99	7.33	6.97	6.85	6.74	7.33	7.18	7.20	7.11		
25	3.1	Area 1A Composite	6.17	4.84	4.62	7.30	6.93	6.76	6.63	7.23	7.19	7.14	6.99	4.40	7.32
30	3.2	20120057	6.10	5.75	4.40	7.32	6.98	6.80	6.59	7.12	7.12	7.15	7.01		
7	3.3		6.35	5.09	4.46	7.26	6.92	6.74	6.64	7.17	7.13	7.04	6.91		
6	3.4		6.54	6.37	5.51	7.28	6.96	6.83	6.74	7.25	7.28	7.07	7.03		
16	3.5		6.15	4.58	4.40	7.27	6.91	6.76	6.68	7.19	7.19	7.11	6.94		
24	4.1	Area 1B Composite	6.18	5.12	4.65	7.68	7.01	6.64	6.57	7.13	7.12	6.99	6.94	4.18	7.68
28	4.2	20120058	5.93	4.50	4.18	7.35	6.93	6.69	6.62	7.05	6.97	7.04	7.01		
15	4.3		6.37	5.17	4.59	7.30	6.93	6.70	6.52	7.05	7.11	7.13	6.91		
12	4.4		6.58	5.55	5.16	7.31	6.87	6.77	6.63	7.19	7.18	7.11	7.04		
26	4.5		6.04	4.77	4.43	7.35	6.90	6.67	6.60	7.08	7.12	6.95	6.91		
27	5.1	Area 1C Composite	6.04	4.56	3.87	7.29	6.94	6.73	6.68	7.16	7.10	6.98	6.88	3.83	7.32
14	5.2	20120059	6.39	4.82	3.83	7.23	6.90	6.68	6.58	7.11	7.12	6.88	6.87		
13	5.3		6.33	5.15	3.94	7.28	6.99	6.76	6.63	7.20	7.16	7.05	7.02		
22	5.4		6.22	4.71	4.13	7.28	6.91	6.70	6.66	7.15	7.10	6.87	6.85		
3	5.5		6.73	5.68	4.42	7.32	7.06	6.84	6.74	7.25	7.21	7.09	6.96		
20	6.1	Area 2 Composite	6.57	4.73	3.97	7.31	6.92	6.71	6.57	7.09	7.01	6.65	6.88	3.90	7.38
10	6.2	20120060	6.22	5.17	3.90	7.33	6.99	6.75	6.65	7.16	7.08	6.95	7.05		
5	6.3		6.76	5.92	4.89	7.38	7.09	6.86	6.80	7.27	7.18	7.15	7.06		
9	6.4		6.39	5.59	4.29	7.37	7.03	6.80	6.73	7.24	7.11	7.15	7.06		
11	6.5		6.37	4.77	3.99	7.27	6.92	6.66	6.60	7.15	7.01	6.90	6.99		
Range														4.18	7.68

\* Aeration initiated.

Table 24

10 Day Solid Phase Readings  
AKRF, Tappan Zee  
pH (SU)

(Static Renewal)

Species:

*A. bahia*

Job #:

32-012

Position #	Code #	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
19	1.1	Sandy Hook Control	7.82	7.45	7.55	7.50	7.76	7.86	7.75	7.71	7.04	7.04	7.15	6.39	7.89
8	1.2	20120081	7.81	7.40	7.55	7.47	7.75	7.86	7.76	7.71	6.90	6.94	7.10		
4	1.3		7.79	7.29	7.57	7.35	7.71	7.85	7.74	7.68	6.39	6.57	6.83		
23	1.4		7.82	7.51	7.61	7.57	7.80	7.87	7.79	7.73	7.21	7.19	7.28		
21	1.5		7.82	7.46	7.56	7.56	7.81	7.89	7.82	7.73	7.15	7.13	7.24		
2	2.1	Mud Dump Reference	7.83	7.54	7.57	7.61	7.82	7.89	7.81	7.75	7.33	7.33	7.36	7.27	7.89
29	2.2	20120079	7.83	7.62	7.61	7.64	7.79	7.86	7.77	7.74	7.44	7.43	7.41		
17	2.3		7.83	7.62	7.64	7.63	7.80	7.88	7.79	7.74	7.39	7.38	7.37		
18	2.4		7.83	7.62	7.63	7.65	7.81	7.88	7.79	7.74	7.41	7.40	7.39		
1	2.5		7.83	7.52	7.59	7.59	7.80	7.87	7.78	7.73	7.27	7.28	7.32		
25	3.1	Area 1A Composite	7.76	7.54	7.46	7.67	7.78	7.85	7.75	7.71	7.52	7.51	7.46	7.39	7.89
30	3.2	20120057	7.74	7.52	7.44	7.65	7.77	7.82	7.74	7.72	7.52	7.51	7.47		
7	3.3		7.77	7.58	7.49	7.69	7.81	7.88	7.78	7.72	7.47	7.49	7.42		
6	3.4		7.78	7.65	7.52	7.63	7.77	7.84	7.75	7.71	7.44	7.44	7.39		
16	3.5		7.76	7.53	7.48	7.71	7.83	7.89	7.81	7.74	7.53	7.53	7.45		
24	4.1	Area 1B Composite	7.76	7.53	7.42	7.69	7.76	7.80	7.73	7.69	7.56	7.51	7.45	7.42	7.86
28	4.2	20120058	7.75	7.52	7.42	7.73	7.81	7.85	7.79	7.74	7.62	7.59	7.52		
15	4.3		7.77	7.53	7.42	7.68	7.78	7.84	7.74	7.70	7.55	7.53	7.46		
12	4.4		7.77	7.52	7.45	7.64	7.72	7.83	7.70	7.68	7.52	7.51	7.44		
26	4.5		7.75	7.52	7.42	7.74	7.81	7.86	7.78	7.72	7.61	7.56	7.49		
27	5.1	Area 1C Composite	7.75	7.52	7.41	7.77	7.83	7.90	7.84	7.76	7.70	7.67	7.60	7.41	7.90
14	5.2	20120059	7.76	7.54	7.44	7.71	7.78	7.84	7.78	7.72	7.66	7.59	7.49		
13	5.3		7.77	7.53	7.44	7.72	7.79	7.85	7.76	7.73	7.65	7.60	7.51		
22	5.4		7.76	7.53	7.44	7.75	7.81	7.88	7.82	7.74	7.69	7.63	7.56		
3	5.5		7.77	7.51	7.41	7.72	7.80	7.86	7.78	7.73	7.64	7.61	7.53		
20	6.1	Area 2 Composite	7.76	7.52	7.40	7.70	7.76	7.84	7.76	7.70	7.68	7.59	7.56	7.40	7.92
10	6.2	20120060	7.75	7.54	7.41	7.78	7.82	7.88	7.81	7.75	7.71	7.67	7.61		
5	6.3		7.75	7.53	7.40	7.80	7.86	7.92	7.87	7.77	7.72	7.72	7.62		
9	6.4		7.76	7.54	7.42	7.80	7.85	7.91	7.84	7.77	7.73	7.71	7.62		
11	6.5		7.75	7.52	7.42	7.73	7.77	7.84	7.78	7.71	7.69	7.66	7.58		
Range														6.39	7.92

Table 25

10 Day Solid Phase Readings  
AKRF, Tappan Zee  
Total Ammonia (mg/L)

(Static Renewal)

Species:

*A. bahia*

Job # :

32-012

Position #	Code #	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
19	1.1	Sandy Hook Control	<0.6			<0.6					<0.6		<0.6		
8	1.2	20120081	<0.6		<0.6					0.79			<0.6		
4	1.3		<0.6	<0.6					<0.6				<0.6		
23	1.4		<0.6					<0.6					<0.6		
21	1.5		<0.6				<0.6					0.66	<0.6	<0.6	0.79
2	2.1	Mud Dump Reference	<0.6		<0.6					0.90			<0.6		
29	2.2	20120079	<0.6					<0.6					<0.6		
17	2.3		<0.6			<0.6					<0.6		<0.6		
18	2.4		<0.6				<0.6					0.68	<0.6		
1	2.5		<0.6	<0.6					<0.6				<0.6	<0.6	0.90
25	3.1	Area 1A Composite	1.47				1.61					1.51	0.97		
30	3.2	20120057	1.95					1.21					0.97		
7	3.3		0.84		1.33					1.79			0.93		
6	3.4		1.01	2.09					1.21				1.01		
16	3.5		1.44			1.08					1.35		1.00	0.84	2.09
24	4.1	Area 1B Composite	1.23			1.06					1.32		1.10		
28	4.2	20120058	1.49					1.03					0.80		
15	4.3		1.41		1.14					1.70			0.91		
12	4.4		1.30	1.77					1.19				0.93		
26	4.5		1.20				1.61					1.51	0.81	0.80	1.77
27	5.1	Area 1C Composite	1.10					1.04					0.96		
14	5.2	20120059	1.38			1.07					1.40		1.18		
13	5.3		1.25		1.14					1.72			0.89		
22	5.4		1.36				1.54					1.57	1.07		
3	5.5		0.64	1.78					1.21				0.78	0.64	1.78
20	6.1	Area 2 Composite	1.53					1.18					1.04		
10	6.2	20120060	1.57			1.10					1.60		1.14		
5	6.3		<0.6	0.86					1.19				1.13		
9	6.4		1.47		1.18					1.73			1.00		
11	6.5		1.25				1.54					2.02	1.07	0.86	2.02
Range														<0.6	2.09

Table 26

96-hour Suspended Particulate Phase  
AKRF, Tappan Zee  
Initial Live Count: 20

Species: *M. beryllina*  
Job #: 32-012

Position #	Code	Sample	Final Live Count	Percent Survival	LC <sub>50</sub>
1	A	Control	18		
54	B		19		
7	C		19		
62	D		17		
57	E		17	90%	
35	A	Area 1A	19		
56	B	10% SPP	18		
60	C		19		
52	D		20		
16	E		16	92%	
21	A	Area 1A	18		
49	B	50% SPP	16		
42	C		18		
40	D		17		
2	E		17	86%	
65	A	Area 1A	19		
47	B	100% SPP	17		
25	C		16		
51	D		17		
58	E		17	86%	>100%
10	A	Area 1B	19		
55	B	10% SPP	17		
43	C		19		
39	D		19		
59	E		17	91%	
14	A	Area 1B	17		
3	B	50% SPP	19		
13	C		18		
17	D		19		
38	E		19	92%	
46	A	Area 1B	15		
45	B	100% SPP	14		
8	C		17		
22	D		18		
34	E		18	82%	>100%

Table 26  
continued

96-hour Suspended Particulate Phase  
AKRF, Tappan Zee  
Initial Live Count: 20

Species: *M. beryllina*  
Job #: 32-012

Position #	Code	Sample	Final Live Count	Percent Survival	LC <sub>50</sub>
26	A	Area 1C	18		
41	B	10% SPP	20		
20	C		20		
11	D		18		
23	E		18	94%	
33	A	Area 1C	18		
37	B	50% SPP	17		
5	C		19		
31	D		15		
28	E		19	88%	
27	A	Area 1C	18		
9	B	100% SPP	19		
6	C		19		
24	D		17		
30	E		20	93%	>100%
18	A	Area 2	18		
53	B	10% SPP	18		
63	C		20		
48	D		18		
29	E		19	93%	
44	A	Area 2	19		
61	B	50% SPP	19		
15	C		19		
4	D		19		
12	E		20	96%	
64	A	Area 2	17		
32	B	100% SPP	18		
36	C		18		
19	D		17		
50	E		18	88%	>100%

Table 27

96 Hour Suspended Particulate Phase Test  
Tappan Zee  
Temperature (° C)

Species: *M. beryllina*  
Job No. 32-012

Position #	Code	Sample	0	24	48	72	96	Low	High
1	A	Control	19.5	19.7	19.9	19.7	19.8		
54	B			19.9	20.2	19.9	19.8		
7	C			19.7	20.0	19.9	19.7		
62	D			19.9	20.3	20.0	19.8		
57	E			19.9	20.3	20.0	19.7	19.5	20.3
35	A	Area 1A	19.4	19.8	20.1	20.0	19.8		
56	B	10% SPP		19.9	20.3	20.0	19.8		
60	C			19.7	20.3	20.0	19.8		
52	D			19.9	20.3	20.0	19.8		
16	E			19.7	20.1	19.9	19.7	19.4	20.3
21	A	Area 1A	19.5	19.9	20.1	20.0	19.7		
49	B	50% SPP		19.8	20.3	20.0	19.7		
42	C			19.9	20.2	20.0	19.7		
40	D			19.9	20.2	20.0	19.8		
2	E			19.8	20.0	19.9	19.7	19.5	20.3
65	A	Area 1A	19.5	19.7	20.3	20.0	19.7		
47	B	100% SPP		20.0	20.3	20.0	19.8		
25	C			19.9	20.1	20.0	19.7		
51	D			19.9	20.3	20.0	19.8		
58	E			20.0	20.3	20.0	19.7	19.5	20.3
10	A	Area 1B	19.5	19.9	20.1	20.0	19.7		
55	B	10% SPP		19.9	20.3	20.0	19.7		
43	C			19.9	20.2	20.0	19.7		
39	D			19.9	20.2	20.0	19.7		
59	E			19.7	20.3	19.9	19.7	19.5	20.3
14	A	Area 1B	19.4	19.8	20.0	20.0	19.7		
3	B	50% SPP		19.8	20.0	20.0	19.7		
13	C			19.8	20.1	20.0	19.7		
17	D			19.9	20.1	20.0	19.7		
38	E			19.8	20.1	19.9	19.7	19.4	20.1
46	A	Area 1B	19.4	19.8	20.3	20.0	19.7		
45	B	100% SPP		19.9	20.3	20.0	19.7		
8	C			19.8	20.1	20.0	19.7		
22	D			19.9	20.1	20.0	19.7		
34	E			19.9	20.2	20.0	19.7	19.4	20.3
Range								19.4	20.3



Table 27  
continued

96 Hour Suspended Particulate Phase Test  
Tappan Zee  
Temperature (° C)

Species: *M. beryllina*  
Job No. 32-012

Position #	Code	Sample	0	24	48	72	96	Low	High
26	A	Area 1C	19.5	19.9	20.1	20.0	19.7	19.5	20.2
41	B	10% SPP		19.8	20.2	20.0	19.7		
20	C			19.8	20.1	20.0	19.7		
11	D			19.8	20.1	20.0	19.7		
23	E			19.8	20.1	20.0	19.7		
33	A	Area 1C	19.5	19.9	20.1	20.0	19.7	19.5	20.2
37	B	50% SPP		19.8	20.2	20.0	19.7		
5	C			19.8	20.0	20.0	19.7		
31	D			19.9	20.1	20.0	19.7		
28	E			19.9	20.1	20.0	19.7		
27	A	Area 1C	19.5	19.9	20.1	20.1	19.7	19.5	20.1
9	B	100% SPP		19.9	20.1	20.0	19.7		
6	C			19.9	20.1	20.0	19.7		
24	D			19.9	20.1	20.0	19.7		
30	E			19.8	20.1	20.0	19.7		
18	A	Area 2	21.3	19.9	20.1	20.0	19.7	19.6	21.3
53	B	10% SPP		20.0	20.3	20.1	19.6		
63	C			19.8	20.0	19.9	19.6		
48	D			20.0	20.3	20.0	19.7		
29	E			19.9	20.3	20.0	19.7		
44	A	Area 2	20.9	20.0	20.3	20.0	19.6	19.6	20.9
61	B	50% SPP		19.8	20.1	20.0	19.6		
15	C			19.9	20.2	20.0	19.7		
4	D			19.8	20.1	20.0	19.6		
12	E			19.8	20.1	20.0	19.6		
64	A	Area 2	20.3	19.9	20.1	20.0	19.6	19.6	20.3
32	B	100% SPP		19.9	20.2	20.1	19.6		
36	C			20.0	20.3	20.1	19.7		
19	D			19.9	20.1	20.0	19.6		
50	E			20.0	20.3	20.0	19.7		
Range								19.5	21.3

Table 28

96 Hour Suspended Particulate Phase Test  
Tappan Zee  
Salinity (ppt)

Species: *M. beryllina*  
Job No. 32-012

Position #	Code	Sample	0	24	48	72	96	Low	High
1	A	Control	28.3	28.4	28.3	28.7	28.8		
54	B			28.3	28.4	28.5	28.8		
7	C			28.5	28.5	28.5	28.9		
62	D			28.4	28.5	28.7	28.9		
57	E			28.5	28.5	28.4	29.0	28.3	29.0
35	A	Area 1A	28.4	28.5	28.6	28.7	28.8		
56	B	10% SPP		28.4	28.6	28.8	28.9		
60	C			28.7	28.6	28.4	28.9		
52	D			28.4	28.6	28.8	28.9		
16	E			28.6	28.6	28.7	28.9	28.4	28.9
21	A	Area 1A	28.6	28.7	28.8	28.3	29.1		
49	B	50% SPP		28.5	28.8	28.9	29.2		
42	C			28.7	28.7	28.6	29.0		
40	D			28.4	28.7	28.7	29.0		
2	E			28.8	28.7	28.8	29.1	28.3	29.2
65	A	Area 1A	28.8	28.4	29.1	29.0	29.5		
47	B	100% SPP		28.8	28.9	29.0	29.3		
25	C			29.0	29.0	29.1	29.4		
51	D			28.9	28.9	28.9	29.3		
58	E			28.9	28.9	29.2	29.3	28.4	29.5
10	A	Area 1B	28.7	28.8	28.9	28.9	29.1		
55	B	10% SPP		28.8	28.9	29.0	29.2		
43	C			28.8	28.9	29.0	29.0		
39	D			28.8	28.9	28.8	29.1		
59	E			29.0	28.9	28.7	29.2	28.7	29.2
14	A	Area 1B	28.8	29.0	28.9	29.2	29.3		
3	B	50% SPP		29.0	29.1	29.1	29.2		
13	C			29.0	29.0	29.0	29.3		
17	D			28.8	29.0	28.9	29.4		
38	E			29.1	29.0	29.3	29.2	28.8	29.4
46	A	Area 1B	29.0	28.8	29.2	28.9	29.5		
45	B	100% SPP		29.1	29.2	29.2	29.3		
8	C			29.1	29.2	29.1	29.5		
22	D			28.8	29.1	29.3	29.4		
34	E			28.7	29.1	29.3	29.4	28.7	29.5
Range								28.3	29.5

Table 28  
continued

96 Hour Suspended Particulate Phase Test  
Tappan Zee  
Salinity (ppt)

Species: *M. beryllina*  
Job No. 32-012

Position #	Code	Sample	0	24	48	72	96	Low	High
26	A	Area 1C	28.7	28.7	28.9	29.0	29.1	28.5	29.3
41	B	10% SPP		29.0	28.9	29.3	29.2		
20	C			28.8	28.9	28.9	29.1		
11	D			28.8	28.9	28.7	29.2		
23	E			28.5	28.9	29.0	29.1		
33	A	Area 1C	29.0	28.3	29.1	29.1	29.5	28.3	29.6
37	B	50% SPP		29.4	29.2	29.6	29.5		
5	C			28.9	29.1	29.1	29.6		
31	D			28.4	29.1	29.0	29.4		
28	E			29.0	29.1	29.2	29.4		
27	A	Area 1C	29.3	29.4	29.5	28.9	29.8	28.8	29.8
9	B	100% SPP		29.2	29.5	29.4	29.8		
6	C			29.3	29.5	29.6	29.8		
24	D			29.4	29.4	29.5	29.7		
30	E			28.9	28.9	28.8	29.8		
18	A	Area 2	28.6	28.9	28.9	29.0	29.2	28.6	29.3
53	B	10% SPP		28.9	28.9	29.0	29.2		
63	C			29.0	29.1	29.2	29.3		
48	D			28.9	28.9	29.0	29.2		
29	E			28.9	28.9	29.0	29.2		
44	A	Area 2	28.8	28.9	29.1	29.2	29.2	28.5	29.5
61	B	50% SPP		28.9	29.2	29.3	29.4		
15	C			28.9	29.0	28.5	29.2		
4	D			29.0	29.1	29.1	29.5		
12	E			29.0	29.0	28.8	29.3		
64	A	Area 2	29.0	29.2	29.5	29.4	29.7	28.3	29.7
32	B	100% SPP		28.3	29.3	29.4	29.5		
36	C			29.2	29.3	29.5	29.5		
19	D			28.8	29.3	29.0	29.5		
50	E			29.2	29.3	29.3	29.6		
Range								28.3	29.8

Table 29

96 Hour Suspended Particulate Phase Test  
Tappan Zee  
DO (mg/L)

Species: *M. beryllina*  
Job No. 32-012

Position #	Code	Sample	0	24	48	72	96	Low	High
1	A	Control	6.86	5.39	5.53	5.29	4.24		
54	B			5.70	5.35	5.34	5.44		
7	C			5.57	5.01	5.61	5.19		
62	D			5.33	5.20	5.00	5.71		
57	E			5.62	5.22	5.22	5.58		
35	A	Area 1A	6.96	5.53	5.26	5.18	5.70		
56	B	10% SPP		5.78	5.35	5.06	5.93		
60	C	5.87		5.36	5.31	5.91			
52	D	5.31		5.30	5.60	5.71			
16	E	5.79		5.72	5.80	5.95			
21	A	Area 1A	6.88	5.48	5.41	5.00	5.49		
49	B	50% SPP		5.48	5.44	4.88	5.84		
42	C	5.40		5.40	4.56	5.78			
40	D	5.44		5.13	4.79	5.33			
2	E	5.54		5.40	5.03	5.48			
65	A	Area 1A	6.69	5.72	5.03	5.23	5.58		
47	B	100% SPP		5.00	5.14	4.66	5.84		
25	C	5.25		5.83	5.32	5.93			
51	D	5.21		4.77	4.41	5.46			
58	E	5.28		5.11	4.90	5.62			
10	A	Area 1B	6.92	5.37	4.58	4.74	5.23		
55	B	10% SPP		5.12	5.01	4.49	5.60		
43	C	5.26		4.72	4.70	5.30			
39	D	5.25		4.81	4.50	5.53			
59	E	5.90		4.80	4.80	5.30			
14	A	Area 1B	6.87	5.15	5.87	4.10	5.47		
3	B	50% SPP		5.43	5.05	4.71	5.37		
13	C	5.14		5.06	4.57	5.53			
17	D	5.31		4.74	4.29	5.60			
38	E	5.39		4.77	4.95	5.71			
46	A	Area 1B	6.75	5.45	4.62	4.72	5.23		
45	B	100% SPP		4.89	4.76	4.22	5.64		
8	C	5.53		4.91	4.31	5.85			
22	D	4.84		4.83	4.57	5.63			
34	E	5.14		4.81	4.65	5.40			
Range								4.10	6.96



Table 29  
continued

96 Hour Suspended Particulate Phase Test  
Tappan Zee  
DO (mg/L)

Species: *M. beryllina*  
Job No. 32-012

Position #	Code	Sample	0	24	48	72	96	Low	High
26	A	Area 1C	6.85	5.24	4.95	4.71	5.62	4.21	6.85
41	B	10% SPP		5.25	5.40	4.47	5.72		
20	C			5.23	4.66	4.23	5.24		
11	D			4.73	4.55	4.21	5.72		
23	E			5.51	4.93	4.56	5.61		
33	A	Area 1C	6.85	5.00	4.61	4.47	5.12	4.07	6.85
37	B	50% SPP		5.04	4.73	4.31	5.01		
5	C			4.72	4.92	4.07	5.40		
31	D			4.94	4.94	4.18	5.56		
28	E			5.37	4.73	4.41	5.46		
27	A	Area 1C	6.63	4.57	5.00	4.10	5.74	4.10	6.63
9	B	100% SPP		4.61	4.61	4.63	5.19		
6	C			4.51	4.52	4.24	5.25		
24	D			4.79	4.57	4.50	5.53		
30	E			5.03	5.03	4.48	5.13		
18	A	Area 2	6.68	5.02	4.88	4.43	5.21	4.43	6.68
53	B	10% SPP		5.14	4.82	4.54	5.68		
63	C			5.53	5.00	4.51	5.53		
48	D			5.51	5.10	4.82	5.42		
29	E			5.61	5.06	4.99	5.16		
44	A	Area 2	6.67	5.46	5.28	4.77	5.90	4.35	6.67
61	B	50% SPP		5.30	4.78	4.45	5.57		
15	C			5.15	4.86	4.72	5.25		
4	D			5.22	4.96	4.50	5.27		
12	E			4.96	4.54	4.35	5.73		
64	A	Area 2	6.48	5.95	4.51	4.54	5.52	4.36	6.48
32	B	100% SPP		5.22	4.51	4.40	5.42		
36	C			5.24	4.86	4.75	5.34		
19	D			5.18	4.85	4.36	5.54		
50	E			5.23	5.16	4.57	5.29		
Range								4.07	6.85

Table 30

96 Hour Suspended Particulate Phase Test  
Tappan Zee  
pH (SU)

Species: *M. beryllina*  
Job No. 32-012

Position #	Code	Sample	0	24	48	72	96	Low	High
1	A	Control	8.03	7.79	7.72	7.46	7.21		
54	B			7.72	7.68	7.47	7.40		
7	C			7.73	7.67	7.43	7.36		
62	D			7.68	7.66	7.47	7.47		
57	E			7.69	7.65	7.47	7.44	7.21	8.03
35	A	Area 1A	8.12	7.79	7.76	7.56	7.56		
56	B	10% SPP		7.82	7.78	7.59	7.62		
60	C			8.01	7.80	7.63	7.64		
52	D			7.80	7.77	7.58	7.59		
16	E			7.81	7.79	7.59	7.59	7.56	8.12
21	A	Area 1A	8.34	8.08	8.04	7.84	7.82		
49	B	50% SPP		8.22	8.06	7.88	7.84		
42	C			8.08	8.07	7.88	7.86		
40	D			8.08	8.06	7.86	7.84		
2	E			8.06	7.99	7.77	7.80	7.77	8.34
65	A	Area 1A	8.47	7.91	8.28	7.76	8.09		
47	B	100% SPP		8.27	8.24	8.06	8.02		
25	C			8.26	8.21	8.01	7.99		
51	D			8.27	8.25	8.08	8.03		
58	E			8.29	8.26	8.09	8.06	7.76	8.47
10	A	Area 1B	8.13	7.84	7.81	7.65	7.69		
55	B	10% SPP		7.82	7.76	7.61	7.65		
43	C			7.81	7.78	7.62	7.63		
39	D			7.82	7.78	7.63	7.65		
59	E			8.02	7.76	7.81	7.61	7.61	8.13
14	A	Area 1B	8.33	8.08	8.06	7.84	7.85		
3	B	50% SPP		8.05	8.03	7.83	7.81		
13	C			8.06	8.03	7.86	7.84		
17	D			8.06	8.05	7.84	7.84		
38	E			8.21	8.03	8.01	7.84	7.81	8.33
46	A	Area 1B	8.46	7.91	8.23	7.74	8.03		
45	B	100% SPP		8.25	8.23	8.06	8.04		
8	C			8.22	8.20	8.02	7.99		
22	D			8.22	8.20	8.01	8.00		
34	E			8.25	8.19	8.06	7.99	7.74	8.46
Range								7.21	8.47

Table 30  
continued

96 Hour Suspended Particulate Phase Test  
Tappan Zee  
pH (SU)

Species: *M. beryllina*  
Job No. 32-012

Position #	Code	Sample	0	24	48	72	96	Low	High
26	A	Area 1C	8.12	7.78	7.82	7.62	7.66	7.62	8.12
41	B	10% SPP		8.04	7.77	7.82	7.63		
20	C			7.84	7.77	7.64	7.64		
11	D			7.81	7.85	7.62	7.74		
23	E			7.83	7.83	7.64	7.68		
33	A	Area 1C	8.34	8.08	8.02	7.84	7.82	7.80	8.34
37	B	50% SPP		8.23	8.01	8.01	7.82		
5	C			8.07	8.01	7.86	7.80		
31	D			8.08	8.04	7.85	7.89		
28	E			8.09	8.02	7.89	7.86		
27	A	Area 1C	8.45	8.26	8.19	8.04	8.01	7.70	8.45
9	B	100% SPP		8.25	8.18	8.05	7.98		
6	C			8.23	8.18	8.01	7.98		
24	D			8.24	8.20	8.03	8.02		
30	E			7.93	7.80	7.70	8.01		
18	A	Area 2	8.11	7.86	7.76	7.65	7.70	7.62	8.11
53	B	10% SPP		7.82	7.77	7.62	7.68		
63	C			8.02	8.01	7.81	7.65		
48	D			7.84	7.80	7.66	7.69		
29	E			7.85	7.79	7.68	7.67		
44	A	Area 2	8.31	8.08	8.06	7.90	7.88	7.80	8.31
61	B	50% SPP		8.24	8.21	8.03	7.88		
15	C			8.08	8.06	7.90	7.83		
4	D			8.06	8.03	7.86	7.80		
12	E			8.05	8.01	7.83	7.86		
64	A	Area 2	8.44	8.27	8.24	8.08	8.06	8.03	8.44
32	B	100% SPP		8.24	8.20	8.08	8.04		
36	C			8.27	8.25	8.08	8.03		
19	D			8.25	8.22	8.06	8.03		
50	E			8.26	8.23	8.05	8.05		
Range								7.62	8.45

RF  
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Table 31

96 Hour Suspended Particulate Phase Test  
 Tappan Zee  
 Total Ammonia (mg/L)

Species: *M. beryllina*  
 Job No. 32-012

Position #	Code	Sample	0	24	48	72	96	Low	High
1	A	Control	<0.6				1.71		
54	B				<0.6		1.23		
7	C			<0.6			1.29		
62	D						1.12		
57	E					<0.6	1.11	<0.60	1.71
35	A	Area 1A		<0.6			1.97		
56	B	10% SPP				1.02	1.78		
60	C						1.74		
52	D				0.68		1.90		
16	E		0.79				2.04	0.68	2.04
21	A	Area 1A		2.75			4.50		
49	B	50% SPP				3.29	4.85		
42	C						4.40		
40	D				2.91		4.38		
2	E		3.75				4.69	2.75	4.85
65	A	Area 1A					8.4		
47	B	100% SPP		7.28			8.80		
25	C		7.88				8.39		
51	D				6.84		8.69		
58	E					6.68	8.69	6.68	8.80
10	A	Area 1B	0.65				1.93		
55	B	10% SPP				1.02	1.85		
43	C				0.62		1.84		
39	D			<0.6			1.83		
59	E						1.93	0.62	1.93
14	A	Area 1B			2.78		4.35		
3	B	50% SPP	3.59				4.63		
13	C			2.75			4.59		
17	D					3.32	4.80		
38	E						4.84	2.75	4.84
46	A	Area 1B					7.55		
45	B	100% SPP				6.16	7.83		
8	C		7.03				8.20		
22	D			6.36			8.26		
34	E				5.91		7.94	5.91	8.26
Range								<0.60	8.80



Table 31

96 Hour Suspended Particulate Phase Test  
 Tappan Zee  
 Total Ammonia (mg/L)

Species: *M. beryllina*  
 Job No. 32-012

Position #	Code	Sample	0	24	48	72	96	Low	High
26	A	Area 1C				0.98	1.91		
41	B	10% SPP					1.77		
20	C			0.6			1.90		
11	D		0.65				1.80		
23	E				5.33		1.92	0.60	5.33
33	A	Area 1C				2.90	4.13		
37	B	50% SPP					4.49		
5	C		3.42				4.36		
31	D				2.51		4.23		
28	E			2.82			4.30	2.51	4.49
27	A	Area 1C				6.21	7.67		
9	B	100% SPP		6.11			7.61		
6	C		7.03				7.73		
24	D				0.00		7.64		
30	E						7.64	0.00	7.73
18	A	Area 2	0.64				1.93		
53	B	10% SPP				1.00	1.93		
63	C						1.76		
48	D				0.65		1.96		
29	E			0.76			1.96	0.64	1.96
44	A	Area 2				3.11	4.93		
61	B	50% SPP					4.76		
15	C				2.82		4.97		
4	D		3.05				5.03		
12	E			3.34			4.70	2.82	5.03
64	A	Area 2					9.67		
32	B	100% SPP		6.96			9.37		
36	C				6.03		9.71		
19	D		6.36				9.56		
50	E					6.73	9.33	6.03	9.71
Range								<0.60	9.71

Table 32

96-hour Suspended Particulate Phase  
AKRF, Tappan Zee  
Initial Live Count: 20

Species: *A. bahia*  
Job #: 32-012

Position #	Code	Sample	Final Live Count	Percent Survival	LC <sub>50</sub>
1	A	Control	20		
54	B		20		
7	C		19		
62	D		19		
57	E		18	96%	
35	A	Area 1A	20		
56	B	10% SPP	20		
60	C		18		
52	D		18		
16	E		20	96%	
21	A	Area 1A	17		
49	B	50% SPP	19		
42	C		17		
40	D		16		
2	E		19	88%	
65	A	Area 1A	20		
47	B	100% SPP	18		
25	C		20		
51	D		20		
58	E		18	96%	>100%
10	A	Area 1B	20		
55	B	10% SPP	20		
43	C		18		
39	D		16		
59	E		18	92%	
14	A	Area 1B	18		
3	B	50% SPP	20		
13	C		20		
17	D		19		
38	E		18	95%	
46	A	Area 1B	17		
45	B	100% SPP	18		
8	C		19		
22	D		20		
34	E		19	93%	>100%

Table 32

96-hour Suspended Particulate Phase  
AKRF, Tappan Zee  
Initial Live Count: 20

Species: *A. bahia*  
Job #: 32-012

Position #	Code	Sample	Final Live Count	Percent Survival	LC <sub>50</sub>
26	A	Area 1A	17		
41	B	10% SPP	16		
20	C		18		
11	D		20		
23	E		18	89%	
33	A	Area 1A	20		
37	B	50% SPP	19		
5	C		19		
31	D		17		
28	E		18	93%	
27	A	Area 1A	17		
9	B	100% SPP	19		
6	C		18		
24	D		19		
30	E		20	93%	>100%
18	A	Area 1B	18		
53	B	10% SPP	18		
63	C		18		
48	D		20		
29	E		20	94%	
44	A	Area 1B	18		
61	B	50% SPP	18		
15	C		20		
4	D		20		
12	E		20	96%	
64	A	Area 1B	20		
32	B	100% SPP	20		
36	C		20		
19	D		17		
50	E		20	97%	>100%

Table 33

96 Hour Suspended Particulate Phase Test  
Tappan Zee  
Temperature (° C)

Species: *A. bahia*  
Job No. 32-012

Position #	Code	Sample	0	24	48	72	96	Low	High
1	A	Control	19.5	19.9	20.3	20.0	20.1		
54	B			19.8	20.2	20.0	19.9		
7	C			20.0	20.5	20.0	20.0		
62	D			19.8	20.1	20.0	19.9		
57	E			19.8	20.2	20.0	19.8		
35	A	Area 1A	19.4	19.9	20.4	20.1	19.9		
56	B	10% SPP		19.9	20.2	20.1	19.8		
60	C	19.9		20.2	20.1	19.8			
52	D	19.9		20.2	20.0	19.9			
16	E	20.0		20.6	20.0	19.9			
21	A	Area 1A	19.5	20.0	20.4	20.1	19.9		
49	B	50% SPP		19.9	20.3	20.1	19.9		
42	C	19.9		20.3	20.1	19.9			
40	D	20.0		20.4	20.0	19.9			
2	E	20.0		20.4	20.0	19.8			
65	A	Area 1A	19.5	19.8	20.1	20.0	19.9		
47	B	100% SPP		19.9	20.3	20.1	19.8		
25	C	20.0		20.4	20.0	19.8			
51	D	19.9		20.3	20.1	19.9			
58	E	19.9		20.3	20.1	19.8			
10	A	Area 1B	19.5	20.0	20.3	20.1	19.9		
55	B	10% SPP		19.9	20.2	20.0	19.8		
43	C	19.9		20.3	20.1	19.9			
39	D	19.9		20.3	20.1	19.8			
59	E	19.9		20.2	20.1	19.8			
14	A	Area 1B	19.4	20.1	20.5	20.1	19.9		
3	B	50% SPP		19.9	20.6	20.1	19.9		
13	C	20.1		20.6	20.1	19.9			
17	D	20.1		20.6	20.1	19.9			
38	E	20.0		20.4	20.1	19.9			
46	A	Area 1B	19.4	19.9	20.3	20.1	19.9		
45	B	100% SPP		19.9	20.3	20.1	19.9		
8	C	20.0		20.5	20.0	19.9			
22	D	20.0		20.5	20.1	19.9			
34	E	20.0		20.4	20.1	19.9			
Range									

Table 33  
continued

96 Hour Suspended Particulate Phase Test  
Tappan Zee  
Temperature (° C)

Species: *A. bahia*  
Job No. 32-012

Position #	Code	Sample	0	24	48	72	96	Low	High
26	A	Area 1C	19.5	20.0	20.4	20.1	19.9	19.5	20.5
41	B	10% SPP		19.9	20.3	20.1	19.9		
20	C			20.0	20.4	20.1	19.9		
11	D			20.0	20.5	20.0	19.9		
23	E			20.0	20.5	20.1	19.9		
33	A	Area 1C	19.5	20.0	20.3	20.1	19.8	19.5	20.5
37	B	50% SPP		19.9	20.3	20.1	19.9		
5	C			20.0	20.5	20.0	19.8		
31	D			20.0	20.4	20.1	19.9		
28	E			20.0	20.4	20.1	19.9		
27	A	Area 1C	19.5	20.0	20.4	20.1	19.9	19.5	20.5
9	B	100% SPP		20.1	20.5	20.1	19.8		
6	C			20.0	20.5	20.1	19.8		
24	D			20.0	20.4	20.1	19.8		
30	E			20.0	20.3	20.1	19.8		
18	A	Area 2	21.3	20.0	20.5	20.0	19.8	19.8	21.3
53	B	10% SPP		19.8	20.2	20.1	19.8		
63	C			19.9	20.1	20.1	19.8		
48	D			19.9	20.3	20.1	19.8		
29	E			20.0	20.4	20.1	19.8		
44	A	Area 2	20.9	19.9	20.3	20.1	19.8	19.8	20.9
61	B	50% SPP		20.1	20.1	20.1	19.8		
15	C			19.9	20.5	20.2	19.8		
4	D			20.0	20.5	20.0	19.8		
12	E			20.1	20.5	20.1	19.8		
64	A	Area 2	20.3	19.8	20.1	20.1	19.8	19.8	20.5
32	B	100% SPP		20.0	20.3	20.0	19.8		
36	C			19.9	20.3	20.1	19.8		
19	D			20.0	20.5	20.0	19.9		
50	E			19.8	20.3	20.1	19.8		
Range								19.5	21.3

Table 34

96 Hour Suspended Particulate Phase Test  
Tappan Zee  
Salinity (ppt)

Species: *A. bahia*  
Job No. 32-012

Position #	Code	Sample	0	24	48	72	96	Low	High
1	A	Control	28.3	28.1	28.4	28.0	28.6		
54	B			28.4	28.4	28.6	28.6		
7	C			28.4	28.5	28.5	28.6		
62	D			28.4	28.5	28.5	28.9		
57	E			28.5	28.5	28.5	28.9	28.0	28.9
35	A	Area 1A	28.4	28.6	28.5	28.6	28.7		
56	B	10% SPP		28.5	28.7	28.8	29.0		
60	C			28.5	28.5	28.6	28.7		
52	D			28.5	28.5	28.7	28.7		
16	E			28.5	28.5	29.0	28.7	28.4	29.0
21	A	Area 1A	28.6	28.8	28.7	28.8	28.8		
49	B	50% SPP		28.7	28.8	28.8	28.8		
42	C			28.7	28.8	28.7	29.0		
40	D			28.8	28.8	28.8	28.9		
2	E			28.7	28.5	28.8	28.9	28.5	29.0
65	A	Area 1A	28.8	29.0	29.0	29.1	29.2		
47	B	100% SPP		29.0	28.9	29.0	29.1		
25	C			29.0	28.9	29.0	29.1		
51	D			29.0	29.0	29.1	29.1		
58	E			29.0	29.0	29.0	29.1	28.8	29.2
10	A	Area 1B	28.7	29.1	28.9	29.0	29.0		
55	B	10% SPP		28.9	29.0	29.1	29.2		
43	C			28.9	28.9	29.0	29.0		
39	D			28.9	28.9	28.9	29.0		
59	E			28.8	28.9	28.9	28.9	28.7	29.2
14	A	Area 1B	28.8	29.0	29.1	29.1	29.2		
3	B	50% SPP		29.1	29.0	29.2	29.1		
13	C			29.0	29.0	29.1	29.1		
17	D			29.0	29.0	29.0	29.1		
38	E			29.0	29.0	29.0	29.0	28.8	29.2
46	A	Area 1B	29.0	29.2	29.2	29.2	29.4		
45	B	100% SPP		29.2	29.2	29.2	29.3		
8	C			29.2	29.2	29.3	29.3		
22	D			29.2	29.2	29.2	29.3		
34	E			29.2	29.2	29.2	29.3	29.0	29.4
Range								28.0	29.4

Table 34  
continued

96 Hour Suspended Particulate Phase Test  
Tappan Zee  
Salinity (ppt)

Species: *A. bahia*  
Job No. 32-012

Position #	Code	Sample	0	24	48	72	96	Low	High
26	A	Area 1C	28.7	28.9	28.9	28.9	29.1	28.7	29.1
41	B	10% SPP		28.9	28.9	28.9	29.0		
20	C			28.9	28.9	28.9	29.0		
11	D			28.9	28.8	28.9	29.0		
23	E			28.9	28.9	28.9	29.0		
33	A	Area 1C	29.0	29.1	29.1	29.2	29.3	29.0	29.4
37	B	50% SPP		29.1	29.2	29.2	29.3		
5	C			29.1	29.1	29.3	29.4		
31	D			29.2	29.2	29.2	29.3		
28	E			29.2	29.2	29.2	29.2		
27	A	Area 1C	29.3	29.4	29.4	29.4	29.4	29.3	29.6
9	B	100% SPP		29.3	29.4	29.5	29.5		
6	C			29.5	29.5	29.6	29.6		
24	D			29.4	29.4	29.5	29.5		
30	E			29.5	29.5	29.6	29.6		
18	A	Area 2	28.6	28.9	28.9	29.0	29.0	28.6	29.1
53	B	10% SPP		28.9	28.9	29.0	29.1		
63	C			29.1	28.9	28.9	29.0		
48	D			28.9	28.9	28.9	29.0		
29	E			28.9	28.9	29.0	29.1		
44	A	Area 2	28.8	29.0	29.0	29.1	29.1	28.8	29.2
61	B	50% SPP		29.2	29.1	29.1	29.1		
15	C			29.0	29.0	29.2	29.1		
4	D			29.0	29.0	29.2	29.2		
12	E			29.0	29.0	29.1	29.1		
64	A	Area 2	29.0	29.0	29.2	29.2	29.2	29.0	29.4
32	B	100% SPP		29.2	29.2	29.3	29.3		
36	C			29.2	29.3	29.3	29.4		
19	D			29.2	29.1	29.2	29.3		
50	E			29.1	29.2	29.3	29.4		
Range								28.6	29.6

Table 35

96 Hour Suspended Particulate Phase Test  
Tappan Zee  
DO (mg/L)

Species: *A. bahia*  
Job No. 32-012

Position #	Code	Sample	0	24	*48	72	96	Low	High
1	A	Control	6.86	6.04	4.35	6.60	5.49		
54	B			5.93	4.54	6.15	5.34		
7	C			5.81	4.43	6.30	6.46		
62	D			5.74	4.26	6.19	6.59		
57	E			5.79	4.11	6.10	6.18	4.11	6.86
35	A	Area 1A	6.96	5.91	4.25	6.45	6.82		
56	B	10% SPP		5.89	5.26	6.40	6.73		
60	C			6.14	4.96	6.39	6.81		
52	D			5.98	4.73	6.45	6.94		
16	E			5.88	4.23	6.49	6.94	4.23	6.96
21	A	Area 1A	6.88	5.82	3.39	6.44	6.84		
49	B	50% SPP		5.39	3.53	6.41	6.71		
42	C			5.44	3.51	6.46	6.85		
40	D			5.74	3.86	6.51	6.92		
2	E			5.76	4.38	6.40	6.73	3.39	6.92
65	A	Area 1A	6.69	5.59	4.31	6.42	6.86		
47	B	100% SPP		5.39	3.62	6.41	6.74		
25	C			5.64	3.66	6.53	6.97		
51	D			5.65	3.36	6.39	6.67		
58	E			5.40	3.38	6.41	6.80	3.36	6.97
10	A	Area 1B	6.92	5.91	4.24	6.45	6.73		
55	B	10% SPP		5.82	4.30	6.33	6.99		
43	C			5.84	3.93	6.40	6.95		
39	D			5.99	3.90	6.36	6.91		
59	E			5.65	3.92	6.45	6.92	3.90	6.99
14	A	Area 1B	6.87	5.64	3.64	6.31	6.87		
3	B	50% SPP		5.73	3.73	5.00	6.83		
13	C			5.70	3.66	5.89	6.87		
17	D			5.59	3.70	6.32	6.77		
38	E			5.61	3.91	6.34	6.67	3.64	6.87
46	A	Area 1B	6.75	5.40	2.94	6.39	6.90		
45	B	100% SPP		5.57	3.27	6.39	6.92		
8	C			5.32	3.88	6.51	6.78		
22	D			5.75	2.69	6.42	6.86		
34	E			5.68	3.63	6.40	6.82	2.69	6.92
Range								2.69	6.99

\* Aeration initiate ↓

RS



Table 35  
continued

96 Hour Suspended Particulate Phase Test  
Tappan Zee  
DO (mg/L)

Species: *A. bahia*  
Job No. 32-012

Position #	Code	Sample	0	24	*48	72	96	Low	High
26	A	Area 1C	6.85	5.44	3.71	6.36	6.95	3.37	6.96
41	B	10% SPP		5.58	3.97	6.38	6.96		
20	C			5.73	3.90	6.52	6.95		
11	D			5.44	3.37	6.72	6.89		
23	E			5.67	3.46	6.44	6.93		
33	A	Area 1C	6.85	5.41	3.60	6.41	6.88	3.06	6.90
37	B	50% SPP		5.34	3.06	6.36	6.77		
5	C			5.52	3.97	6.52	6.90		
31	D			5.55	3.60	6.36	6.66		
28	E			5.76	3.75	6.48	6.88		
27	A	Area 1C	6.63	5.10	3.05	6.29	6.73	2.68	6.73
9	B	100% SPP		5.07	2.68	6.36	6.37		
6	C			5.34	2.71	6.43	6.19		
24	D			5.37	3.24	6.36	6.73		
30	E			4.85	3.25	6.42	6.65		
18	A	Area 2	6.68	5.30	3.76	6.48	6.79	3.60	7.00
53	B	10% SPP		5.78	3.95	6.41	6.78		
63	C			5.91	4.16	6.43	6.77		
48	D			5.90	3.94	6.41	7.00		
29	E			5.37	3.60	6.43	6.90		
44	A	Area 2	6.67	5.40	3.69	5.99	6.64	3.26	6.92
61	B	50% SPP		5.37	4.06	6.28	6.88		
15	C			5.63	3.26	6.31	6.46		
4	D			5.82	3.73	6.51	6.82		
12	E			5.57	3.68	6.46	6.92		
64	A	Area 2	6.48	5.07	3.47	6.38	6.72	3.04	6.88
32	B	100% SPP		5.19	3.22	6.53	5.26		
36	C			4.68	3.04	6.40	5.84		
19	D			5.30	3.57	6.51	6.88		
50	E			4.66	3.15	6.38	6.49		
Range								2.68	7.00

\* Aeration initiated

Table 36

96 Hour Suspended Particulate Phase Test  
Tappan Zee  
pH (SU)

Species: *A. bahia*  
Job No. 32-012

Position #	Code	Sample	0	24	48	72	96	Low	High
1	A	Control	8.03	7.63	7.68	7.85	7.71	7.54	8.03
54	B			7.64	7.65	7.71	7.54		
7	C			7.66	7.67	7.79	7.71		
62	D			7.65	7.62	7.74	7.70		
57	E			7.63	7.61	7.74	7.73		
35	A	Area 1A	8.12	7.77	7.80	7.84	7.81	7.73	8.12
56	B	10% SPP		7.80	7.81	7.86	7.79		
60	C	7.79		7.79	7.86	7.82			
52	D	7.80		7.83	7.84	7.83			
16	E	7.73		7.76	7.86	7.81			
21	A	Area 1A	8.34	8.06	8.08	8.00	7.99	7.95	8.34
49	B	50% SPP		8.11	8.13	8.00	7.99		
42	C	8.11		8.11	8.02	7.99			
40	D	8.09		8.12	8.04	8.04			
2	E	8.01		8.01	7.97	7.95			
65	A	Area 1A	8.47	8.32	8.32	8.20	8.19	8.13	8.47
47	B	100% SPP		8.29	8.32	8.16	8.13		
25	C	8.25		8.30	8.16	8.17			
51	D	8.30		8.32	8.16	8.14			
58	E	8.32		8.33	8.19	8.18			
10	A	Area 1B	8.13	7.99	7.72	7.97	7.84	7.71	8.13
55	B	10% SPP		7.92	7.76	7.94	7.90		
43	C	7.92		7.73	7.95	7.90			
39	D	7.95		7.71	7.94	7.90			
59	E	7.89		7.73	7.93	7.85			
14	A	Area 1B	8.33	8.16	8.09	8.03	8.01	7.92	8.33
3	B	50% SPP		8.09	8.03	7.94	7.95		
13	C	8.14		8.06	8.00	7.99			
17	D	8.17		8.09	8.02	7.98			
38	E	8.16		8.11	8.00	7.92			
46	A	Area 1B	8.46	8.33	8.28	8.14	8.12	8.07	8.46
45	B	100% SPP		8.31	8.27	8.14	8.12		
8	C	8.29		8.24	8.11	8.07			
22	D	8.30		8.25	8.15	8.09			
34	E	8.32		8.26	8.14	8.08			
Range								7.54	8.47

Table 36  
continued

96 Hour Suspended Particulate Phase Test  
Tappan Zee  
pH (SU)

Species: *A. bahia*  
Job No. 32-012

Position #	Code	Sample	0	24	48	72	96	Low	High
26	A	Area 1C	8.12	7.94	7.83	7.93	7.87	7.82	8.12
41	B	10% SPP		7.94	7.82	7.88	7.84		
20	C			7.99	7.86	7.94	7.86		
11	D			8.08	7.87	7.97	7.90		
23	E			7.97	7.83	7.89	7.86		
33	A	Area 1C	8.34	8.18	8.13	8.03	7.99	7.97	8.34
37	B	50% SPP		8.18	8.13	8.04	7.98		
5	C			8.12	8.09	8.01	7.98		
31	D			8.18	8.12	8.01	7.97		
28	E			8.16	8.10	8.02	7.97		
27	A	Area 1C	8.45	8.32	8.27	8.12	8.06	8.01	8.45
9	B	100% SPP		8.30	8.25	8.11	8.04		
6	C			8.28	8.24	8.10	8.01		
24	D			8.31	8.27	8.14	8.08		
30	E			8.32	8.28	8.17	8.08		
18	A	Area 2	8.11	8.08	7.88	8.00	7.89	7.81	8.11
53	B	10% SPP		7.96	7.81	7.95	7.83		
63	C			8.10	7.83	7.93	7.83		
48	D			7.95	7.85	7.93	7.87		
29	E			8.00	7.85	7.96	7.88		
44	A	Area 2	8.31	8.18	8.13	8.04	8.02	7.99	8.31
61	B	50% SPP		8.28	8.12	8.04	8.02		
15	C			8.17	8.10	8.01	7.99		
4	D			8.16	8.06	8.06	8.03		
12	E			8.16	8.09	8.05	8.03		
64	A	Area 2	8.44	8.30	8.30	8.19	8.16	8.10	8.44
32	B	100% SPP		8.33	8.29	8.21	8.13		
36	C			8.32	8.30	8.20	8.16		
19	D			8.32	8.29	8.18	8.18		
50	E			8.33	8.29	8.16	8.10		
Range								7.81	8.45

Table 37

96 Hour Suspended Particulate Phase Test  
Tappan Zee  
Total Ammonia (mg/L)

Species: *A. bahia*  
Job No. 32-012

Position #	Code	Sample	0	24	48	72	96	Low	High
1	A	Control	<0.6				1.19		
54	B				<0.6		1.54		
7	C			<0.6			1.39		
62	D						1.56		
57	E					0.68	1.57	<0.60	1.57
35	A	Area 1A		<0.6			2.00		
56	B	10% SPP				1.14	1.93		
60	C						1.97		
52	D				0.83		1.95		
16	E		0.79				2.04	0.79	2.04
21	A	Area 1A		2.72			4.85		
49	B	50% SPP				3.51	4.65		
42	C						4.85		
40	D				3.14		4.91		
2	E		3.75				5.36	2.72	5.36
65	A	Area 1A					8.3		
47	B	100% SPP		7.02			8.63		
25	C		7.88				8.36		
51	D				7.30		8.39		
58	E					7.70	8.59	7.02	8.63
10	A	Area 1B	0.65				2.46		
55	B	10% SPP				1.02	2.00		
43	C				0.73		2.12		
39	D			<0.6			2.17		
59	E						2.01	0.65	2.46
14	A	Area 1B			2.92		4.70		
3	B	50% SPP	3.59				4.91		
13	C			2.75			4.85		
17	D					3.39	4.65		
38	E						4.84	2.75	4.91
46	A	Area 1B					8.16		
45	B	100% SPP				7.01	8.39		
8	C		7.03				8.04		
22	D			6.18			8.07		
34	E				6.43		8.23	6.18	8.39
Range								<0.60	8.63

Table 37

96 Hour Suspended Particulate Phase Test  
 Tappan Zee  
 Total Ammonia (mg/L)

Species: *A. bahia*  
 Job No. 32-012

Position #	Code	Sample	0	24	48	72	96	Low	High
26	A	Area 1C				1.03	2.06		
41	B	10% SPP					2.11		
20	C			<0.6			2.09		
11	D		0.65				2.06		
23	E				0.69		2.10	0.65	2.11
33	A	Area 1C				3.18	4.65		
37	B	50% SPP					4.74		
5	C		3.42				4.74		
31	D				2.69		4.45		
28	E			2.71			4.72	2.69	4.74
27	A	Area 1C				6.98	8.46		
9	B	100% SPP		6.08			8.39		
6	C		7.03				8.29		
24	D				6.36		8.36		
30	E						8.13	6.08	8.46
18	A	Area 2	0.64				2.30		
53	B	10% SPP				1.09	2.03		
63	C						2.06		
48	D				0.81		2.08		
29	E			0.64			2.12	0.64	2.30
44	A	Area 2				3.63	5.36		
61	B	50% SPP					5.40		
15	C				3.04		5.09		
4	D		3.05				5.17		
12	E			3.31			5.25	3.04	5.40
64	A	Area 2					9.44		
32	B	100% SPP		6.91			9.12		
36	C				7.01		9.19		
19	D		6.36				9.15		
50	E					7.85	9.44	6.36	9.44
Range								<0.60	9.44

Table 38

**Summary Data Sheet for *M. edulis* Embryo Development Test/Proportion Alive**  
**AKRF, Tappan Zee, Area 1A**

ASI Job No. 32-012

LC <sub>50</sub>		20120057	2/29/2012 - 3/2/2012				48 Hours				
Concentration	Replicate	Concentrated Volume	N-CDS	D-CDS	LL-CDS	B (N-CDS + D-CDS)	Initial Population	A	M/"M" %	E 100(A-M)/(100-M)	Control Survival (N-CDS + D-CDS + LL-CDS)
0	A	25	150	17	0	4175	5025	16.92			4175
	B	25	181	18	0	4975	5025	1.00			4975
	C	25	167	17	0	4600	5025	8.46			4600
	D	25	174	17	0	4775	5025	4.98			4775
	E	25	179	16	0	4875	5025	2.99			4875
								Mean %	6.87 93.13		93.13
10% SPP	A	25	167	20	0	4675	5025	6.97		0.11	
	B	25	161	14	0	4375	5025	12.94		6.52	
	C	25	186	14	0	5000	5025	0.50		-6.84	
	D	25	190	13	0	5075	5025	-1.00		-8.44	
	E	25	152	17	0	4225	5025	15.92		9.72	
								Mean %	7.06 92.94	0.21 99.79	
50% SPP	A	25	157	14	0	4275	5025	14.93		8.65	
	B	25	62	68	0	3250	5025	35.32		30.56	
	C	25	184	25	0	5225	5025	-3.98		-11.65	
	D	25	179	21	0	5000	5025	0.50		-6.84	
	E	25	63	92	0	3875	5025	22.89		17.20	
								Mean %	13.93 86.07	7.59 92.41	
100% SPP	A	25	0	145	0	3625	5025	27.86		22.54	
	B	25	0	99	0	2475	5025	50.75		47.12	
	C	25	0	164	0	4100	5025	18.41		12.39	
	D	25	0	179	0	4475	5025	10.95		4.38	
	E	25	0	109	0	2725	5025	45.77		41.77	
								Mean %	30.75 69.25	25.64 74.36	

LC<sub>50</sub> = >100%

N-CDS= Number of larvae with completely developed shells

D-CDS= Number of deformed larvae with completely developed shells

LL-CDS= Number of live larvae with earlier stage than completely developed shells stage

A= The % of embryos that did not result in live larvae with completely developed shells

B= The number of live larvae with completely developed shells at the end of the test

N= The number of embryos in the 2-cell stage or beyond at the beginning of the test

M= Average % of the embryos that did not result in live larvae with completely developed shells in the control treatments

The test is unacceptable if M is &gt;30% for oysters or &gt;40% for hard clams

E = Abbott's formula = 100(A-M)/(100-M)

A = 100(N-B)/N

(initial count)

Table 39

**Summary Data Sheet for *M. edulis* Embryo Development Test - Proportion Normal**  
**AKRF, Tappan Zee, Area 1A**

ASI Job No. 32-012

EC <sub>50</sub>		20120057		2/29/2012 - 3/2/2012		48 Hours					
Concentration	Replicate	Concentrated Volume	N-CDS	D-CDS	LL-CDS	B (N-CDS +D-CDS)	Initial Population	A	M/"M" %	E 100(A-M)/(100-M)	Control (N-CDS)
0	A	25	150	17		3750	5025	25.37	15.32 84.68		3750
	B	25	181	18		4525	5025	9.95			4525
	C	25	167	17		4175	5025	16.92			4175
	D	25	174	17		4350	5025	13.43			4350
	E	25	179	16		4475	5025	10.95			4475
								Mean %			
10% SPP	A	25	167	20		4175	5025	16.92	14.83 85.17	1.88 5.41 -9.28 -11.63 10.69 -0.59 100.59	
	B	25	161	14		4025	5025	19.90			
	C	25	186	14		4650	5025	7.46			
	D	25	190	13		4750	5025	5.47			
	E	25	152	17		3800	5025	24.38			
								Mean %			
50% SPP	A	25	157	14		3925	5025	21.89	35.82 64.18	7.76 63.57 -8.11 -5.17 62.98 24.21 75.79	
	B	25	62	68		1550	5025	69.15			
	C	25	184	25		4600	5025	8.46			
	D	25	179	21		4475	5025	10.95			
	E	25	63	92		1575	5025	68.66			
								Mean %			
100% SPP	A	25	0	145		0	5025	100.00	100.00 0.00	100.00 100.00 100.00 100.00 100.00 100.00 0.00	
	B	25	0	99		0	5025	100.00			
	C	25	0	164		0	5025	100.00			
	D	25	0	179		0	5025	100.00			
	E	25	0	109		0	5025	100.00			
								Mean %			

EC<sub>50</sub> = 57.3%

N-CDS= Number of larvae with completely developed shells

D-CDS= Number of deformed larvae with completely developed shells

LL-CDS= Number of live larvae with earlier stage than completely developed shells stage

A= The % of embryos that did not result in live larvae with completely developed shells

B= The number of live larvae with completely developed shells at the end of the test

N= The number of embryos in the 2-cell stage or beyond at the beginning of the test

M= Average % of the embryos that did not result in live larvae with completely developed shells in the control treatments

The test is unacceptable if M is &gt;30% for oysters or &gt;40% for hard clams

E = Abbott's formula = 100(A-M)/(100-M)

A = 100(N-B)/N

(initial count)

Table 40

**Summary Data Sheet for *M. edulis* Embryo Development Test/Proportion Alive**  
**AKRF, Tappan Zee, Area 1B**

ASI Job No. 32-012

LC <sub>50</sub> 20120058 2/29/2012 - 3/2/2012 48 Hours											
Concentration	Replicate	Concentrated Volume	N-CDS	D-CDS	LL-CDS	B (N-CDS + D-CDS)	Initial Population	A	M/"M" %	E 100(A-M)/(100-M)	Control Survival (N-CDS + D-CDS + LL-CDS)
0	A	25	150	17	0	4175	5025	16.92			4175
	B	25	181	18	0	4975	5025	1.00			4975
	C	25	167	17	0	4600	5025	8.46			4600
	D	25	174	17	0	4775	5025	4.98			4775
	E	25	179	16	0	4875	5025	2.99			4875
								<b>Mean %</b>	6.87 93.13		93.13
10% SPP	A	25	171	16	0	4675	5025	6.97		0.11	
	B	25	154	18	0	4300	5025	14.43		8.12	
	C	25	173	13	0	4650	5025	7.46		0.64	
	D	25	193	18	0	5275	5025	-4.98		-12.71	
	E	25	171	15	0	4650	5025	7.46		0.64	
								<b>Mean %</b>	6.27 93.73	-0.64 100.64	
50% SPP	A	25	189	15	0	5100	5025	-1.49		-8.97	
	B	25	162	19	0	4525	5025	9.95		3.31	
	C	25	166	17	0	4575	5025	8.96		2.24	
	D	25	212	16	0	5700	5025	-13.43		-21.79	
	E	25	180	13	0	4825	5025	3.98		-3.10	
								<b>Mean %</b>	1.59 98.41	-5.66 105.66	
100% SPP	A	25	0	176	0	4400	5025	12.44		5.98	
	B	25	0	148	0	3700	5025	26.37		20.94	
	C	25	0	146	0	3650	5025	27.36		22.01	
	D	25	0	170	0	4250	5025	15.42		9.19	
	E	25	0	129	0	3225	5025	35.82		31.09	
								<b>Mean %</b>	23.48 76.52	17.84 82.16	

LC<sub>50</sub> = >100%

N-CDS= Number of larvae with completely developed shells

D-CDS= Number of deformed larvae with completely developed shells

LL-CDS= Number of live larvae with earlier stage than completely developed shells stage

A= The % of embryos that did not result in live larvae with completely developed shells

B= The number of live larvae with completely developed shells at the end of the test

N= The number of embryos in the 2-cell stage or beyond at the beginning of the test

M= Average % of the embryos that did not result in live larvae with completely developed shells in the control treatments

The test is unacceptable if M is &gt;30% for oysters or &gt;40% for hard clams

E = Abbott's formula = 100(A-M)/(100-M)

A = 100(N-B)/N

(initial count)



Table 41

**Summary Data Sheet for *M. edulis* Embryo Development Test - Proportion Normal**  
**AKRF, Tappan Zee, Area 1B**

ASI Job No. 32-012

EC <sub>50</sub>		20120058		2/29/2012 - 3/2/2012		48 Hours					
Concentration	Replicate	Concentrated Volume	N-CDS	D-CDS	LL-CDS	B (N-CDS + D-CDS)	Initial Population	A	M/"M" %	E 100(A-M)/(100-M)	Control (N-CDS)
0	A	25	150	17		3750	5025	25.37			3750
	B	25	181	18		4525	5025	9.95			4525
	C	25	167	17		4175	5025	16.92			4175
	D	25	174	17		4350	5025	13.43			4350
	E	25	179	16		4475	5025	10.95			4475
								<b>Mean %</b>	15.32 84.68		84.68
10% SPP	A	25	171	16		4275	5025	14.93		-0.47	
	B	25	154	18		3850	5025	23.38		9.52	
	C	25	173	13		4325	5025	13.93		-1.65	
	D	25	193	18		4825	5025	3.98		-13.40	
	E	25	171	15		4275	5025	14.93		-0.47	
								<b>Mean %</b>	14.23 85.77	-1.29 101.29	
50% SPP	A	25	189	15		4725	5025	5.97		-11.05	
	B	25	162	19		4050	5025	19.40		4.82	
	C	25	166	17		4150	5025	17.41		2.47	
	D	25	212	16		5300	5025	-5.47		-24.56	
	E	25	180	13		4500	5025	10.45		-5.76	
								<b>Mean %</b>	9.55 90.45	-6.82 106.82	
100% SPP	A	25	0	176		0	5025	100.00		100.00	
	B	25	0	148		0	5025	100.00		100.00	
	C	25	0	146		0	5025	100.00		100.00	
	D	25	0	170		0	5025	100.00		100.00	
	E	25	0	129		0	5025	100.00		100.00	
								<b>Mean %</b>	100.00 0.00	100.00 0.00	

EC<sub>50</sub> = 70.7%

N-CDS= Number of larvae with completely developed shells

D-CDS= Number of deformed larvae with completely developed shells

LL-CDS= Number of live larvae with earlier stage than completely developed shells stage

A= The % of embryos that did not result in live larvae with completely developed shells

B= The number of live larvae with completely developed shells at the end of the test

N= The number of embryos in the 2-cell stage or beyond at the beginning of the test

M= Average % of the embryos that did not result in live larvae with completely developed shells in the control treatments

The test is unacceptable if M is &gt;30% for oysters or &gt;40% for hard clams

E = Abbott's formula = 100(A-M)/(100-M)

A = 100(N-B)/N

(initial count)

Table 42

**Summary Data Sheet for *M. edulis* Embryo Development Test/Proportion Alive**  
**AKRF, Tappan Zee, Area 1C**

ASI Job No. 32-012

LC <sub>50</sub>		20120059		2/29/2012 - 3/2/2012		48 Hours					
Concentration	Replicate	Concentrated Volume	N-CDS	D-CDS	LL-CDS	B (N-CDS +D-CDS)	Initial Population	A	M/"M" %	E	Control Survival (N-CDS + D-CDS + LL-CDS)
										100(A-M)/(100-M)	
0	A	25	150	17	0	4175	5025	16.92	6.87 93.13		4175
	B	25	181	18	0	4975	5025	1.00			4975
	C	25	167	17	0	4600	5025	8.46			4600
	D	25	174	17	0	4775	5025	4.98			4775
	E	25	179	16	0	4875	5025	2.99			4875
	Mean %										93.13
10% SPP	A	25	177	18	0	4875	5025	2.99	4.88 95.12	-4.17 4.91 7.59 -3.63 -15.38 -2.14 102.14	
	B	25	160	18	0	4450	5025	11.44			
	C	25	156	17	0	4325	5025	13.93			
	D	25	177	17	0	4850	5025	3.48			
	E	25	193	23	0	5400	5025	-7.46			
	Mean %										
50% SPP	A	25	192	20	0	5300	5025	-5.47	10.75 89.25	-13.25 5.98 3.85 7.05 17.20 4.17 95.83	
	B	25	157	19	0	4400	5025	12.44			
	C	25	164	16	0	4500	5025	10.45			
	D	25	158	16	0	4350	5025	13.43			
	E	25	134	21	0	3875	5025	22.89			
	Mean %										
100% SPP	A	25	0	150	0	3750	5025	25.37	29.05 70.95	19.87 39.10 15.60 25.75 18.80 23.82 76.18	
	B	25	0	114	0	2850	5025	43.28			
	C	25	0	158	0	3950	5025	21.39			
	D	25	0	139	0	3475	5025	30.85			
	E	25	0	152	0	3800	5025	24.38			
	Mean %										

LC<sub>50</sub> = >100%

N-CDS= Number of larvae with completely developed shells

D-CDS= Number of deformed larvae with completely developed shells

LL-CDS= Number of live larvae with earlier stage than completely developed shells stage

A= The % of embryos that did not result in live larvae with completely developed shells

B= The number of live larvae with completely developed shells at the end of the test

N= The number of embryos in the 2-cell stage or beyond at the beginning of the test

M= Average % of the embryos that did not result in live larvae with completely developed shells in the control treatments

The test is unacceptable if M is &gt;30% for oysters or &gt;40% for hard clams

E = Abbott's formula = 100(A-M)/(100-M)

A = 100(N-B)/N

(initial count)

Table 43

**Summary Data Sheet for *M. edulis* Embryo Development Test - Proportion Normal**  
**AKRF, Tappan Zee, Area 1C**

ASI Job No. 32-012

EC <sub>50</sub>		20120059		2/29/2012 - 3/2/2012		48 Hours					
Concentration	Replicate	Concentrated Volume	N-CDS	D-CDS	LL-CDS	B (N-CDS + D-CDS)	Initial Population	A	M/"M" %	E 100(A-M)/(100-M)	Control (N-CDS)
0	A	25	150	17		3750	5025	25.37			3750
	B	25	181	18		4525	5025	9.95			4525
	C	25	167	17		4175	5025	16.92			4175
	D	25	174	17		4350	5025	13.43			4350
	E	25	179	16		4475	5025	10.95			4475
								<b>Mean %</b>	15.32 84.68		84.68
10% SPP	A	25	177	18		4425	5025	11.94		-4.00	
	B	25	160	18		4000	5025	20.40		5.99	
	C	25	156	17		3900	5025	22.39		8.34	
	D	25	177	17		4425	5025	11.94		-4.00	
	E	25	193	23		4825	5025	3.98		-13.40	
								<b>Mean %</b>	14.13 85.87	-1.41 101.41	
50% SPP	A	25	192	20		4800	5025	4.48		-12.81	
	B	25	157	19		3925	5025	21.89		7.76	
	C	25	164	16		4100	5025	18.41		3.64	
	D	25	158	16		3950	5025	21.39		7.17	
	E	25	134	21		3350	5025	33.33		21.27	
								<b>Mean %</b>	19.90 80.10	5.41 94.59	
100% SPP	A	25	0	150		0	5025	100.00		100.00	
	B	25	0	114		0	5025	100.00		100.00	
	C	25	0	158		0	5025	100.00		100.00	
	D	25	0	139		0	5025	100.00		100.00	
	E	25	0	152		0	5025	100.00		100.00	
								<b>Mean %</b>	100.00 0.00	100.00 0.00	

EC<sub>50</sub> = 70.1%

N-CDS= Number of larvae with completely developed shells

D-CDS= Number of deformed larvae with completely developed shells

LL-CDS= Number of live larvae with earlier stage than completely developed shells stage

A= The % of embryos that did not result in live larvae with completely developed shells

B= The number of live larvae with completely developed shells at the end of the test

N= The number of embryos in the 2-cell stage or beyond at the beginning of the test

M= Average % of the embryos that did not result in live larvae with completely developed shells in the control treatments (initial count)

The test is unacceptable if M is &gt;30% for oysters or &gt;40% for hard clams

E = Abbott's formula = 100(A-M)/(100-M)

A = 100(N-B)/N

(initial count)

Table 44

Summary Data Sheet for *M. edulis* Embryo Development Test/Proportion Alive  
AKRF, Tappan Zee, Area 2

ASI Job No. 32-012

LC <sub>50</sub>		20120060	2/29/2012 - 3/2/2012				48 Hours				
Concentration	Replicate	Concentrated Volume	N-CDS	D-CDS	LL-CDS	B (N-CDS + D-CDS)	Initial Population	A	M/"M" %	E 100(A-M)/(100-M)	Control Survival (N-CDS + D-CDS + LL-CDS)
0	A	25	150	17	0	4175	5025	16.92			4175
	B	25	181	18	0	4975	5025	1.00			4975
	C	25	167	17	0	4600	5025	8.46			4600
	D	25	174	17	0	4775	5025	4.98			4775
	E	25	179	16	0	4875	5025	2.99			4875
								Mean %	6.87 93.13		93.13
10% SPP	A	25	184	17	0	5025	5025	0.00		-7.37	
	B	25	172	16	0	4700	5025	6.47		-0.43	
	C	25	177	19	0	4900	5025	2.49		-4.70	
	D	25	190	16	0	5150	5025	-2.49		-10.04	
	E	25	175	18	0	4825	5025	3.98		-3.10	
								Mean %	2.09 97.91	-5.13 105.13	
50% SPP	A	25	132	21	0	3825	5025	23.88		18.27	
	B	25	155	23	0	4450	5025	11.44		4.91	
	C	25	165	16	0	4525	5025	9.95		3.31	
	D	25	175	26	0	5025	5025	0.00		-7.37	
	E	25	167	20	0	4675	5025	6.97		0.11	
								Mean %	10.45 89.55	3.85 96.15	
100% SPP	A	25	0	170	0	4250	5025	15.42		9.19	
	B	25	0	140	0	3500	5025	30.35		25.21	
	C	25	0	170	0	4250	5025	15.42		9.19	
	D	25	0	123	0	3075	5025	38.81		34.29	
	E	25	0	178	0	4450	5025	11.44		4.91	
								Mean %	22.29 77.71	16.56 83.44	

LC<sub>50</sub> = >100%

N-CDS= Number of larvae with completely developed shells

D-CDS= Number of deformed larvae with completely developed shells

LL-CDS= Number of live larvae with earlier stage than completely developed shells stage

A= The % of embryos that did not result in live larvae with completely developed shells

B= The number of live larvae with completely developed shells at the end of the test

N= The number of embryos in the 2-cell stage or beyond at the beginning of the test

M= Average % of the embryos that did not result in live larvae with completely developed shells in the control treatments

The test is unacceptable if M is &gt;30% for oysters or &gt;40% for hard clams

E = Abbott's formula = 100(A-M)/(100-M)

A = 100(N-B)/N

(initial count)

Table 45

**Summary Data Sheet for *M. edulis* Embryo Development Test - Proportion Normal**  
**AKRF, Tappan Zee, Area 2**

ASI Job No. 32-012

EC <sub>50</sub>		20120060	2/29/2012 - 3/2/2012				48 Hours				
Concentration	Replicate	Concentrated Volume	N-CDS	D-CDS	LL-CDS	B (N-CDS + D-CDS)	Initial Population	A	M/"M" %	E 100(A-M)/(100-M)	Control (N-CDS)
0	A	25	150	17		3750	5025	25.37			3750
	B	25	181	18		4525	5025	9.95			4525
	C	25	167	17		4175	5025	16.92			4175
	D	25	174	17		4350	5025	13.43			4350
	E	25	179	16		4475	5025	10.95			4475
								<b>Mean %</b>	15.32 84.68		84.68
10% SPP	A	25	184	17		4600	5025	8.46		-8.11	
	B	25	172	16		4300	5025	14.43		-1.06	
	C	25	177	19		4425	5025	11.94		-4.00	
	D	25	190	16		4750	5025	5.47		-11.63	
	E	25	175	18		4375	5025	12.94		-2.82	
								<b>Mean %</b>	10.65 89.35	-5.52 105.52	
50% SPP	A	25	132	21		3300	5025	34.33		22.44	
	B	25	155	23		3875	5025	22.89		8.93	
	C	25	165	16		4125	5025	17.91		3.06	
	D	25	175	26		4375	5025	12.94		-2.82	
	E	25	167	20		4175	5025	16.92		1.88	
								<b>Mean %</b>	21.00 79.00	6.70 93.30	
100% SPP	A	25	0	170		0	5025	100.00		100.00	
	B	25	0	140		0	5025	100.00		100.00	
	C	25	0	170		0	5025	100.00		100.00	
	D	25	0	123		0	5025	100.00		100.00	
	E	25	0	178		0	5025	100.00		100.00	
								<b>Mean %</b>	100.00 0.00	100.00 0.00	

EC<sub>50</sub> = 68.2%

N-CDS= Number of larvae with completely developed shells

D-CDS= Number of deformed larvae with completely developed shells

LL-CDS= Number of live larvae with earlier stage than completely developed shells stage

A= The % of embryos that did not result in live larvae with completely developed shells

B= The number of live larvae with completely developed shells at the end of the test

N= The number of embryos in the 2-cell stage or beyond at the beginning of the test

A = 100(N-B)/N

(initial count)

M= Average % of the embryos that did not result in live larvae with completely developed shells in the control treatments

The test is unacceptable if M is &gt;30% for oysters or &gt;40% for hard clams

E = Abbott's formula = 100(A-M)/(100-M)

Table 46

28-Day Solid Phase Bioaccumulation Bioassay  
 AKRF, Tappan Zee  
 Initial Live Count: 20

Species: *M. nasuta*  
 Job #: 32-012

Position #	Code	Sample	Initial Live Count: 20	
8	1.1	Tuckerton Control	20	
17	1.2	20120080	18	
30	1.3		19	95%
5	2.1	Mud Dump Reference	20	
3	2.2	20120079	20	
32	2.3		20	
31	2.4		19	
16	2.5		20	99%
23	3.1	Area 1A	20	
7	3.2	20120057	18	
26	3.3		20	
18	3.4		20	
25	3.5		20	
6	3.6		20	
1	3.7		19	98%
10	4.1	Area 1B	19	
21	4.2	20120058	20	
27	4.3		20	
4	4.4		20	
9	4.5		20	99%
12	5.1	Area 1C	20	
14	5.2	20120059	20	
11	5.3		20	
15	5.4		20	
20	5.5		20	100%
19	6.1	Area 2	20	
22	6.2	20120060	19	
28	6.3		19	
24	6.4		19	
2	6.5		20	
29	6.6		19	
13	6.7		20	97%

Table 47

28-Day Bioaccumulation Bioassay  
AKRF, Tappan Zee  
Temperature (° C)

Species: *M. nasuta*  
Job #: 32-012

Position #	Code	Sample	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
8	1.1	Tuckerton Control	12.1	12.5	13.1	12.8	13.9	12.4	13.2	12.7	12.6	13.1	13.0	13.1	13.4	12.9	12.7
17	1.2	20120080	12.1	13.1	13.7	13.5	14.6	12.8	14.0	13.6	13.4	13.8	13.7	13.7	13.9	13.6	13.4
30	1.3		12.3	12.5	13.0	12.8	13.8	12.4	13.2	12.9	12.7	12.9	13.0	13.0	13.2	12.9	12.6
5	2.1	Mud Dump Reference	12.6	12.5	13.0	12.6	13.8	12.3	13.1	12.6	12.5	12.7	12.9	12.9	13.2	12.7	12.6
3	2.2	20120079	12.1	12.6	13.0	12.7	13.7	12.3	13.1	12.7	12.5	12.8	13.0	12.9	13.2	12.8	12.6
32	2.3		13.0	12.5	12.9	12.7	13.6	12.2	13.0	12.5	12.4	12.7	12.8	12.8	13.0	12.6	12.5
31	2.4		12.5	12.5	12.9	12.7	13.8	12.3	13.2	12.7	12.6	12.8	12.9	12.9	13.1	12.8	12.6
16	2.5		13.0	13.0	13.5	13.3	14.4	12.9	13.8	13.4	13.1	13.7	13.5	13.6	13.8	13.5	13.3
23	3.1	Reach Area 1A	11.9	12.7	13.2	12.9	14.0	12.5	13.4	13.1	12.9	13.2	13.2	13.2	13.4	13.1	12.9
7	3.2	20120057	12.5	12.6	13.0	12.7	13.9	12.2	13.1	12.7	12.5	12.9	13.0	13.0	13.2	12.8	12.7
26	3.3		12.2	12.6	13.2	12.9	14.0	12.6	13.4	13.0	12.7	13.1	13.2	13.2	13.4	13.0	12.8
18	3.4		12.4	13.0	13.5	13.3	14.3	12.9	13.8	13.5	13.3	13.7	13.6	13.6	13.7	13.5	13.3
25	3.5		11.8	12.7	13.2	12.9	14.0	12.6	13.4	13.0	12.9	13.2	13.2	13.2	13.4	13.1	12.8
6	4.1		12.5	12.5	13.0	12.6	13.8	12.3	13.1	12.7	12.5	12.8	12.9	13.0	13.2	12.8	12.6
1	4.2		12.1	12.7	13.0	12.7	13.8	12.2	13.2	12.9	13.1	13.3	13.3	13.1	13.3	12.9	12.8
10	4.3	Reach Area 1B	12.3	12.6	13.1	12.8	13.9	12.4	13.2	12.8	12.7	13.1	13.0	13.1	13.3	12.9	12.7
21	4.4	20120058	12.1	12.8	13.3	13.2	14.2	12.7	13.6	13.2	13.0	13.4	13.5	13.4	13.6	13.3	13.1
27	4.5		12.8	12.6	13.1	12.8	14.0	12.5	13.3	12.9	12.7	13.0	13.1	13.1	13.3	13.0	12.8
4	4.6		12.4	12.5	12.9	12.6	13.7	12.2	13.0	12.5	12.5	12.7	12.9	12.9	13.1	12.7	12.5
9	4.7		11.9	12.6	13.1	12.8	13.9	12.4	13.2	12.8	12.7	13.1	13.0	13.1	13.3	12.9	12.7
12	5.1	Reach Area 1C	12.4	12.7	13.2	12.9	14.1	12.5	13.3	12.9	12.7	13.2	13.1	13.2	13.4	13.0	12.9
14	5.2	20120059	12.2	12.8	13.3	13.1	14.1	12.7	13.6	13.2	13.0	13.4	13.4	13.4	13.6	13.3	13.1
11	5.3		12.3	12.6	13.1	12.8	13.9	12.5	13.3	12.8	12.6	13.1	13.1	13.1	13.3	12.9	12.8
15	5.4		12.6	12.9	13.4	13.1	14.2	12.7	13.6	13.3	13.1	13.5	13.3	13.5	13.6	13.4	13.1
20	5.5		12.5	12.9	13.4	13.2	14.3	12.9	13.7	13.4	13.2	13.6	13.6	13.5	13.7	13.5	13.2
19	6.1	Reach Area 2	12.7	12.9	13.4	13.2	14.3	12.9	13.8	13.5	13.3	13.6	13.6	13.6	13.7	13.5	13.2
22	6.2	20120060	13.1	12.7	13.3	13.0	14.1	12.6	13.5	13.1	12.9	13.3	13.3	13.3	13.4	13.2	13.0
28	6.3		12.7	12.5	13.0	12.8	13.9	12.5	13.3	12.9	12.7	12.9	13.0	13.0	13.2	12.9	12.7
24	6.4		12.0	12.6	13.2	12.9	14.0	12.5	13.3	13.0	12.8	13.2	13.2	13.2	13.3	13.0	12.8
2	6.5		12.3	12.6	13.0	12.7	13.9	12.3	13.1	12.7	12.6	12.9	13.1	13.0	13.2	12.8	12.6
29	6.6		12.5	12.5	13.0	12.7	13.8	12.4	13.2	12.8	12.7	12.9	13.0	13.0	13.2	12.9	12.7
13	6.7		12.7	12.8	13.3	13.1	14.1	12.7	13.5	13.1	13.0	13.3	13.4	13.4	13.5	13.2	13.1

Table 47 continued

**28-Day Bioaccumulation Bioassay**  
**AKRF, Tappan Zee**  
**Temperature (° C)**

**Species: *M. nasuta***  
**Job #: 32-012**

Position #	Code	Sample	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Low	High
8	1.1	Tuckerton Control	13.0	13.3	12.2	12.9	13.0	13.0	13.2	12.9	13.0	13.4	13.5	13.2	12.8	13.1		
17	1.2	20120080	13.7	13.9	12.9	13.6	13.5	13.6	13.7	13.6	13.6	14.0	14.0	13.6	13.3	13.7		
30	1.3		12.8	13.1	12.1	12.8	12.8	12.8	13.0	12.8	12.8	13.2	13.3	12.9	12.6	13.0	12.1	14.6
5	2.1	Mud Dump Reference	12.8	13.2	12.1	12.8	12.8	12.8	13.1	12.8	12.8	13.2	13.3	13.0	12.6	13.0		
3	2.2	20120079	12.8	13.2	12.1	12.7	12.8	12.8	13.0	12.9	12.8	13.2	13.3	12.9	12.6	13.0		
32	2.3		12.6	13.0	12.1	12.6	12.6	12.7	12.9	12.7	12.7	13.0	13.2	12.8	12.5	12.9		
31	2.4		12.8	13.1	12.1	12.7	12.7	12.8	13.0	12.8	12.8	13.2	13.3	12.9	12.5	13.0		
16	2.5		13.5	13.8	12.7	13.4	13.4	13.5	13.6	13.5	13.4	13.9	14.0	13.5	13.5	13.6	12.1	14.4
23	3.1	Reach Area 1A	13.1	13.4	12.4	13.1	13.1	13.2	13.2	13.2	13.2	13.5	13.6	13.3	12.9	13.3		
7	3.2	20120057	12.9	13.3	12.3	12.9	12.9	12.9	13.2	12.9	12.9	13.3	13.4	13.0	12.7	13.0		
26	3.3		13.0	13.4	12.3	13.0	13.0	13.1	13.3	13.0	13.0	13.4	13.5	13.2	12.8	13.2		
18	3.4		13.5	13.7	12.7	13.4	13.5	13.5	13.3	13.5	13.4	13.8	13.9	13.6	13.3	13.6		
25	3.5		13.1	13.4	12.3	13.0	13.1	13.1	13.2	13.0	13.1	13.4	13.5	13.2	12.8	13.2		
6	4.1		12.8	13.2	12.2	12.8	12.8	12.9	13.1	12.8	12.8	13.2	13.4	13.0	12.6	13.0		
1	4.2		13.2	13.3	12.4	13.0	13.3	13.2	13.1	12.9	12.9	13.3	13.4	13.1	12.7	13.1	11.8	14.3
10	4.3	Reach Area 1B	13.0	13.3	12.3	13.0	13.0	13.0	13.2	13.0	13.0	13.4	13.5	13.1	12.9	13.2		
21	4.4	20120058	13.3	13.6	12.6	13.3	13.3	13.3	13.4	13.3	13.3	13.7	13.7	13.5	13.1	13.4		
27	4.5		13.0	13.3	12.3	13.0	13.0	13.0	13.2	13.0	13.0	13.3	13.5	13.1	12.8	13.1		
4	4.6		12.7	13.1	12.1	12.7	12.7	12.8	13.0	12.7	12.7	13.2	13.2	12.9	12.6	12.9		
9	4.7		12.9	13.3	12.2	12.9	13.0	13.0	13.2	13.0	13.0	13.4	13.5	13.1	12.8	13.2	11.9	14.2
12	5.1	Reach Area 1C	13.2	13.5	12.4	13.2	13.2	13.2	13.3	13.2	13.2	13.5	13.6	13.3	13.2	13.4		
14	5.2	20120059	13.3	13.6	12.5	13.3	13.3	13.3	13.4	13.3	13.3	13.6	13.7	13.4	13.2	13.4		
11	5.3		13.1	13.4	12.3	13.1	13.1	13.1	13.2	13.1	13.1	13.5	13.5	13.2	13.0	13.3		
15	5.4		13.3	13.7	12.5	13.3	13.3	13.3	13.4	13.3	13.3	13.7	13.8	13.4	13.3	13.5		
20	5.5		13.4	13.7	12.7	13.4	13.4	13.4	13.5	13.4	13.4	13.8	13.9	13.5	13.2	13.6		
19	5.6		13.4	13.7	12.6	13.4	13.4	13.4	13.4	13.4	13.4	13.8	13.8	13.5	13.3	13.5		
22	5.7		13.2	13.5	12.4	13.2	13.2	13.2	13.3	13.3	13.2	13.6	13.6	13.4	13.0	13.3	12.2	14.3
28	6.1	Reach Area 2	12.9	13.2	12.2	12.9	12.9	12.9	13.1	12.8	12.9	13.2	13.4	13.0	12.7	13.0		
24	6.2	20120060	13.0	13.4	12.3	13.0	13.0	13.0	13.2	13.1	13.1	13.4	13.5	13.2	12.9	13.2		
2	6.3		12.9	13.2	12.2	12.8	12.9	12.9	13.0	12.9	12.9	13.2	13.3	13.0	12.7	13.0		
29	6.4		12.8	13.2	12.2	12.9	12.8	12.9	13.0	12.8	12.9	13.2	13.3	12.9	12.7	13.0		
13	6.5		13.3	13.6	12.5	13.3	13.3	13.3	13.4	13.2	13.3	13.6	13.7	13.3	13.2	13.4	12.0	14.1
Range																	11.8	14.6





Table 48

**28-Day Bioaccumulation Bioassay**  
**AKRF, Tappan Zee**  
**Salinity (ppt)**

**Species:** *M. nasuta*  
**Job #:** 32-012

Position #	Code	Sample	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
8	1.1	Tuckerton Control	28.9	29.8	29.7	29.7	30.0	30.0	30.0	29.6	29.4	29.0	29.4	30.4	30.5	30.6	30.7
17	1.2	20120080	28.4	29.7	29.6	29.7	29.9	30.0	30.0	29.6	29.3	29.3	29.4	30.4	30.4	30.7	30.7
30	1.3		29.0	29.7	29.6	29.6	29.9	30.0	30.0	29.3	29.4	29.4	29.4	30.2	30.4	30.7	30.7
5	2.1	Mud Dump Reference	28.9	30.0	29.7	29.8	30.0	30.2	30.1	29.2	29.5	29.4	29.4	30.5	30.5	30.7	30.7
3	2.2	20120079	28.9	30.1	29.8	29.8	30.0	30.1	30.1	29.7	29.6	29.4	29.4	30.7	30.6	30.8	30.7
32	2.3		29.1	29.7	29.7	29.7	30.0	30.0	30.0	29.5	29.4	29.4	29.4	30.5	30.5	30.7	30.7
31	2.4		29.1	29.7	29.7	29.7	29.9	30.0	30.0	29.5	29.4	29.3	29.4	30.4	30.4	30.7	30.7
16	2.5		29.0	29.7	29.6	29.7	29.9	30.0	30.0	29.5	29.4	29.3	29.4	30.3	30.4	30.6	30.7
23	3.1	Reach Area 1A	28.7	29.5	29.5	29.6	29.9	30.0	30.0	29.4	29.4	29.3	29.3	30.3	30.4	30.6	30.7
7	3.2	20120057	29.2	29.7	29.7	29.7	30.0	30.1	29.9	29.5	29.5	29.4	29.4	30.3	30.4	30.6	30.7
26	3.3		29.1	29.6	29.6	29.6	29.9	29.9	29.9	29.4	29.4	29.3	29.3	30.4	30.4	30.5	30.7
18	3.4		28.5	29.6	29.6	29.5	29.9	30.0	30.0	29.4	29.3	29.3	29.2	30.4	30.4	30.6	30.6
25	3.5		28.3	29.5	29.5	29.6	29.9	29.9	30.0	29.4	29.4	29.3	29.3	30.4	30.4	30.6	30.7
6	4.1		28.9	29.7	29.6	29.7	29.9	30.1	30.0	29.4	29.5	29.4	29.4	30.5	30.4	30.7	30.7
1	4.2		28.8	30.4	30.3	30.2	30.1	30.6	30.6	29.9	30.0	30.1	30.0	30.7	31.0	30.6	30.7
10	4.3	Reach Area 1B	28.8	29.8	29.6	29.7	29.9	30.0	30.0	29.6	29.5	29.3	29.4	30.4	30.4	30.7	30.7
21	4.4	20120058	28.8	29.6	29.6	29.5	29.9	30.0	30.0	29.4	29.4	29.3	29.3	30.4	30.4	30.6	30.6
27	4.5		28.9	29.6	29.6	29.6	29.9	30.0	30.0	29.4	29.4	29.3	29.3	30.4	30.4	30.6	30.7
4	4.6		29.1	29.9	29.7	29.7	30.0	30.1	30.2	29.5	29.4	29.5	29.4	30.4	30.6	30.7	30.6
9	4.7		28.7	29.7	29.6	29.7	29.9	30.0	30.0	29.5	29.5	29.3	29.3	30.4	30.4	30.6	30.7
12	5.1	Reach Area 1C	28.8	29.6	29.6	29.6	29.9	30.0	30.0	29.5	29.5	29.3	29.3	30.4	30.4	30.7	30.7
14	5.2	20120059	28.7	29.7	29.6	29.6	29.9	30.0	30.0	29.5	29.4	29.3	29.3	30.4	30.4	30.6	30.7
11	5.3		28.8	29.7	29.6	29.7	29.9	30.0	30.0	29.5	29.6	29.3	29.4	30.4	30.4	30.7	30.7
15	5.4		29.0	29.6	29.6	29.6	29.9	30.0	30.0	29.5	29.4	29.3	29.3	30.4	30.3	30.6	30.7
20	5.5		28.8	29.6	29.6	29.6	29.9	29.9	30.0	29.4	29.3	29.3	29.3	30.4	30.4	30.6	30.6
19	6.1	Reach Area 2	28.8	29.5	29.6	29.6	29.9	29.9	29.9	29.4	29.3	29.3	29.4	30.4	30.4	30.6	30.6
22	6.2	20120060	28.1	29.6	29.6	29.5	29.9	29.9	30.0	29.4	29.3	29.3	29.3	30.4	30.4	30.6	30.7
28	6.3		28.8	29.6	29.6	29.6	29.5	29.9	30.0	29.3	29.4	29.3	29.4	30.3	30.4	30.6	30.6
24	6.4		27.9	29.6	29.6	29.6	29.9	29.9	30.0	29.4	29.4	29.3	29.3	30.4	30.4	30.7	30.7
2	6.5		29.1	30.0	29.9	29.8	30.0	30.1	30.1	30.0	29.5	29.3	29.4	30.6	30.7	30.7	30.8
29	6.6		28.8	29.6	29.6	29.6	29.9	30.0	30.0	29.5	29.4	29.3	29.3	30.4	30.4	30.6	30.7
13	6.7		29.0	29.6	29.6	29.6	29.9	30.0	30.0	29.5	29.5	29.3	29.3	30.4	30.4	30.6	30.7

Table 48 continued

**28-Day Bioaccumulation Bioassay**  
**AKRF, Tappan Zee**  
**Salinity (ppt)**

**Species:** *M. nasuta*  
**Job #:** 32-012

Position #	Code	Sample	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Low	High
8	1.1	Tuckerton Control	30.7	30.8	30.8	29.8	29.3	29.2	29.7	30.3	30.4	30.4	31.0	31.0	31.0	31.1		
17	1.2	20120080	30.7	30.7	30.8	29.4	29.2	29.2	29.7	30.3	30.4	30.4	31.0	31.0	31.0	31.1		
30	1.3		30.7	30.7	30.8	29.6	29.2	29.2	29.7	30.3	30.4	30.4	31.0	31.0	31.0	31.1	28.4	31.1
5	2.1	Mud Dump Reference	30.8	30.9	30.9	29.6	29.3	29.2	29.9	30.3	30.5	30.5	31.1	31.1	31.1	31.2		
3	2.2	20120079	30.9	30.9	31.0	29.8	29.5	29.2	30.0	30.3	30.5	30.5	31.1	31.1	31.1	31.2		
32	2.3		30.7	30.8	30.8	29.7	29.2	29.2	29.7	30.2	30.4	30.4	31.0	30.9	31.2	31.1		
31	2.4		30.7	30.7	30.8	29.7	29.2	29.2	29.7	30.2	30.4	30.4	31.0	31.0	31.1	31.1		
16	2.5		30.7	30.7	30.8	29.6	29.2	29.2	29.8	30.3	30.4	30.4	31.0	31.0	30.9	31.0	28.9	31.2
23	3.1	Reach Area 1A	30.7	30.7	30.8	29.6	29.2	29.2	29.7	30.2	30.3	30.4	31.0	30.9	30.9	31.1		
7	3.2	20120057	30.8	30.8	30.8	29.7	29.3	29.2	29.8	30.3	30.4	30.5	31.0	31.0	30.3	31.1		
26	3.3		30.7	30.7	30.8	29.6	29.2	29.2	29.7	30.3	30.3	30.4	31.0	30.9	31.0	31.1		
18	3.4		30.6	30.7	30.7	29.6	29.2	29.2	29.7	30.4	30.4	30.4	31.0	31.0	31.0	31.1		
25	3.5		30.6	30.7	30.8	29.6	29.2	29.2	29.7	30.2	30.3	30.4	31.0	31.0	31.0	31.1		
6	4.1		30.8	30.8	30.8	29.7	29.3	29.2	29.7	30.3	30.4	30.4	31.0	31.0	31.0	31.1		
1	4.2		30.8	30.8	31.3	30.4	29.9	29.8	30.3	30.5	30.6	30.7	31.0	31.6	31.3	31.4	28.3	31.6
10	4.3	Reach Area 1B	30.7	30.7	30.8	29.5	29.2	29.2	29.7	30.3	30.4	30.5	30.9	31.0	30.6	31.0		
21	4.4	20120058	30.6	30.7	30.8	29.6	29.2	29.1	29.7	30.2	30.4	30.4	31.0	30.9	31.0	31.1		
27	4.5		30.7	30.7	30.8	29.6	29.2	29.2	29.7	30.3	30.4	30.4	31.0	30.9	31.0	31.1		
4	4.6		30.8	31.0	30.9	29.7	29.3	29.2	29.8	30.3	30.5	30.5	31.0	31.1	31.0	31.3		
9	4.7		30.7	30.8	30.8	29.5	29.3	29.1	29.7	30.2	30.4	30.4	31.0	31.0	31.1*	31.1	28.7	31.3
12	5.1	Reach Area 1C	30.7	30.7	30.8	29.4	29.3	29.2	29.7	30.3	30.4	30.4	31.0	31.0	31.0	31.0		
14	5.2	20120059	30.7	30.7	30.8	29.6	29.2	29.1	29.7	30.3	30.3	30.4	31.0	30.9	31.0	31.0		
11	5.3		30.7	30.8	30.8	29.6	29.2	29.2	29.4	30.3	30.4	30.5	31.0	31.0	31.0	31.1		
15	5.4		30.7	30.7	30.8	29.6	29.2	29.1	29.7	30.2	30.3	30.4	31.0	31.0	31.0	31.0		
20	5.5		30.6	30.7	30.8	29.5	29.2	29.2	29.7	30.2	30.3	30.4	31.0	31.0	31.0	31.0		
19	5.6		30.7	30.7	30.7	29.6	29.2	29.1	29.7	30.2	30.3	30.4	30.9	30.9	30.9	31.0		
22	5.7		30.7	30.7	30.8	29.6	29.2	29.1	29.7	30.2	30.3	30.4	31.0	30.9	31.0	31.1	28.7	31.1
28	6.1	Reach Area 2	30.7	30.7	30.8	29.6	29.2	29.2	29.7	30.3	30.4	30.4	31.0	30.9	31.0	31.0		
24	6.2	20120060	30.7	30.7	30.8	29.7	29.2	29.2	29.6	30.2	30.4	30.4	31.0	31.0	31.0	31.1		
2	6.3		30.9	30.9	31.1	29.7	29.5	28.3	30.0	30.7	30.6	30.6	31.2	31.2	31.2	31.2		
29	6.4		30.6	30.7	30.8	29.6	29.2	29.2	29.7	30.3	30.3	30.4	31.0	30.9	31.0	31.0		
13	6.5		30.7	30.7	30.8	29.4	29.2	29.2	29.8	30.3	30.4	30.4	31.0	31.0	30.8	31.1	27.9	31.2
Range																	27.9	31.6

\* Re-checked.

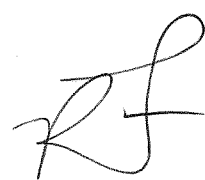


Table 49

**28-Day Bioaccumulation Bioassay**  
**AKRF, Tappan Zee**  
**DO (mg/L)**

**Species:** *M. nasuta*  
**Job #:** 32-012

Position #	Code	Sample	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
8	1.1	Tuckerton Control	8.32	8.18	8.16	7.99	7.41	7.70	8.16	8.22	8.33	7.59	7.68	8.03	8.68	7.91	8.45
17	1.2	20120080	8.38	8.27	8.43	7.81	7.28	7.49	7.88	7.95	8.09	7.45	7.45	7.68	8.46	7.54	8.01
30	1.3		8.26	8.02	8.20	7.84	7.47	7.63	7.94	8.04	8.08	7.64	7.37	7.56	8.26	7.16	7.65
5	2.1	Mud Dump Reference	8.36	8.23	8.38	8.03	7.62	7.90	8.18	8.39	8.45	7.81	7.76	8.09	8.93	7.97	8.56
3	2.2	20120079	8.75	8.29	8.47	8.08	7.70	7.88	8.18	8.48	8.51	7.85	7.72	8.12	8.98	7.98	8.61
32	2.3		8.20	8.09	8.24	7.95	7.55	7.69	7.99	8.13	8.12	7.54	7.42	7.62	8.29	7.18	7.62
31	2.4		8.26	8.04	8.22	7.84	7.48	7.62	7.93	8.06	8.08	7.55	7.40	7.56	8.26	7.19	7.60
16	2.5		8.23	7.99	8.10	7.74	7.42	7.67	7.92	8.02	8.14	7.44	7.41	7.81	8.57	7.53	8.05
23	3.1	Reach Area 1A	8.16	8.10	8.23	9.47	7.42	7.63	7.88	7.95	8.05	7.36	7.37	7.64	8.34	7.27	7.77
7	3.2	20120057	8.19	8.24	8.40	8.05	7.66	7.94	8.21	8.34	8.42	7.79	7.76	8.08	8.91	7.95	8.52
26	3.3		8.37	8.09	8.24	7.87	7.44	7.62	7.91	8.03	8.22	7.36	7.43	7.60	8.29	7.22	7.70
18	3.4		8.34	8.01	8.06	7.72	7.38	7.45	7.80	7.80	7.89	7.33	7.39	7.59	8.31	7.37	7.86
25	3.5		8.43	8.15	8.24	7.96	7.45	7.64	7.95	8.03	8.10	7.39	7.41	7.62	8.31	7.30	7.73
6	4.1		8.34	8.24	8.40	8.05	7.62	7.96	8.17	8.33	8.43	7.79	7.73	8.08	8.91	7.94	8.54
1	4.2		8.34	8.27	8.43	8.39	7.59	7.87	8.11	8.56	8.57	7.84	7.85	8.08	8.96	7.94	8.66
10	4.3	Reach Area 1B	8.40	8.16	8.23	7.77	7.51	7.70	8.02	8.05	8.20	7.54	7.49	7.86	8.65	7.51	8.24
21	4.4	20120058	8.34	8.04	8.23	7.82	7.44	7.53	7.81	7.91	7.98	7.30	7.30	7.62	8.30	7.28	7.75
27	4.5		8.23	8.05	8.19	7.85	7.51	7.63	7.92	8.03	8.08	7.41	7.38	7.56	8.29	7.26	7.60
4	4.6		8.44	8.28	8.45	8.10	7.68	7.94	8.22	8.43	8.45	7.87	7.76	8.14	8.97	7.97	8.62
9	4.7		8.54	8.17	8.05	7.68	7.40	7.63	7.90	7.98	8.06	7.38	7.55	7.75	8.46	7.63	8.25
12	5.1	Reach Area 1C	8.32	8.12	8.27	7.87	7.51	7.79	8.10	8.16	8.26	7.60	7.61	7.91	8.70	7.70	8.23
14	5.2	20120059	8.38	8.05	8.20	7.87	7.50	7.75	8.05	8.11	8.24	7.56	7.58	7.86	8.65	7.68	8.16
11	5.3		8.35	8.18	8.29	7.81	7.54	7.78	8.07	8.14	8.32	7.59	7.58	7.91	8.70	7.68	8.23
15	5.4		8.28	8.00	8.13	7.85	7.46	7.72	7.99	8.06	8.20	7.50	7.58	7.82	8.62	7.62	8.13
20	5.5		8.32	7.88	8.12	7.79	7.49	7.46	7.76	7.83	7.94	7.27	7.42	7.57	8.26	7.30	7.72
19	6.1	Reach Area 2	8.28	7.96	8.07	7.73	7.36	7.48	7.80	7.85	7.92	7.31	7.60	7.60	8.32	7.35	7.82
22	6.2	20120060	8.12	8.09	8.22	7.89	7.42	7.59	7.88	7.94	8.02	7.33	7.38	7.64	8.34	7.32	7.77
28	6.3		8.29	7.99	8.14	7.82	7.46	7.60	7.89	8.02	8.09	7.35	7.40	7.53	8.26	7.18	7.67
24	6.4		8.56	8.19	8.27	8.29	7.46	7.65	7.95	8.00	8.08	7.33	7.38	7.65	8.35	7.30	7.76
2	6.5		8.33	8.28	8.46	8.07	7.75	7.79	8.16	8.91	8.41	7.89	7.72	8.10	8.97	7.97	8.63
29	6.6		8.31	8.00	8.15	7.85	7.45	7.63	7.90	8.04	8.11	7.35	7.38	7.54	8.27	7.19	7.65
13	6.7		8.26	8.12	8.24	7.88	7.51	7.75	8.07	8.13	8.28	7.58	7.59	7.89	8.67	7.69	8.21

Table 49 continued

**28-Day Bioaccumulation Bioassay**  
**AKRF, Tappan Zee**  
**DO (mg/L)**

**Species:** *M. nasuta*  
**Job #:** 32-012

Position #	Code	Sample	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Low	High
8	1.1	Tuckerton Control	8.20	7.78	7.98	7.82	7.67	8.05	7.86	8.11	7.89	7.77	7.91	7.15	7.67	7.56		
17	1.2	20120080	7.93	7.59	7.80	7.80	7.53	7.84	7.80	7.96	7.60	7.53	7.75	7.37	7.43	7.17		
30	1.3		8.00	7.73	7.63	7.75	7.54	7.93	7.82	8.04	7.76	7.69	7.83	7.58	7.56	7.55	7.15	8.68
5	2.1	Mud Dump Reference	8.23	7.82	8.07	8.13	7.73	8.05	7.94	8.16	7.91	7.83	7.98	7.73	7.73	7.67		
3	2.2	20120079	8.25	7.85	8.12	8.22	7.74	8.01	7.98	8.25	7.93	7.80	7.98	7.72	7.77	7.71		
32	2.3		8.07	7.77	7.81	7.82	7.57	8.01	7.89	8.06	7.77	7.74	7.88	7.60	7.94	7.59		
31	2.4		8.02	7.70	7.89	7.77	7.53	7.95	7.83	8.03	7.77	7.65	7.82	7.57	7.65	7.54		
16	2.5		7.98	7.62	7.73	7.91	7.46	7.88	7.82	7.94	7.72	7.63	7.79	7.50	7.55	7.50	7.18	8.98
23	3.1	Reach Area 1A	8.00	7.62	7.88	7.81	7.48	7.87	7.79	7.91	7.69	7.61	7.79	7.50	7.56	7.50		
7	3.2	20120057	8.24	7.83	8.00	8.16	7.73	8.08	7.95	8.14	7.93	7.81	7.97	7.73	7.75	7.69		
26	3.3		7.97	7.65	7.86	7.74	7.49	7.90	7.77	7.94	7.75	7.65	7.79	7.54	7.54	7.51		
18	3.4		7.81	7.54	7.75	7.76	7.44	7.72	7.75	7.85	7.51	7.41	7.67	7.30	7.41	7.27		
25	3.5		8.00	7.66	7.83	7.77	7.53	7.93	7.82	7.97	7.74	7.66	7.82	7.55	7.54	7.66		
6	4.1		8.23	7.83	8.01	8.14	7.71	8.05	7.95	8.14	7.91	7.82	7.97	7.71	7.74	7.68		
1	4.2		8.36	7.84	8.18	8.12	7.80	7.94	8.01	8.19	7.93	8.00	7.98	7.81	7.75	7.71	7.22	9.47
10	4.3	Reach Area 1B	8.05	7.71	7.80	7.90	7.51	7.90	7.70	7.93	7.73	7.65	7.75	7.26	7.61	7.55		
21	4.4	20120058	7.96	7.57	7.76	7.77	7.39	7.80	7.74	7.86	7.61	7.54	7.71	7.40	7.50	7.41		
27	4.5		7.96	7.66	7.81	7.71	7.52	7.89	7.76	7.96	7.74	7.64	7.79	7.52	7.57	7.51		
4	4.6		8.28	7.85	8.10	8.23	7.76	8.06	7.99	8.20	7.95	7.84	8.00	7.75	7.76	7.71		
9	4.7		8.04	7.63	7.91	7.77	7.50	7.95	7.72	7.99	7.76	7.61	7.73	7.08	7.82	7.40	7.08	8.97
12	5.1	Reach Area 1C	8.03	7.73	7.97	8.01	7.58	7.96	7.77	7.94	7.77	7.69	7.82	7.44	7.59	7.55		
14	5.2	20120059	8.05	7.69	7.86	7.96	7.54	7.95	7.81	7.98	7.77	7.67	7.82	7.50	7.56	7.55		
11	5.3		8.10	7.78	7.90	7.97	7.59	7.94	7.72	7.96	7.77	7.69	7.81	7.40	7.60	7.58		
15	5.4		8.03	7.66	7.79	7.94	7.52	7.94	7.79	7.96	7.76	7.64	7.80	7.52	7.54	7.53		
20	5.5		8.00	7.51	7.72	7.72	7.39	7.76	7.72	7.85	7.57	7.47	7.67	7.37	7.44	7.34		
19	5.6		7.83	7.53	7.78	7.76	7.42	7.77	7.77	7.87	7.57	7.47	7.69	7.35	7.41	7.33		
22	5.7		7.99	7.60	7.81	7.79	7.45	7.84	7.78	7.89	7.66	7.57	7.76	7.44	7.53	7.46	7.27	8.70
28	6.1	Reach Area 2	7.98	7.64	7.84	7.74	7.49	7.88	7.77	8.02	7.73	7.66	7.79	7.55	7.57	7.51		
24	6.2	20120060	8.02	7.66	7.86	7.83	7.52	7.91	7.83	7.95	7.74	7.65	7.82	7.55	7.56	7.53		
2	6.3		8.26	7.84	8.09	8.17	7.70	8.03	8.03	8.98	7.89	7.80	7.99	7.70	7.78	7.72		
29	6.4		8.01	7.86	7.77	7.69	7.53	7.91	7.81	7.99	7.74	7.68	7.81	7.56	7.56	7.54		
13	6.5		8.06	7.69	7.85	7.98	7.55	7.95	7.80	7.97	7.77	7.68	7.82	7.48	7.59	7.55	7.18	8.98
Range																	7.08	9.47

Table 50

**28-Day Bioaccumulation Bioassay**  
**AKRF, Tappan Zee**  
**pH (SU)**

**Species:** *M. nasuta*  
**Job #:** 32-012

Position #	Code	Sample	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
8	1.1	Tuckerton Control	7.69	7.69	7.71	7.67	7.79	7.84	7.70	7.64	7.57	7.71	7.68	7.84	7.80	7.67	7.77
17	1.2	20120080	7.70	7.72	7.65	7.75	7.78	7.77	7.76	7.69	7.69	7.81	7.77	7.87	7.85	7.77	7.82
30	1.3		7.66	7.72	7.79	7.78	7.87	7.92	7.80	7.82	7.78	7.85	7.80	7.92	7.92	7.83	7.84
5	2.1	Mud Dump Reference	7.75	7.75	7.79	7.79	7.88	7.91	7.77	7.69	7.61	7.79	7.75	7.91	7.91	7.76	7.83
3	2.2	20120079	7.75	7.72	7.78	7.80	7.87	7.88	7.75	7.65	7.55	7.78	7.74	7.91	7.90	7.74	7.81
32	2.3		7.73	7.81	7.84	7.82	7.93	7.96	7.83	7.84	7.81	7.88	7.84	7.95	7.96	7.86	7.86
31	2.4		7.69	7.78	7.82	7.78	7.92	7.95	7.81	7.82	7.79	7.87	7.83	7.94	7.94	7.85	7.85
16	2.5		7.65	7.80	7.83	7.82	7.91	7.95	7.82	7.79	7.75	7.87	7.79	7.95	7.95	7.85	7.87
23	3.1	Reach Area 1A	7.69	7.81	7.82	7.89	7.91	7.95	7.81	7.81	7.78	7.86	7.83	7.93	7.93	7.84	7.85
7	3.2	20120057	7.63	7.77	7.81	7.81	7.89	7.92	7.78	7.71	7.63	7.81	7.76	7.93	7.92	7.77	7.82
26	3.3		7.72	7.81	7.83	7.81	7.92	7.95	7.82	7.82	7.79	7.85	7.83	7.93	7.93	7.84	7.85
18	3.4		7.71	7.78	7.76	7.74	7.88	7.92	7.78	7.73	7.72	7.83	7.74	7.91	7.92	7.82	7.84
25	3.5		7.71	7.80	7.83	7.82	7.91	7.95	7.82	7.82	7.79	7.86	7.83	7.93	7.93	7.84	7.84
6	4.1		7.74	7.76	7.80	7.80	7.89	7.92	7.77	7.70	7.63	7.80	7.75	7.92	7.92	7.77	7.82
1	4.2		7.71	7.69	7.76	7.80	7.78	7.85	7.72	7.60	7.44	7.80	7.77	7.86	7.86	7.72	7.80
10	4.3	Reach Area 1B	7.71	7.77	7.80	7.79	7.90	7.93	7.79	7.72	7.67	7.82	7.76	7.92	7.93	7.75	7.81
21	4.4	20120058	7.72	7.80	7.81	7.82	7.91	7.95	7.81	7.80	7.77	7.85	7.85	7.93	7.94	7.84	7.85
27	4.5		7.72	7.80	7.83	7.80	7.91	7.95	7.82	7.82	7.80	7.85	7.83	7.93	7.92	7.84	7.85
4	4.6		7.75	7.73	7.79	7.79	7.87	7.89	7.76	7.67	7.57	7.78	7.74	7.90	7.90	7.75	7.81
9	4.7		7.69	7.75	7.77	7.75	7.88	7.91	7.76	7.68	7.62	7.81	7.73	7.90	7.90	7.69	7.78
12	5.1	Reach Area 1C	7.71	7.79	7.81	7.80	7.91	7.94	7.80	7.75	7.70	7.83	7.78	7.93	7.93	7.79	7.83
14	5.2	20120059	7.73	7.80	7.82	7.81	7.91	7.94	7.81	7.76	7.73	7.84	7.80	7.93	7.93	7.81	7.84
11	5.3		7.73	7.79	7.81	7.80	7.91	7.94	7.79	7.73	7.69	7.83	7.77	7.93	7.93	7.77	7.82
15	5.4		7.73	7.80	7.82	7.81	7.91	7.94	7.81	7.77	7.73	7.84	7.76	7.94	7.93	7.82	7.85
20	5.5		7.72	7.80	7.81	7.81	7.90	7.94	7.81	7.80	7.76	7.85	7.86	7.92	7.92	7.83	7.85
19	6.1	Reach Area 2	7.73	7.78	7.80	7.77	7.89	7.93	7.80	7.79	7.75	7.84	7.87	7.92	7.92	7.83	7.85
22	6.2	20120060	7.63	7.80	7.82	7.81	7.91	7.94	7.82	7.81	7.78	7.85	7.85	7.93	7.93	7.84	7.85
28	6.3		7.73	7.81	7.83	7.80	7.91	7.95	7.82	7.82	7.80	7.84	7.83	7.93	7.94	7.84	7.85
24	6.4		7.70	7.81	7.82	7.86	7.91	7.95	7.81	7.81	7.78	7.85	7.82	7.93	7.94	7.83	7.85
2	6.5		7.72	7.71	7.77	7.79	7.85	7.86	7.74	7.63	7.52	7.78	7.74	7.89	7.88	7.72	7.80
29	6.6		7.73	7.80	7.83	7.80	7.92	7.95	7.82	7.82	7.80	7.85	7.83	7.94	7.94	7.84	7.85
13	6.7		7.72	7.79	7.81	7.80	7.91	7.94	7.80	7.76	7.72	7.84	7.79	7.93	7.93	7.80	7.84

Table 50 continued

**28-Day Bioaccumulation Bioassay**  
**AKRF, Tappan Zee**  
**pH (SU)**

**Species:** *M. nasuta*  
**Job #:** 32-012

Position #	Code	Sample	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Low	High
8	1.1	Tuckerton Control	7.76	7.86	7.74	7.84	7.82	7.81	7.95	7.79	7.87	7.87	7.80	7.84	7.84	7.81		
17	1.2	20120080	7.82	7.90	7.86	8.00	7.92	7.84	7.99	7.85	7.89	7.88	7.82	7.93	7.90	7.86		
30	1.3		7.87	7.96	7.84	7.99	7.92	7.91	8.02	7.90	7.96	7.95	7.89	7.98	7.92	7.93	7.57	8.02
5	2.1	Mud Dump Reference	7.78	7.91	7.79	7.96	7.86	7.85	8.00	7.79	7.91	7.90	7.82	7.92	7.88	7.85		
3	2.2	20120079	7.73	7.87	7.75	7.93	7.82	7.83	7.97	7.75	7.87	7.88	7.79	7.89	7.85	7.82		
32	2.3		7.91	7.99	7.88	8.04	7.96	7.94	8.06	7.94	8.00	7.99	7.92	8.00	7.87	7.97		
31	2.4		7.91	7.98	7.87	8.03	7.95	7.92	8.06	7.91	7.98	7.98	7.92	7.98	7.93	7.96		
16	2.5		7.89	7.97	7.88	8.03	7.94	7.90	8.06	7.90	7.97	8.00	7.90	7.97	7.86	7.94	7.55	8.06
23	3.1	Reach Area 1A	7.90	7.96	7.86	8.02	7.94	7.89	8.03	7.91	7.97	7.97	7.90	7.98	7.90	7.94		
7	3.2	20120057	7.79	7.92	7.79	7.96	7.87	7.85	7.99	7.80	7.91	7.91	7.84	7.93	7.87	7.87		
26	3.3		7.91	7.97	7.87	8.01	7.93	7.91	8.03	7.91	7.97	7.97	7.89	7.98	7.91	7.95		
18	3.4		7.85	7.94	7.86	8.00	7.92	7.88	8.03	7.89	7.94	7.93	7.86	7.95	7.90	7.91		
25	3.5		7.90	7.97	7.87	8.01	7.93	7.91	8.03	7.91	7.97	7.97	7.90	7.98	7.90	7.94		
6	4.1		7.78	7.91	7.78	7.96	7.87	7.85	7.99	7.80	7.91	7.90	7.83	7.92	7.86	7.86		
1	4.2		7.66	7.82	7.66	7.87	7.82	7.79	7.88	7.66	7.80	7.80	7.70	7.84	7.74	7.75	7.44	8.03
10	4.3	Reach Area 1B	7.81	7.93	7.79	7.99	7.89	7.85	8.00	7.83	7.93	7.92	7.85	7.94	7.88	7.89		
21	4.4	20120058	7.91	7.96	7.87	8.01	7.93	7.89	8.03	7.91	7.97	7.96	7.89	7.98	7.90	7.94		
27	4.5		7.90	7.96	7.87	8.01	7.93	7.90	8.03	7.91	7.97	7.97	7.89	7.98	7.90	7.94		
4	4.6		7.75	7.88	7.76	7.94	7.84	7.84	7.97	7.77	7.89	7.89	7.80	7.90	7.84	7.83		
9	4.7		7.78	7.92	7.76	7.98	7.86	7.82	7.99	7.80	7.89	7.89	7.82	7.90	7.88	7.86	7.57	8.03
12	5.1	Reach Area 1C	7.84	7.95	7.82	8.00	7.91	7.87	8.02	7.85	7.95	7.94	7.87	7.96	7.89	7.90		
14	5.2	20120059	7.85	7.96	7.84	8.00	7.92	7.88	8.03	7.87	7.95	7.95	7.88	7.96	7.90	7.91		
11	5.3		7.82	7.95	7.81	8.00	7.91	7.87	8.02	7.84	7.94	7.93	7.86	7.96	7.89	7.90		
15	5.4		7.85	7.95	7.85	8.00	7.92	7.88	8.02	7.87	7.95	7.96	7.88	7.96	7.93	7.91		
20	5.5		7.92	7.96	7.86	8.00	7.93	7.89	8.02	7.90	7.96	7.96	7.88	7.97	7.91	7.93		
19	5.6		7.87	7.95	7.86	7.99	7.92	7.88	8.03	7.89	7.96	7.95	7.87	7.96	7.90	7.92		
22	5.7		7.91	7.96	7.87	8.01	7.94	7.90	8.03	7.91	7.97	7.96	7.89	7.98	7.90	7.94	7.69	8.03
28	6.1	Reach Area 2	7.90	7.97	7.87	8.02	7.94	7.92	8.04	7.91	7.98	7.97	7.90	7.99	7.91	7.95		
24	6.2	20120060	7.90	7.97	7.86	8.02	7.94	7.91	8.04	7.91	7.97	7.97	7.90	7.99	7.91	7.94		
2	6.3		7.70	7.84	7.72	7.90	7.79	7.81	7.94	7.73	7.84	7.85	7.77	7.85	7.82	7.79		
29	6.4		7.92	8.03	7.87	8.03	7.95	7.92	8.05	7.91	7.98	7.97	7.91	7.99	7.89	7.95		
13	6.5		7.85	7.95	7.83	8.00	7.92	7.88	8.02	7.85	7.95	7.94	7.87	7.96	7.90	7.91	7.52	8.05
Range																	7.44	8.06

Table 51

28-Day Bioaccumulation Bioassay  
 AKRF, Tappan Zee  
 Total Ammonia (mg/L)

Species: *M. nasuta*  
 Job #: 32-012

Position #	Code	Sample	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
8	1.1	Tuckerton Control	<0.6														
17	1.2	20120080	<0.6														
30	1.3		<0.6														
5	2.1	Mud Dump Reference	<0.6														
3	2.2	20120079	<0.6														
32	2.3		<0.6														
31	2.4		<0.6														
16	2.5		<0.6														
23	3.1	Reach Area 1A	1.04														
7	3.2	20120057	0.63														
26	3.3		0.97														
18	3.4		2.86														
25	3.5		2.45														
6	4.1		0.64														
1	4.2		0.74														
10	4.3	Reach Area 1B	1.71														
21	4.4	20120058	1.11														
27	4.5		0.74														
4	4.6		0.82														
9	4.7		0.81														
12	5.1	Reach Area 1C	0.88														
14	5.2	20120059	0.73														
11	5.3		0.92														
15	5.4		1.32														
20	5.5		0.92														
19	6.1	Reach Area 2	2.89														
22	6.2	20120060	1.09														
28	6.3		0.73														
24	6.4		1.41														
2	6.5		1.42														
29	6.6		0.73														
13	6.7		1.39														

Table 51 continued

28-Day Bioaccumulation Bioassay  
AKRF, Tappan Zee  
Total Ammonia (mg/L)

Species: *M. nasuta*  
Job #: 32-012

Position #	Code	Sample	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Low	High
8	1.1	Tuckerton Control														<0.6		
17	1.2	20120080														<0.6		
30	1.3															<0.6	<0.6	<0.6
5	2.1	Mud Dump Reference														<0.6		
3	2.2	20120079														<0.6		
32	2.3															<0.6		
31	2.4															<0.6		
16	2.5															<0.6	<0.6	<0.6
23	3.1	Reach Area 1A														<0.6		
7	3.2	20120057														<0.6		
26	3.3															<0.6		
18	3.4															<0.6		
25	3.5															<0.6		
6	4.1															<0.6		
1	4.2															<0.6	<0.6	2.86
10	4.3	Reach Area 1B														<0.6		
21	4.4	20120058														<0.6		
27	4.5															<0.6		
4	4.6															<0.6		
9	4.7															<0.6	<0.6	1.71
12	5.1	Reach Area 1C														<0.6		
14	5.2	20120059														<0.6		
11	5.3															<0.6		
15	5.4															<0.6		
20	5.5															<0.6		
19	5.6															<0.6		
22	5.7															<0.6	<0.6	2.89
28	6.1	Reach Area 2														<0.6		
24	6.2	20120060														<0.6		
2	6.3															<0.6		
29	6.4															<0.6		
13	6.5															<0.6	<0.6	1.42
Range																	<0.6	2.89





Table 52

28-Day Solid Phase Bioaccumulation Bioassay  
 AKRF, Tappan Zee  
 Initial Live Count: 20

Species: *N.virens*  
 Job #: 32-012

Position #	Code	Sample	Initial Live Count: 20	
8	1.1	Sandy Hook Control	20	
17	1.2	20120081	18	
30	1.3		20	97%
5	2.1	Mud Dump Reference	20	
3	2.2	20120079	19	
32	2.3		20	
31	2.4		20	
16	2.5		19	98%
23	3.1	Area 1A	20	
7	3.2	20120057	19	
26	3.3		20	
18	3.4		17	
25	3.5		20	96%
6	4.1	Area 1B	20	
1	4.2	20120058	20	
10	4.3		20	
21	4.4		20	
27	4.5		20	
4	4.6		20	
9	4.7		20	100%
12	5.1	Area 1C	19	
14	5.2	20120059	20	
11	5.3		20	
15	5.4		19	
20	5.5		20	
19	5.6		20	
22	5.7		20	99%
28	6.1	Area 2	19	
24	6.2	20120060	19	
2	6.3		18	
29	6.4		20	
13	6.5		20	96%

Table 53

**28-Day Bioaccumulation Bioassay**  
**AKRF, Tappan Zee**  
**Temperature (° C)**

**Species:** *N. virens*  
**Job #:** 32-012

Position #	Code	Sample	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
8	1.1	Sandy Hook Control	19.3	19.2	19.3	19.5	19.2	19.6	19.6	19.7	19.4	19.6	19.5	19.4	19.5	19.3	19.2
17	1.2	20120081	19.4	19.2	19.4	19.6	19.3	19.8	19.7	19.8	19.5	19.8	19.7	19.5	19.6	19.4	19.4
30	1.3		19.6	19.5	19.8	20.0	19.6	20.2	20.1	20.2	19.9	20.2	20.1	19.9	20.1	19.8	19.9
5	2.1	Mud Dump Reference	19.4	19.4	19.6	19.8	19.5	19.8	19.9	19.9	19.6	20.0	19.8	19.6	19.7	19.5	19.4
3	2.2	20120079	19.4	19.4	19.6	19.8	19.5	19.9	19.8	19.9	19.6	20.1	19.8	19.6	19.7	19.5	19.4
32	2.3		19.7	19.6	19.8	20.1	19.6	20.2	20.1	20.1	19.9	20.2	20.1	19.9	20.1	19.7	19.9
31	2.4		19.7	19.6	19.8	20.0	19.6	20.3	20.1	20.2	19.9	20.2	20.1	19.9	20.1	19.7	19.9
16	2.5		19.4	19.2	19.4	19.6	19.4	19.8	19.8	19.8	19.5	19.8	19.7	19.5	19.6	19.4	19.4
23	3.1	Reach Area 1A	19.1	19.0	19.2	19.4	19.1	19.6	19.5	19.6	19.3	19.5	19.4	19.4	19.4	19.2	19.2
7	3.2	20120057	19.5	19.4	19.6	19.8	19.4	19.8	19.8	19.8	19.6	20.0	19.8	19.6	19.7	19.6	19.4
26	3.3		19.1	19.0	19.2	19.3	18.9	19.5	19.5	19.5	19.3	19.5	19.3	19.3	19.3	19.1	19.1
18	3.4		19.4	19.2	19.4	19.6	19.3	19.8	19.7	19.8	19.5	19.9	19.6	19.5	19.6	19.4	19.4
25	3.5		19.1	18.9	19.2	19.4	19.1	19.5	19.5	19.5	19.3	19.5	19.3	19.3	19.4	19.2	19.1
6	4.1	Reach Area 1B	19.3	19.3	19.5	19.8	19.4	19.8	19.8	19.8	19.6	20.0	19.7	19.6	19.7	19.5	19.3
1	4.2	20120058	19.5	19.4	19.6	19.9	19.5	19.8	19.9	19.9	19.7	20.2	19.9	19.8	19.8	19.4	19.4
10	4.3		19.4	19.3	19.5	19.6	19.2	19.7	19.7	19.8	19.5	19.7	19.6	19.5	19.6	19.4	19.3
21	4.4		19.4	19.2	19.4	19.6	19.3	19.7	19.7	19.7	19.5	19.8	19.6	19.5	19.6	19.4	19.3
27	4.5		19.1	19.0	19.2	19.3	19.0	19.4	19.4	19.5	19.2	19.4	19.3	19.3	19.4	19.1	19.1
4	4.6		19.4	19.4	19.6	19.9	19.5	19.9	19.9	19.9	19.7	20.1	19.8	19.7	19.8	19.6	19.4
9	4.7		19.4	19.2	19.4	19.6	19.2	19.7	19.7	19.8	19.5	19.7	19.5	19.5	19.6	19.4	19.3
12	5.1	Reach Area 1C	19.4	19.2	19.4	19.6	19.3	19.7	19.7	19.8	19.5	19.7	19.6	19.5	19.6	19.4	19.3
14	5.2	20120059	19.4	19.3	19.5	19.7	19.3	19.8	19.8	19.9	19.6	19.8	19.6	19.6	19.7	19.4	19.4
11	5.3		19.4	19.2	19.4	19.5	19.2	19.7	19.7	19.8	19.5	19.7	19.5	19.4	19.6	19.4	19.3
15	5.4		19.4	19.2	19.5	19.6	19.4	19.8	19.8	19.8	19.5	19.9	19.7	19.6	19.7	19.4	19.4
20	5.5		19.4	19.2	19.4	19.6	19.3	19.7	19.7	19.7	19.5	19.8	19.6	19.5	19.6	19.4	19.3
19	5.6		19.4	19.2	19.4	19.6	19.2	19.7	19.7	19.8	19.5	19.8	19.6	19.5	19.6	19.4	19.3
22	5.7		19.1	19.2	19.4	19.5	19.1	19.7	19.6	19.6	19.4	19.5	19.4	19.4	19.5	19.2	19.3
28	6.1	Reach Area 2	19.0	19.1	19.2	19.3	19.0	19.6	19.5	19.6	19.3	19.5	19.3	19.3	19.4	19.2	19.2
24	6.2		19.1	19.0	19.2	19.4	19.1	19.5	19.5	19.5	19.3	19.4	19.3	19.3	19.4	19.2	19.1
2	6.3		19.4	19.4	19.5	19.8	19.5	19.8	19.7	19.9	19.6	20.0	19.8	19.6	19.7	19.5	19.4
29	6.4		19.7	19.5	19.8	19.9	19.6	20.1	20.0	20.0	19.9	20.1	20.0	19.8	19.9	19.8	19.8
13	6.5		19.3	19.2	19.4	19.5	19.2	19.7	19.6	19.7	19.5	19.6	19.5	19.5	19.6	19.3	19.2

Table 53 continued

**28-Day Bioaccumulation Bioassay**  
**AKRF, Tappan Zee**  
**Temperature (° C)**

**Species:** *N. virens*  
**Job #:** 32-012

Position #	Code	Sample	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Low	High
8	1.1	Sandy Hook Control	19.6	19.4	19.2	19.2	19.3	19.4	19.6	19.4	18.9	19.6	19.5	19.6	19.3	19.4	18.9	20.3
17	1.2	20120081	19.7	19.4	19.3	19.3	19.5	19.5	19.8	19.6	19.0	19.8	19.6	19.7	19.4	19.5		
30	1.3		20.0	19.8	19.6	19.6	19.8	19.9	20.3	19.9	19.2	20.2	20.0	20.1	19.8	19.7		
5	2.1	Mud Dump Reference	19.7	19.5	19.4	19.4	19.5	19.5	19.7	19.6	18.9	19.7	19.6	19.7	19.4	19.4	18.9	20.3
3	2.2	20120079	19.7	19.5	19.4	19.4	19.6	19.6	19.8	19.7	19.0	19.7	19.6	19.7	19.5	19.5		
32	2.3		19.9	19.9	19.7	19.7	19.9	19.9	20.3	20.0	19.2	20.2	20.1	20.2	19.8	19.8		
31	2.4		20.0	19.8	19.6	19.6	19.8	19.8	20.3	19.9	19.2	20.2	20.0	20.1	19.8	19.7		
16	2.5		19.7	19.4	19.3	19.3	19.5	19.6	19.8	19.6	19.0	19.8	19.6	19.7	19.4	19.5		
23	3.1	Reach Area 1A	19.4	19.2	19.1	19.1	19.2	19.3	19.6	19.3	18.8	19.5	19.4	19.5	19.3	19.3	18.7	20.0
7	3.2	20120057	19.8	19.5	19.4	19.4	19.5	19.5	19.8	19.6	19.0	19.8	19.6	19.7	19.4	19.5		
26	3.3		19.4	19.2	19.1	19.1	19.2	19.3	19.5	19.2	18.7	19.4	19.4	19.4	19.1	19.2		
18	3.4		19.7	19.4	19.3	19.3	19.5	19.5	19.8	19.6	19.0	19.7	19.6	19.7	19.4	19.4		
25	3.5		19.4	19.2	19.1	19.1	19.2	19.2	19.5	19.2	18.8	19.4	19.4	19.5	19.2	19.2		
6	4.1	Reach Area 1B	19.7	19.4	19.3	19.3	19.5	19.4	19.7	19.6	18.9	19.8	19.5	19.7	19.4	19.4		
1	4.2	20120058	19.7	19.5	19.4	19.4	19.7	19.6	19.9	19.8	19.0	19.6	19.5	19.7	19.5	19.5	18.7	20.2
10	4.3		19.6	19.4	19.3	19.3	19.3	19.5	19.7	19.5	19.0	19.6	19.5	19.6	19.4	19.4		
21	4.4		19.7	19.4	19.3	19.3	19.5	19.5	19.7	19.6	18.9	19.6	19.5	19.6	19.3	19.4		
27	4.5		19.4	19.2	19.1	19.1	19.1	19.2	19.5	19.2	18.7	19.5	19.5	19.5	19.3	19.3		
4	4.6		19.7	19.5	19.5	19.5	19.6	19.6	19.8	19.7	19.0	19.7	19.6	19.7	19.5	19.5		
9	4.7		19.6	19.4	19.3	19.3	19.3	19.4	19.7	19.4	19.0	19.6	19.5	19.6	19.3	19.4		
12	5.1	Reach Area 1C	19.6	19.4	19.3	19.3	19.3	19.4	19.6	19.4	18.9	19.6	19.6	19.6	19.4	19.4		
14	5.2	20120059	19.7	19.4	19.2	19.2	19.4	19.5	19.8	19.5	19.0	19.8	19.7	19.7	19.5	19.5	18.8	19.9
11	5.3		19.6	19.4	19.3	19.3	19.3	19.3	19.6	19.4	18.9	19.6	19.5	19.6	19.4	19.4		
15	5.4		19.8	19.5	19.4	19.4	19.5	19.5	19.8	19.6	19.0	19.8	19.7	19.8	19.4	19.4		
20	5.5		19.6	19.4	19.3	19.3	19.5	19.5	19.7	19.6	18.9	19.6	19.6	19.6	19.3	19.4		
19	5.6		19.6	19.4	19.3	19.3	19.5	19.5	19.8	19.6	18.9	19.7	19.6	19.6	19.3	19.4		
22	5.7		19.5	19.3	19.2	19.2	19.3	19.4	19.6	19.3	18.8	19.6	19.5	19.6	19.4	19.4		
28	6.1	Reach Area 2	19.4	19.2	19.0	19.0	19.2	19.3	19.5	19.3	18.8	19.5	19.4	19.5	19.2	19.3		
24	6.2	20120060	19.4	19.2	19.1	19.1	19.1	19.3	19.5	19.2	18.8	19.5	19.4	19.5	19.2	19.3		
2	6.3		19.7	19.4	19.3	19.3	19.6	19.6	19.8	19.7	19.0	19.7	19.5	19.7	19.5	19.5	18.8	20.1
29	6.4		20.0	19.7	19.6	19.6	19.7	19.7	20.1	19.8	19.1	20.1	19.9	20.0	19.7	19.7		
13	6.5		19.6	19.4	19.2	19.2	19.3	19.4	19.6	19.4	18.9	19.6	19.5	19.6	19.4	19.4		
Range																	18.7	20.3

Table 54

**28-Day Bioaccumulation Bioassay**  
**AKRF, Tappan Zee**  
**Salinity (ppt)**

**Species:** *N. virens*  
**Job #:** 32-012

Position #	Code	Sample	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
8	1.1	Sandy Hook Control 20120081	29.6	29.9	30.0	30.1	29.4	29.3	29.3	29.3	30.4	30.5	30.7	30.7	30.7	30.7	30.7
17	1.2		29.6	29.9	30.0	30.0	29.5	29.3	29.3	29.3	30.4	30.4	30.6	30.7	30.7	30.7	30.6
30	1.3		29.6	29.7	29.9	30.0	29.4	29.3	29.2	29.3	30.4	29.9	30.6	30.6	30.6	30.7	30.7
5	2.1	Mud Dump Reference 20120079	29.6	29.9	29.9	30.2	29.4	29.3	29.3	29.3	30.4	30.4	30.7	30.7	30.7	30.7	30.3
3	2.2		29.6	29.9	29.9	30.1	29.4	29.2	29.3	29.3	30.4	30.4	30.7	30.7	30.3	30.7	29.8
32	2.3		29.6	29.8	29.9	30.0	29.5	29.3	29.2	29.4	30.4	30.3	30.6	30.7	30.5	30.6	30.7
31	2.4		29.6	29.9	29.9	30.0	29.4	29.4	29.3	29.3	30.4	30.3	30.6	30.7	30.6	30.7	30.7
16	2.5		29.6	29.9	30.0	30.0	29.4	29.3	29.3	29.3	30.4	30.4	30.6	30.7	30.7	30.7	30.7
23	3.1	Reach Area 1A 20120057	29.5	29.7	29.8	29.9	29.3	29.3	29.3	29.3	30.3	30.4	30.6	30.6	30.7	30.7	30.8
7	3.2		29.4	29.6	29.7	29.9	29.4	29.2	29.2	29.3	30.4	30.4	30.6	30.7	30.7	30.7	30.3
26	3.3		29.5	29.7	29.8	29.9	29.5	29.3	29.3	29.3	30.4	30.4	30.6	30.6	30.7	30.7	30.7
18	3.4		29.4	29.7	29.8	29.9	29.4	29.3	29.3	29.3	30.4	30.4	30.6	30.7	30.7	30.7	30.5
25	3.5		29.4	29.4	29.7	29.9	29.3	29.3	29.3	29.3	30.4	30.4	30.6	30.7	30.7	30.7	30.7
6	4.1	Reach Area 1B 20120058	29.4	29.8	29.8	29.9	29.4	29.3	29.3	29.3	30.4	30.4	30.7	30.7	30.7	30.7	30.2
1	4.2		29.4	29.5	29.8	30.0	29.3	28.7	29.3	29.3	30.4	30.4	30.5	30.8	30.7	30.7	30.4
10	4.3		29.4	29.7	29.8	29.9	29.4	29.2	29.2	29.3	30.4	30.4	30.6	30.7	30.6	30.7	30.7
21	4.4		29.5	29.7	29.8	29.9	29.4	29.3	29.2	29.3	30.4	30.4	30.6	30.6	30.7	30.7	30.7
27	4.5		29.5	29.8	29.8	29.9	29.3	29.3	29.2	29.3	30.4	30.4	30.6	30.6	30.6	30.7	30.8
4	4.6		29.3	29.7	29.8	30.0	29.3	29.2	29.3	29.3	30.3	30.4	30.6	30.7	30.7	30.7	29.8
9	4.7		29.5	29.7	29.8	29.8	29.4	29.3	29.3	29.3	30.4	30.4	30.6	30.7	30.7	30.7	30.7
12	5.1	Reach Area 1C 20120059	29.5	29.8	29.8	29.9	29.4	29.2	29.3	29.3	30.3	30.4	30.6	30.7	30.7	30.7	30.7
14	5.2		29.4	29.7	29.8	29.9	29.4	29.3	29.3	29.3	30.4	30.4	30.7	30.7	30.7	30.7	30.8
11	5.3		29.5	29.7	29.8	29.9	29.4	29.3	29.3	29.3	30.4	30.4	30.6	30.7	30.7	30.7	30.7
15	5.4		29.4	29.7	29.8	29.9	29.4	29.3	29.3	29.4	30.4	30.4	30.7	30.7	30.7	30.7	30.8
20	5.5		29.5	29.4	29.8	29.9	29.4	29.3	29.2	29.3	30.4	30.4	30.6	30.7	30.7	30.7	30.7
19	5.6		29.5	29.7	29.8	29.9	29.4	29.3	29.2	29.3	30.4	30.4	30.6	30.7	30.7	30.7	30.7
22	5.7		29.3	29.8	29.8	29.9	29.4	29.3	29.3	29.3	30.4	30.4	30.7	30.7	30.7	30.7	30.4
28	6.1	Reach Area 2	28.6	29.8	29.7	29.9	29.4	29.3	29.2	29.3	30.4	30.4	30.6	30.7	30.7	30.7	30.7
24	6.2		29.5	29.8	29.8	29.9	29.3	29.3	29.2	29.3	30.4	30.4	30.7	30.7	30.7	30.7	30.8
2	6.3		29.4	29.7	29.8	29.9	29.3	29.1	29.4	29.3	30.4	30.4	30.5	30.9	30.7	30.7	29.7
29	6.4		29.4	29.7	29.7	29.9	29.3	29.3	29.2	29.3	30.3	29.7	30.6	30.7	30.6	30.6	30.7
13	6.5		29.4	29.6	29.8	29.9	29.4	29.3	29.3	29.3	30.4	30.4	30.6	30.7	30.7	30.7	30.7

Table 54 continued

**28-Day Bioaccumulation Bioassay**  
**AKRF, Tappan Zee**  
**Salinity (ppt)**

**Species:** *N. virens*  
**Job #:** 32-012

Position #	Code	Sample	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Low	High
8	1.1	Sandy Hook Control	29.6	29.2	29.2	29.2	30.3	30.4	30.4	31.0	31.0	31.0	30.9	31.1	31.2	31.0		
17	1.2	20120081	29.5	29.2	29.1	29.1	30.2	30.3	30.4	30.9	31.0	30.9	31.0	31.1	31.1	31.0		
30	1.3		29.5	29.2	29.1	29.1	30.2	30.3	30.4	30.9	30.9	30.9	30.9	31.0	31.1	31.0	29.1	31.2
5	2.1	Mud Dump Reference	29.5	29.2	29.2	29.2	30.2	30.4	30.4	31.0	31.0	30.9	30.9	31.1	30.8	30.8		
3	2.2	20120079	29.4	29.0	29.2	29.2	30.0	28.7	30.4	31.0	30.9	30.9	30.9	31.1	31.0	30.9		
32	2.3		29.6	29.2	29.1	29.1	30.2	30.3	30.4	31.0	31.0	30.9	30.9	31.0	30.8	31.0		
31	2.4		29.5	29.1	29.1	29.1	30.2	30.3	30.4	31.0	31.0	30.9	31.0	31.0	31.1	31.0		
16	2.5		29.5	29.2	29.1	29.1	30.2	30.3	30.4	31.0	31.0	31.0	31.0	31.1	31.1	31.0	28.7	31.1
23	3.1	Reach Area 1A	29.5	29.2	29.2	29.2	30.2	30.3	30.4	30.9	31.0	31.0	31.0	31.1	31.1	31.0		
7	3.2	20120057	29.5	29.2	29.1	29.1	30.2	30.3	30.4	31.0	31.0	30.9	30.9	30.9	31.1	30.8		
26	3.3		29.6	29.2	29.2	29.2	30.2	30.3	30.4	31.0	31.0	31.0	31.0	31.1	31.2	31.1		
18	3.4		29.5	29.2	29.1	29.1	30.2	30.3	30.4	31.0	31.0	31.0	31.0	31.1	31.1	31.0		
25	3.5		29.6	29.2	29.2	29.2	30.2	30.3	30.4	31.0	31.0	31.0	31.0	31.1	31.1	31.1	29.1	31.2
6	4.1	Reach Area 1B	29.5	29.2	29.2	29.2	30.2	30.4	30.4	31.0	31.0	31.0	31.0	31.0	31.1	30.4		
1	4.2	20120058	29.3	29.1	29.2	29.2	30.0	29.1	30.5	31.0	30.9	30.5	30.5	31.0	31.1	30.8		
10	4.3		29.5	29.2	29.1	29.1	30.3	30.3	30.4	31.0	30.9	30.9	30.9	31.1	31.1	31.0		
21	4.4		29.5	29.2	29.1	29.1	30.2	30.3	30.4	31.0	31.0	31.0	31.0	31.1	31.1	31.0		
27	4.5		29.5	29.2	29.2	29.2	30.2	30.3	30.4	31.0	31.0	30.9	31.0	31.1	31.1	31.0		
4	4.6		29.5	29.2	29.1	29.1	30.2	30.4	30.4	31.0	30.9	30.9	30.7	31.0	31.1	30.9		
9	4.7		29.5	29.2	29.1	29.1	30.2	30.3	30.4	31.0	31.0	31.0	30.9	31.1	31.1	31.0	28.7	31.1
12	5.1	Reach Area 1C	29.5	29.2	29.2	29.2	30.2	30.3	30.4	31.0	31.0	30.9	30.9	31.1	31.1	31.0		
14	5.2	20120059	29.5	29.2	29.2	29.2	30.3	30.3	30.4	31.0	31.0	30.9	30.9	31.1	31.2	31.0		
11	5.3		29.5	29.1	29.1	29.1	30.2	30.4	30.4	31.0	31.0	30.9	30.9	31.1	31.2	31.0		
15	5.4		29.5	29.2	29.1	29.1	30.3	30.4	30.4	31.0	31.0	30.9	31.0	31.1	31.2	31.1		
20	5.5		29.5	29.2	29.1	29.1	30.2	30.3	30.4	31.0	31.0	30.9	31.0	31.1	31.1	31.0		
19	5.6		29.5	29.2	29.2	29.2	30.2	30.3	30.4	31.0	31.0	30.9	30.7	31.1	31.2	31.1		
22	5.7		29.5	29.2	29.2	29.2	30.2	30.4	30.4	31.0	31.0	31.0	31.0	31.1	31.1	31.1	29.1	31.2
28	6.1	Reach Area 2	29.5	29.1	29.2	29.2	30.2	30.3	30.4	31.0	31.0	30.9	31.0	31.1	31.1	31.0		
24	6.2	20120060	29.6	29.2	29.2	29.2	30.2	30.3	30.4	31.0	31.0	31.0	31.0	31.1	31.1	31.0		
2	6.3		29.3	28.9	29.2	29.2	30.0	29.8	30.4	31.0	30.8	30.9	30.7	31.1	31.0	31.0		
29	6.4		29.4	29.2	29.1	29.1	30.2	30.3	30.4	30.9	31.0	30.9	30.9	31.0	31.1	31.0		
13	6.5		29.5	29.2	29.2	29.2	30.3	30.3	30.4	31.0	31.0	30.9	31.0	31.1	31.1	31.0	28.6	31.1
Range																	28.6	31.2

Table 55

**28-Day Bioaccumulation Bioassay**  
**AKRF, Tappan Zee**  
**DO (mg/L)**

**Species:** *N. virens*  
**Job #:** 32-012

Position #	Code	Sample	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
8	1.1	Sandy Hook Control 20120081	7.01	6.49	6.53	6.98	7.05	6.74	7.08	6.88	7.26	8.30	7.10	7.91	7.10	6.84	6.64
17	1.2		7.00	6.64	6.69	6.98	7.19	6.82	7.12	6.85	7.26	8.23	7.07	7.91	7.06	6.83	6.70
30	1.3		6.89	6.55	6.56	6.99	7.09	6.71	6.95	6.75	7.02	7.22	6.88	7.80	6.99	6.77	6.52
5	2.1	Mud Dump Reference 20120079	6.99	6.42	6.44	7.22	7.02	6.77	7.02	6.85	7.28	8.33	7.15	7.92	7.06	6.84	6.61
3	2.2		6.97	6.56	6.58	6.91	7.07	6.82	7.14	6.93	7.28	8.31	7.17	7.99	7.11	6.88	6.64
32	2.3		6.98	6.54	6.44	6.95	7.06	6.68	6.86	6.73	7.03	7.14	6.88	7.80	6.99	6.76	6.56
31	2.4		6.94	6.58	6.59	6.93	7.03	6.67	6.94	6.74	7.04	7.22	6.90	7.79	7.01	6.76	6.56
16	2.5		6.96	6.61	6.63	6.93	7.28	6.76	7.09	6.79	7.22	8.19	7.05	7.85	7.05	6.75	6.62
23	3.1	Reach Area 1A 20120057	6.98	6.57	6.60	6.99	7.11	6.75	7.08	6.81	7.16	8.09	7.09	7.89	7.10	6.87	6.70
7	3.2		6.94	6.43	6.49	6.92	7.06	6.78	7.08	6.84	7.24	8.23	7.14	7.94	7.07	6.75	6.57
26	3.3		6.99	6.67	6.62	7.09	7.05	6.79	7.08	6.80	7.14	8.03	7.01	7.89	7.02	6.89	6.69
18	3.4		6.98	6.64	6.68	7.04	7.21	6.82	7.11	6.87	7.22	8.20	7.10	7.90	7.05	6.81	6.68
25	3.5		7.02	6.68	6.62	7.07	7.13	6.79	7.08	6.83	7.17	8.06	7.09	7.87	7.12	6.85	6.69
6	4.1	Reach Area 1B 20120058	7.00	6.44	6.55	6.93	7.01	6.77	7.05	6.85	7.26	8.35	7.16	7.95	7.08	6.86	6.61
1	4.2		6.96	6.50	6.63	6.96	7.32	6.91	7.17	7.29	7.35	8.38	7.32	8.09	7.18	6.99	6.52
10	4.3		6.78	6.05	6.06	6.75	6.89	6.40	6.89	6.74	6.95	8.05	7.01	7.78	6.89	6.77	6.56
21	4.4		6.91	6.26	6.42	6.82	7.02	6.66	6.98	6.78	7.12	8.08	7.03	7.86	7.02	6.79	6.65
27	4.5		6.98	6.74	6.65	7.06	7.14	6.79	7.04	6.79	7.12	8.00	7.07	7.89	7.11	6.84	6.63
4	4.6		6.92	6.52	6.42	6.91	7.10	6.83	7.07	6.90	7.20	8.26	7.18	7.95	7.05	6.82	6.61
9	4.7	Reach Area 1C 20120059	6.90	6.23	6.37	6.93	7.11	6.69	7.03	6.85	7.14	8.25	7.13	7.93	7.05	6.80	6.62
12	5.1		6.85	6.37	6.15	6.61	6.83	6.51	6.85	6.63	6.99	8.04	6.98	7.74	6.94	6.74	6.56
14	5.2		6.90	6.47	6.29	6.79	6.94	6.62	6.95	6.69	7.05	8.04	6.99	7.76	6.94	6.74	6.77
11	5.3		6.80	6.41	6.10	6.58	6.87	6.50	6.85	6.63	6.98	8.04	6.93	7.62	6.83	6.72	6.56
15	5.4		6.91	6.65	6.45	6.93	8.28	6.69	7.11	6.78	7.12	8.15	7.05	7.86	7.04	6.80	6.54
20	5.5		6.92	6.28	6.10	6.99	7.18	6.82	7.05	6.85	7.17	8.13	7.08	7.89	7.03	6.81	6.55
19	5.6		6.95	6.56	6.62	6.99	7.10	6.80	7.07	6.85	7.20	8.18	7.07	7.87	7.04	6.82	6.67
22	5.7		6.96	6.53	6.52	7.00	6.95	6.74	7.12	6.77	7.15	8.12	7.04	7.87	7.10	6.86	6.69
28	6.1	Reach Area 2	7.07	6.72	6.68	7.04	7.15	6.81	7.07	6.84	7.14	8.00	7.02	7.88	7.14	6.86	6.63
24	6.2		7.01	6.64	6.70	7.05	7.15	6.77	7.07	6.82	7.15	8.09	7.09	7.89	7.11	6.89	6.70
2	6.3		6.94	6.44	6.56	6.89	7.04	6.82	7.20	7.01	7.31	8.30	7.20	8.10	7.08	7.01	6.66
29	6.4		6.87	6.62	6.61	7.06	7.13	6.76	7.00	6.79	7.05	7.31	6.94	7.84	7.06	6.75	6.50
13	6.5		6.95	6.46	6.49	6.78	6.84	6.52	6.91	6.68	7.09	8.10	6.96	7.72	6.89	6.74	6.45

Table 55 continued

**28-Day Bioaccumulation Bioassay**  
**AKRF, Tappan Zee**  
**DO (mg/L)**

**Species: *N. virens***  
**Job #: 32-012**

Position #	Code	Sample	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Low	High
8	1.1	Sandy Hook Control	6.98	6.69	7.11	7.11	7.20	6.97	6.88	7.10	6.86	6.73	6.75	6.86	7.14	7.13		
17	1.2	20120081	6.98	6.72	7.07	7.07	7.18	6.94	6.84	7.01	6.79	6.69	6.68	6.82	7.05	7.09		
30	1.3		6.80	6.66	7.09	7.09	7.12	6.87	6.78	7.04	6.82	6.61	6.64	6.66	6.93	7.06	6.49	8.30
5	2.1	Mud Dump Reference	6.84	6.65	7.05	7.05	7.20	6.92	6.84	7.07	6.83	6.67	6.70	6.86	7.15	7.12		
3	2.2	20120079	6.91	6.66	7.09	7.09	7.25	7.13	6.88	7.10	6.83	6.64	6.69	6.87	7.20	7.10		
32	2.3		6.90	6.64	7.07	7.07	7.07	6.81	6.74	6.96	6.76	6.59	6.65	6.72	6.94	7.01		
31	2.4		6.86	6.63	7.04	7.04	7.07	6.78	6.68	6.90	6.71	6.58	6.62	6.73	6.87	6.97		
16	2.5		6.94	6.68	7.06	7.06	7.14	6.95	6.84	7.02	6.79	6.68	6.71	6.82	7.05	7.08	6.42	8.33
23	3.1	Reach Area 1A	6.98	6.75	7.11	7.11	7.20	6.98	6.89	7.13	6.89	6.76	6.79	6.88	7.12	7.16		
7	3.2	20120057	6.90	6.68	7.09	7.09	7.21	6.99	6.88	7.07	6.85	6.68	6.71	6.83	7.13	7.14		
26	3.3		6.94	6.74	7.16	7.16	7.21	7.01	6.92	7.12	6.88	6.72	6.78	6.87	7.09	7.18		
18	3.4		7.00	6.71	7.09	7.09	7.18	6.94	6.82	7.01	6.78	6.70	6.69	6.81	7.04	7.04		
25	3.5		6.97	6.75	7.15	7.15	7.23	7.00	6.92	7.13	6.87	6.76	6.77	6.86	7.11	7.14	6.43	8.23
6	4.1	Reach Area 1B	6.90	6.65	7.08	7.08	7.21	6.96	6.87	7.08	6.84	6.69	6.73	6.88	7.12	7.15		
1	4.2	20120058	6.87	6.68	7.13	7.13	7.50	7.30	7.04	7.27	6.90	6.74	6.80	6.95	8.51	7.27		
10	4.3		6.93	6.62	6.97	6.97	7.14	6.86	6.77	6.99	6.75	6.55	6.71	6.82	7.11	7.12		
21	4.4		6.90	6.69	7.07	7.07	7.17	6.95	6.86	7.06	6.83	6.75	6.76	6.85	7.09	7.12		
27	4.5		6.91	6.71	7.12	7.12	7.18	6.97	6.89	7.11	6.84	6.67	6.71	6.80	7.07	7.13		
4	4.6		6.91	6.65	7.08	7.08	7.24	6.88	6.88	7.10	6.84	6.59	6.64	6.81	7.17	7.13		
9	4.7		6.90	6.68	7.04	7.04	7.19	6.97	6.88	7.11	6.85	6.70	6.73	6.87	7.13	7.13	6.05	8.51
12	5.1	Reach Area 1C	6.82	6.59	6.97	6.97	7.09	6.88	6.78	6.94	6.71	6.61	6.64	6.77	7.05	7.04		
14	5.2	20120059	6.83	6.60	7.04	7.04	7.09	6.89	6.79	6.99	6.68	6.56	6.60	6.73	7.00	7.04		
11	5.3		6.83	6.59	6.95	6.95	7.08	6.88	6.71	6.93	6.74	6.59	6.63	6.78	7.07	7.07		
15	5.4		6.87	6.68	7.08	7.08	7.15	7.00	6.85	7.04	6.80	6.66	6.72	6.79	7.01	7.09		
20	5.5		6.94	6.70	7.09	7.09	7.18	6.97	6.86	7.05	6.83	6.72	6.74	6.84	7.08	7.11		
19	5.6		6.95	6.71	7.09	7.09	7.19	6.97	6.85	7.06	6.83	6.73	6.74	6.83	7.02	7.09		
22	5.7		6.99	6.73	7.10	7.10	7.20	6.98	6.90	7.10	6.88	6.75	6.80	6.88	7.14	7.16	6.10	8.28
28	6.1	Reach Area 2	6.96	6.73	7.13	7.13	7.19	6.97	6.90	7.10	6.86	6.67	6.69	6.79	6.93	7.02		
24	6.2	20120060	7.00	6.76	7.13	7.13	7.22	6.99	6.90	7.13	6.88	6.75	6.78	6.87	7.12	7.16		
2	6.3		6.99	6.69	7.12	7.12	7.27	7.10	6.89	7.10	6.83	6.63	7.06	6.86	7.48	7.13		
29	6.4		6.83	6.72	7.16	7.16	7.17	6.96	6.89	7.09	6.86	6.64	6.71	6.78	7.09	7.08		
13	6.5		6.85	6.56	6.99	6.99	7.08	6.87	6.76	6.95	6.68	6.64	6.66	6.77	7.03	7.05	6.44	8.30
Range																	6.05	8.51

Table 56

**28-Day Bioaccumulation Bioassay**  
**AKRF, Tappan Zee**  
**pH (SU)**

**Species:** *N. virens*  
**Job #:** 32-012

Position #	Code	Sample	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
8	1.1	Sandy Hook Control 20120081	7.87	7.83	7.86	7.70	7.76	7.75	7.73	7.74	7.87	7.87	7.65	7.64	7.67	7.78	7.77
17	1.2		7.88	7.87	7.89	7.74	7.78	7.77	7.78	7.76	7.89	7.89	7.71	7.70	7.72	7.82	7.77
30	1.3		7.88	7.87	7.87	7.75	7.77	7.75	7.79	7.76	7.86	7.92	7.74	7.73	7.77	7.85	7.78
5	2.1	Mud Dump Reference 20120079	7.86	7.79	7.85	7.69	7.75	7.75	7.70	7.73	7.88	7.87	7.62	7.61	7.64	7.76	7.77
3	2.2		7.87	7.81	7.87	7.68	7.79	7.76	7.69	7.73	7.89	7.89	7.59	7.59	7.64	7.75	7.79
32	2.3		7.88	7.86	7.86	7.75	7.77	7.75	7.79	7.77	7.85	7.88	7.74	7.74	7.77	7.84	7.77
31	2.4		7.89	7.90	7.90	7.76	7.78	7.76	7.81	7.77	7.88	7.92	7.75	7.74	7.78	7.86	7.78
16	2.5		7.88	7.86	7.87	7.73	7.78	7.77	7.78	7.76	7.89	7.89	7.71	7.71	7.73	7.82	7.78
23	3.1	Reach Area 1A 20120057	7.88	7.88	7.88	7.75	7.77	7.74	7.78	7.75	7.86	7.86	7.71	7.71	7.74	7.83	7.76
7	3.2		7.86	7.82	7.85	7.70	7.76	7.78	7.73	7.74	7.88	7.86	7.64	7.63	7.66	7.76	7.76
26	3.3		7.87	7.89	7.88	7.75	7.76	7.75	7.78	7.76	7.85	7.86	7.72	7.71	7.74	7.82	7.74
18	3.4		7.88	7.88	7.87	7.74	7.78	7.75	7.77	7.76	7.87	7.88	7.71	7.70	7.72	7.82	7.76
25	3.5		7.87	7.88	7.87	7.75	7.77	7.76	7.79	7.75	7.86	7.87	7.72	7.72	7.75	7.84	7.76
6	4.1	Reach Area 1B 20120058	7.88	7.85	7.90	7.70	7.76	7.77	7.73	7.74	7.89	7.90	7.64	7.64	7.66	7.77	7.77
1	4.2		7.86	7.78	7.90	7.65	7.76	7.79	7.65	7.74	7.93	7.92	7.47	7.46	7.55	7.65	7.87
10	4.3		7.84	7.81	7.82	7.68	7.73	7.73	7.71	7.72	7.84	7.83	7.64	7.63	7.65	7.77	7.75
21	4.4		7.87	7.87	7.87	7.73	7.76	7.74	7.77	7.76	7.86	7.87	7.71	7.70	7.73	7.82	7.76
27	4.5		7.88	7.89	7.89	7.76	7.77	7.75	7.79	7.75	7.87	7.88	7.72	7.72	7.77	7.84	7.76
4	4.6		7.84	7.83	7.86	7.68	7.77	7.75	7.69	7.72	7.88	7.88	7.60	7.60	7.64	7.74	7.78
9	4.7		7.85	7.80	7.83	7.69	7.75	7.74	7.71	7.73	7.85	7.84	7.64	7.63	7.66	7.77	7.76
12	5.1	Reach Area 1C 20120059	7.87	7.85	7.86	7.70	7.75	7.74	7.73	7.74	7.84	7.84	7.66	7.66	7.69	7.77	7.76
14	5.2		7.85	7.85	7.83	7.70	7.75	7.74	7.73	7.73	7.84	7.83	7.67	7.67	7.70	7.79	7.76
11	5.3		7.86	7.82	7.82	7.68	7.74	7.72	7.73	7.73	7.85	7.84	7.65	7.65	7.68	7.78	7.76
15	5.4		7.87	7.85	7.84	7.70	7.77	7.75	7.75	7.73	7.85	7.86	7.68	7.68	7.71	7.81	7.75
20	5.5		7.86	7.85	7.83	7.73	7.77	7.73	7.77	7.75	7.86	7.87	7.71	7.71	7.72	7.82	7.76
19	5.6		7.87	7.86	7.87	7.74	7.77	7.77	7.78	7.75	7.87	7.87	7.71	7.71	7.72	7.83	7.76
22	5.7		7.87	7.87	7.86	7.74	7.77	7.74	7.78	7.76	7.86	7.87	7.71	7.71	7.74	7.83	7.77
28	6.1	Reach Area 2	7.94	7.91	7.90	7.76	7.77	7.75	7.80	7.76	7.87	7.88	7.73	7.73	7.77	7.84	7.76
24	6.2		7.89	7.90	7.90	7.76	7.77	7.74	7.79	7.75	7.87	7.87	7.71	7.72	7.75	7.84	7.76
2	6.3		7.86	7.81	7.89	7.66	7.77	7.79	7.69	7.74	7.90	7.89	7.56	7.57	7.60	7.74	7.79
29	6.4		7.86	7.89	7.88	7.75	7.76	7.75	7.79	7.76	7.86	7.94	7.72	7.72	7.75	7.84	7.76
13	6.5		7.87	7.87	7.87	7.71	7.76	7.75	7.74	7.74	7.87	7.86	7.67	7.67	7.70	7.79	7.76



Table 56 continued

**28-Day Bioaccumulation Bioassay**  
**AKRF, Tappan Zee**  
**pH (SU)**

**Species:** *N. virens*  
**Job #:** 32-012

Position #	Code	Sample	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Low	High
8	1.1	Sandy Hook Control	7.91	7.82	7.45	7.45	7.40	7.75	7.71	7.54	7.88	7.80	7.97	7.86	7.82	7.61		
17	1.2	20120081	7.92	7.83	7.63	7.63	7.60	7.81	7.79	7.66	7.87	7.79	7.84	7.86	7.83	7.67		
30	1.3		7.91	7.84	7.73	7.73	7.72	7.81	7.81	7.73	7.86	7.78	7.85	7.83	7.82	7.73	7.40	7.97
5	2.1	Mud Dump Reference	7.90	7.82	7.36	7.36	7.30	7.72	7.67	7.48	7.88	7.81	7.98	7.87	7.82	7.58		
3	2.2	20120079	7.92	7.83	7.28	7.28	7.20	7.67	7.66	7.43	7.89	7.92	7.98	7.87	7.84	7.56		
32	2.3		7.90	7.83	7.74	7.74	7.74	7.84	7.84	7.74	7.88	7.79	7.84	7.86	7.82	7.74		
31	2.4		7.93	7.84	7.75	7.75	7.73	7.83	7.84	7.74	7.88	7.80	7.84	7.86	7.83	7.73		
16	2.5		7.93	7.84	7.62	7.62	7.59	7.80	7.80	7.65	7.87	7.79	7.86	7.87	7.83	7.68	7.20	7.98
23	3.1	Reach Area 1A	7.91	7.83	7.68	7.68	7.65	7.83	7.82	7.72	7.89	7.79	7.86	7.87	7.84	7.73		
7	3.2	20120057	7.90	7.82	7.43	7.43	7.35	7.73	7.70	7.52	7.88	7.79	7.96	7.85	7.83	7.60		
26	3.3		7.89	7.81	7.70	7.70	7.69	7.82	7.81	7.73	7.87	7.77	7.84	7.85	7.83	7.73		
18	3.4		7.90	7.82	7.63	7.63	7.61	7.81	7.80	7.67	7.88	7.79	7.84	7.84	7.83	7.69		
25	3.5		7.91	7.83	7.70	7.70	7.68	7.83	7.82	7.74	7.89	7.79	7.85	7.86	7.82	7.73	7.35	7.96
6	4.1	Reach Area 1B	7.92	7.83	7.40	7.40	7.34	7.75	7.70	7.52	7.89	7.80	7.98	7.86	7.83	7.61		
1	4.2	20120058	7.90	7.81	7.08	7.08	6.65	7.60	7.58	7.31	7.87	7.91	7.95	7.86	7.83	7.48		
10	4.3		7.88	7.79	7.47	7.47	7.44	7.74	7.71	7.54	7.84	7.76	7.94	7.84	7.82	7.61		
21	4.4		7.91	7.83	7.66	7.66	7.64	7.82	7.81	7.71	7.89	7.79	7.85	7.86	7.83	7.71		
27	4.5		7.92	7.83	7.71	7.71	7.70	7.83	7.83	7.74	7.89	7.77	7.83	7.84	7.81	7.71		
4	4.6		7.90	7.82	7.32	7.32	7.26	7.69	7.66	7.44	7.87	7.84	7.96	7.85	7.83	7.57		
9	4.7		7.88	7.80	7.47	7.47	7.43	7.74	7.71	7.54	7.86	7.78	7.96	7.85	7.83	7.62	6.65	7.98
12	5.1	Reach Area 1C	7.89	7.79	7.53	7.53	7.49	7.76	7.74	7.58	7.85	7.78	7.89	7.85	7.82	7.64		
14	5.2	20120059	7.90	7.81	7.56	7.56	7.53	7.78	7.76	7.61	7.87	7.79	7.85	7.84	7.81	7.65		
11	5.3		7.89	7.80	7.51	7.51	7.46	7.75	7.72	7.56	7.85	7.77	7.94	7.85	7.81	7.63		
15	5.4		7.90	7.82	7.59	7.59	7.56	7.79	7.78	7.64	7.87	7.79	7.85	7.86	7.82	7.66		
20	5.5		7.91	7.83	7.65	7.65	7.64	7.81	7.81	7.70	7.89	7.79	7.85	7.86	7.83	7.71		
19	5.6		7.92	7.83	7.65	7.65	7.63	7.81	7.80	7.69	7.89	7.78	7.85	7.86	7.83	7.71		
22	5.7		7.91	7.83	7.67	7.67	7.66	7.82	7.82	7.71	7.89	7.79	7.86	7.86	7.83	7.72	7.46	7.94
28	6.1	Reach Area 2	7.92	7.84	7.71	7.71	7.70	7.84	7.84	7.75	7.90	7.79	7.85	7.87	7.83	7.72		
24	6.2	20120060	7.92	7.83	7.69	7.69	7.66	7.83	7.82	7.73	7.90	7.78	7.85	7.85	7.83	7.72		
2	6.3		7.92	7.82	7.23	7.23	7.12	7.65	7.62	7.38	7.87	7.89	7.95	7.85	7.83	7.52		
29	6.4		7.91	7.82	7.72	7.72	7.71	7.83	7.83	7.74	7.89	7.79	7.85	7.86	7.82	7.74		
13	6.5		7.91	7.81	7.55	7.55	7.52	7.78	7.76	7.61	7.87	7.76	7.87	7.86	7.82	7.66	7.12	7.95
Range																	6.65	7.98

Table 57

28-Day Bioaccumulation Bioassay  
 AKRF, Tappan Zee  
 Total Ammonia (mg/L)

Species: *N. virens*  
 Job #: 32-012

Position #	Code	Sample	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
8	1.1	Sandy Hook Control	<0.6	<0.6	<0.6												
17	1.2	20120081	<0.6														
30	1.3		<0.6														
5	2.1	Mud Dump Reference	<0.6														
3	2.2	20120079	<0.6	<0.6	<0.6												
32	2.3		<0.6														
31	2.4		<0.6														
16	2.5		<0.6														
23	3.1	Reach Area 1A	<0.6														
7	3.2	20120057	<0.6	1.1	0.76												
26	3.3		0.63														
18	3.4		0.61														
25	3.5		0.88														
6	4.1	Reach Area 1B	0.87														
1	4.2	20120058	0.77	<0.6	<0.6												
10	4.3		<0.6														
21	4.4		<0.6														
27	4.5		<0.6														
4	4.6		1.01														
9	4.7		<0.6														
12	5.1	Reach Area 1C	<0.6														
14	5.2	20120059	<0.6														
11	5.3		<0.6														
15	5.4		0.77														
20	5.5		1.12														
19	5.6		<0.6														
22	5.7		1.12														
28	6.1	Reach Area 2	4.38														
24	6.2		0.66														
2	6.3		0.79	0.88	0.81												
29	6.4		0.66														
13	6.5		1.20														



Table 57 continued

28-Day Bioaccumulation Bioassay  
AKRF, Tappan Zee  
Total Ammonia (mg/L)

Species: *N. virens*  
Job #: 32-012

Position #	Code	Sample	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Low	High
8	1.1	Sandy Hook Control														<0.6		
17	1.2	20120081														<0.6		
30	1.3															<0.6	<0.6	<0.6
5	2.1	Mud Dump Reference														<0.6		
3	2.2	20120079														<0.6		
32	2.3															<0.6		
31	2.4															<0.6		
16	2.5															<0.6	<0.6	<0.6
23	3.1	Reach Area 1A														<0.6		
7	3.2	20120057														<0.6		
26	3.3															<0.6		
18	3.4															<0.6		
25	3.5															<0.6	<0.6	1.08
6	4.1	Reach Area 1B														<0.6		
1	4.2	20120058														<0.6		
10	4.3															<0.6		
21	4.4															<0.6		
27	4.5															<0.6		
4	4.6															<0.6		
9	4.7															<0.6	<0.6	1.01
12	5.1	Reach Area 1C														<0.6		
14	5.2	20120059														<0.6		
11	5.3															<0.6		
15	5.4															<0.6		
20	5.5															<0.6		
19	5.6															<0.6		
22	5.7															<0.6	<0.6	1.12
28	6.1	Reach Area 2														<0.6		
24	6.2	20120060														<0.6		
2	6.3															<0.6		
29	6.4															<0.6		
13	6.5															<0.6	<0.6	4.38
Range																	<0.6	4.38