

Delivery Order No. 22

May 2007

FINAL Water Quality Monitoring Summary Report 2006 Remedial Dredging





Environmental Monitoring, Sampling, and Analysis

New Bedford Harbor Superfund Site New Bedford Harbor, MA

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Submitted to:

Department of the Army U.S. Army Corps of Engineers North Atlantic Division New England District

Contract Number: DACW33-03-D-0004 Delivery Order Number: DO#22

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May 2007

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EXECUTIVE SUMMARY

Remediation dredging was performed in New Bedford Harbor from August through October 2006. Dredge activities occurred primarily in two areas: 'Area A' encompassing southern sections of DMU-1 and DMU-102, and 'Area B' encompassing sections of DMU-2 and DMU-3. Additional dredging activities were conducted in Areas 'C' and 'D' located in DMU-2 (Figure 3). The primary objective of the water quality monitoring program is to conduct boat-based field monitoring to provide field reconnaissance information to the United States Army Corps of Engineers (USACE), United States Environmental Protection Agency (USEPA), and dredging operators, to gauge the extent of water quality impacts resulting from dredging operations. This data is used to guide project operations as necessary in order to minimize environmental impacts, limit recontamination of previously dredged areas, ensure that the dredging activities are conducted in a manner which does not hinder the seasonal migration of anadromous fish to and from the Acushnet River, and to determine the degree and extent of sediment plumes advecting away from the site during dredging operations.

Water quality monitoring started prior to the dredge operations to establish background readings, and continued throughout November, approximately 2 weeks after dredging stopped. Monitoring activities utilized YSI sondes to collect instantaneous real time data on the monitoring vessel. Additional YSI sondes were deployed on moorings to collect longer term data. Each YSI was equipped to measure turbidity, salinity, temperature, depth and dissolved oxygen. The upper level turbidity criterion, defined as a "reportable event" is set at 50 Nephelometric Turbidity Units (NTU) above background measured 600 ft downstream of the dredging and associated activities. A warning criteria was established for an exceedance of 50 NTU above background at 300 ft downstream of the dredging and associated activities. If the warning criteria was exceeded, the USACE was contacted immediately to determine what, if any, operational modifications might be warranted to abate the condition and to reduce the potential for a criteria exceedance at the 600-foot transect. Neither the warning, nor the reportable criteria were exceeded at any time during the 2006 monitoring.

Based on a criteria-driven sampling program, water samples were collected for turbidity, TSS and PCB analyses on seven occasions during the dredge program. Samples from four of these events were also collected for toxicity testing. Metals samples were collected during three of the sampling events and were archived for potential analysis. Samples were collected either to establish baseline conditions and/or re-establish relationships between field measurements (i.e. turbidity) and toxicity results to verify the protectiveness of the +50 NTU criteria. No samples were collected in response to an exceedance of the +50 NTU turbidity criteria.

The deployment of the continuously recording water quality sensors provided additional information that complimented the adaptive monitoring approach discussed above. The location of sensors both north and south of the dredge areas provided information about tidal influences on sediment suspension and transport. Continuous readings provided water quality data for periods when adaptive sampling was not underway. This included inactive dredge periods such as nights and weekends, providing a reasonable background condition for comparison.





As expected, turbidity and TSS results showed a strong correlation (R² = 0.9695). Total PCB (as SUM 18 CONG) concentrations also correlated well with TSS and thus with elevated turbidity. However, dissolved PCBs, which are considered as a direct indicator of water quality, do not demonstrate a similar correlation with TSS. For example, the total to dissolved PCB ratio increased from approximately 2:1 in low TSS samples to 40:1 in the highest TSS sample. *In situ* turbidity measurements indicated that these turbidity plumes, representing high suspended solid loads and elevated total PCB concentrations, were isolated to the area immediately adjacent to dredging and debris removal and were also relatively short lived. Dissolved PCBs in the water column are thought to be the fraction that causes direct toxicity to marine organisms and may be subjected to long range transport. Dissolved PCB concentrations were generally low and did not correlate well with TSS.





1.0 INTRODUCTION

1.1 Site Description

The New Bedford Harbor Superfund Site (Site), located in Bristol County, Massachusetts, extends from the shallow northern reaches of the Acushnet River estuary south through the commercial harbor of New Bedford and into 17,000 adjacent acres of Buzzards Bay (Figure 1). Industrial and urban development surrounding the harbor has resulted in sediments becoming contaminated with high concentrations of many pollutants, notably polychlorinated biphenyls (PCBs) and heavy metals. At least two manufacturers in the area used PCBs while producing electronic devices from 1940 to the late 1970s, when the use of PCBs was banned by the EPA. Based on human health concerns and ecological risk assessments, the U.S. Environmental Protection Agency (USEPA) added New Bedford Harbor to the National Priorities List in 1982 as a designated Superfund Site. Through an Interagency Agreement between the USEPA and the U.S. Army Corps of Engineers, New England District (USACE NAE), the USACE is responsible for carrying out the design and implementation of the remedial measures at the site. The Site has been divided into three areas – the upper, lower and outer harbors – consistent with geographical features of the area and gradients of contamination (Figure 2). All of the activities conducted under the Water Quality Monitoring occurred in the upper Harbor.

Aerovox Inc. in New Bedford, MA used PCBs from c. 1940 to c. 1977 in the manufacture of electrical capacitors and transformers. This facility is considered one of the major sources of historic PCB contamination to New Bedford Harbor. The highest concentrations of PCBs were found in sediments in a 5-acre area in the northern portion of the Acushnet River Estuary adjacent to the Aerovox facility. These 'hot spot' sediments, which contained PCBs upwards of 100,000 mg/kg, were removed between 1994 and 1995 as part of USEPA's first clean-up phase. Full scale remediation dredging was initiated in 1994 and continued in 2005 and 2006. To a lesser extent, PCB contamination in New Bedford Harbor is related to activities at the Cornell-Dubilier mill on the western shore of the outer harbor. In 2005 a 15 acre underwater cap pilot project was implemented near Cornell-Dubilier to cap PCB contaminated sediments (Figure 2).

The Site is divided into a series of Dredge Management Units (DMU) based on contamination levels, contamination sources, topography, and other factors. In 2006, dredge activities were planned for two areas (1) 'Area A' located in the southern sections of DMU-1 and DMU-102, and (2) 'Area B' located along the boundary of DMU-2 and DMU-3 and DMU-4. In addition, dredging was conducted in Areas 'C' and 'D' of DMU-2 (Figure 3).

The remediation of this site involves the excavation and dredging of approximately 880,000 cubic yards of PCB contaminated sediment. The majority of contaminated material is being removed utilizing a hydraulic dredge that will pump dredge slurry to the project's Sawyer Street facility where it will be mechanically processed to remove all sand, gravel, and debris material. The silt and clay size materials will then be pumped to the Area D Dewatering Facility located on Herman Melville Boulevard where it will be mechanically dewatered and transported off-site for disposal.







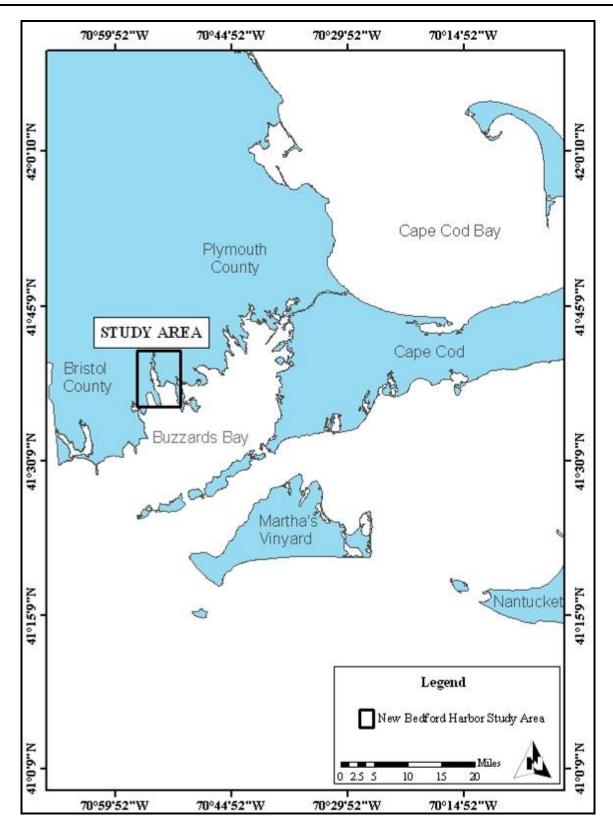


Figure 1. Location of the Site in Southeastern MA.







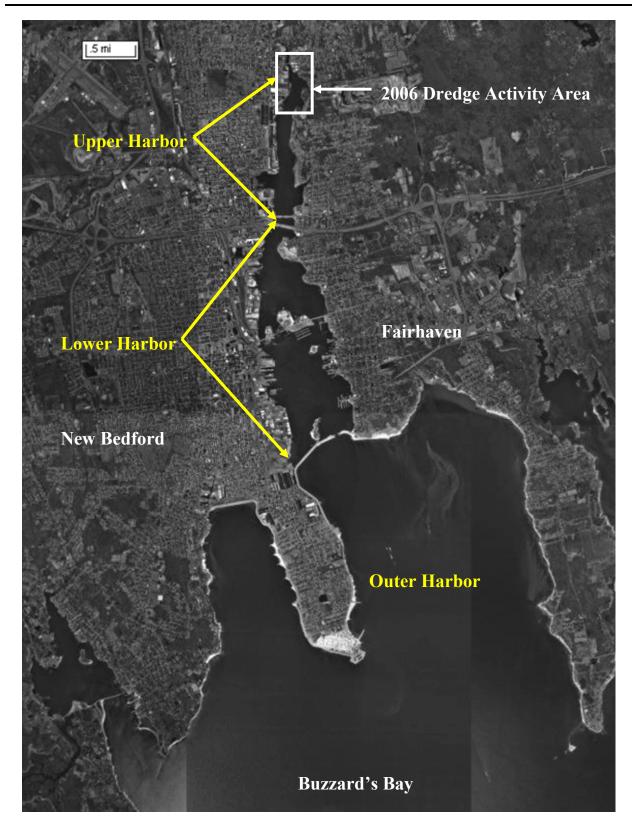


Figure 2. Location of the 2006 Dredge Activity Area within New Bedford Harbor.





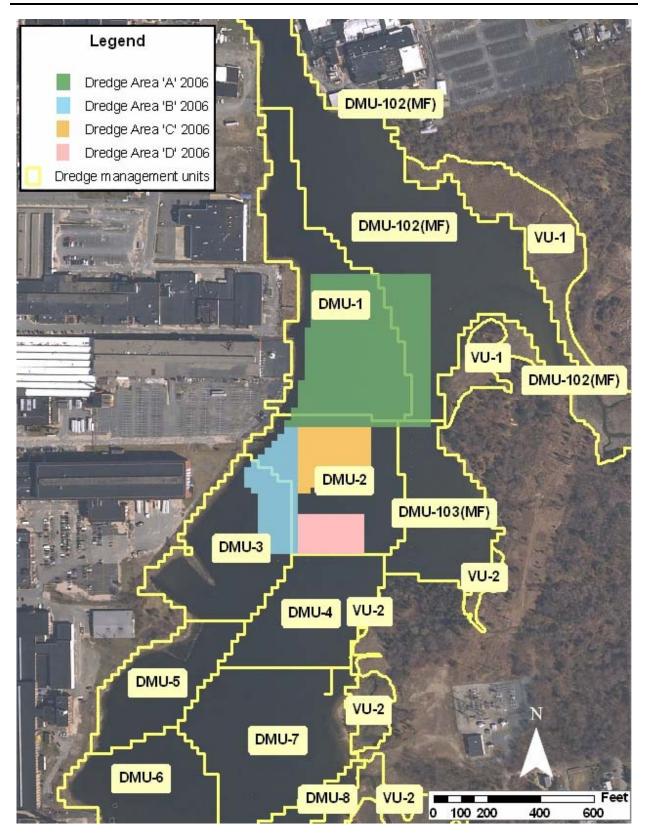


Figure 3. 2006 Dredge Areas





1.2 Project Objectives and Field Activity Summary

The resuspension of sediments during dredging, and dredging related activities, can transport contaminated sediments away from the dredge area. Additionally, contaminated sediments suspended in the water column present a concern for potential toxicity to aquatic organisms in the project area. The primary objective of this monitoring effort was to conduct boat-based field monitoring to provide field reconnaissance information to the United States Army Corps of Engineers (USACE), United States Environmental Protection Agency (USEPA) and dredging operators, to gauge the extent of water quality impacts resulting from dredging operations. This information may be used to make operational adjustments as needed to limit the dispersal of suspended sediments and their associated contaminants as well as limit the extent of biological impacts to the water column. An additional objective was to ensure that the dredging activities were conducted in a manner which did not hinder the seasonal migration of anadromous fish in the Acushnet River (i.e. fish are able to successfully navigate past dredging operations).

The upper level turbidity criterion, defined as a "reportable event" is set at 50 Nephelometric Turbidity Units (NTU) above background measured 600 ft downstream of the dredging and associated activities. A warning criteria was established for an exceedance of 50 NTU above background at 300 ft downstream of the dredging and associated activities. If the warning criteria was exceeded, the USACE was contacted immediately to determine what, if any, operational modifications may be warranted to abate the condition and to reduce the potential for a criteria exceedance at the 600-foot transect.

1.3 Water Quality Monitoring Program

The focus of the 2006 water quality monitoring program was on near-field water column impacts as well as assessment of the extent of sediment resuspension and transport away from the dredging operation. This data is used to guide project operations as necessary in order to minimize environmental impacts, limit recontamination of previously dredged areas, ensure that the dredging activities are conducted in a manner which does not hinder the seasonal migration of anadromous fish to and from the Acushnet River, and to determine the degree and extent of sediment plumes advecting away from the site during dredging operations. To meet this objective, a tiered monitoring approach was employed which incorporated field measurements of turbidity and water quality parameters and water sampling for toxicity testing and laboratory analysis on a periodic basis as needed. Water column measurements were conducted along four key transects for each of the dredge areas. The locations are described here and illustrated for dredge Area A, in Figure 4. As dredging operations moved throughout the dredge areas, the monitoring locations moved relative to those activities as follows:

- **Reference:** A reference station 1,000 ft up-current of dredging operations to provide background conditions.
- **Dredge Boundary:** Measurements were made at the edge of the dredge area. This is defined as a down-current location as close as practicable and as safety allows.
- **300 ft Downstream:** Defined as a transect set, 300 ft down-current from the dredging operation.
- **600 ft Downstream:** Defined as a transect set, 600 ft down-current from the dredging operation.







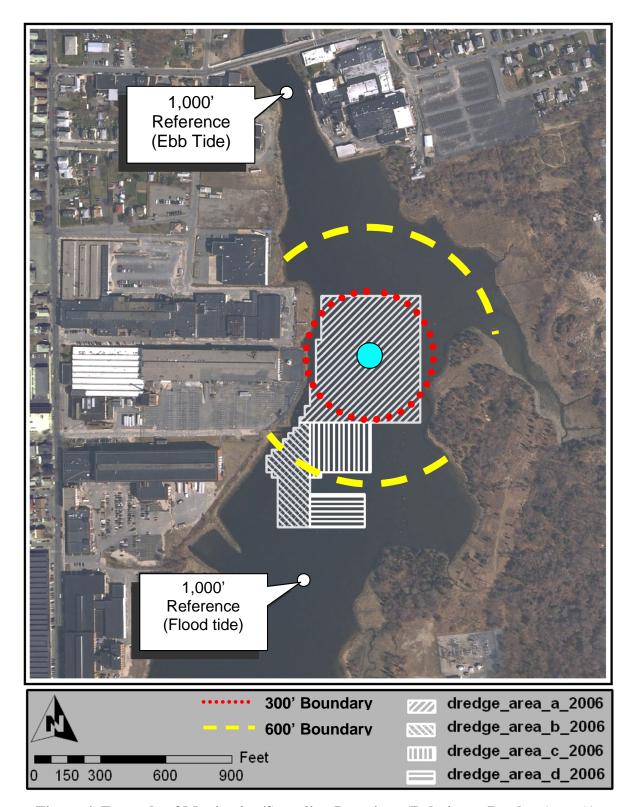


Figure 4. Example of Monitoring/Sampling Locations (Relative to Dredge Area A).





2.0 METHODS

The Battelle QAPP (Battelle, June 2006a) and the Water Quality Field Sampling Plan (FSP) (Battelle, July 2006b) contain additional details on survey/sampling methods.

2.1 Sampling Rationale

The established sampling approach for this program employs a variety of sampling methods to characterize sediment resuspension, sediment transport, and its impact on water quality. The overall approach utilizes an adaptive, criteria-based sampling scheme to monitor project-related water quality impacts. This is broken up into a series of sampling 'levels' which vary in the degree to which analytical samples are collected. The more intensive levels were utilized when there was greater potential for a specific dredging activity to have an impact on water quality. This was particularly true for new activities or activities in new areas. Based on information from these sampling levels, sampling was reduced to the lower intensity levels when appropriate. Sampling Levels I, II, and III are designed to collect water samples at designated distances away from the dredge operation to limit the extent of impact (Boundary, 300 ft, and 600 ft). Based on results acquired throughout the monitoring season, a second type of sampling was added to the design. Under this approach, specific levels of turbidity were targeted for sampling regardless of their location relative to dredging. This approach was added in order to evaluate turbidity/PCB/toxicity relationships and confirm that current criteria are adequately protective of the aquatic environment. These approaches are discussed below and the criteria based sampling following the decision sequence in Figure 5. Table 1 lists all sample collection information.

- Level I: Level I represents a sampling approach for discrete samples and was conducted for those activities having the greatest potential to impact water quality or when new conditions were encountered. Initially discrete samples were collected at designated locations: Reference, Dredge Boundary, 300 ft downstream, and 600 ft downstream. At each station discrete water samples were collected for all parameters from the depth of highest turbidity, based on the *in situ* readings. During the monitoring season it was observed that sampling under Level I, while achieving its objectives, was not capturing elevated turbidity levels. As a result there was limited data regarding the water quality impacts associated with elevated turbidity. As a result, Level I sampling was modified to include additional discreet sample collections at locations having a full range of turbidities (25-100 NTU) to be used in evaluating the protectiveness of the threshold criteria. In all cases it was necessary to sample in fairly close proximity (<300 ft) from debris removal operations in order to collect high turbidity samples. Often times samples were collected <75 ft from operations. These samples were obtained to evaluate turbidity/PCB/toxicity relationships and did not represent exceedances of water quality criteria
- Level II: Level II represents a lower level of monitoring intensity (from Level I) given a decreased concern for water quality impacts from an activity. Similar to Level I, Level II was designed to collect samples based on distance from dredge activities although no 600 ft sample was required due to the decreased concern for far-field impact(s). Similar to Level I, modifications were made during the dredge season in order to adequately characterize the sediment plume which was rarely found near the pre-established



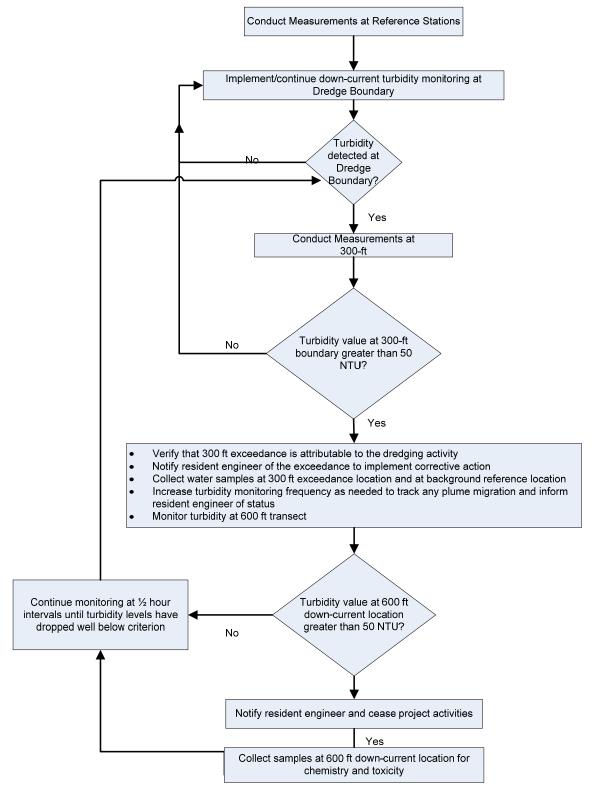


transects. Table 1 lists the samples which were submitted for analysis under Level II sampling.

• Level III: The sampling was conditional based on results of turbidity monitoring. Furthermore, a Level III monitoring effort was contingent upon any exceedance of the project-based criterion or based on detection of sheens or plumes emanating from the project area. It should be noted that at no point during the 2006 season were any of the Level III criteria exceeded. As a result no samples were analyzed under the Level III design.







Notes: 1:50 NTU value was defined as 50 NTU above background turbidity level

Figure 5. Decision Sequence for Water Quality Monitoring.



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Table 1. Number of Samples Collected During Each Level of Required Monitoring.

		Monitoring					
Week	Date	Level	Sample Description ¹	Sample ID	Parameters ²		
-1	8/10/06	Background	NA	NA	NA		
			Reference	WQ-XXX-001-081406	DPC, TPC, TSS, TUR, TOX, MET		
1	8/14/06	Level I	Boundary	WQ-XXX-002-081406	DPC, TPC, TSS, TUR, TOX, MET		
1	0/14/00	(Background)	300 ft	WQ-XXX-003-081406	DPC, TPC, TSS, TUR, TOX, MET		
			600 ft	WQ-XXX-004-081406	DPC, TPC, TSS, TUR, TOX, MET		
	8/15/06	III	NA	NA	NA		
	8/16/06		Reference	WQ-XXX-001-081606	DPC, TPC, TSS, TUR, TOX		
		I	Boundary	WQ-XXX-002-081606	DPC, TPC, TSS, TUR, TOX		
			300 ft	WQ-XXX-003-081606	DPC, TPC, TSS, TUR, TOX		
	8/17/06	III	NA	NA	NA		
	8/18/06	III	NA	NA	NA		
2	8/21/06	III	NA	NA	NA		
	8/22/06	III	NA	NA	NA		
	8/23/06	III	NA	NA	NA		
			Reference	WQ-XXX-001-082806	DPC, TPC, TSS, TUR, TOX		
3	8/28/06	I	50 NTU	WQ-XXX-002-082806	DPC, TPC, TSS, TUR, TOX		
			25 NTU	WQ-XXX-003-082806	DPC, TPC, TSS, TUR, TOX		
	8/29/06	III	NA	NA	NA		
	8/30/06	III	NA	NA	NA		
			0 NTU	WQ-XXX-001-090606	TSS, TUR		
	9/6/06	II	15 NTU	WQ-XXX-002-090606	TSS, TUR		
			20 NTU	WQ-XXX-003-090606	TSS, TUR		
4			35 NTU	WQ-XXX-004-090606	TSS, TUR		
			135 NTU	WQ-XXX-005-090606	TSS, TUR		
			75 NTU	WQ-XXX-006-090606	TSS, TUR		
			50 NTU	WQ-XXX-007-090606	TSS, TUR		
	9/7/06 II		NA	NA	NA		
5	9/11/06	III	NA	NA	NA		
	9/12/06	III	NA	NA	NA		
6	9/18/06	III	NA	NA	NA		
			1 NTU	WQ-XXX-001-091906	DPC, TPC, TSS, TUR, TOX, MET		
	9/19/06	I	50 NTU	WQ-XXX-002-091906	DPC, TPC, TSS, TUR, TOX, MET		
			25 NTU	WQ-XXX-003-091906	DPC, TPC, TSS, TUR, TOX, MET		
			75 NTU	WQ-XXX-004-091906	DPC, TPC, TSS, TUR, TOX, MET		
9/20/06		III	NA	NA	NA		
7	9/25/06	III	NA	NA	NA		
8	10/4/06	III	NA	NA	NA		
	10/9/06	5 II	75 ft N (flood tide) of Debris Removal	WQ-XXX-001-100906	DPC, TPC, TSS, TUR		
9			25 ft S (ebb tide) of Debris Removal	WQ-XXX-002-100906	DPC, TPC, TSS, TUR		
			25 ft S (ebb tide, 30 min after previous sample) of Debris Removal	WQ-XXX-003-100906	DPC, TPC, TSS, TUR		
			200 ft S of Debris Removal	WQ-XXX-004-100906	DPC, TPC, TSS, TUR		
	10/11/06	III	NA	NA	NA		
10	10/16/06	II	South Reference	WQ-XXX-001-101606	DPC, TPC, TSS, TUR, MET		
			25 NTU	WQ-XXX-002-101606	DPC, TPC, TSS, TUR, MET		
	10/17/06	III	NA	NA	NA		

⁻ Samples are collected either based on distance (i.e., 300 ft, 600 ft) or Turbidity levels (i.e., 25, 50 NTU), see Section 2.1 for further discussion on Sample Location.

² – Parameters listed in the Table are the following: DPC =Dissolved PCB, TPC =Total PCB, TSS =Total Suspended Solids, TUR =Turbidity, TOX =Toxicity, MET =Metals

NA – Not Applicable





2.2 In Situ Measurements

In situ measurements of depth, turbidity, temperature, salinity, and dissolved oxygen were acquired using a YSI 6920 water quality probe with real-time display and data logging. Monitoring combined preplanned measurements to support discrete sampling as described below, and criteria based sampling following the decision sequence in Figure 5.

It should be noted that since the Acushnet River is tidally influenced, the definitions of upstream and downstream are generally dependent upon tide. On ebb tides, "downstream" is always to the south of dredging activities. However, during flood tides flow is often predominately to the north. Variability in freshwater flow also impacts dominant current direction and its influence on transport of suspended sediments. Several times throughout the 2006 monitoring program a clear stratification of the water column was observed. In these cases lower density freshwater sat on top of higher density, more saline tidal waters. Frequently the incoming tidal water was moving north, while the freshwater lens was flowing south. These physical water properties were closely monitored throughout the day, and adjustments were made in the sampling design in order to accurately assess sediment resuspension and its transport in all directions. Throughout this report the terms "downstream" and "down-current" always refer to the direction of water movement relative to the dredging operations at that point in time regardless of physical direction (north versus south).

The following describes field activities by location:

Reference Station: At the start of each sampling day the vessel transited to the reference location 1,000 ft upcurrent (based on tidal stage) from the active dredge area. This location was outside the influence of any localized turbidity sources (ex. CSO discharges or storm water drains), but still representative of the water flowing through the deeper channel areas up current of the dredge area. Water depth was measured with a lead-line and the result recorded on the field log. The in situ sensors were lowered slowly (~5sec/foot) through the water column with care taken to avoid placing the instruments on the bottom. As the sensors were lowered, the sampling personnel observed the turbidity readings and identified the depth of the highest turbidity values. After the full "downcast" was conducted, the sensors were pulled back up through the water column and held at the location of highest turbidity. The *in situ* readings for all parameters at this depth were recorded on the Field Log Sheet. This reading served as the background value for subsequent turbidity readings taken throughout the day (i.e. this value was subtracted from subsequent readings to determine if the 50 NTU above background criterion was exceeded). Discrete samples were collected as required (see Section 2.1). Reference locations were resampled if conditions changed. Examples of relevant changes include change in tidal flow; change in dredge operations; and changing weather conditions such as rain events which can dramatically alter ambient water quality conditions. Resampling of the reference location was conducted at the field team's discretion based on real-time data feedback and field observations.

<u>Dredge Boundary:</u> Following the collection of *in situ* and discrete samples at the reference location, the sampling team transited down-current of dredging operations. *In situ* readings were collected as close to the dredge, or other operation, as safety allowed in the same manner described for the reference location. Based on the sampling requirements for that survey day (i.e. Levels I, II, and III) discrete samples were or were not collected (Section 2.1).





300 ft Downstream: 300 ft downstream from the dredge operations, the vessel operated along a transect across the width of the river while collecting *in situ* readings. Real-time data feedback was used to identify any suspended sediment plumes. The focus was on identifying the centroid of the plume (highest turbidity readings) as well as the plume boundaries (lowest turbidity readings above background). High and low readings along the transect were recorded to show the relative intensity of the plume as well as its spatial dimensions. Once the centroid was identified, subsequent readings were concentrated at this location in order to identify fluctuations in the plume intensity and potential exceedances of the caution threshold. Based on the sampling requirements for that survey day (i.e. Levels I, II, and III) discrete samples were or were not collected (Section 2.1).

<u>600 ft Downstream</u>: 600 ft downstream from the dredge operations, *in situ* transects were conducted as described above for the 300 ft downstream transect. Based on the sampling requirements for that survey day (i.e. Levels I, II, and III) discrete samples were or were not collected (Section 2.1).

Fixed point in situ sensors: In addition to the boat-based monitoring in situ data were collected using YSI 6920 water quality meters with internal data logging capabilities which were deployed at fixed locations for extended periods of time. The sensors internally recorded water temperature, salinity, dissolved oxygen, and turbidity. The sensors were deployed on August 15 during the first week of dredging and remained in use until November 15, approximately 3 weeks after the cessation of dredge related activities. Their location (horizontal and vertical) was based on data acquired during the first week of monitoring. The objective of sensor placement was to supplement the boat-based monitoring. Locations included one upstream and one downstream location just beyond the dredge area. The upstream sensor was located in the main river channel, 100 ft north of the northwest corner of the active dredge area. The downstream sensor was originally located 200 ft south of the southwest corner of the dredge area. The downstream sensor was relocated on September 19 (week 6) to avoid interference with dredge operations and the movement of equipment. The new location was 200 ft south of the dredge area, in the middle of the main channel. These locations are shown on Figure 6. The sensors were deployed on moorings with a surface marking buoy and a subsurface buoy from which the sensor was suspended. With tidal fluctuations, the water depths at the mooring locations ranged from approximately two to seven feet. Due to the relatively shallow water at the deployment locations and the large tidal fluctuation, a sampling configuration was designed which maximized characterization of the entire water column while keeping the sensors from resting on the bottom sediments. A depiction of the deployment configuration is shown in Figure 7. At lower tides the sensors floated within one foot of the surface. At higher tides, the sensors were maintained approximately three feet off the bottom.

The YSI internal sampling rate was set to 15 minutes. The sensors were retrieved and deployed as part of the boat-based monitoring program. The sensors were retrieved for routine maintenance as needed. Between each deployment, the sensors were cleaned, recalibrated, the data were downloaded, and the batteries were replaced as needed to ensure a minimum of two weeks battery life.







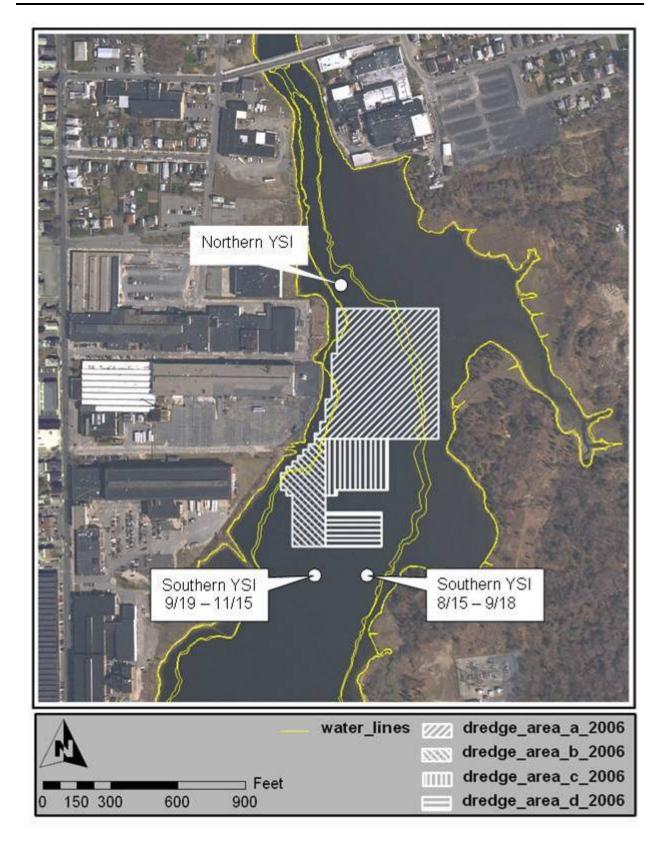


Figure 6. Location of Continuous In Situ Sensor (YSI) Deployments







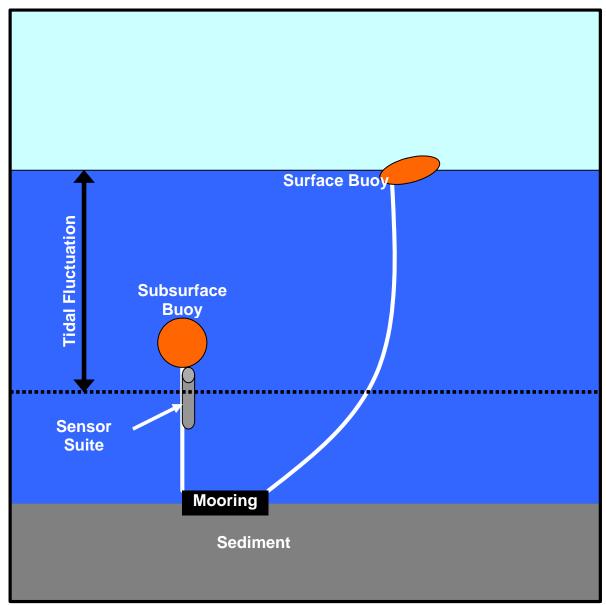


Figure 7. Depiction of the Continuous In Situ Sensor Deployment Configuration

2.3 Discrete Water Samples

The collection of discrete water quality samples was conducted using a 12-volt Teflon diaphragm pump and the appropriate length of Teflon® tubing. The inlet of the tubing was attached to the body of the YSI *in situ* sensors to ensure that the sensor measurements and the analytical results are representative of the same parcel of water. Prior to collecting samples at each location sample water was pumped continuously through the system for several minutes to purge the system. This purging ensured that the system was cleared prior to actual sample collection to avoid site to site cross-contamination.





Following purging, water from the pump outlet was collected directly into the appropriate sample containers for each analysis (Table 2). Table 2 also provides the sample volume, preservation, and analytical lab information. The samples were labeled as described in Table 2. All samples collected in the field were placed in coolers on ice until transport to the field trailer. At the field trailer samples were stored cold $(4 \pm 2 \, ^{\circ}\text{C})$ in the sample refrigerator or on ice in the coolers until packaged for shipment to the laboratories. Samples were packaged in wet or blue ice and were hand delivered or shipped overnight to the appropriate laboratories. Table 1 details the sample collection for each Station during each Level of activity.

Table 2. Sample Volumes, Containers, and Processing for Field Samples.

Parameter	Sample Volume	Sample Container	Preservation	Storage Condition	Holding Times ¹	Analytical Lab	
TSS	1L	HDPE Bottle	Ice	4 <u>+</u> 2 °C	7 Days	Alpha Woods Hole Lab 375 Paramount Drive Suite 2 Raynham, MA 02767 Ph:508-822-9300	
Turbidity	1L	HDPE Bottle	Ice	4 <u>+</u> 2 °C	48 Hours		
Aqueous Total PCB	1 L	Wide-mouth Amber Glass Bottle	Ice	4 <u>+</u> 2 °C	7 Days	Battelle Duxbury ²	
Aqueous Dissolved PCB	2 L	Wide-mouth Amber Glass Bottle	Ice	4 <u>+</u> 2 °C	7 Days	397 Washington Street Duxbury, MA 02332 Ph: 781-952-5200	
Total Metals	500 ml	HDPE Bottle	HN03	4 <u>+</u> 2 °C	6 Months		
Toxicity (all samples for toxicological analysis collected into one container)	5 gallons	Cubitainer	Ice	4 <u>+</u> 2 °C	24 Hours	EnviroSystems, Inc One Lafayette Road P.O. Box 778 Hampton, NH 03843 Ph: 603-926-3345	

¹ – Holding time to initial Lab preparation.

2.4 Sample Analysis

Like the field sampling, sample analysis includes both predefined samples and contingency based samples. Figure 8 shows the laboratory based decision sequence for analysis of samples. All samples were delivered to the respective laboratories (Table 2).

Requirements for chemical and biological testing can be found in the QAPP Addendum *Environmental Monitoring, Sampling, and Analysis at the New Bedford Harbor Superfund Site, New Bedford, MA* for detailed analytical requirements (Battelle, 2006a). An overview of the methods used is provided below.

² – All metals samples were archived at Battelle, Duxbury. If analysis is required, samples will be analyzed by Battelle Marine Sciences Lab in Sequim, Washington.





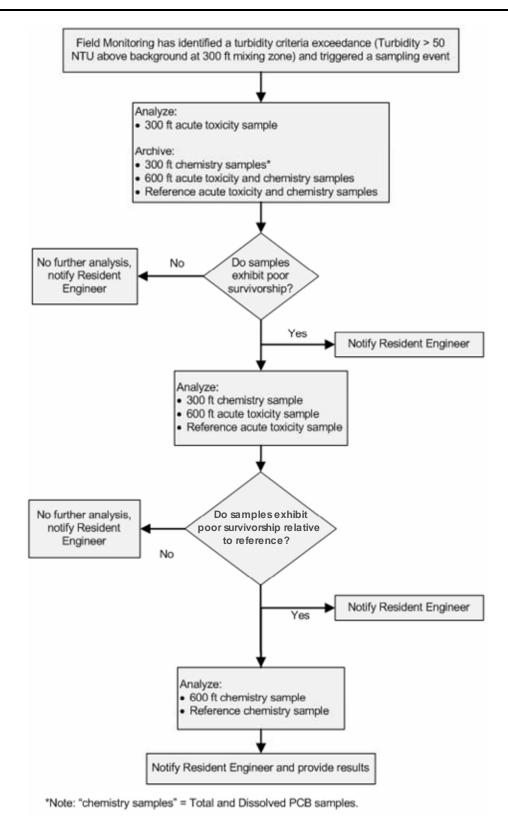


Figure 8. Decision Sequence for Sample Analysis





2.4.1 TSS/Turbidity Analyses

Total suspended solid (TSS) and turbidity in the water samples were analyzed by Alpha Woods Hole Group (AWHG). TSS was analyzed following AWHG SOP Total Suspended Solids (TSS) Non-Filterable Residue, Rev. 5.0 which was based on EPA Method 160.2; turbidity was analyzed following AWHG SOP Turbidity 180.1, Rev. 2.2, which was based on EPA Method 180.1

2.4.2 PCB Analyses

The analysis of 18 NOAA PCB congeners in water samples was conducted by Battelle Duxbury laboratory. Water samples were extracted following modified EPA Method 3510C (Battelle SOP 5-200). Prior to extraction, water samples that were designated for dissolved PCB analysis were filtered through pre-baked glass fiber filters (1 µm pore size). The sample filtration and extraction were usually conducted within 24 hours of sample collection. Total (or whole water) PCB samples involved extraction of approximately 1 liter of unfiltered water. Both dissolved (filtered) and whole water samples were spiked with surrogates and extracted three times with dichloromethane using separatory funnel techniques. The combined extract was dried over anhydrous sodium sulfate, concentrated, and processed through an alumina column. Depending on the color of the extract, it was further cleaned using gel-permeation chromatograph/high performance liquid chromatography (GPC/HPLC). Samples in batches 06-0286 (collected on 8/14), 06-0306 (collected on 8/28), 06-0328 (collected on 9/19), and 06-0349 (collected on 10/9) received both alumina column and GPC/HPLC clean-ups, while samples in batch 06-0290 (collected on 8/16) only received alumina clean-up. In addition, sample extracts in batch 06-0359 (collected on 10/16) were cleaned first using sulfuric acid, and then processed through disposable Florisil columns for further clean-up. Analytical results of these water samples indicated that samples processed through different clean-up procedures did not show significant differences in surrogate recoveries and matrix interference, suggesting that all clean-up combinations were sufficient and effective.

The post alumina, GPC/HPLC, or Florisil extract was concentrated, fortified with internal standards (IS), and then analyzed for 18 NOAA PCB congeners using gas chromatography/electron capture detector (GC/ECD), following modified EPA Method 8082 (Battelle SOP 5-128). Sample data were quantified by the method of internal standards, using the spiked internal standards (IS) compounds. Due to the highly-contaminated nature of the samples, most of the water sample extracts were diluted and analyzed again to resolve concentrations of compounds that exceeded the calibration range during the initial GC/ECD runs.

2.4.3 Toxicity Analyses

Acute and chronic (sub-lethal) exposure screening assays evaluating surface water samples collected from New Bedford Harbor were performed to evaluate the potential toxicity of surface water samples collected in New Bedford Harbor associated with dredging activities. Assay design included a laboratory control treatment and one or more surface water samples, generally including a site reference sample. Samples were evaluated "As Received" without dilutions. Testing was based on programs and protocols developed by the US EPA (2002) primarily designed by the EPA to provide standard approaches for the evaluation of toxicological effects of discharges on aquatic organisms, and for the analysis of water samples. Testing included the





following assays; modified 2 day acute and 7 day chronic assays conducted with the mysid shrimp, *Americamysis bahia*, and the red macro alga, *Champia parvula*, and 60 minute chronic fertilization assays conducted with the purple sea urchin, *Arbacia punctulata*. All mysid and urchin fertilization assays and a portion of the algal assays were conducted by Envirosystems, Inc. (ESI) at its Hampton, New Hampshire facility. Additionally, the algal assays were conducted by the Saskatchewan Research Council, SRC, Saskatoon, Saskatchewan, Canada. Supporting data including laboratory bench sheets, full statistical reports, custody forms, sample receipt forms and water quality data are provided in Appendix D.

2.4.3.1 Test Species

A. bahia, ≤ 5 days old, were obtained from cultures maintained by Aquatic Research Organisms (ARO), Hampton, New Hampshire. Juvenile shrimp were collected daily, isolated, and placed in a rearing tank for up to 6 days. Holding tanks were maintained in a flow-through culture mode at a temperature of $25\pm2^{\circ}$ C. At the start of the assays the mysids were 7 days old. Juveniles were fed ≤ 24 hour old brine shrimp on a daily basis. Water temperature, salinity, and pH were monitored on a daily basis. Prior to testing organisms were siphoned from the rearing tanks to a holding vessel, and then transferred to test chambers using a large bore pipet, minimizing the amount of water added to test solutions.

A. punctulata adults were from cultures maintained by ESI. Original stock was obtained from commercial supply. Male and female urchins were maintained in separate chambers as recommended by protocol (USEPA 2002) and ESI. Adult urchins were induced to spawn by the injection of a potassium chloride solution. The viability of gametes obtained was determined prior to their addition to the test solutions. Eggs and/or sperm that would not result in a fertilized egg were rejected from the pool of gametes used in the assay.

C. parvula biomass was obtained from stock cultures maintained by the Saskatchewan Research Council. Original stocks were obtained from the University of Texas algal collection. The male and female plants are maintained in separate culture vessels under sterile conditions. Algal cultures were maintained on an orbital shaker (100 rpm) at 23±2°C under 16 hour light: 8 hours dark at 40 to 75 foot candles light intensity. Cultures are "cropped" and transferred to fresh nutrient solutions on a weekly basis.

2.4.3.2 Surface Water Samples and Laboratory Control Water

Grab surface water samples were collected by Battelle staff on each of the four Level I surveys in the Harbor; (see Toxicity in Table 2). Samples were placed in polyethylene cubitainers for shipment to the laboratory. Two, 2.5 gallon cubitainers were collected for each of the chronic assays. Prior to testing in the lab, samples were evaluated to document salinity, conductivity, and total residual chlorine. Total residual chlorine was measured by amperometric titration (MDL 0.05 mg/L). Prior to use in the assays the salinity of the samples was adjusted, if necessary, to predetermined levels using artificial sea salts for *A. bahia* and *A. punctulata* assays, and GP-2 salts (USEPA 2002) for the *C. parvula* assays. The salinity of samples for the *A. bahia* acute and chronic exposure assays was adjusted to 25±2‰ while the salinity for samples used for the *A. punctulata* and *C. parvula* assays was adjusted to 30±2‰. Samples with initial salinity measurements above these levels were not adjusted.





Laboratory control water used for mysid and sea urchin assays was collected from the Hampton/Seabrook Estuary. This water is classified as SA-1 and has been used to culture marine test organisms since 1981. The laboratory control water used in the algal assay, collected from Rye, New Hampshire, is the same water used in culture maintenance. Prior to use, seawater used in the algal assays was filtered through glass fiber filters and sterilized. Dilution water used in the algal assays conducted by SRC was natural seawater collected from the West Coast of Canada. Salinity of the surface water samples was adjusted using commercial sea salts.

2.4.3.3 Bioassays

Americamysis bahia Modified Acute and Chronic Exposure Bioassays

Modified acute and chronic exposure screening assays were conducted in a static renewal test mode with renewals made at 24-hour intervals. The 7 day assays were conducted at a temperature of 26±1°C with a photoperiod of 16:8 hours light:dark. Mysids were maintained in 250 mL beakers containing 150 mL of test solution. Approximately 100 mL of the test solution were replaced each day. The assay incorporated 8 replicates with 5 organisms/replicate. Survival and dissolved oxygen were measured daily in each replicate prior to test solution renewal. Salinity, temperature and pH were recorded in a composite sample of the "old" test solution and in the "new" test solution prior to being added to the test chamber. Incubator temperatures were also recorded on a daily basis.

During the test, mysids were fed 24 hour old *Artemia* nauplii. On Day 7 of the assay, surviving mysids were removed from test solutions, rinsed to remove any surface detritus and salts, and transferred to tared foils and dried for 24 hours at 103°C. Foils were weighed to the nearest 0.01 mg. Mean dry weights per individual were obtained by dividing the net dry weight of all surviving organisms by the number of organisms added at the start of the assay.

Arbacia punctulata Chronic Exposure Fertilization Assays

Gametes were obtained by potassium chloride injection to induce spawning. Sperm were collected dry, diluted to achieve a concentration of approximately 5.0 x 10⁷ sperm/mL in the surface water treatments. Actual sperm concentrations are provided on laboratory bench sheets in Appendix D. Sperm solutions were added to 5 mL aliquots of each sample being evaluated and allowed to remain in the test solutions for 60 minutes before the addition of unfertilized eggs.

Each treatment incorporated a total of four replicates. After 20 minutes of exposure the assay was terminated by the addition of 0.2 mL of preservative. Aliquots of preserved solution were counted to determine numbers of fertilized and unfertilized eggs. Fertilization was accepted based on the presence or absence of a fertilization membrane around the egg.

Champia parvula Modified Acute and Chronic Exposure Assays

The 7 day red algae assay was conducted with a 2 day exposure period to the surface waters and laboratory control treatments. Each treatment used four replicates with five female branches and one male branch per replicate. Temperature was maintained at 23 ± 1 °C. The light source was cool white and fluorescent bulbs set on a 16:8 hours light:dark cycle, with a light intensity of 40 to 75 foot candles. Light intensity was checked at the start of each assay. Temperatures were monitored on a daily basis. Test chambers were 200 mL borosilicate glass fleakers. After 2 days exposure, female branch tips were transferred to approximately 100 mL of recovery medium





with added nutrients and allowed to recover and mature for 5 days. During transfer, plants were examined to determine the physical condition of the individual branches. Branches showing signs of degeneration were noted and used to establish an acute endpoint. After the recovery period, the number of cystocarps (reproductive bodies) on each female branch were counted.

2.4.3.4 Data Analysis

Statistical analysis of acute and chronic exposure data was completed using CETIS, (Comprehensive Environmental Toxicity Testing System), software. The program computes acute and chronic exposure endpoints based on EPA decision tree guidelines specified in individual test methods. For chronic exposure endpoints statistical significance was accepted at <0.05.

2.4.3.5 Quality Control

As part of the toxicity testing laboratory quality control program, standard reference toxicant assays are conducted on a regular basis for each test species. These results, summarized in Table 5 of Section 4.4.3, provide relative health and response data while allowing for comparison with historic data sets. Review of reference toxicant data associated with the August and September 2006 (*Arbacia punctulata*) test documents that the fertilization C-NOEC, 5.0 mg/L copper, was outside the acceptable range of 20 to 80 mg/L copper. The acceptable NOEC range for this assay is defined as \pm the mean concentration of the central tendency. For the same series of assays the fertilization IC-25 was within the acceptable range of for the endpoint. A review of the data collected with the urchin development assays documented no deviation from protocol and no changes in the analysis technique used in the assessment of fertilization.





3.0 SURVEY CHRONOLOGY AND DAILY OBSERVATIONS

Week of August 10, 2006 (week 1)

August 10, 2006:

- **Dredge activity:** Mobilization, running dredge pipe, stringing cable.
- **Monitoring activity**: First day of water quality monitoring. Monitored high water and ebb tide. Shakedown of equipment, identifying sample locations, and site access.
- Fish Passage: Bait fish and bluefish breaking surface from Sawyer St. to Wood St.
- **Results summary:** No dredge activity generating turbidity plumes. Took readings at reference locations, values 0.2 to 2.8 NTU. No samples collected.

August 14, 2006:

- **Dredge activity:** Testing of dredge lines. Initiated debris removal in Area A.
- **Monitoring activity:** Level I monitoring in Area A. Monitored flooding tide, high water, 1.5 hours of ebb.
- **Fish Passage:** Small bait fish, bluefish, pogies, and birds working surface throughout entire area.
- **Results summary:** No significant turbidity plumes identified.
- Exceedances and sample collections: Collected planned samples under Level I monitoring. Given low turbidity values, samples will serve as background/reference results. No exceedances occurred.

August 15, 2006:

- **Dredge activity:** Testing dredge lines. Debris removal in Area A.
- **Monitoring activity:** Level III monitoring, flood tide to high water and 1.5 hours of ebb. Deployed moored YSI data loggers north and south of dredge area.
- **Fish Passage:** Baitfish and bluefish with birds working entire area.
- **Results summary:** Turbidity plumes identified coming from debris removal operations. Plume of 50-100 NTU moving north of flood tide. Beyond 100 ft turbidity values dropped off sharply. During slack water the turbidity plume was isolated to <30 ft from barge. Some oil sheen seen coming up around debris removal operations. Northwest wind pushing sheen to Southeast (disassociated from turbidity plume).
- Exceedances and sample collections: None.

August 16, 2006:

- **Dredge activity:** First day of dredging in Area A. Debris removal Area A.
- Monitoring activity: Level I monitoring flood tide.
- **Fish Passage:** Bait and bluefish with birds working throughout area.
- **Results summary:** Some initial turbidity plumes seen coming at dredge startup. Plumes were short-lived spatially and temporally. Higher turbidity values seen around debris removal. Values up to 200 NTU, but plume dissipated within 100 ft and 20 minutes. Level I samples collected.
- Exceedances and sample collections: No exceedances. Collected planned samples under Level I monitoring.





August 17, 2006:

- **Dredge activity:** Dredging and debris removal in Area A.
- Monitoring activity: Level III monitoring during flood tide.
- Fish Passage: Fish seen throughout area.
- **Results summary:** Limited turbidity around dredge area. Elevated turbidity (up to 150 NTU) seen around debris removal activities, especially when moving the barge. Large oil sheen seen south of debris removal. Sheen covered the majority of Area B/C. Oil booms contained majority of sheen.
- Exceedances and sample collections: None.

August 18, 2006:

- **Dredge activity:** First day of dredging in Area B/C. Continued dredging and debris removal in Area A.
- Monitoring activity: Level III monitoring on flood tide in all areas.
- Fish Passage: Snapper blues and bait fish throughout area.
- **Results summary:** Low level turbidity values (30-50 NTU) seen near barge, but beyond 100 ft values were <30 NTU. Oil sheen coming off of debris removal activity moving to North. Some of the sheen was escaping gap in oil boom. Repaired boom to contain sheen.
- Exceedances and sample collections: None.

Week of August 21, 2006 (week 2)

August 21, 2006:

- **Dredge activity:** Dredging in Area A and Area B/C. Switched back and forth as needed since Area A dredge was down several times due to debris. Debris removal active in Area A until water too low (~1030).
- **Monitoring activity:** Level III monitoring ebb tide.
- **Fish Passage:** Bait and bluefish with birds working throughout entire area.
- **Results summary:** No significant turbidity plumes around dredge activities. Elevated turbidity values seen around debris removal, but limited to <100 ft. Prop wash from support boats at debris removal generated most of the turbidity. Oil sheen seen downstream of debris removal. Largely contained by oil booms but some seen escaping on southeast side.
- Exceedances and sample collections: None.

August 22, 2006:

- **Dredge activity:** Dredging and debris removal in Area A.
- Monitoring activity: Level III monitoring during ebb tide.
- Fish Passage: Baitfish with birds working throughout entire area.
- **Results summary:** Limited turbidity around dredge area. Elevated turbidity (exceeding 100-150 NTU) seen around debris removal activities. Primarily generated by prop wash when moving the barge. Beyond 100 ft turbidity still detectable but values between 30-60 NTU. The plume is isolated vertically to a fairly narrow band just above the halocline (confined to the freshwater lens on top of more saline tidal water). Spotty and short-lived turbidity peaks of ~35 NTU were found as much as 1,000 ft downstream. These were very ephemeral patches and no samples were collected.





• Exceedances and sample collections: None.

August 23, 2006:

- **Dredge activity:** Dredging and debris removal in Area A.
- Monitoring activity: Level III monitoring during ebb tide.
- **Fish Passage:** Baitfish seen throughout entire area. Fewer big fish and birds than seen during the previous week. Lots of birds working the baitfish between north end of dredge area and Wood St.
- **Results summary:** Very little turbidity seen near the operations. No signal seen near the dredge. Low level plume (20-50 NTU) seen within 100 ft of debris removal, with lower values beyond 100 ft.
- Exceedances and sample collections: None.

Week of August 28, 2006 (week 3)

August 28, 2006:

- **Dredge activity:** Dredging and debris removal in Area A.
- Monitoring activity: Level I monitoring flood tide.
- **Fish Passage:** Some baitfish seen, although in lower numbers than seen in previous weeks. Large numbers of predatory wading birds (i.e. Egret, Heron) on eastern side of river suggesting presence of baitfish. Some bass and bluefish seen, although again in lower numbers than in the previous weeks. Fish and birds more concentrated north of dredge area as compared to anywhere else.
- Results summary: No significant turbidity plumes around dredge activities. Turbidity plumes identified near debris removal activities. Turbidity was <50 NTU above background at ~100 ft from debris removal. Heavy rainfall and runoff from 8/26 8/28 resulted in elevated stream flow. Freshwater was moving quickly downstream (south) along the surface even as tidal waters were moving north underneath. Monitoring occurred both north and south of work activities. Suspended sediment tended to be transported in the surface waters (downstream) rather than in the flooding tidal water. Again, the extent of the transport was limited to <50 NTU at >100 ft. Moderate oil sheens as well as petroleum and H₂S odors were also associated with debris removal. Oil sheens were mostly captured by oil booms in the northern dredge area. Sheens that transited beyond this appeared to be contained in the southern area.
- Exceedances and sample collections: Under Level I sampling samples were collected for analysis. Based on conversations with Jay Mackay the previous week, sample collections targeted a range of turbidity values (rather than set distances). Samples were collected at a reference location (10.5 NTU), an elevated turbidity location near the debris barge (50-70 NTU), and an intermediate turbidity location ~200 ft downstream (20-30 NTU). No exceedances occurred.

August 29, 2006:

- **Dredge activity:** Dredging and debris removal in Area A. Dredging in area B.
- Monitoring activity: Level III monitoring during flood tide.
- **Fish Passage:** No observations made.
- **Results summary:** Limited turbidity around dredge area. Elevated turbidity (40-80 NTU above background) seen within 125 ft of debris removal activities. Primarily generated by





prop wash when moving the barge. Beyond 100 ft turbidity still detectable but values between 20-30 NTU. Turbidity plumes moving north on incoming tide and south driven by wind and elevated streamflows. Thick oil sheen coming from debris removal activities (working in hot area just off Areovox). Oil sheen being contained by booms. New booms placed in afternoon.

• Exceedances and sample collections: None.

August 30, 2006:

- **Dredge activity:** Dredging and debris removal in Area A. Dredging in area B.
- Monitoring activity: Level III monitoring during flood tide.
- Fish Passage: No fish observed.
- Results summary: Elevated turbidity associated with dredge in Area A. Dredge was at Northeast corner in the shallow (intertidal) areas. Support skiffs were being used to move the dredge and were creating sediment plumes with prop wash. Readings reached 100 NTU over background approximately 300 ft north of the dredge itself. Monitoring could not be conducted north of the dredge area because the tidal height made the dredge wire impassable. The elevated turbidity was observed for ~15minutes. Once the skiff ceased activity, the turbidity levels quickly diminished. No similar levels were seen again. Oil sheens were also observed in conjunction with this prop wash but were well contained in the dredge area. Only low level turbidity readings and oil sheens were associated with the debris removal and the dredge in Area B.
- Exceedances and sample collections: The elevated turbidity values discussed above were short lived. By the time the sampling crew set up for sample collections turbidity levels had declined below warning levels (~15min). No samples were collected.

Week of September 4, 2006 (week 4)

September 4, 2006:

• Labor Day, no dredging/ no monitoring.

September 5, 2006:

• Dredge crews not returning from holiday until afternoon. Afternoon activities primarily resetting of equipment following bathymetric surveys. Water quality activities consisted of retrieval, download, cleaning, and redeployment of moored sensors.

September 6, 2006:

- **Dredge activity:** Dredging and debris removal in Area A.
- Monitoring activity: Level II monitoring during ebb tide.
- Fish Passage: Small number of fish seen moving throughout area.
- **Results summary:** Limited turbidity around dredge activity. Limited turbidity generated by debris removal, although values exceeded 100 NTU above background in very close proximity (<100 ft) to activities. Fairly large area of oil sheen seen associated with debris removal. Sheen was generally contained by oil booms.
- Exceedances and sample collections: Collected a suite of discrete TSS and turbidity samples under Level II sampling for analysis. Samples were selected across a range of turbidity levels to generate a correlation curve of *in situ* turbidity readings to TSS values. No exceedances occurred.





September 7, 2006:

- **Dredge activity:** Clean-up passes on east side of Area A. Debris removal in Area A.
- Monitoring activity: Level III monitoring during ebb tide.
- Fish Passage: Small number of bluefish seen in area, mostly feeding on small pogies.
- **Results summary:** Limited turbidity around dredge activity. Elevated turbidity values associated with debris removal. Values >100 NTU above background within 100 ft of barge, and dropping 20 NTU with every 100-150 ft
- Exceedances and sample collections: None.

Week of September 11, 2006 (week 5)

September 11, 2006:

- **Dredge activity:** Dredging and debris removal in Area A.
- **Monitoring activity:** Level III monitoring during flood tide, through high tide, and into ebb tide.
- **Fish Passage:** Few, if any fish seen in the area.
- **Results summary:** Limited turbidity around dredge activity. Limited turbidity generated by debris removal. Fairly large area of oil sheen seen associated with debris removal. Sheen was pushed southward by the wind but was generally contained by oil booms.
- Exceedances and sample collections: None.

September 12, 2006:

- **Dredge activity:** Limited activity. Debris removal equipment was not in operation. Dredge was inactive much of the time because holding tanks were full.
- Monitoring activity: Level III monitoring during flood tide.
- Fish Passage: Baitfish seen passing through area.
- **Results summary:** With very little activity in the dredge area, there was very little turbidity. Moored sensors were retrieved, downloaded, and redeployed.
- Exceedances and sample collections: None.

Week of September 18, 2006 (week 6)

September 18, 2006:

- **Dredge activity:** Dredging and debris removal in Area A.
- Monitoring activity: Level III monitoring during ebb tide.
- **Fish Passage:** High numbers of bait fish and feeding birds seen north of the dredge area. Lower numbers of fish seen throughout other areas. It did not appear that dredge activities related to fish presence/absence, as abundance near Sawyer St. (no activity) was similar to that near the dredging.
- **Results summary:** Limited turbidity around dredge activity. Debris removal activities were on the west side of Area A near Areovox. Sediment type is very fine and oily. Some of the largest turbidity plumes of the season were seen, although still no exceedances were observed. At peak ebb current the plume could be tracked 500-600 ft away from debris barge. However, at this distance values were only ~15 NTU above the 5 NTU background. Large oil sheens were seen extending away from debris removal, primary





downstream on the ebbing tide. Crews have doubled and tripled the oil booms and containment was good.

• Exceedances and sample collections: None.

September 19, 2006:

- **Dredge activity:** Dredging and debris removal in Area A.
- **Monitoring activity:** Level I monitoring during flood tide and Level III monitoring during flood tide.
- **Fish Passage:** High numbers of bait fish and feeding birds seen north of the dredge area. Striped Bass seen everywhere in moderate numbers. High numbers of stripers seen around Sawyer St. docks.
- Results summary: Level I monitoring targeted range of turbidities (Ref, 25, 50, 75 NTU) to re-evaluate turbidity/toxicity relationship and levels of protection. Turbidity plumes were minimal this day, and 75 NTU samples were collected within 50 ft of debris removal barge. A quick review of the results shows that fertilization rates in the laboratory control and New Bedford Harbor Reference Site treatments met/exceeded minimum criteria for the assay. Results of the statistical analysis showed that fertilization rates in all New Bedford Harbor samples were statistically less than that observed in the laboratory control treatment (this includes the reference sample). However, statistical comparisons made against the New Bedford Harbor Reference Site sample documented no statistical reduction in fertilization rates for any of the three monitoring points (25, 50, and 75 NTU).
- Exceedances and sample collections: Collection of four planned samples under Level I sampling. No exceedances were noted.

September 20, 2006:

- **Dredge activity:** Dredging and debris removal in Area A. Both activities had frequent shut-downs due to debris (oyster shells).
- Monitoring activity: Level III monitoring during ebb tide.
- **Fish Passage:** Moderate numbers of bait fish and feeding birds seen north of the dredge area. Lower numbers of fish seen throughout other areas. It did not appear that dredge activities related to fish presence/absence, as abundance near Sawyer St. (no activity) was similar to that near the dredging.
- **Results summary:** Limited turbidity around dredge activity and debris removal. Activity was limited due to problems with debris. Small, pulsed turbidity plumes and oil sheens were seen when debris removal was active, but levels and frequency were very low.
- Exceedances and sample collections: None.

Week of September 25, 2006 (week 7)

Limited dredge activity this week due to breakdown associated with shells, and slow downs associated with elevated VOC values in processing areas. One day of water quality monitoring conducted

September 25, 2006:

• **Dredge activity:** Dredging and debris removal in Area A.





- **Monitoring activity:** Level III monitoring during ebb tide.
- **Fish Passage:** Some fish seen in the area. Large amount of bird activity (i.e. bait fish) seen on east side of river. No apparent impact of dredging on fish passage.
- **Results summary:** Both dredging and debris removal are stop-and-start. Limited turbidity around dredge activity. Peak turbidity values were associated with debris removal activities on the west side of Area A near Areovox. Turbidity elevated (90-100 NTU) with 100 ft of debris removal, but levels <25 NTU beyond that. Sporadic oil sheens seen associated with debris removal. Oil booms are containing sheens well.
- Exceedances and sample collections: None.

Week of October 2, 2006 (week 8)

Limited dredge activity this week due to breakdown associated with shells, and slow downs associated with elevated VOC values in processing areas. One day of water quality monitoring conducted.

October 4, 2006:

- **Dredge activity:** East-west dredging in Dredging Area A. Debris removal in Area B.
- **Monitoring activity:** Level III monitoring during ebb tide, through slack low, and into flood tide.
- **Fish Passage:** There are very few fish remaining in the river as compared to earlier in the dredge season. This is noticeable throughout the harbor and is a seasonal effect. No apparent impact of dredging was seen on fish passage.
- **Results summary:** Dredging has been stop-and-start. The presence of high volumes of oyster shells has reduced the dredge production. Limited turbidity around dredge activity. Peak turbidity values continue to be associated with debris removal activities. Turbidity was elevated only within very close proximity to debris removal (50-100 NTU at <75 ft). Beyond 75-100 ft turbidity dropped to <20 NTU above background. Oil sheens were seen drifting away from the debris removal activities but were well contained by the oil booms.
- Exceedances and sample collections: None.

Week of October 9, 2006 (week 9)

October 9, 2006:

- **Dredge activity:** East-west dredging in Dredging Area A. Debris removal in Area B.
- **Monitoring activity:** Level II monitoring during flood tide, through slack high, and into ebb tide.
- **Fish Passage:** There are very few fish remaining in the river as compared to earlier in the dredge season. This is noticeable throughout the harbor and is a seasonal effect. No apparent impact of dredging was seen on fish passage.
- **Results summary:** No elevated turbidity associated with dredging. Elevated turbidity seen in immediate area (<25 ft) of debris removal activities in Area B. Followed turbidity peaks and movement with changing tidal flows.
- Exceedances and sample collections: Samples collected under planned Level II sampling. No exceedances were noted.





October 11, 2006:

- **Dredge activity:** Dredging west side of Area A. Debris removal in southwest corner of Area B.
- **Monitoring activity:** Level III monitoring during flood tide, through slack high, and into ebb tide.
- **Fish Passage:** There are very few fish remaining in the river as compared to earlier in the dredge season. This is noticeable throughout the harbor and is a seasonal effect. No apparent impact of dredging was seen on fish passage.
- **Results summary:** No elevated turbidity associated with dredging. Small patch of oil seen near dredging activity. All oil appeared to be contained by oil booms. Only minimal amount of debris removal was conducted. Very limited turbidity was associated with this activity.
- Exceedances and sample collections: None.

Week of October 16, 2006 (week 10)

October 16, 2006:

- **Dredge activity:** Dredging west side of Area B.
- Monitoring activity: Level II monitoring during ebb tide and into low tide.
- **Fish Passage:** There are very few fish remaining in the river as compared to earlier in the dredge season. This is noticeable throughout the harbor and is a seasonal effect. No apparent impact of dredging was seen on fish passage.
- Results summary: The dredge itself did not appear to be creating suspended sediment plumes. However, the boats supporting the dredge created the largest turbidity plumes seen throughout the dredge season. A fairly steady northwest wind required that boats push against the dredge to keep it on its targeted path. As the tide dropped (low at 11:05) prop wash from these support boats kicked up fairly large amounts of sediment. Very close to these boats turbidity as high as 250 NTU was measured. However, lack of current around this slack tide kept the elevated turbidity fairly close to the operations. In general turbidity was <25 NTU throughout the dredge area. Dredging was suspended several hours around following low tide. In addition to the elevated turbidity, large oil slicks were generated by the prop wash. Most of the slick was contained by the oil booms, but some escaped the booms and was pushed by the wind south of the dredge area. Operators also towed booms behind support boats in an effort to contain the oil.
- Exceedances and sample collections: Despite elevated turbidity in the immediate area of operations, no exceedances were measured. However, planned Level II sampling was conducted.

October 17, 2006:

- **Dredge activity:** Dredging west side of Area B.
- Monitoring activity: Level III monitoring during ebb tide and into low tide.
- **Fish Passage:** Fish seen actively feeding south of the dredge area.
- **Results summary:** Similar to 10/16 dredge support boats created the majority of the turbidity plumes, although values were much lower than the previous day. Turbidities remained <25 NTU throughout the area. Oil sheens were the predominant feature of the day. Sheens were seen around the active dredge area. The oil sheens were dispersed by





both the wind (towards the north) and the ebbing tide (towards the south) creating a fairly large surface area. In general the sheen was contained by the oil booms, although some portions did escape up to 200 ft to the south.

• Exceedances and sample collections: None.





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4.0 RESULTS

4.1 Dredging and Field Monitoring Summary

Dredging was conducted from mid-August to mid-October. Dredging was initiated in Area A, which is located in the southern sections of DMU-1 and DMU-102. The eastern portion of Area A (in DMU-102) is intertidal. As a result, dredging could not always be conducted during lower tides. To maintain efficiency a second dredge was set up on stand-by in Area B (located along the boundary of DMU-2 and DMU-3 and DMU-4) or in Areas C and D of DMU-2 (Figure 3). When low water prevented dredging in Area A, dredge crews moved over to the second dredge. This approach meant that the dredging location was variable from day to day and even within days. Also, weekly bathymetric data and sediment core samples were collected to provide feedback to the dredge operators in areas that dredging had been conducted. Based on this data, dredgers returned to previously dredged areas to perform clean up passes. Dredging in Areas A and B were conducted in a North-South orientation, while dredging in Areas C and D were conducted East-West

Once the dredge areas were determined, sheet piling was placed around the perimeter, at approximately 50 ft spacing. A perimeter cable was run around the sheet piles at approximately the high tide mark. Also along the perimeter, floating, absorbent oil booms were placed to contain any surface oil slicks. A 'gate' in the south end of the dredge area was used for all vessels entering or leaving the operation. Unlike the 2004 dredging operation, silt curtains were not used for 2006 dredging.

Dredging was performed using a Mud CatTM hydraulic dredge equipped with a horizontal auger (Figure 9). The dredge was propelled by winching itself along a transverse cable which spans the

dredge area to opposite sides of the perimeter cable. As a pass is completed, support crews relocated the cable to position for the next pass. Dredge material was pumped through a pipeline to a booster pump, then to the desanding facility at Sawyer Street. Following desanding, the remaining fine material was



Figure 9. Mud CatTM Hydraulic Dredge

pumped via a separate pipeline to the dewatering, treatment, and handling facility in the Lower Harbor. In total, the 2006 dredging removed over 20,000 cubic yards of material.

The hydraulic dredge can not handle large debris which is common in this portion of the harbor. Debris removal was accomplished by 'raking' the bottom with a barge-mounted excavator (Figure 10). The end of the excavator has two grated jaws that open and close. The jaws are deployed to the bottom, once on the bottom the two jaws scrape the bottom and then close into each other and capture the debris. Barges secured to the side of the debris removal platform





stored the debris and were moved offsite as needed. Support boats were used throughout the operation to transport crews, maintain dredges, handle the pipeline, and move barges.

Water quality monitoring was conducted in an adaptive manner in response to changing operational and weather related conditions. The monitoring approach was modified as tides and

winds changed; as dredges changed areas; as debris removal activities changed; and as warranted based on support activities. The monitoring activities were also largely influenced by tidal conditions and safety. The dredge areas and the associated perimeter cable spanned most of the width of the river limiting unrestricted access to northern portions of the river, including potential reference locations. Only at high tide was the east side of the river passable.



Figure 10. Debris Removal Excavator

At low tides it was often possible to pass under the perimeter cable, but sampling time was limited. All of these activities (dredging, debris removal, and support activities) had the potential to impact water quality. The monitoring program incorporated assessment of the entire operation.

4.2 Boat-Based Measurements and Sample Collection

Boat-based monitoring followed the protocols outlined in Sections 2.1 and 2.2. Under these protocols the sampling teams functioned in an adaptive sampling mode, utilizing real-time *in situ* data to guide monitoring and sample collection. Depending on the objectives for each survey day, the real-time data either supported a criteria-based sampling approach or guided the planned collection of water samples. Because no water quality exceedances were identified throughout the entire 2006 dredge season, no criteria-based samples were collected. However, even non-exceedance data gathered during the monitoring program provides valuable information as to the effects of dredging on water quality during dredge operations. This is discussed further in Section 5. The results below describe the discrete sampling activities by collection date. Results of chemical and biological testing are provided later in this section.

Water samples were collected for turbidity, TSS and PCB analyses on seven occasions during the dredge program. Samples from four of these events were also collected for toxicity testing (Table 1). Metals samples were collected during three of the sampling events and were archived for potential analysis. Based on results of the other parameters, none of the metals samples have been analyzed. Samples were collected either to establish baseline conditions and/or re-establish relationships between field measurements (i.e. turbidity) and toxicity results to verify the protectiveness of the +50 NTU criteria. No samples were collected in response to an exceedance of the +50 NTU turbidity criteria.





8/14/06: The first set of four samples was collected following Level I protocol (turbidity, TSS, PCBs and toxicity testing) prior to initiation of dredging activities. Samples were collected at the upstream reference location, at the dredging boundary (~30 ft from dredging operations) and 300 and 600 ft downstream from dredging activities during HWS. Turbidity levels in all samples collected on this date were low.

8/16/06: Three samples were collected in response to observance of elevated turbidity plumes (though below the +50NTU at 300 ft criteria). Level I protocols were followed and samples were collected for turbidity, TSS, PCB and toxicity testing. Sample collection occurred during flood tide therefore the reference sample was collected south of the dredging activities and the boundary sample and 300 foot samples were collected north of dredging operations. Relatively low turbidity was measured in actual samples collected both at the boundary of dredging activities and at the 300 ft location.

8/28/06: Level I protocols were followed and samples were collected for turbidity, TSS, PCB and toxicity testing. However, based on conversations with USACE NAE, specific turbidity ranges, rather than distances from the dredging operations, were targeted. The goal of this sampling was to reconfirm the validity of the +50 NTU turbidity criteria as an environmentally protective threshold. Because elevated turbidities were not generally seen at the predefined distances, it was necessary to sample much closer to the source of the sediment plumes (typically debris removal) in order to acquire high turbidity samples. Three samples were collected: a reference sample, collected ~1000 ft south of the dredging operations, a sample targeting the 50-75 NTU range, collected adjacent to debris removal activity occurring on-site, and a sample targeting an intermediate turbidity (20-30 NTU), collected approximately 300 ft south of dredging activity. Samples were collected during a flood tide, however, surface water was flowing south due to recent heavy rainfall and runoff.

9/6/06: Seven samples were collected for analysis of turbidity and TSS only, across a range of turbidity levels to generate a correlation curve of *in situ* turbidity readings to TSS values.

9/19/06: Four samples were collected for the full suite of analyses. Again, no elevated turbidity levels were seen in the predefined boundary locations, so the sampling team targeted high turbidity close to the operations in order to re-evaluate turbidity/toxicity relationships and levels of protection and therefore targeted a reference sample and three turbidity ranges (25, 50 and 75 NTU). The reference sample was collected ~ 1000 ft downstream (South) of dredging activities. The other three samples were collected within 300 ft of dredging and debris removal activities.

10/9/06: Both dredging and debris removal activities were occurring on this date. Samples related to debris removal activities were collected in Area B. Four samples were collected; One sample was collected 75 ft north of the debris removal activities during the flood tide, two samples were collected 25 ft south of debris removal as the tide turned to ebb (south now being downcurrent). The two samples were collected approximately 30 minutes apart at represent considerably different turbidity conditions. The fourth sample was collected ~ 200 ft south of debris removal was collected on the ebb tide.





10/16/06: Two samples were collected associated with dredging activities. One reference sample was collected approximately 400 ft south of dredging activities on the ebb tide. One sample was collected within 50 ft south of dredging activities. Both samples were analyzed for turbidity, TSS and PCBs.

4.3 Continuous In Situ Data

The deployment of the continuously recording water quality sensors provided additional information that complimented the adaptive monitoring approach discussed above. The location of sensors both north and south of the dredge areas provides information about tidal influences on sediment suspension and transport. Continuous readings provided water quality data for periods when adaptive sampling was not underway. This includes inactive dredge periods such as nights and weekends providing a reasonable background condition for comparison. Dredging operations frequently stopped and started due to mechanical or physical issues and the location of activities was highly variable. As a result it is often difficult to ascertain how specific time periods in the continuous record relate to dredge activity. However, since no dredging took place on nights or weekends it is appropriate to use these time periods to define 'inactivity' and to use daytime to define 'activity' of the dredging operation. Using these definitions, it is possible to distinguish dredging related water characteristics from background conditions. Appendix B provides plots of turbidity at both locations for the entire monitoring period. Additionally, these figures indicate tidal cycles and highlight nighttime and weekend periods. Individual examples are provided along with the results below.

In the discussion below and in the plots provided in Appendix B a red line is indicated on each plot representing 50 NTU. A water quality criterion for the New Bedford Harbor Environmental Monitoring program has been established at 50 NTU above background, or natural, turbidity. The background turbidity signal in the river is influenced by tidal conditions, stream flow, wind, and other factors. As a result the background turbidity signal can fluctuate on scales from minutes to days. In general, the background turbidity signal was between 3 and 10 NTU. The continuous data presented in the following plots does not subtract out background values. As a result, the 50 NTU line should be viewed strictly as a guideline. For example, a value of 50 NTU represents a turbidity reading that is typically 40-47 NTU above background.

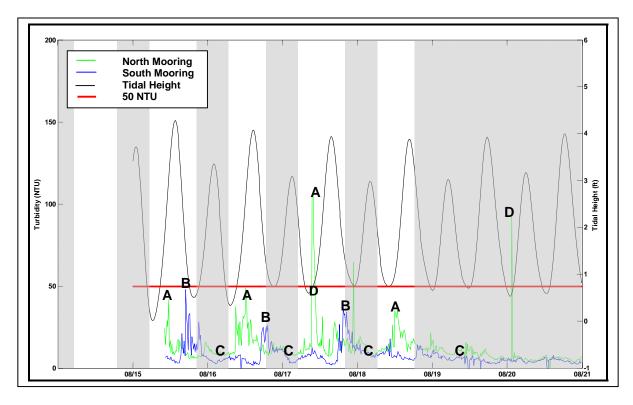
Turbidity signals related to dredge activity were clearly seen in the continuous *in situ* data. These signals manifest as peaks in turbidity above background values. The influence of tidal height and direction on sediment plume transport can also be clearly seen. Figure 11 through Figure 15 in this section provide a good example of how these effects can be seen in the data. The same assessments may also be applied to all of the data plots provided in Appendix B. Figure 11 shows the turbidity data from both moorings for Week 1 of dredging, including the following weekend. Nights and weekends are shaded on the figure to indicate periods of inactivity in the dredging operation. The following describes individual water quality characteristics identified during this first week of dredging. The letters below correspond to letters on Figure 11.

A. On an incoming tide current flow is predominately towards the north. As a result, any suspended sediment plumes related to dredging would be expected to show up in the northern mooring data and would not be expected in the southern mooring data. This can be seen in all four of the active dredge periods during this week (labeled 'A'). Note that the YSI was set to take a thirty second sample every 15 minutes. Data peaks such as those





- seen on 8/17 and 8/20 are indicative of very short lived turbidity pulses, which could be attributed to low tide, wind, river flow, or other natural influences.
- **B.** The effect seen in 'A' is reversed on an outgoing tide, so that the southern mooring picks up any dredge related turbidity signal.
- C. During periods when there was no known dredge activity (nights and weekends) turbidity values tended to be lower, with few distinct peaks.
- **D.** Particularly low tides reduce water depths in the river considerably. At the northern mooring, water depth was often <2 ft at low tide. During these periods, resuspension of sediments from river flow, wind, or other natural influences could be seen.



^{*} Letters Correspond to Text.

Figure 11. Example of Turbidity Signals Related to Dredging and Tidal Direction.

As indicated in point 'D' the effect of low tides on the turbidity regimes in the river were often very strong. This is particularly true during extreme astronomical tides. The week of September 9/4 had strong spring tides. Figure 12 shows the effect of the exceptionally low tides on the turbidity signal at each mooring. Note that even during periods of no dredge activity (nights of 9/7, 9/8, and weekend) large turbidity signals were observed during the low tides. Available weather data was also reviewed for these time periods. However, no apparent correlations existed between wind or precipitation and turbidity.





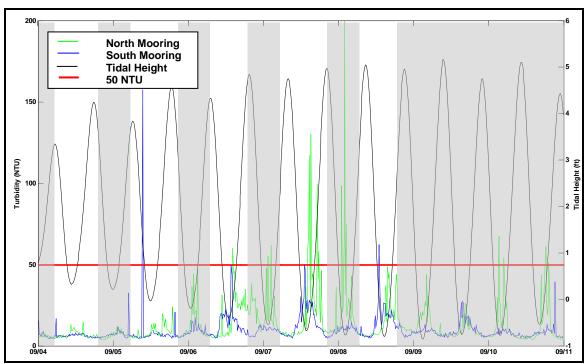


Figure 12. Example of Turbidity Signals Related to Extreme Low Tides.

As seen in Figure 11 the direction of tidal flow had a strong influence on sediment transport and helped distinguish between background and dredge-related turbidity signals. Tidal height is also an import factor in both the physical processes and in interpretation of the data. As discussed in Section 2.1 and shown in Figure 7, the mooring configurations were designed to best characterize the entire water column. In an estuarine system such as the Acushnet River tidal waters typically have much different properties than the river's own fresh water flow and large differences can be seen from the surface to the bottom. The mooring was designed such that the sensors would pass through the surface waters and into the deeper tidal waters with the rising and falling tides. This oscillation between water masses can be seen in Figure 13 where tidal height, sensor depth, and salinity are shown for the week of September 4. Due to the large tidal fluctuations, this week provides a strong example these processes. Sensor depth fluctuates with the rising and falling tide. The small 'shoulders' in the sensor depth plots represent the time periods during lower tides where the sensor buoy rises and falls with the tide. The salinity data shows a strong correlation with depth. As the sensor is allowed to move into the surface waters during lower tides the lower salinity freshwater water flow is measured. As the tide rises and the sensor is therefore deeper in the water column, the increase in salinity is characteristic of the tidal waters moving in along the bottom from the Outer Harbor and Buzzards Bay.





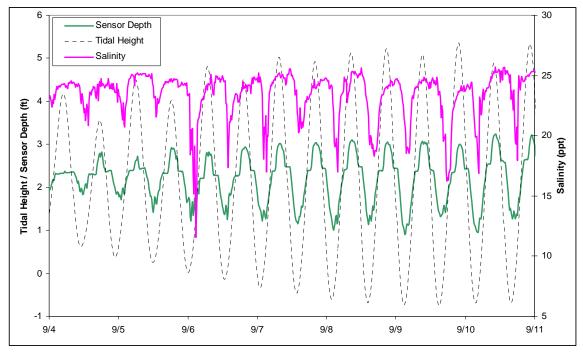


Figure 13. Example of Relationship Between Tidal Height, Sensor Depth, and Salinity at the Northern Mooring.

When interpreting the turbidity data provided in Appendix B it is important to keep in mind that both direction of the tidal flow and the depth of the sensor relative to the distinct water masses can influence the turbidity readings. The horizontal distribution of the two sensors at either end of the dredge area provides information regarding turbidity plume movement with tidal flows. (i.e. the northern sensor picks up dredge related turbidity on flood tides and the southern sensor picks up dredge related turbidity on ebb tides). Salinity readings provide a good indicator of which water mass was being characterized by the sensor at any given time (i.e. river water vs. tidal water). Observations in the field suggested that fine sediments tended to remain in the surface layer and were slow to settle through the halocline. The continuous *in situ* data supports this observation. Figure 14 and Figure 15 show salinity versus turbidity data at the northern and southern moorings (respectively). In each case elevated turbidity is seen almost exclusively in the lower salinity waters. The effect is more pronounced at the northern mooring where water depths are shallower and river flow is a more predominant feature of the water column. The effect of the halocline on turbidity measurements and sediment transport is discussed further in Section 5.





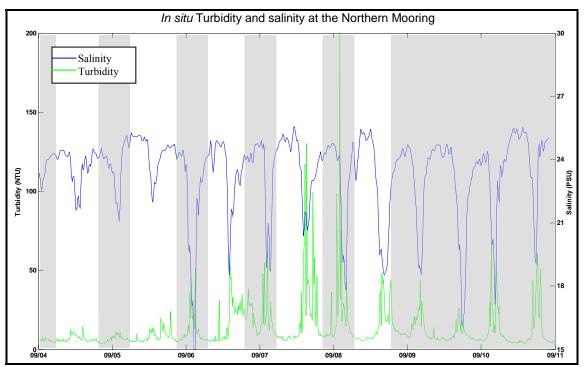


Figure 14. Example of Relationship Between Turbidity and Salinity at the Northern Mooring.

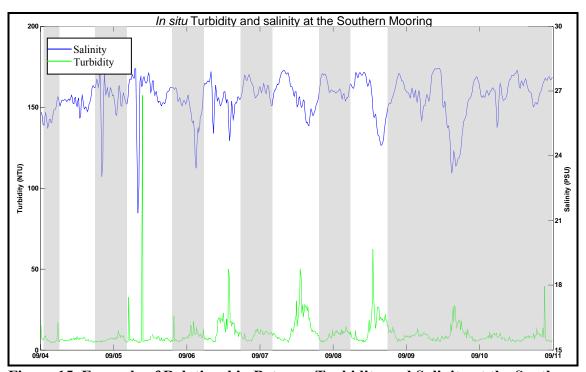


Figure 15. Example of Relationship Between Turbidity and Salinity at the Southern Mooring.





The 2006 dredge plan encompassed several different areas. These areas were active at various times during any given week as tides and other factors dictated. As a result it is somewhat difficult to assess the location of dredging activities relative to particular data points in the continuous record. However, some general observations can be made. All of the debris removal activities were in area A (northern area) until September 25. During this time period, the northern mooring generally showed higher turbidity readings than the southern mooring. In early October, this changed. On 10/3 and 10/4 the readings were as high if not higher at the southern mooring. During this time the dredging and debris removal had moved to the south west corner of Area B (near the southern mooring). As might be expected these general trends tend to show that elevated turbidity signals are seen in closer proximity to the operations – particularly debris removal.

4.4 Analytical

4.4.1 TSS/Turbidity Analyses

TSS results and turbidity results are presented in Table 3. As shown in Table 3, TSS results ranged from 1 mg/L to 330 mg/L and turbidity results ranged from 4 NTU to 150 NTU. TSS and turbidity samples collected were associated with sampling based on locations generally showed relatively low TSS and turbidity measurements. Additional samples collected to target specific turbidity ranges were collected to afford an opportunity to confirm relationship between turbidity, TSS, PCB, and toxicity as described in Section 5.0.

Table 3. Summary of TSS/Turbidity Results

Date	Sample ID	Station	Sample Description ¹	Total Suspended Solids (TSS) mg/L	Turbidity NTU
08/14/2006	WQ-TSS/TUR-001-081406	REF081406	Reference	5.7	8.6
08/14/2006	WQ-TSS/TUR-001-081406-REP	REF081406	Reference	9.3	9
08/14/2006	WQ-TSS/TUR-002-081406	BOUND081406	Boundary	13	6.5
08/14/2006	WQ-TSS/TUR-002-081406-REP	BOUND081406	Boundary	1	8.3
08/14/2006	WQ-TSS/TUR-003-081406	300081406	300 ft	1	5.3
08/14/2006	WQ-TSS/TUR-003-081406-REP	300081406	300 ft	4.3	4.8
08/14/2006	WQ-TSS/TUR-004-081406	600081406	600 ft	2.3	4.6
08/14/2006	WQ-TSS/TUR-004-081406-REP	600081406	600 ft	1	4.7
08/16/2006	WQ-TSS/TUR-001-081606	REF081606	Reference	9.4	5.6
08/16/2006	WQ-TSS/TUR-001-081606-REP	REF081606	Reference	11	4.4
08/16/2006	WQ-TSS/TUR-002-081606	BOUND081606	Boundary	28	16
08/16/2006	WQ-TSS/TUR-002-081606-REP	BOUND081606	Boundary	22	15
08/16/2006	WQ-TSS/TUR-003-081606	300081606	300 Ft	11	14
08/16/2006	WQ-TSS/TUR-003-081606-REP	300081606	300 ft	7	14
08/28/2006	WQ-TSS/TUR-001-082806	SOUTHR082806	Reference	18	7.7
08/28/2006	WQ-TSS/TUR-001-082806-REP	SOUTHR082806	Reference	18	10
08/28/2006	WQ-TSS/TUR-002-082806	50NTU082806	50 NTU	110	63
08/28/2006	WQ-TSS/TUR-002-082806-REP	50NTU082806	50 NTU	110	65
08/28/2006	WQ-TSS/TUR-003-082806	25NTU082806	25 NTU	91	56
08/28/2006	WQ-TSS/TUR-003-082806-REP	25NTU082806	25 NTU	55	30
09/06/2006	WQ-TSS/TUR-001-090606	0NTU090606	0 NTU	10	6.8





Date	Sample ID	Station	Sample Description ¹	Total Suspended Solids (TSS) mg/L	Turbidity NTU
09/06/2006	WQ-TSS/TUR-002-090606	15NTU090606	15 NTU	75	30
09/06/2006	WQ-TSS/TUR-003-090606	20NTU090606	20 NTU	63	24
09/06/2006	WQ-TSS/TUR-004-090606	35NTU090606	35 NTU	85	47
09/06/2006	WQ-TSS/TUR-005-090606	135NTU090606	135 NTU	310	150
09/06/2006	WQ-TSS/TUR-006-090606	75NTU090606	75 NTU	100	58
09/06/2006	WQ-TSS/TUR-007-090606	50NTU090606	50 NTU	80	40
09/19/2006	WQ-TSS/TUR-001-091906	1NTU091906	1 NTU	1	5.2
09/19/2006	WQ-TSS/TUR-002-091906	50NTU091906	50 NTU	86	56
09/19/2006	WQ-TSS/TUR-003-091906	25NTU091906	25 NTU	43	35
09/19/2006	WQ-TSS/TUR-004-091906	75NTU091906	75 NTU	330	140
10/09/2006	WQ-TSS/TUR-001-100906	75N100906	75 ft N (flood tide) of Debris Removal	85	54
10/09/2006	WQ-TSS/TUR-002-100906	25S100906	25 ft S (ebb tide) of Debris Removal	180	85
			25 ft S (ebb tide, 30 min after previous sample) of Debris		
10/09/2006	WQ-TSS/TUR-003-100906	25S2100906	Removal	16	10
10/09/2006	WQ-TSS/TUR-004-100906	200S1090906	200 ft S of Debris Removal	11	8
10/16/2006	WQ-TSS/TUR-001-101606	SOUTHR101606	South Reference	19	7.2
10/16/2006	WQ-TSS/TUR-001-101606-DUP	SOUTHR101606	South Reference	15	6.6
10/16/2006	WQ-TSS/TUR-002-101606	25NTU101606	25 NTU	53	24

⁻ Samples are collected either based on distance (i.e., 300 ft, 600 ft) or Turbidity levels (i.e., 25, 50 NTU), see Section 2.1 for further discussion on Sample Location.

4.4.2 PCB Analyses

Water samples for PCB analysis were collected six of the seven sample collection dates. Twenty water samples, plus two field duplicates were analyzed for total (dissolved + particulate) PCBs and dissolved PCBs.

The sum of 18 NOAA congeners (referred to as "SUM 18 CONG" in the text) for all the collected water samples are presented in Table 4. Because no appropriate multiplier is available from previous studies to correlate SUM 18 CONG to total PCB concentration in the water samples of the New Bedford Harbor, SUM 18 CONG is used in this report as an indicator of the relative level of PCB contamination in the water samples. Note that SUM 18 CONG only represents a fraction of the total PCB concentration in the water samples. The detailed analytical results of the water samples, including the concentrations for individual 18 NOAA congeners, as well as SUM 18 CONG, are presented in Appendix C. For each sample station, results from total (sample ID with prefix "WQ-TPC") and dissolved (sample ID with prefix "WQ-DPC") PCB analyses are presented side-by-side for easy comparison. As shown in Table 4, SUM 18 CONG ranges from 0.80 μ g/L (WQ-TPC-003-081406) to 230 μ g/L (WQ-TPC-004-091906) for total PCBs, and from 0.33 μ g/L (WQ-DPC-003-081406) to 7.4 μ g/L (WQ-DPC-002-101606) for dissolved PCBs.





Table 4. Summary of PCB Results

			Sample	Total Aqueous	Dissolved PCB
Date	Sample ID	Station	Description ¹	PCB (µg/L)	(μg/L)
08/14/2006	WQ-TPC/DPC-001-081406	REF081406	Reference	3.1	1.8
08/14/2006	WQ-TPC/DPC-002-081406	BOUND081406	Boundary	0.99	0.34
08/14/2006	WQ-TPC/DPC-003-081406	300081406	300 ft	0.80	0.33
08/14/2006	WQ-TPC/DPC-004-081406	600081406	600 ft	1.1	0.44
08/16/2006	WQ-TPC/DPC-001-081606	REF081606	Reference	1.4	0.48
08/16/2006	WQ-TPC/DPC-002-081606	BOUND081606	Boundary	4.9	1.3
08/16/2006	WQ-TPC/DPC-003-081606	300081606	300 ft	5.1	1.3
08/16/2006	WQ-TPC/DPC-003-081606-DUP	300081606	300 ft	4.5	1.9
08/28/2006	WQ-TPC/DPC-001-082806	SOUTHR082806	Reference	2.5	1.2
08/28/2006	WQ-TPC/DPC-002-082806	50NTU082806	50 NTU	19	2.1
08/28/2006	WQ-TPC/DPC-003-082806	25NTU082806	25 NTU	4.9	1.1
09/19/2006	WQ-TPC/DPC-001-091906	1NTU091906	1 NTU	1.9	0.88
09/19/2006	WQ-TPC/DPC-002-091906	50NTU091906	50 NTU	37	4.1
09/19/2006	WQ-TPC/DPC-003-091906	25NTU091906	25 NTU	14	2.4
09/19/2006	WQ-TPC/DPC-004-091906	75NTU091906	75 NTU	230	5.7
10/09/2006	WQ-TPC/DPC-001-100906	75N100906	75 ft N (flood tide) of Debris Removal	20	5.2
10/09/2006	WQ-TPC/DPC-002-100906	25S100906	25 ft S (ebb tide) of Debris Removal	62	0.56
			25 ft S (ebb tide, 30 min after previous sample) of Debris		
10/09/2006	WQ-TPC/DPC-003-100906	25S2100906	Removal	11	5.7
10/00/2006	WO TRO/DRO 004 10000	2000100000	200 ft S of Debris	0.2	2.2
10/09/2006	WQ-TPC/DPC-004-100906	200S1090906	Removal South Reference	9.2	2.2
10/16/2006	WQ-TPC/DPC-001-101606	SOUTHR101606		2.4	1.2
10/16/2006	WQ-TPC/DPC-001-101606-DUP	SOUTHR101606	South Reference	2.9	2.5
10/16/2006	WQ-TPC/DPC-002-101606	25NTU101606	25 NTU	27	7.4

⁻ Samples are collected either based on distance (i.e., 300 ft, 600 ft) or Turbidity levels (i.e., 25, 50 NTU), see Section 2.1 for further discussion on Sample Location.

4.4.3 Toxicity Analyses

Toxicity samples were collected on four of the seven dates noted above and 14 samples were submitted for biological testing. Three of the sampling events were performed as part of the planned monitoring program. The final set of toxicity samples (collected 9/19) were collected to re-evaluate the turbidity/toxicity relationship and targeted samples representing a range of turbidity levels. Each sampling event included an upstream reference sample and testing included a laboratory control sample. Results for test endpoints for each sample were statistically compared to those from both the event-specific site reference sample and the laboratory control. Table 5 provides a summary of survival, growth, development and reproduction endpoints and associated statistical analyses for all tests conducted. Supporting data, including laboratory bench sheets, water quality data, statistical analyses and custody forms are provided in Appendix D.





Table 5. Summary of Toxicity Results

			Sea Urchin (Arbacia punctalat a)	(An	Mysid (Americamysis bahia)			Red alga (Champia parvula)	
Sample Date	Sample ID	Sample Description ¹	mean fertilizatio n (%)	48-hr mean survival (%)	7-day mean survival (%)	7-day mean growth (mg/mysid)	48-hr mean survival (%)	7-day mean reproduction (cystocarp/tip)	
8/14/2006	NA	NA	96.2	100	100	0.330	100	21.7	
	-001	Reference	91.7 ²	100	95	0.427	100	28.0	
	-002	Boundary	94.2 ²	100	100	0.465	100	28.7	
	-003	300 ft	87.3 ^{2,3}	100	100	0.474	100	24.7	
	-004	600 ft	90.9 2	100	100	0.436	100	15.4 ^{2,3}	
8/16/2006	NA -001	NA Reference	97.6 93.1 ²	97.5 100	95 100	0.429 0.448	100 100	80.3 85.2	
	-002 -003	Boundary 300 ft	91.5 ^{2,3} 90.2 ^{2,3}	100	100 97.5	0.465 0.456	100	86.4 82.8	
8/28/2006	NA	NA	90.3	100	100	0.284	100	25.1	
	-001	Reference	91.0	100	100	0.319	100	29.4	
	-003	25 NTU	86.7	100	100	0.398	100	29.4	
	-002	50 NTU	85.3 ²	97.5	97.5	0.325	100	27.4	
9/19/2006	NA -001	NA Reference	99.3 94.0 ²	100	92.5 97.5	0.241 0.511	100 100	23.9 24.5	
	-002	50 NTU	95.6 ²	97.5	95	0.462	100	0.8 2,3	
	-003	25 NTU	94.0 ²	100	100	0.623	100	$0.2^{2,3}$	
	-004	75 NTU	92.7 ²	95	75 ^{2,3}	0.696	100	0.2 2 ^{2,3}	

NA – Not Applicable

Sea Urchin (*Arbacia punctalata*) 1-hr sperm cell fertilization - Percent fertilization was greater than 90% for all but three samples. Statistically, % fertilization was significantly lower than the laboratory control sample for all but two samples tested and statistically significantly lower than the site-specific reference sample for three samples. However, mean fertilization was greater than 85% in all samples, indicating that while some impact relative to control and reference samples was observed, the impact was relatively small.

Mysid (*Americamysis bahia*) **48-hr survival** – All 14 samples tested for mysid 48-hr survival were within 5% of the laboratory controls and overall survival was excellent.

Mysid (*Americamysis bahia*) 7-day mean survival - All but one of the samples tested for mysid 7-day survival were within 5 % of the laboratory controls. Only one sample, the 75 NTU sample

¹ – Samples are collected either based on distance (i.e., 300 ft, 600 ft) or Turbidity levels (i.e., 25, 50 NTU), see Section 2.1 for further discussion on Sample Location.

² – Significantly different from associated laboratory control sample

³- Significantly different from associated reference sample





collected on 9/19, showed significant reduction in survival compared to both the laboratory control and the site reference sample. This sample contained the highest dissolved and whole water PCB concentrations collected during the program.

Mysid (*Americamysis bahia*) 7-day mean growth – mean growth ranged from 0.24 to 0.67 mg/mysid. Growth was similar to/or greater than the laboratory control and site reference for all samples tested indicating no negative effect on mysid growth.

Red alga (*Champia parvula*) 48-hr mean survival – All samples showed 100% survival indicating no acute impact to the alga.

Red alga (*Champia parvula*) 7-day mean reproduction – Champia reproduction, measured as the number of cystocarps produced, was generally found to be similar or higher in site samples relative to the laboratory control. One sample, collected at 600 ft on 8/14, showed significant reduction in mean reproduction compared to both the control and site reference, however, number of cystocarps was still greater than 50% of those observed in the control and reference. Cystocarp production in site samples collected on 9/19, however, was not only significantly lower than both the control and reference in all three samples, the number of cystocarps produced was less than 1% of those produced in the control and site reference.





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5.0 DISCUSSION

The field monitoring program was designed to assess the impacts of dredging on water quality with an ultimate goal of minimizing harm to biological components of the system. To achieve that goal the monitoring was carried out in several ways;

- Adaptive *in situ* monitoring was used to track sediment plumes in real-time. This design allowed for immediate feedback to the dredging operation so that potential issues could be addressed before ecological harm was incurred.
- Pre-defined sampling provided guidelines for collection of analytical samples. The results
 of these analyses provide critical data regarding the chemical and biological impacts of
 dredging related activities on the system.
- Continuous data collection provided long-term information during periods when humanbased sampling was not possible and when potential threats to the systems were minimal.
- Observational monitoring was conducted during all aspects of the program. This included anecdotal observations of fish passage and behavior, and observations of non-targeted parameters such as oil sheens and air quality. Like the adaptive *in situ* monitoring, observational monitoring provides rapid feedback to managers and operators can help to minimize ecological risk.

5.1 Fish Passage

A large part of the observational monitoring was geared towards fish passage and behavior. Although no defined fish monitoring program is in place, the weekly presence of field crews provided anecdotal information. Early in the dredge season (mid to late August) large numbers of fish were seen in the area. Lower trophic level baitfish were consistently seen in large schools moving throughout the river from Sawyer St. to Wood Street. Larger predatory fish such as striped bass and bluefish were also seen in large numbers chasing bait. Heron, egret, and other wading birds were seen feeding along the shoreline during these weeks. Terns, cormorants, and gulls were seen in fairly large numbers as well. During this time period, when fish were most abundant, there appeared to be no restriction of movement past the dredge area.



Figure 16. A Flock of Terns Competes with a School of Bluefish for Food





By late August fish abundance declined throughout the harbor. Baitfish, predatory fish, and birds appeared to decline in approximately proportionate numbers. The decline in fish abundance appeared to be seasonal and universal rather than related to dredging activity. Lower numbers of fish were also seen near Sawyer St. where activities were less intense. As the dredging season continued, fish abundance increased for short intervals throughout September but generally remained lower than in mid August. Based on anecdotal observations dredging operations did not appear to impact fish passage.

5.2 Suspended Sediment and Sediment Transport from Dredging Activities

As in previous years a project-specific warning level of 50 NTUs above background 300 ft down current of dredging operations was set as a threshold for sample collection and assessment of operations. A project criterion of 50 NTUs above background at 600 ft down current was set as a threshold for immediate cessation of operations related to the exceedance. In 2005 there were five exceedances of the turbidity warning level and one exceedance of the project turbidity criterion. During the 2006 dredge season there were no exceedances of either the warning level or the project turbidity criterion.

During operations there were three general activities with potential to generate suspended sediment plumes; 1) dredging, 2) debris removal, and 3) support activities. Dredging itself created virtually no measurable sediment plumes. When safety allowed, the monitoring team transited in tight radiuses (<30 ft) around the active dredges. Even at these distances elevated turbidity was rarely measured. Debris removal generated the most consistent suspended sediment plumes. The act of 'raking' the bottom generated smaller plumes that tended to settle quickly. The largest impacts were associated with pulling the equipment (with or without debris) up through the water column. As sediment cascaded off of the equipment sediment plumes traveled down current. This was particularly true for the very fine sediment fractions which often remained in the upper water column for extended periods and distances. The majority of water quality monitoring was focused around debris removal activities. Support activities included transport of people and gear, dredge maintenance, and occasional pushing of dredge or debris removal gear when winds or currents impacted operations. This last activity required greater propeller power from the larger boats and was the only support activity which tended to resuspended sediments. This was generally only a problem at low tide when prop wash reached the bottom. While this was an infrequent problem it tended to generate the largest, most sustained turbidity plumes.

Turbidity plumes generated by all activities tended to be extremely short lived, both spatially and temporally. Suspended sediment plumes related to debris removal tended to be pulsed in nature. For example, monitoring crews would conduct radial transects around the operation at approximately 100 ft. When the debris removal bucket would come up through the water column turbidity would quickly begin to increase. Using real-time readings from the *in situ* sensors, the team would attempt to track movement of the plume away from the source towards the criterion boundaries. In general, turbidity would drop back down to background levels well before the 300 ft mark was reached. In cases where elevated turbidity persisted out towards the boundary, the readings would generally persist for less than 5-10 minutes. Even within close proximity to operations, the plumes tended to be fleeting. A good example of this was seen on October 9. On this date, sampling crews targeted elevated turbidity for sample collection, and operated in close





proximity to the debris removal barge to find these values. As the tide switched from flood to ebb the turbidity plume moved from north of the operation to south of the operation. Two samples were collected 25 ft south of debris removal barge. The first sample was collected in a high turbidity condition with final TSS concentrations of 180mg/L. Thirty minutes later a second sample was collected in the same location. The plume had dispersed by this time and TSS values were an order of magnitude less (16mg/L). In an effort to characterize the toxicity effect of elevated turbidity (discussed previously) high NTU samples were targeted. This sampling effort proved to be fairly difficult as turbidity plumes did not usually persist on long enough time scales to collect a full suite of discrete samples.



Figure 17. Debris Removal Generated the Majority of Turbidity Plumes

The short term, pulsed nature of the suspended sediment plumes is also seen in the continuous *in situ* data record. Clear spikes can be seen where turbidity exceeds 50 NTU above background. In most cases these spikes represent one data point. The only extended periods of elevated turbidity occurred during extreme low tides. However, comparable signals were seen during inactive dredge periods.

One of the more subtle characteristics of sediment transport observed during the monitoring period was the tendency for very fine sediments to become entrained in the upper water column. This was first observed visually during the monitoring program. Sampling crews observed 'clouds' of fine sediment and targeted these features for *in situ* readings. This revealed a thin layer of elevated turbidity associated with the low salinity surface water. Immediately below this layer turbidity declined to background levels. The lighter surface layer usually only represented about the upper one foot of the water column. The elevated turbidity associated with this layer was often even thinner, comprising only a few inches resting on top of the sharp density gradient. The estuarine turbidity maximum (ETM) is a common property of estuaries resulting as tidal water moves upriver creating turbulence and resuspending sediments from the bottom while





particulates in the outflowing river are trapped against the density gradient, adding to the turbidity levels. Additionally, as the freshwater contacts the more saline water dissolved material can flocculate creating more particulates which add to the turbidity levels. While this appears to be the general mechanism behind the thin surface turbidity peaks that were observed, suspended sediments from debris removal activities clearly contributed to the turbidity values. Turbidity readings in these surface layers were generally only about 15-30 NTU, well below the threshold criterion, but at times these levels persisted for several hundred feet away from the source.

5.3 Impacts to the Water Column

As expected, turbidity and TSS results showed a strong correlation (R² = 0.9695) (Figure 18). Total PCB (as SUM 18 CONG) concentrations also correlated well with TSS and thus with elevated turbidity (Figure 19). However, dissolved PCB, which is considered as a direct indicator of water quality, do not demonstrate a similar correlation with TSS (Figure 20). For example, the total to dissolved PCB ratio increases from approximately 2:1 in low TSS samples to 40:1 in the highest TSS sample. As noted previously, *in situ* turbidity measurements indicated that these turbidity plumes, representing high suspended solids loads and elevated total PCB concentrations, were isolated to the area immediately adjacent to dredging and debris removal and were also relatively short lived. Total PCB concentrations remained relatively low at the dredge boundary and beyond. Dissolved PCBs in the water column are thought to be the fraction that causes direct toxicity to marine organisms and may be subjected to long range transport. Dissolved PCB concentrations were generally low and did not correlate well with TSS (Figure 20).

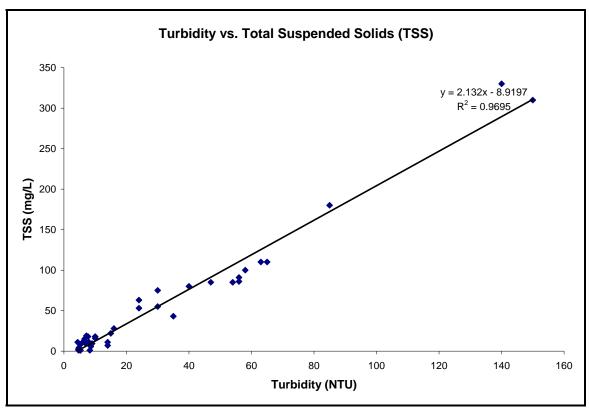


Figure 18. Turbidity vs. TSS Plot





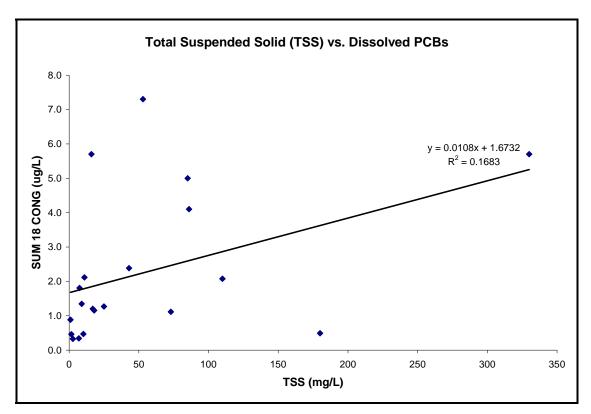


Figure 19. TSS vs. Total PCB Plot

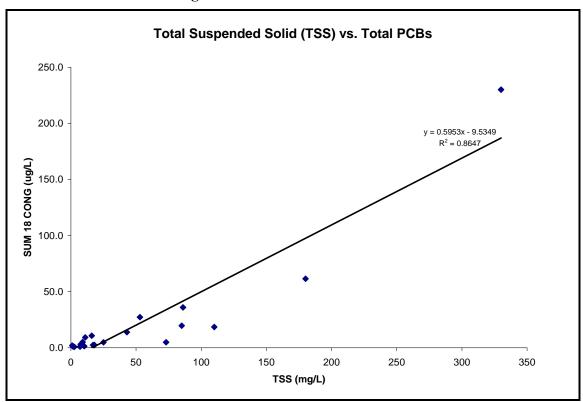


Figure 20. TSS vs. Dissolved PCB Plot





Toxicity testing showed some significant reduction in endpoints for all species (Table 5). Acute tests showed little impact from elevated turbidity, TSS or PCBs, with the only significant reduction in mean-survival observed in the 7-day Mysid test in the sample collected on 9/19 representing the highest turbidity, TSS and PCB concentrations measured during the program. Sublethal effects were measured in a number of samples. While Arbacia fertilization appeared significantly lower than control and reference samples in a number of cases, the magnitude of the reductions were slight. The other test used to assess sub-lethal effects, the Champia reproduction test, had the lowest cystocarp production in the three samples collected on 9/19, which also contained the highest dissolved and whole water PCB concentrations measured during the program. While there does appear to be measurable water column impacts, they appear to be limited to samples containing elevated turbidity, TSS and PCBs.

Overall, occurrences of turbidity plumes appeared to be limited to the areas immediately adjacent to dredging and debris removal, and these plumes were observed to be relatively short lived and isolated to the surface of the water column. No exceedances of the turbidity criteria of +50 NTU above background were observed outside of the 300 ft boundary. And while measurable water column impacts were observed based on toxicity testing, these were isolated to samples collected well within the project boundaries. Data collected confirmed that the +50 NTU criterion continues to be ecologically protective, while still allowing remediation efforts to progress.





6.0 REFERENCES

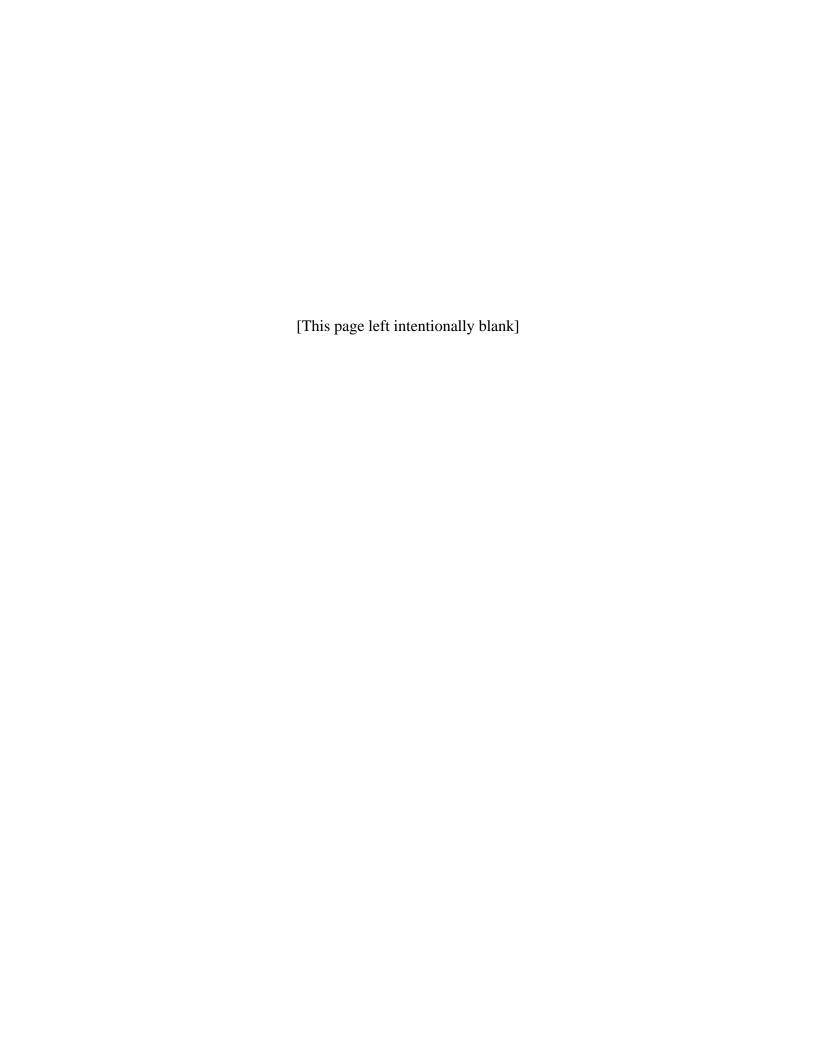
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Appendix A Water Quality Monitoring Field Logs



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Daily Field Summary Sheet for Water Quality Monitoring

Date: 8'-10-06	•
Weather: <u>OC, 80s, SW5-10</u>	Way point "Ret A!" DONROLL CON PRED DED DED DED DED DED DED DED DED DED
Tides: 0.5 @ _ 0244	CZI VO Dele
L -0.5 @ 0244 H +4.8 @ 0912	waypoint Relation
L -0.5 @ 1457	1000 H of Dredse
Monitoring Dovied	acea A. ~ 100
Monitoring Period: From: 0855 To: // 00	S of wood ST. Workers
	We'll we'll
Tidal Stage HWS Ebb LWS Flood	
Dredging Activity:	A South
mabilization:	The state of the s
	I Definition
- Running dredge pipe - STringing cable	Way point BSOUTE
	Southern and Waypoint "ABOO"
	of S/c areas A 300'S of Area A
	Waypoint A 600"
Turbidity Summary	* Waynoin T 18 300"
Location Turbidity Sensor/water	Feet
(NTU) Depth (ft)	0 200 400
Ref B 2.2 5/14.	Legend (
BSOUTH 0.9 8.5/7	
B600 0.2 6.5/5	dredge_area_b_2006
	dredge_area_c_2006
	•
Oil sheen/ Debris:	
NONE	
Fish Passage: Bait fich and Blue	fish breaking Surface from Sawyer ST To Wood ST.
Tion I dissage.	
Samples Collected for Laboratory Anal	ysis – Sample IDs:
TSS (1L)	Turbidity (500ml)
Total PCB (1L) Toxicity (21L)	Turbidity (500ml) e 5 Dissolved PCB (2x1L) Metals (500ml)
Mandon Tad 'Shakadan' Sa	Week To Test on the self leading
Notes: Condocted Shakedown Sc	rivey to test gear, mark locations, and no dredge areas. Marked waypoints are re.
id itie	to dreage areas. Marked waypoints are
wentities on map above	e
Sampling Crew: A. Monstield. T. Chief Scientist Signature: A. M.	Bengley J. Dens more
Chief Scientist Signature:	6

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Water Qual Monitoring In situ Data Field Form

Dredging Location	mob in A, B, and C
Dredging Description	
Survey Vessel	CR ENV. SKIFF
Chief Scientist	Alex Mansfield
Sampling Technician	Tad Beagler
Vessel Captain	
Other Personnel	NA
Weather conditions	Overcast, 80°, SW 5-10

Date	8-10-06
Page	/ of /

Tide in	Tide information					
High	0917 Am wo 8/10					
Low	0244					
High	09/2					
Low	1457					

Station Number	Time		Longitude	Water depth	Sample Depth	Turbidity Nブリ	Salinity	DO M8/L	Temp	Notes
RefA	0912	40°40.674'	70°54.990'	8	6	2.8	1	5.31	25.23	
RefB	0934	41040.597'	70.54.967	5'	4	2.2		8.31	25,19	
BSOUTH	0956	40°40.674' 41°40.597' 41°40.341' 41°40.252'	70° 54.977° 70° 55.044′	8.5	7′	0.9		7.98	25,19	
B600	1005	410 40.252	70° 55.044"	6,5	5-	0.2		8,01	24.81	
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Daily Field Summary Sheet for Water Quality Monitoring

D. A = 1/202/	RefA. Samples dollected
Date: August 14, 2006 Weather: (Leac, 805, Sw-5/Sw20 Tides:	
z raep.	
<u>L -0.2 @ 0545</u>	
1-1 + 41-8' @ 1236 1 + 0.2' @ 1833	
Monitoring Period:	
From: <u>0835</u> To: <u>1400</u>	
Tidal Stage (HWS Ebb LWS Flood)	
Davidson Astricts	A North
Testing Dredge Lines	*
Tering Diecze E.Res	
Debris Remaral STarted at	
11:00 STopped ot 1145.	75 Fad W
sesumed at 1300	
	Debris Removal Barge
	Boundary Samuel
Turbidity Summary	Boundary Sample 1230' From borge
Location Turbidity Sensor/water (NTU) Depth (ft)	
REFA 4.8' 5.2"/4.0"	*
A NETL 5.5 2.6/2.1	300fr samples
BOUNDAY 5.3 6.0/5.0 75 radius ~5.0 variable	
75 radius ~5.0 variable Boundary Simple 4.5 7.5/4.6	* 100(-10)
300fT suple 0.9 8.0/6,7	* 1/600+TSEmples
000ft 5-ple 0.6 7.9/5.7	Legend
,	Feet drodge ergs a 2006
Oil sheen/ Debris:	0 200 400 / S Uredge_area_a_2000
NO Sheen Observed	
Fish Passage: SNAPPY blues, pos res	and buit w/birds working Throughout entire crea
Samples Collected for Laboratory Ana	llysis – Sample IDs:
TSS (1L)	DoTo Sice Dissolved PCB (2x1L) Dec Attached Data shee
Total PCB (1L) <u>Qee Attochec</u>	Dolo Thee Dissolved PCB (2x1L) Dec H lached Dala Thee
lost T Sampline : Planton Sond	by at Ref boundary 200' 1/0'
Notes: Took Banks aund (eadings) a	Metals (500ml) Es at Ret, boundary, 300', 600'. I Amorth and boundary prior to Debris (comoral starty). Uring debris removal. No plume do Tected To la start of the start
Ran circles around barse d	uling debils removal. No plume do Tected
Took planned samples despi	Te low Turbidity values
Same Care Alax Maris	jeld, Matt fitzpatrick, Shy Downware
Chief Scientist Signature: \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	THE THE SAID WATER
Cinci Scientist Signature 3 57 /	

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Water Qual Monitoring In situ Data Field Form

Dredging Location	AREA A
Dredging Description	Testing Dredge Pipe. Debris Removal
Survey Vessel	CR ENV SKIFF
Chief Scientist	Alex Mansfield
Sampling Technician	WATE FITZ POTTICK
Vessel Captain	Ship Densmare
Other Personnel	NL
Weather conditions	Clear, 80°, SW5KNT: - Picked up To 25 in PM

Date	8-14-06
Page	of

Tide information							
High							
Low	0545						
High	1236						
Low	1833						

StationID	Station	Time	Latitude	Longitude	Water	Sample	Turbidity	Salinity	DO	Temp	Notes
	Number				depth	Depth	NTU	PPT	mg/L	00	Sample ID
			41040.676	70°55.003′	5.2'	4.0'	4.8	24,6	5.5	22.8	WQ-XXX-001-081466
	A North	0935		70° 54. 946	2-6	2.1'	5-5	25.5	6.5	23.3,	Nosamples
			41040.427	70°54.922	6.0	5.0	5.3	25,9	8.9	23.4	No Samples
	75' Radius	1030	Ran acirel	e oround buse.	Variat	le,	~5	~26.5			No Plume observed
Bound081406	Bounday Say	1305	410.427	70" 54. 922"		2.5/4.6	3.3/4.5	26.9	10.7	24.3	WQ-XXX-002-031406
300081406	300'Sample	L <i>1320</i>	141 40.367	70 54 957	8.0	6.7	0,9	27.1			WQ-XXX-003.081406
600081406	600 Scapl	1345	41040.2730	70.54.996-	7.9'	5.7	0.6	21.1	8-1	23.9	WQ-Xxx-004-081406
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Daily Field Summary Sheet for Water Quality Monitoring

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	Tidal Stage: HWS Ebb LWS Flood) \	10	142T	1	Lee	TU		
				*			11°		Ŀ	
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	Turbidity Summary		5	}		-				
	Location Turbidity Sensor/water					$ \rangle \rangle$				
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Tight	Sufface Sheen being blown do SE	away	toon	burg	e. A	1 Sluc	K Wal	w SL	reen S	een 10
	Surface Sheen being blown to SE Fish Passage: Bait Fish and blow	refish	. W/b	irds u	DOCKI	NF	entil	pe as	rea	
						0				
	Samples Collected for Laboratory Ana	ılysis – Sa	ample l	lDs: :::::::::::::::::::::::::::::::::::	(1,1)		1			
	TSS (1L) Total PCB (1L)	(_ rurv Diss	olved P	CB (2x)	11.)	to so	2m 01	e s	-
	Tovicity (211)		_ Meta	als (500	ml)	<u></u>	<u> </u>			
	Deployed YSIs North and South	of Dies	lgo or a	a. N	RTh @	1955	SOUT	161	015,	
	Notes: Ran continuous radius aro	and port	ge. Cu	Ment	borr!	ny Tur	bidity	plum	م 10	00
	40 HOTH Wind pushing oil	sheen .	To SE	, AT	slack	Water	Tu16	dity	plum	.4
	Notes: Ren continuous radius are for North. Wind pushing oil was isolated to the imm	ed in Te	borge	crea ((<30')	, Oil st	need pr	es ent		
, , ,)	Sampling Crew: Mex Wanstrold Chief Scientist Signature: 4 4 7.	Mil	اء أول	Sk	no Ca	a. A.				
	Chief Scientist Signature: 100	111111	~ ~~~~	<i>y</i> 5 · × <i>i</i>	I J CHS	3,00 m	· · ·			
	emei scientist signature:		-							

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Water Qual Monitoring In situ Data Field Form

Dredging Location	AREA A
Dredging Description	Debis removal. Testing Dredge pine
Survey Vessel	CR ENV SKIFF
Chief Scientist	A. Marsfield
Sampling Technician	Mike Wolsh
Vessel Captain	Ship Densmore
Other Personnel	1/A -
Weather conditions	Rain 701, 5W 15-20

Date	8-15-06
Page	of

Tide information							
High							
Low	+0.1 @ 0634						
High	44.6 @ 1334						
Low	t0.5 @ 1936						

Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity NT V	Salinity	DO	Temp		
REFA	1040	41°40.677	70° 55.003′	5.9'	5.0'	9.5	21.66	2.48	23.34	Sampled under bridge	due To rain
										•	
				•					-		
		-									
						,					
			· · · · · · · · · · · · · · · · · · ·	<u> </u>							
									1		

Battelle Daily Field Summary Sheet for Water Quality Monitoring

Date: 8-16-06	
Weather:	
Tides:	
L +0.4 @ 0730 H +4.4 @ 1435	7.00
L +0.8 @ 2103	300'10
<u> </u>	
Monitoring Period:	1 1 1 20 2 4 1 1 1
From: <u>/030</u> To: <u>1500</u>	
From: <u>7030</u> 10: <u>7000</u>	Bound
Tidal Stage: HWS Ebb LWS Flood	oll sheet
Tidal Stage: 11WS E00 EWS 1100d	
Dredging Activity:	40-80ATU
1ST Dovat Dredging in	Y
AREA A. Storted in center and are working To East.	
and are leaves in To East	
and the mor Hind 10 tog 11	200-300 NTC
Debris Removal East of Deeds C.	
DEDITO REMOVAL COST OF DIEUTE.	
Turbidity Summary	
Location Turbidity Sensor/water	
Reference 4.5 S.5/3.5 150'S 300 NTU 5.5/4.2	
150'S 300 NTU 5.5/4.2	
130 3 300 NT 0 3.07 472	
Refrence 3.7 58./4.5	*- Reference
	- Ret - Ret
-ple (Boundary 1) 14.8 4.4/2.0'	
300 / 27,0 3.0/2.5	
	Legend
	Feet drades area a 2006
	0 200 400 dredge_area_a_2006
Oil sheen/ Debris:	• • • • • • • • • • • • • • • • • • • •
Some oil sheen when Debris barge	being moved.
Biolo Donnes Blan Col I hat	Wide a dry To I of of clay
rish rassage: Diverish and Dail v	Vbids working entire length of fire
Samples Collected for Laboratory Ar	nalysis Sampla IDs.
Samples Collected for Laboratory Ar TSS (1L)	
	Turbidity (500ml) Dissolved PCB (2x1L) ee Dole heel
Toxicity (21L)	Metals (500ml)
Notes: -	100 300 1c 07 0100g e w/ TurbistTi, 200 300 NTO, Settlee
Plume	gone in ~40 minutes. Although durrent running H, the plume To the south. Highest Turbidity values cand debass removal barge. Polves >200 NTW. These plumes min)
craga pipe appear To be Containing	plume To the south, Highest Turbidity values cand
O'll sheeds seed when have	do has removed bosse. Polves >200 NTW. These planes
tended to be det lead (1001)	
- G - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	min) (Parl St in Desire
Sampling Crew: Alex Manticla	1 and bagger, On if Densmare
Chief Scientist Signature:	
′ (· ·

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Water Qua Monitoring In situ Data Field Form

Dredging Location	AREA A
Dredging Description	Debis Removal, 1st Day Dredsing
Survey Vessel	CR ENV SKIFF
Chief Scientist	Alex Marsfield
Sampling Technician	tad Beasley
Vessel Captain	Ship Deasmore
Other Personnel	
Weather conditions	Clack, 80, No bi este.

Date	8-16-06	
Page	of	

Tide information							
High							
Low	0736						
High	1435						
Low	2103						

STation	Station	Time	Latitude	Longitude	Water	Sample	Turbidity	Salinity	DO	Temp	Notes	
$G\Sigma$	Number				depth	Depth.	NTU	PPT				
	Reference	1036	410269	70°54,998'	3.5	2.5'	4.5	23,73	10.25	23.77	South of Diedge or	1000
•		145			2.3	1.67	84.9	82.7	1 <i>7.00</i>	24.7	North edge of Ilea A	Į
REF081606	Reference	1330		70° 54.998'	5.8,	4.5'	3.7	25.11	929	23.73	WQ-XXX-001-081606	
		1400	41° 40.523'	70'54,914	4.4	20'	14.8	23.8	13.45	25.56	WB-XXX-002-081606	
300081606	30011	1415	41140.5791	70°54.968'	3,81	2.3	24.0	25.5	12.23	25.14	WQ-XXX-003-081606	
											ALSO MS/MSD	
											and Field Dups	
											for PCB	
	_											
											,	
									<u> </u>			
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Daily Field Summary Sheet for Water Quality Monitoring

Date: 8-17-06)) V ((-		
Weather: Clear, 80s,							
Tides: L +0.6 @ 0836 							
<u>L+0.8</u> @ <i>pos</i> 6		\ \					
Monitoring Period:							
From: $1/00$ To: 1500			_			~ <i>p</i>	
Tidal Stage: HWS Ebb LWS Flood			B	oundor			
Dredging Activity: Dodging AREA A STOOTOO			×			7	
at 1/4/5							1
Debris Renoval STarted					/	1	
7,500	1000 10e		2	Ė	-0:19	Leens)	} \
		5)		7
Turbidity Summary Location Turbidity Sensor/water							
				40	Ishe	ex	
Reference 8.5 Depth(ft) 3.7/25					100		
				<i>)</i>)	}	
					\mathcal{L}		
	12			ence	7/		
		\0.	. Rex				
		未) Feet-		Leg	end		
	0 200	400			dredge	e_area_a	_2006
Oil sheen/ Debris:	المن ما ملم المنا	75W	Sent Leave	يد لي	270	- H	. J
Heavey Sheens generated when moving Through gops in on boom	Cept 12 6	MSE. NON-S	oen leavin	O hox	<u>~1 30</u>	<u> </u>	eno
Fish Passage:							
Samples Collected for Laboratory Ana	ılysis – Saı	mple IDs:					
TSS (1L)		Turbidity	(500ml)_		k /		
Total PCB (1L) Toxicity (21L)	e S	_ Dissolved _ Metals (50	. PCB (2x1 00ml)	LL)	10 S	sa m	ple s
Notes: Elevated Turbidity only see Short-lived (100)	in when 1	moving de	ibris borg	re (<150	(UTN	, Plume	. Was
Turbidity in immediate doodge orea	(450°) nem	ir exceede	v ta oe b				
Sampling Crew: Alex Manstield, Too Chief Scientist Signature: 1 2 19	Beogley	, Ship J	Densma(+	ı			
Chief Scientist Signature:	6-10	•					

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Water Qua Monitoring In situ Data Field Form

Dredging Location	AREA A
Dredging Description	Dredsing
Survey Vessel	CREHN SKIFF
Chief Scientist	Alex Mansfield
Sampling Technician	Tad Beagley
Vessel Captain	Ship Densmore
Other Personnel	
Weather conditions	clear, 80's, No breeze

Date	8-17-06
Page	of

Tide inf	formation
High	
Low	L+06 0836
High	4+4.3 1539
Low	L+0.8 2236

Time	Latitude	Longitude	Water	Sample	Turbidity	Salinity	DO	Temp	Notes
	de de Olo	70° CC 00 A'		Depth	70.7		O iim	ausi	
130	41.40.864	70 33,000	3, /	25	8.5				
150	41.40.527	70°54.933	1.8	1.5	26.8	30.21	10.26	27.5	
1300	41040.707	70.55,019	3.5'	3.2	11.8	32.5	6.49	25.10	
		,				1			
		•							
				·					
-						 			
			130 41°40.269' 70°55.00 0' 150 41°40.527' 70°54.933' 1300 41°40.707' 70°55.019'	depth 130 41° 40.269' 70° 55.00 0' 3.7' 150 41° 40.527' 70° 54.933' 1.8' 1.80 41° 40.707' 70° 55.019' 3.5'	depth Depth	depth Depth NTU 130 4 °40.269' 70°55.000' 3.7' 2.5' 8.5 150 4 °40.527' 70°54.933' 1.8' 1.5' 24.8 1300 4 °40.707' 70°55.019' 3.5' 3.2' 1/·8	130 41°40.269' 70°55.000' 3.7' 2.5' 8.5 32.47 150 41°40.527' 70°54.933' 1.8' 1.5' 26.8 30.21 1300 41°40.707' 70°55.019' 3.5' 3.2' 11.8 32.5	130 41°40.269' 70°55.000' 3.7' 2.5' 8.5 32.47 8.43 150 41°40.527' 70°54.933' 1.8' 1.5' 26.8 30.21 10.26 1300 41°40.707' 70°55.019' 3.5' 3.2' 11.8 32.5 6.49	130 41°40.269' 70°55.000' 3.7' 2.5' 8.5 32.47 8.43 24.94 150 41°40.527' 70°54.933' 1.8' 1.5' 26.8 30.21 10.26 27.5 1300 41°40.707' 70°55.019' 3.5' 3.2' 11.8 32.5 6.49 25.10

*Much higher rendings Them previously seen. Suspect values, although dal was

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Daily Field Summary Sheet for Water Quality Monitoring

Tidal Stage: HWS Ebb LWS Flood Dredging Activity: IST day of deading in Acc BC #30 = 1245 AREA A 1300 = 1245 Turbidity Summary Location Turbidity Sensor/water (NTU) Depth (ft) Fetreuse #1.1 NTU 3.1/2.4 On A Dredge 55 NTU Norther Rat 24 3 NTU Oil sheen/ Debris: Oil sheen/ D
Tides: C + 0.7
Tidal Stage: HWS Ebb LWS Flood Dredging Activity: ST day of dredging in Acc 3/c 1300 > 1245 One of dredging in Acc 3/c 1300 > 1245 One of dredging in Acc 3/c One of dredging i
Tidal Stage: HWS Ebb LWS Flood Dredging Activity: ST day of dredging in Acc 3/c 1300 > 1245 One of dredging in Acc 3/c 1300 > 1245 One of dredging in Acc 3/c One of dredging i
Tidal Stage: HWS Ebb LWS Flood Dredging Activity: ST day of dredging in Acc 3/c 1300 > 1245 One of dredging in Acc 3/c 1300 > 1245 One of dredging in Acc 3/c One of dredging i
Samples Collected for Laboratory Analysis - Sample IDs:
Distributed operated for ~5min (I) 1/10 (NO plane seed) Turbidity Summary Location Turbidity Sensor/water (NTU) Depth (ft) (I) NTU 3.1/2.9 (O'N of Dredge 55 NTU 3.071.7 Norther Part 24.3 NTU O'I sheen/Debris: O'I sheen blowing north of deage Fish Passage: Snappy blow and boit throughout River Samples Collected for Laboratory Analysis - Sample IDs:
Cil Sheen blowing north of deage Fish Passage: Snappy blow and boil throughout River Samples Collected for Laboratory Analysis – Sample IDs:
Location Turbidity Sensor/water Reterence (NTU) Depth (ft) 3.1/2.9 On of Dredge 55 NTU 3.07/.7 Norther Part 24.3 NTU Oil sheen/ Debris: Oil sheen/ Debris: Oil sheen blowing north of dedge Fish Passage: Snappy blue and bait throughout River Samples Collected for Laboratory Analysis – Sample IDs:
Oil sheen/ Debris: Oil sheen blowing north of deelge Fish Passage: Snappy blue and bait throughout River Samples Collected for Laboratory Analysis - Sample IDs:
Fish Passage: Snappy blue and bait throughout River Samples Collected for Laboratory Analysis - Sample IDs:
Samples Collected for Laboratory Analysis – Sample IDs:
· · · · · · · · · · · · · · · · · · ·
Total PCB (1L) Total PCB (1L) Toxicity (21L) Turbidity (500ml) Dissolved PCB (2x1L) Metals (500ml)
Notes: ~2 passes at orea B/C (East-west) them moved to AREAA at higher water low level (260ntv) plume seen in immediate area, but diminished at 2100. Replacing booms around debris removal released faitly large sheem. Sheen blown beyond box until outside boom repaired
Sampling Crew: Alex Monsfield Too Boogley, Chip Rother Chief Scientist Signature:

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Water Qua Monitoring In situ Data Field Form

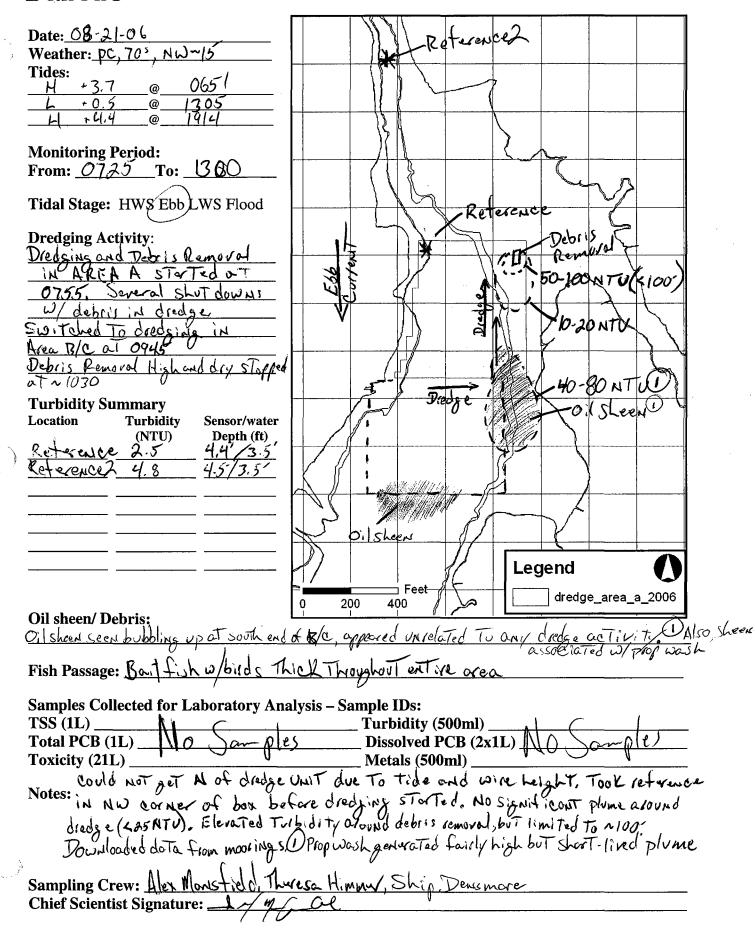
	,
Dredging Location	AREA B/C
Dredging Description	1st Day of dadging in BC
Survey Vessel	CR ENV. SKIFF
Chief Scientist	Alex Mansfield
Sampling Technician	Too Beagle/
Vessel Captain	Chip Rythe
Other Personnel	- Annual Control of the Control of t
Weather conditions	OC 705

Date	8-18-06
Page	of

Tide information					
High					
Low	0956				
High	1641				
Low	2348				

Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO ms/L	Temp	Notes
Reterence	1145	41040.2691	70.85.000	3,1	3	23.011.1	27,09	7.09	25.2	
50-Dredge	1230			3.0-	1.7	.55	26.74	6.76	25.4	
Upstrem Re	-1345			24'	1.1	24.3	25.7	5,92	26.8	
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1) Readings Deapped of after initial.



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Water Qual. Monitoring In situ Data Field Form

Dredging Location	Diedains and Debiis Removal AREA A NOBOO-1000, than Dieds e B/C 1000-1030	Date	CB-21-06
Dredging Description	Dredge in Arec A ON bottom 5 Topped -1245	Page	of
Survey Vessel	UK ENV. SKIFT		
Chief Scientist	Alex Mans field	Tide in	formation
Sampling Technician	Thereso Himmy	High	065/
Vessel Captain	Ship Densmare	Low	1305
Other Personnel		High	19/4
Weather conditions	PC, 705 NW 45	Low	

Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity ハーン	Salinity PP 1	DO*	Temp	Notes
Reference	0745	41°40.683'	70'55,016	4.4"	3.5°	2.5	D フィ(0	0110	
Ret 2	1035	41°40.683'	70'55,016	4.5	3.5	48	23.1		24.9	
						·				
								<u> </u>		
		- '								
										
						·				
-										
				· 						

*DO leading & sparadic. Suspect Torn membrane, or oil on surface of membrane

Date: 8-22-0C	Wood ST Returence
Weather: pc, 70°,	
Tides:	
<u> 4 + 3,9 @ 0735</u>	
L+0.4 @ 1343	
H+4.4. @ 1956	
Monitoring Period:	
From: <u>0800</u> To: <u>1300</u>	
Tidal Stage: HWS Ebb LWS Flood	
Dredging Activity: ARFA A Dredge (STOT 0830)	North In The Indian
AREA A Dredge (STORT 0830)	North retarence
AREA A Debois removal	(etarent)
	THE TONTON
	(4) 30-130
	5 1 1 2000
Turbidity Summary	30-150NTO
Location Turbidity Sensor/water	~ 10 NTU
O A O (NTU) Depth (ft)	
South Retrance 2-3 63/4.4	
North Retwence 3.9 4.1/1.2	
(1) 23.1 $3.8^{2}/2.0^{2}$	
Wood ST 3.1 4.0-/2.7	south Retwence
	Legend
	Feet dredge_area_a_2006
00.1 (0.1)	0 200 400 diedge_alea_a_2000
Oil sheen/ Debris:	2 4 0 1 0 1
light oil shown seen drifting	c South of Websis Removal
Fish Passage: Baitfish w/birds	working south couch out occas
rish Passage: Don't Fine W offs	Marking step into them a ser
Samples Collected for Laboratory Ana	alysis – Sample IDs:
Total DCD (11)	Discalual DCD (2-11)
Total PCB (IL)	Turbidity (500ml) Dissolved PCB (2x1L)
Toxicity (21L)	Metals (500ml)
Largest Turbidity plumes	seed when moving the debits removal barge (prop wash)
Notes: (at 6/00 Twh 1st of Tour	needs 100-150 NTV. Beyond 100' drops to 70 101-1 Tirelity
Duran icht I - T	beloating Start lived (220 - 1) al
prome isolated to top! (ON Tup of	national, oner inter coming plumes at a 33 MI
al ~1,000 down STream, No Surp	seen when moving the debtis removal barge (prop worth) receds 100-150 NTV. Beyond 100' drops TO 30-60 NTV. Turdity halocline), Short lived (n20 min plume) of n 35 NTV les collected due to ephemeral nature of plume
Sampling Crew: Alex Mansfield, Je	silva takey Ship Densmore
Chief Scientist Signature: $\cancel{\bot} \cancel{y} \cancel{y}$	- ol

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Water Qual Monitoring In situ Data Field Form

Dredging Location	Area A
Dredging Description	Diedaing East- Half, Debiis pemoval
Survey Vessel	
Chief Scientist	Alex Mansfield
Sampling Technician	Jessica Foher
Vessel Captain	Ship Devismore
Other Personnel	
Weather conditions	pc, 70°

Date	8-22-06	
Page	of	

Tide information						
High	0735					
Low	1343					
High	1956					
Low	6					

	Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity NTU	Salinity PAT	DO*	°C	Notes	
South	Retrence	0818	41.40:306	70°54, 961 70°54, 964 70°54, 878 70°55, 007	6.3'	44'	2.3	27.2	Ma/L 4.2	23.6 23.9 23.3	Prior To drodge	STacTUP
North	Reference	0825	41.40.503	70054.964	4.1	1.2'	5,9	27.2	5-1	23.9	11 0	7
	(1)	OE35	4/040,427	70°54.878	3.8	2.0	23.1	22.0	3.25	23.3		
wood	ST	1150	41"40,678	70055.007	4.0	2.7	3./	26.7	3.43	24.77	Checked at 1	ow Warn
									 		_	
									 		<u> </u>	
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*New membrane, readings lower than expected, % sat at surface only ~50% suspect that membrane is being fouled when passing through surface sheen.

Date: 8-23-06 Weather: 61201, 805, No bleeze	Northern Reference
Tides: (-(+4.1 @ 0817	
H + 4.4 @ \$0.3.5	
Monitoring Period: From: <u>2945</u> To: <u>1300</u>	
Tidal Stage: HWS Ebb LWS Flood	
Dredging Activity: Dredsing AREA	
Dredging AREA A Deblis Removal ARIZA A	
	Debris
Turbidity Summary Location Turbidity Sensor/water	100 NEW 20-50 NTU
South Reterence (0950)3.6 5.7/1.2' North Reterence 3.9' 4.5/3.1'	10-20 NTU
	Retarence * Legend
	Legend Column Co
Oil sheen/ Debris: light sheen S of Dredge + Dabols borge	Mostly contained by boom w/ Trickles at Gapr
Fish Passage: boit fish Scentle Lots of birds between Area A and	soughout less big fish and birds as compared to plevious were wood St.
Samples Collected for Laboratory Ana TSS (1L)	alysis – Sample IDs: Turbidity (500ml)
Total PCB (1L) Toxicity (21L)	Dissolved PCB (2x1L) Metals (500ml)
Notes: Very little Turbidity Seen Hi low level Turbidity plume (20-5	Metals (500ml) Metals (500ml) ENT The operations. No Signal Seen near draige (d) Been within 100' of debris removal. lower
Sampling Crew: Alex Manstald, Chief Scientist Signature:	M Cool Nereson Timmer, Ship Densmoth
*	

Water Quality Monitoring In situ Data Field Form

Dredging Location	Dredging and debris removal in ARICA A
Dredging Description	
Survey Vessel	CR ENV SKiff
Chief Scientist	Alex Mans field
Sampling Technician	Theresa Himmer
Vessel Captain	Ship Dansmore
Other Personnel	Jar macker aboard for ~30 min
Weather conditions	Clear, 80° no breze

Date	8-23-06
Page	of

Tide in	Tide information			
High	0817			
Low	1415			
High	2035			
Low				

Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity PPT	DO My/L	Temp	Notes
South Ret	0950	41:40.306	10°54.961'	5.7°	1.2'	NTU 3.6	25.1	7.3	24.7	
North Ret	1155			4.5'	3.1	3.91	26.9	2.0*	253	
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* Membrane possibly fould from oil sheen

Date: 8-8-06	
Weather: 16in, 80, No Wind	
Tides: + 0.3' @ 0426 + 4.0' @ 1129	
L + 0.6' @ 1654	
Monitoring Period:	
From: <u>09/0</u> To: <u>/030</u>	
Tidal Stage: HWS Ebb LWS Flood	
Dredging Activity:	
Prodicing and Debris	
NAREAA	
	SONTU TO THE TOTAL SONTU
	Sayle A DOI Sheer
·	
Turbidity Summary	25NTU
Location Turbidity Sensor/water	* Sample
(NTU) Depth (ft)	
· · · · · · · · · · · · · · · · · · ·	
	The Refrence
	South Ret
	Legend
	FACE
	0 200 400 dredge_area_a_2006
Oil sheen/ Debris:	mell w/ Debis Romoval
Fish Passage: limited number	of Lish som, Many Egnets, Heron on shareline
feeding.	
Samples Collected for Laboratory An	alysis – Sample IDs:
TSS (1L)	Turbidity (500ml) Dissolved PCB (2x1L) Metals (500ml)
Total PCB (IL)	Dissolved PCB (2x1L) de Da Sheel
Post of Control of The	Metals (SOUMI)
Notes:	as TargeTed SONTU and 25NTU
	and the second
Flood Tide slove, our surtage	e wolf towing south due to heary paintally
(unot our past temdays	ce water flowing south due to heavy rainfall
Sampling Crew: 1/2/ W/w/stold	Jessica Faher, Ship Donsmore
Chief Scientist Signature:	tous

Water Quairy Monitoring In situ Data Field Form

	•	
Dredging Location	AREA A	
Dredging Description	Dredains and Debris Removal	
	CR ENV. SK: H	
Chief Scientist	Alex Mansfield	
Sampling Technician	Jessica Fahay	
Vessel Captain	Ship Dens mole	
Other Personnel		
Weather conditions	rain BOS no breeze	

Date	8-28-06
Page	of

Tide information			
High	0		
Low	0426		
High	1/29		
Low	1654		

<u>O</u>	Station Number	Time		Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes WQ-XXX-00 -08280 WQ-XXX-002-082806 WQ-XXX-003-082806	Station ID
Sor	h Ref UTU	0930	41340.313	70°54.954' 70°54.936' 70°54.918'	6.7'	5.8	10.5	21.7	*	21.4"	WQ-XXX-001-08280	6 SOUTHEROBESCE
150	UTU	0950	410 40 429	70-54.936	5.6	2.7'	50-70			<u> </u>	MQ-XXX-002-08260G	SONTUOSZYOL
125	MTU	1015	41 40.394	70° 54.918'	6.1	2.5'	20-30				WQ- xx X-003-082806	25 NTU 082806
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		l	L <u>. </u>	<u> </u>			l			<u> </u>		

* Readings No good

O w.d. 25.10/20/06

	Date: 8/29/06 Weather: Cloudy Drizzle, 5-1009	
	Tides: WIND WIND WIND WIND WIND WIND WIND WIND	
	H + 3.8 @ 1210	
	L + 0.8 @ 1734	
	Monitoring Period:	
	From: 1010 To: 1340	
	Tidal Stage: HWS Ebb LWS Flood)	ab de la companya della companya della companya de la companya della companya del
		The age of the second s
	Dredging Activity:	
	(S in metaling, N alone 1045)	I was I was
	* 40-80 NTV Not debis removal	Service Servic
	100-125 H away from barge (N)	
	100 100 p away from bases (N)	
		0: 100
	Turbidity Summary	20 70 (12)
	Location Turbidity Sensor/water	La Company of the Com
	(NTU) Depth (ft) 2.7 9102	* 5
	100 NE debugnes 25.0 1.4 @ 1111	
	S& Dudge 7-65.5 1.6 @ 1133	
	·	
		Legend
		Foot
	Oil cheen/ Debrice	0 200 400 dredge_area_a_2006
hichic	Oil speen/Debris:	M (all morning) smoil show outside a @ see data sheet
•	•	boomaier & see daingheit
	Fish Passage:	
	Samples Collected for Laboratory Ana	,
	TSS (1L)	Turbidity (500ml)
	Total PCB (1L) Toxicity (21L)	Dissolved PCB (2x1L) Metals (500ml)
	Notes: Took a break around 1215 pr	n - No deadsis a dalui malical hoise completed Returnes
	(3) 1'5 pm - No decodging on	debie remeval hoppening Flacine new booms in because
)	debie removedia in the ho	n-No decologing a debui material being completed. Returned debuie numeral hoppening Flacing new booms in because r spot. Also, referring.
	Sampling Crew: Mike Walsh,	essica Fahers, Ship Densmare
	Chief Scientist Signature:	July 1'
	//	/ -

Water Quality Monitoring In situ Data Field Form

Dredging Location	Aveg A
Dredging Description	Dibies Removal
Survey Vessel	CR ENV. SKIFF
Chief Scientist	Jessica Faley
Sampling Technician	Mike Walsh
Vessel Captain	Ship Densmore
Other Personnel	
Weather conditions	Cloudy ul light Rain breeze N-NEW world 10
•	

Date	8-29-06
Page	/ of /

Tide information							
High	-						
Low	0459						
High	1210						
Low	1734						

	Station	Time	Latitude	Longitude	Water	Sample	Turbidity	Salinity	DO	Temp	Notes] .
	Number				depth	Depth						
	S. R. juine	1016	41.40,305'	-070°54,966	5.9'	4.41.5	5.8	17.35	6,58	20.11	S. Reference - wish	How engages
	S. Rel.	1020	4	<i>(</i> 1	5.1'	2.9	1.2	20.55	5.58	20,98	, , , , , , , , , , , , , , , , , , ,	Layer
	Ų.											· 3
	N. Red	10:39	41-40.519	070°54, 960	4.8'	4	30.0	21.04	257	21.15		
	N. Rel.	10	15	<i>(</i> c		14	20.9	15.08		20.30		
_	V											
-(1)	augh	1052	41.40 474	070 54, 958	4.3	2.7	81.5	19.41	3.28	20.68	N. of debus removas	
\cup												
2	aug A	1124	41.40,369	070 54.974	6.0'	4.0	3.5	22.37	5.64	21.52	@ 250' S. of debisione	meral
0		1125	11	**	6.0	1.3	21.2	17.37	5.51	1737	@ 250' S. of debiente 20.39 @ 300' S of de	air cemaras
		y -2										
			· -									
	-											
					-							
			<u></u>									
						<u> </u>						I

* Conductivity would not calclaide "Out of Kong"

values were 1.004-1.016 for all trys

list try rending was . 999 - "Orl of large" was still occurry

Date: 8/30/06 Weather: Mostly Cloudy/N-5143	
Tides: L 0.5 @ 0537 H 3.7 @ 1257	
Monitoring Period: From: 0840 To: 1215 Tidal Stage: HWS Ebb LWS Flood	W. P. St. wash
Dredging Activity: - Manny - 100 Debruz remaral dui - to size mainfuncunce. - Predging in Northern section of Sinthern dredge	Truse 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Turbidity Summary Location Turbidity Sensor/water (NTU) Depth (ft)	3-Film + 5.Paf
	Legend
Oil sheen/Debris: Sheen South of Dibors Kemurul; Sheen	0 200 400 / dredge_area_a_2006
Fish Passage: Nove	
Samples Collected for Laboratory Ana TSS (1L) Total PCB (1L) Toxicity (21L)	Alysis – Sample IDs: Turbidity (500ml) Dissolved PCB (2x1L) Metals (500ml)
Notes: USED Morning #6I for - High Counts observed north of F running was Keeping Bridge on to	We maniformy->0-Ringsfell off wards I typicall used. Iredge @ 25-100ntn (shartly) while skift with outloow neck
Sampling Crew:	

Water Quality Monitoring In situ Data Field Form

Dredging Location	Avea A
Dredging Description	Pelvis Renaral / Predying
Survey Vessel	CR Eno. Skiff
Chief Scientist	Mily Walsh
Sampling Technician	Icszicu Fahry
Vessel Captain	ship Densmene
Other Personnel	
Weather conditions	Mostly Cloudy / wowde NNF 5

Date	8/30/06
Page	/ of /

Tide information							
High	e e e e e e e e e e e e e e e e e e e						
Low	0537						
High	1257						
Low	1820						

	Station	Time	Latitude	Longitude	Water	Sample	Turbidity	Salinity	DO	Temp	Notes		
	Number	0 8111	1310 110 271	120001 099	depth	Depth	201	22 76	117-0	2170	60	Car Pall of Per	Suyan
	Ref south	0991	41° 40. 276	070°54,999	4.5ft 4.5ft	3.5H	3.8ntu 9.3ntu	22.36	284	21.38	Orking on DOSCY	50 Fell off	assure (a)
	Ky Jumin	0100	11 10: 312	0/0 3 (1 102	11377	~`/	11 3141	A 11 1	200	2117	,,	, t	renduel
you fan I	ebors Remov.	10:08			3.8 Ft	1,894	98 nta	26.9	1.9/	21.3			
175 ft War	e of Dubis R.	10:11			3.8F+	1,8ft	51,70tu	24.37	7.38	21.2			
173 H Na							·						
175' south	of Debris K.	(0),20			4.5ft.	1.714	3.8	28.42	3.63	21.4			
175' north 100' NW 9 100-500 N 9	2 4		_		>_ A) f.	200		221	2 /7	41.20	side (b. over (- days t	مداروسة
175' north	Vredge A	10:35			4,8 ft	1.8 ft	95nt	27.1	2.50	21.38	sight pushing	y agranger D	nege
1/17/18/W S	Budo A	10:40			4.5ft 4.5ft	20ft	150 Ntu 53 Ntn	26.8	3:65	21.33	SKH STOPPE	Q	
10-50 N 9	Fredge A	10,35			יופיד	2011	>7 M/L				71.11 STOPPE	~	
				_									
						'							
		<u> </u>					<u>, </u>		<u> </u>				

1 Suspect DD Reading 8/30/06 MW

Daily Field Summary Sheet for Water Quality Monitoring

	01.1	
	Date: 9/6/06	
`. /	Weather: cloudy (10070 com) Tides;	
	HQ+43 @ 0712	
	<u> </u>	
	Manitaning David	
	Monitoring Period: From: 850 To: 1230	
	Tidal Stage: HWS Ebb LWS Flood	
	Dredging Activity:	
	deficies remercel + duedaj rez in Northern saction (AREA)	
Den Ton		
Dard Silvy		Sheek The Sheek
	Turbidity Summary	
	Location x Turbidity Sensor/water	
	S. Ecorner 18.5 Depth (ft)	
Just	5. of deader 29.5 2.1 -0.15/20	
Wigg	125 metron 5.8 2.8	
	· · · · · · · · · · · · · · · · · · ·	Legend (
		0 200 400 dredge_area_a_2006
	Oil sheen/ Debris:	
	between S+N areas - boom open	·
	Fish Passage: few (but some) fish	sexul in all areas
	Samples Collected for Laboratory Ana	alysis – Sample IDs:
		Turbidity (500ml) See Data sheet
	Total PCB (1L)	Dissolved PCB (2x1L) Metals (500ml)
	Collected Sorte of Turk	Metals (500ml) pidity and TSS Sompler To generate calibration
	Notes: CVNe.	V
· ·		

Water Quality Monitoring In situ Data Field Form

Dredging Location	ALEAA
Dredging Description	Dreds into - Debris Renoval
Survey Vessel	dr. sk. ff
Chief Scientist	Alex Mansfrold
Sampling Technician	Jessica Fone/
Vessel Captain	Ship Dews were
Other Personnel	
Weather conditions	Od 705 no broeze

Date	09-06-06
Page	of

Tide information								
High	0712 +4.5							
Low	1259 0.3							
High	1935 +5.U							
Low	<u> </u>							

	Station	Time	Latitude	Longitude	Water	Sample	Turbidity	Salinity	DO	Temp	Notes	Station
	Number				depth	Depth						ID
	S. MODRING				5.8	1.6	3	21.9	5,52			
	N. Corner	0908			4	2.2	7.2	22,6	4.35			
¥	Ø ONTU	1023	8/55,50 ↔	2705750	4.5	2.9	3.7	23.6	5.01	20.98	WQ-XXX-001-090606	ONTU090606
1	1 15 NT	1055	2704659	815.782	5.5	2.2	15.4	22.4	5.82	21.57	W12-XXX-002-090606	15 NTU090606
	220NT	1102		8+ O	4.5	2.5	22.1	22.8	4.19	21.39	WQ-XXX-003-090606	ZONTUOGOLOG
			2706636	816047				<u> </u>				
*	3 BENTU		2706449	815684	5,0	2,2	35.0	21.96	4.02	21.47	Wa-xxx -004 - 090606	35N7U090606
		1150	2707000	815 909	2.5	1.7	135.0	20.9	54	21,83	WA- XXX -005-090606	135NT11090606
	5 75NT		2706929	915941	2.5	1-5	60-90	19.01	7.77	21,26	WO- XXX-006-090606	75 NTU 070606
	GOONTL		2706985	815926	2.4	1.6	50.1	18.53	7.68		Wa- XXX-007-090606	50NTU090606
	4 001-10	1701			,	7.0	00.7	70070	7.98	P 11. U 1	100 PAR 001 0 70900	30,1,001
		-			<u> </u>	<u>.</u>						
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		·										
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1											•	1

*Collected Range of Tss/Turbidy values for ealibration. Filename on YSI = 090606

** Files stored during collection to get arraye values

O ald reading was stored.

Date: 9-7-06	
Date: 9-7-06 Weather: Clew, 705	
Tides:	
H 4.9 @ 08:06	
L -0.6 @ /3:53 H 5.6 @ 20:23	
H 5.1 @ 20.23	
Monitoring Period:	
From: <u>0830</u> To:	Noth
~	Retience Retience
Tidal Stage: HWS Ebb LWS Flood	
_	Removed 11.
Dredging Activity:	Cemoral (131)
Clear-up passes + Dulis Removal in Alea A	
occupied in the A	
	Contraction
Turbidity Summary	so-Th Ret
Location Turbidity Sensor/water	
. (NTU) Denth (ft)	Feet 0 200 400
South Ret 0.0 6.7./1.3	
North Ref ~4.8 (bot) 5.0./0.54.0	Legend ()
North Ret 4.1 surf 5:0 /0.5	dredge_area_a_2006
	dredge_area_b_2006
	dredge_area_c_2006
Oil shoon/ Dobrice	•
Mace I'll well should some	since le four dobble vous avail
VALY II. I'LE OTT STOREN OUT THE PT	ime; ly from debils removal
Fish Passage: Such is Lucent in 10	ow neumber: Throughout orea, mostly feeding
on small posies	, , ,
Samples Collected for Laboratory Analy	rsis – Sample IDs:
TSS (1L)	Turbidity (500ml)
Total PCB (1L)	Dissolved PCB (2x1L)
Toxicity (21L)	Metals (500ml)
Suspended sed, ment contined	To Thin layer liding on top of pychodine,
Notes: at ~ / deep. Debits remo	Dissolved PCB (2xIL) The Metals (500ml) To Thin layer liding on Top of premodine, val eausing the only significant plumes
	· · · · · · · · · · · · · · · · · · ·
Sampling Crew: A Moustec, M. F.	TE patrick S. Deus more.
Chief Scientist Signature:	

Water Quality Monitoring In situ Data Field Form

Dredging Location	
Dredging Description	Clean-up passes + Debis Removal
Survey Vessel	CR SK: ft.
Chief Scientist	A. Mansfreld
Sampling Technician	M. F.Tz patrick
Vessel Captain	S. Devember
Other Personnel	
Weather conditions	Clock. 703. No breeze

Date	9.7.06
Page	of

Tide information					
High	0800				
Low	1333				
High	2023				
Low					

	Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes
troś	hret	0909	270575/	815520	6.6	1.27	0.0	26.84	5.09	21.85	
ort	h Ref	0931	2707266	815520 815699	5.0	0.5	4.1	25.2	651	21.39	Surface sample Bottom sample
or	L Ret	0972	11	1,	5.0	4.0-	4.8"	27.09	4.1	21.09	Batton somple
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L								<u> </u>	<u> </u>		

(Surt) (bot)

Date: $9-11-06$ Weather: $9-11-06$ Tides: $200 - 0.5$ @ 0430 $116 - 0.2$ @ 116 $120 - 0.2$ @ 1715					
Monitoring Period: From: 0930 To: 1330 Tidal Stage: HWS Ebb LWS Flood Dredging Activity: AREA - Dredging + Debr., Remodal	North Corner Deb!is				
Turbidity Summary Location Turbidity Sensor/water South Red 2.6 5.9/5.0 North Corner 36.6 4.9/2.3	South Re F O 200 400 Legend dredge_area_a_2006 dredge_area_b_2006 dredge_area_c_2006				
Oil sheen/ Debris: Heary shew + odor from debris removed, sheen pushed south, on the wind. Fish Passage: None Samples Collected for Laboratory Analysis - Sample IDs: TSS (1L) Turbidity (500ml) Total PCB (1L) Toxicity (21L) Metals (500ml) Notes: Debris removal Near North west corner, can not transit further North because of Cabling. 1115 - Sedand trop deployed at North hoosing Sife 1135 - Sedand trop deployed at South Morning Sife					
Sampling Crew: A. W. Lield 5. Chief Scientist Signature: A. W. J.	Fcher, S. Devinere, M. Walsh				

Water Quanty Monitoring In situ Data Field Form

Dredging Location	AREAA
Dredging Description	Diedsing and Debis Removal
Survey Vessel	CR SK FF
Chief Scientist	1 Wousteld
Sampling Technician	J. Fahrey
Vessel Captain	S. Densmore
Other Personnel	
Weather conditions	Cleur, 70° NE 10-15

Date	9-11-06
Page	of

Tide information					
High					
Low	0430				
High	11/6				
Low	1115				

	Station Number	Time	Latitude	Longitude 5.057148 815343.6 8157/3.5	Water depth	Sample Depth	Turbidity	Salinity PPT	DO my/L	Temp	Notes	
Sau	The Re F	0935	Northing 2705782-5 2707227.1	815547.6	3.91	3.0	26	25.79	7.44	20.39	South Reference North Corner of Area	lac
* Nort	Let	1005	2707227.1	8157/3,5	4.9"	2.27	36.6.	23.4	6.95	19.77	North Corner of Area	4
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* Tide height does not allow passage further North Location is only ~ 100' from Debi's removal.

Daily Field Summary Sheet for Water Quality Monitoring

Date: 9/12/60 Weather: Sunny, Clust, busy, Tides: 71/12/1 @ 1210 4.8 Lew 1511 @ 1811 0.2 Lew 0.516 @ 0.516 - 0.2 Monitoring Period: From: 0.721 To: 1140 Tidal Stage: HWS Ebb LWS Flood Dredging Activity: No AM. Pulm3 Kinural Area All manual Present tanks were full because holding tanks were full Turbidity Summary Location Turbidity Sensor/water (NTU) Depth (ft) 1.7/4.9' 5.66 7.3 4.0/5.0'	Was feet o 200 400 Legend				
Oil sheen/ Debris: Fish Passage:					

1) fixing pipe leak mean dock; was not Fixed by 1130 mm

E ffelle

Water Que Monitoring In situ Data Field Form

alog A-Northern
Dridging
CR SKIA
m wals h
J. Fahen
5- Dengarore
Sugry Clian 70° NNE 10-15

Date	9/12/06
Page	/ of /

Tide information				
High	A STATE OF THE STA			
Low	0516			
High	1210			
Low	18 (1			

N. Moceins

	Station Number	Time	Latitude	Longitude	Water	Sample Depth	Turbidity	Salinity	DO	Temp	Notes
u,	Number N 0 .1	5020	2002387 121	41° 5713 5	depth 4, 9	1.7	25.5	77 7	6.26	17 65	Marie De Ga Traine
	N. Ref.	13947	200 576 57	815713.5 81°5565.6	5.0	4.0	$\frac{\alpha_{3,3}}{\gamma_{i}3}$	23.7	2.7	17.98	mooning Pala retrieval
	9 KO:	0112	10 3 160 .1	81 3363 6	<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>		1,2	7071	6.7	1 12.9	Maring Dada 1 4110000
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}	Date: 9-18-06 Weather: 00, 80, No Breeze	Ret Noth
	Tides: - +3.5 @ 0.54 - +0.7 @ 12 ,5 - -4 0 @ 1805	
	Monitoring Period: From: 0910 To: 1215	Not the second of the second o
	Tidal Stage: HWS Ebb LWS Flood	
	Debris removed And dodging in AREAA.	Debris Pamava Pamava
		Sheen 191000 1 40-60
)3	Turbidity Summary Location Turbidity Sensor/water (NTU) Depth (ft) Nor In Ref 5.0 45/19 Sisoth of Debats Recyc 40-60 1.3/0.6	20NIO SI Progred
	Oil sheen/ Debris: Major Oil sheen associated with del	Legend 0 200 400 dredge_area_a_2006
	Fish Passage: lots of battish Northof	
	Samples Collected for Laboratory Ana	
•	Sampling Crew: A. Mon. Cold, 5. Fa. Chief Scientist Signature: A. M. M.	hel Denimore

E ttelle

Water Que Monitoring In situ Data Field Form

Dredging Location	TAREA A
Dredging Description	Debris Removal + Dredzing
Survey Vessel	
Chief Scientist	Alex Manstield
Sampling Technician	Jessica Faher
Vessel Captain	Ship Densmore
Other Personnel	
Weather conditions	OC, 80, No breeze

9-18-06	
of	
	of

Tide in	formation]
High	052/1]
Low	1215]
High	2232 1805 nisk	ad Ti
Low		The y

	Station	Time	Latitude	Longitude	Water	Sample	Turbidity	Salinity	DO	Temp	Notes	
	Number				depth	Depth	NTU	797	mstL	2		
Non	r Retrence	0949	2708288	815946	4.5	1.91	5-0	25.24	3.67	22.47		
South ex	d Area A	1022	2708288		1-2	0.5	35.6	24.35	5.14	22.25	@South end of ARB	AA
											1350 for Debri	Rencial
				`					<u> </u>			
					<u> </u>				<u> </u>			
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Date: 9/19/06	
Weather:	
Tides: @ 0678 @ 1254 @	
niar w s no s n	
Monitoring Period:	
From: <u>0850</u> To: <u>7030</u>	
From: 0830 To: 1030 -/300	7517
Dredging Activity:	
Debus Removal + Drodging	50M x02
in Alexa A	The state of the s
	25NTUS 003 72
1) - debis femoral - N. comer	(located)
2- drodging - south middle section	mis lobelal)
* sample locations	
	WINTY TO THE PROPERTY OF THE P
Turbidity Summary	
Location Turbidity Sensor/water	S Nactive Feet
(NTU) Depth (ft)	0 200 400
801	Legend (
001 . 1.7 2.72	
002 538 0.96	dredge_area_a_2006
003 24.2 0.07	dredge_area_b_2006
004 (08.0)	dredge_area_c_2006
- Depte NIV	
Oil sheen/ Debris:	/) n
som oil sheen around the	dedg.
Fish Passage Ro T/ / Service	High numbers North of dred crear- very where, Many striper, at sayer it Doa lysis - Sample IDs:
Fish Passage: Ott. (4.) L Seco (A	HIGH NUMBER TO COLOR OF DOCALE
Samples Collected for Laboratory Anal	vois - Sample IDe.
TSS (11) (10) -TSS -(10) - 00/20/	Turbidity (500ml) a medowani- secon
Total PCR (11) (4/2) Trainer (40) 24/202	Turbidity (500ml)
Toxicity (211) 414 TOX (201204) 20101	Motols (500ml) (10 May (40) (500ml) (500ml)
Toxicity (21L)	Metals (500ml) <u>WQ - MET - (001-004) - 09190 c</u>
Notes: Collected Surples To	bok at Ronge of Turbidity values ~75 NTV
from returned To	~73 NT U
	<i>f</i> , ,
Sampling Crew M /1/a/c/	Faley, ship Densman, Alex Mansfroll
Chief	Transform of the production

Baitelle

Water Quality Monitoring In situ Data Field Form

Dredging Location	Area A
Dredging Description	Dredging and Debrig Remo
Survey Vessel	CR SR: FP
Chief Scientist	A. Monstield
Sampling Technician	M. Wolsh, J. Fahul
Vessel Captain	S. Densmye
Other Personnel	
Weather conditions	partly Smay

Date	9/19/06
Page	of

Tide information				
High	0628	+ 7-8		
Low	1254	+0.5		
High	1849	+4.1		
Low				

Station	Time	Latitude	Longitude	Water	Sample	Turbidity	Salinity	DO	Temp	Notes	
Number		2705772,5		depth	Depth		1				
S. moorins	0955	8155567		5-1	4,07	4.0	27.33	8-06	21-35	Returence	
001/INTU	0900	2705768.7		5,1	2-72	1.7	26,96	8,62	21,42	INTU091906 \	
003/25NTL	1000	2706769.2		3,1	0,96	53.8	23.81	7.33	22,41	25NTU091906	5/0
002/50NTU	1007	2706918,6	815716.8	3-1	0,27	24.2	22.27	8.55	22.68	50 NTU091906	TI
004/75NTL	1022	2707085,7	815740.7	2.8	1.05	108.0	23.01	7.58	22.68	75 NTU091906	
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· ····································	Date: 9/20/2000	
· /	Weather: 17th Cloudy / WNW 10-15	
	Tides: 0709 - 40	
	1324 - 0.4 High @ 1928 - 4.2	
	Monitoring Period:	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
	From: <u>0915</u> To: 1140	NRE NRE
		60 9120
	Tidal Stage: HWS Ebb LWS Flood	
	Dredging Activity:	amos
	Dulyny and Debt B Runwal	Robert
	Area AD	
	raye Athrity Stopped ~ 1000	
	Dreage Activity resumed a 1120	Grand :
	Turbidity Summary	5. R. Q.
	Location Turbidity Sensor/water (NTU) Depth (ft)	Feet
	N. R. J. in Bruf 14.9 3.3/2.6	0 200 400
The grath	N.R. 4 in Break 14.9 3.3/2.6 Petrol Remard 21.2 3.7/.02 we N. Ref 8.7 3.1/2.4	Legend C
T	we N. Ref 8:7 3:1/2:4	dredge_area_a_2006
	3.2 U _{10/:5}	dredge_area_b_2006
		dredge_area_c_2006
	Oil sheen/ Debris:	-
	Heavy Sheen and Strong	Odor around Ordgany + Debrys Removal
	concentrated in sovert cernin	of Area A
	Fish Passage: A few Fish	north of area a
	Samples Collected for Laboratory Anal	lysis – Sample IDs
	TSS (1L)	Turbidity (500ml)
	Total PCB (1L)	Dissolved PCB (2x1L)
	Toxicity (21L)	Metals (500ml)
	Notes:	
	notes.	
1		
٠. '	Committee Committee A. C.	ita anha Shan Decana
	Sampling Crew: M. Valsh; M. F. Chief Scientist Signature: Mindend	1200 Ann

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Water Que Monitoring In situ Dam Field Form

Dredging Location
Dredging Description
Survey Vessel
Chief Scientist
Sampling Technician
Vessel Captain
Other Personnel
Weather conditions

Aru A

Dring Amount
Depris hundel

CR Shiff

Min Walth

Sip Amount

Other Personnel
Weather conditions

Date	9/20/06
Page	/ of

Tide information					
High	0709				
Low	1326				
High	1928				
Low		-			

South	Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes	
mooning/ sident trop	Ref Sent	0920	706057.95	815482,08	7.4	6.7	के स	25.76	6.0	22.05		L
	surfare	0923	į١	11	7.4	0.2	3:0	23.0	7.25	77.65	surface Reaction	je.
	4.0.0	2024	00000	C.A. man	7		110 Ct 1	A : (57)				J A
	NRcf	0929	70 1299,90	815699.06	3,3	2.6	14.940.0	25.58	4.65	33.58	NWest Come of Are	a 17
.	a de AMA	0065		815690.34C		2 22 (311)	0.5	22 58	. 3 .	2777	MA 0 01 - 1	
5425	cornergia	0132	706767.65	815690,34	3.7	·2-038m	2112	22.58	6-28	27.37	50 ft from Delm3 R	emirece
Tout	N. Ref	1040	70 7378.93	81 55 55,65	3.1	2,4	8,7	25,73	5.1	बत्र. ७५		,
• •												
middle North	Selmint Tap	1043	707476.76	815629,42	3,8	• 入	५,५	19.8	6.61	23.1	Surface	
, , , , , , , , , , , , , , , , , , ,		1045	11	Įί	3.8	2.9	4.9	25,91	5,88	72.65	Boftom	
							0.0	-00.7		3) (
	South Ref	1105	705776.77	815519.58	4.0	•5	3.3	23.3	7.1	वर.७		
Sm. Ha W	mound	1133	706057.95	\$15482.08	5.3		8.0	33.5	817	23.3	Surface	
o side	mentTRAP	1135	11	11	5,3	4,5	3,8	26.26	6.23	22.14	Betton	
ma -												
									\			
						<u> </u>						

1) wrong love

2 Wrong Line

(3) WA)

A 11.	Date: 9/25/06	chancing alio-15
· . ,	Weather: Sunny ~ 65° Light W	Changing to
	Tides:	
	High @ 1016	
	High @ 1016 Low @ 1551	from 6 Pers in a few spot
	H14 m @ 2232	Lewing 1000 1000 A
		Rewling 1080
	Monitoring Period:	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
	From: 0878 To: 1050	
	THE LOCAL TRANSPORT OF THE PARTY OF THE PART	References Himes sulls and in the me
	Tidal Stage: HWS Ebb LWS Flood	ansospe
	Dredging Activity:	Remova
	Debris Removal + Dedging	Dredging
	Area A	sheen sheen
	Dredging stop ~ 0900	
	120'South E was - 0930	
	1-20 500 E W	
	Debris removal stops ~ 1000 resume	
		7 3 × 3
		Southern
	Turbidity Summary	Section of trust
	Location Turbidity Sensor/water	Feet Feet
3	(NTU) Depth (ft)	0 200 400
$(\)$	South Ref. 2.6 3.32/5.7* N. Ref. 23.1 -8/4.7 *	I logand
\	N. Ref. 23.1 -8/4.7 *	Legend
D-100'	Just V of Obris 60-90 2.5/26.6 * Just 5 of Debn's 20-30 2.2/6.0 *	dredge_area_a_2006
5-100 i	Just 5 of Debris 20-30 Z.Z/G.OX	dredge_area_b_2006
ot issuace		dredge_area_c_2006
	XT	orbidity is highest near the change in Salinity
	Oil sheen/ Debris:	
		t of area A - sheen broke up with
	the North wind; seems mos	t of area A - sheen broke up with
	Fish Passage:	, , , , , , , , , , , , , , , , , , ,
	Samples Collected for Laboratory Analy	ysis – Sample IDs:
	TSS (1L)	Turbidity (500ml)
	Total PCB (1L) May Same	Dissolved PCB (2x1L) No Somoles
	Toxicity (21L)	Turbidity (500ml) Dissolved PCB (2x1L) Metals (500ml)
	Notes: 0 10	
	Company are as high	h a 25 DIO around the 3 t E Sides
	of the the barge, - 0900	- higher North and west
	tide tore vente us from althor	h a 25NTU around the SIE Sides - higher North and west g North of Area A
	ine bound	\mathcal{C}
2	Sampling Crew: M. Lo Walsh	Matt Atrontack, Ship Densmore
	Chief Scientist Signature	A has hele
	Cirici Determine Dignature	- India

E telle

Water Que Monitoring In situ Date Field Form

Dredging Location	Area A
Dredging Description	Debris Removal + Dredging
Survey Vessel	CR Skiff
Chief Scientist	Matt Atroutisk
Sampling Technician	Mike Walsh
Vessel Captain	Ship Densmore
Other Personnel	None
Weather conditions	Sunny Clear, ~65°, Lite west wind

Date	9/25/06
Page	of \

Tide information						
High	1016					
Low	1551					
High	2232					
Low						

	Station Number	Time		Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes	
S. Sed	oc l		2706066.7 27060 67 7	815480.3	7.0	0.77	2,2,	19,95	6.75	19,46	Surface	
	001	0832	()	~(U	5.5	3.4	23.08	5.42	20.12	bettom	
s. reference	00 Z	0837	2705760.0	815547.7	5.7	3.32	2.6	23.18	5.55	20.09	max turb reading	
s. reference	6 03		2707255.0		4. 7	0.81	23.1	19.89	4.01	19.77	~ 100' from Debris	barge
	004	0910	2707178.9		W 5	1.5	90	21.0	4.24	20,0	~50 (N of "	• , O
	005	0942	270 7240,0	815847.3	6.6	2.54	75% D	21.48	4.13	20.17	very variable temb	iclity
									ļ		~120-60	1
										ļ		
	· · · · · · · · · · · · · · · · · · ·										<u> </u>	
						-						
ŀ												
Ì												
Ì					<u> </u>	-						

Battelle Daily Field Summary Sheet for Water Quality Monitoring										
Date: 10/4/2006 Weather: Fosgy, 1:26150 Tides: 44.5 @ 05:58 16-0.1 @ 11:50 1-1+4.6 @ 1827										
Monitoring Period: From: 0900 To: 1330										
Tidal Stage: HWS Ebb LWS Flood										
Dredging Activity: Debris Remodeling SW COGNEY OF AREAB Minimal Dredging ON E-W Transact act South end of Area A	2 5- J									
Turbidity Summary Location Turbidity Sensor/water Soul Let (NTU) Depth (ft) 7.2 1.5.4.6 Legend dredge_area dredge_area dredge_area	_a_2006 _b_2006									
Oil sheen/ Debris: Heavy Oil Sheen Destring NE away from Debris	Renor									
Fish Passage: Very Lew tish remaining in horse No credging	Fish Passage: Very Lew fish remaining in horsy, No bredging image									
Samples Collected for Laboratory Analysis – Sample IDs:) @e									
TSS (1L) Turbidity (500ml) Total PCB (1L) Dissolved PCB (2x1L) \(\)										
Total PCB (1L) Dissolved PCB (2x1L) Metals (500ml)										
	dop									

	Date: 10/9/06	
,	Weather: Clear, 70°	
	1-1 + 5.4 @ 1001 	
	Monitoring Period: From: <u>0815</u> To: <u>1430</u>	1 De farence
	Tidal Stage: (HWS/Eb) LWS Flood	Scale
٠	Debcis Romoral Area B.	Debres
	Diodeins crea A.	25'5 Sade
		South
, (Turbidity Summary Location Turbidity Sensor/water (NTU) Depth (ft)	DowissTreas 0 200 400
) ! 2	North Ret 2-4 6.5/2'-05 75' Suple 46-63 2.1' 5' 3 Souple 70-75 2.5'	Legend cho Tice dredge_area_a_2006 dredge_area_b_2006
		dredge_area_c_2006
	Oil sheen/ Debris:	
	Fish Passage: NO fish seen in 6	iver. Dredging not having not eithe impact
	Samples Collected for Laboratory Analy	
	Total PCB (1L)	Turbidity (500ml) Dissolved PCB (2x1L) Metals (500ml)
	Toxicity (21L)	Metals (500ml)
	Notes: Elevated Tolorony 30 th tide), Collected PCB+ Turbid Collected Ts), TURB, TOT PCB, D.	Metals (500ml) 75 North of Debris Removal (on flood Ty scaples related to Area B activities. Solved PCB
\	Collected Jownshew Sample Co	sea. Treprisca 1701
	Sampling Crew: Mows field. Chief Scientist Signature: Let). Fahe. / S. Densmare
	Cinci scientist signature:///	

Lattelle

Water Quay Monitoring In situ Data Field Form

Dredging Location
Dredging Description
Survey Vessel
Chief Scientist
Sampling Technician
Vessel Captain
Other Personnel
Weather conditions

Debris Removed AREAB, Dredging Area A

L. Monst, eld

S. Folley

Vessel Captain
Other Personnel
Weather Conditions

Date	10/9/06	
Page	of	

Tide information						
High	physical resistance					
Low	0314					
High	1001					
Low	1606					

	Station	Time	Latitude	Longitude	Water	Sample	Turbidity	Salinity	DO	Temp	Notes	
	Number	_			depth	Depth				_		
	South Ret	0830	2705789	815574	6.3'	4.4'	2.1	26.5	7.05	16.9		
p_{N} , d	North Ret	0840	2705789	815688	6.5	2.03	4.9	25.5	6.15	16 8		
SRF	work Ret	084/	l u	l.	6.5	.0.93	4.7	24-8	6.01	16.8		4
			2706718	815629	5.5	2.4	50	26.3	5-8	17.0		STationID
75 No	The of Debris	0940	2706714	815629 815592	45.5	4.4	64	1	1,0	,,,		75N100406
						121	46-63	25.60	6.5	16.6	WQ-XXX-001-10090	7625510090k
35'S	with of Day	51115	2706576 2706568	815652	5.5	2.5	70-75	26.04	6.4	16.9	WQ-XXX-002-10090	62552100906
-25 Soc	ith of Dobi	- 1/45	2706568	815660	5-0'	2.2	~15	26.17	7.2	16.9	WQ-XXX-003-100901	انه ح
22250	ith of Debi.	s 1200	2706061	815495	8.2	1.34	6.5-8.5	25-65	7.6	17.2	WQ-XXX-004-100906	2805100906
, 00						,						
												·
							,					

Weather: Survey / NE 5 Tides: Liv @ 0403 - 0.1 [-1.44 @ 1145 4.7 Lev @ 1749 0.3 Monitoring Period:	Joh
Monitoring Period:	1.04
Monitoring Period:	
Monitoring Period:	
Monitoring Period:	
Monitoring Feriod:	
From: 0835 To: 1400	
Tidal Stage: HWS Ebb LWS Flood	
Dredging Activity:	
Dredging Activity: - Debriz Remark & warm of ann	
- Predging Aria A west side	9
- Dredging Aria A west side	<u>> </u>
- Minimum	1/
Act ivit	
Turbidity Summary	
Location Turbidity Sensor/water	Feet
(N10) Depth(11) (0)	
NRA VINST VI	a 2006
dredge_area_	
dredge_area	
	للصحيا
Oil sheen/ Debris:	
Slight oil sheed New drage on ebb Tide	
- STATE OF S	
Fish Passage: No fish Seen anywhere on Ring	
Samples Collected for Laboratory Analysis – Sample IDs:	
TSS (1L) Turbidity (500ml)	
Toxicity (21L) Metals (500ml)	
Notes: Recovered Sediment Trops & YSI, and PE Somples	
·	
Sampling Crew: Mylsh Alex Mansfield, 5. Paramera	
Sampling Crew:M which Mansfrul, 5. Farance Chief Scientist Signature:	

Date: 10/16/06	
Weather: Sumy, NNW~15	
Tides: High @ 6421 - 3.3 High Low @ 1105 - 0.9	
M-gh @ 1645 - 3.6	
Monitoring Period: From: 0930 To: 1130	Harry R. Land
Tidal Stage: HWS Flood	100 desp
Dredging Activity: No debas Renoval.	Tulose To dial services
Diedzing ARIAB	PUR SULTUDIOS TO A SOLUTION OF THE PROPERTY OF
	No so I for the second
	in gen gen
Turbidity Summary	X
Location Turbidity Sensor/water (NTU) Depth (ft)	Sheer Sheer Somple
5007- Ref 3.5 13/3.2	25N
	Som Reference
	Legend
	Legend o 200 400 dredge_area_a_2006
Oil sheen/ Debris:	that kick up large o. I sheems.
Fish Passage: ONLY a tentich se	cent in river no obvious dadge-related obstacles
Samples Collected for Laboratory An	alysis – Sample IDs:
Total PCB (1L)	Turbidity (500ml) Dissolved PCB (2x1L) Matala (500ml)
Toxicity (21L)	Wietals (500ml)
Notes: Collected Backyround Sun	ples and Ason B related Somples
Very green Water (Phyto bloom).	ples and Ason B related Somples Near low Tode Turbidity plumed seen associated w geinline against wind Hatrity coased at
1000 Tide	
-	value & Denumer
Sampling Crew: 1 Monsfull, M. 1. Chief Scientist Signature: 2 / W	g-éi

Water Qua Monitoring In situ Data Field Form

Dredging Location	
Dredging Description	
Survey Vessel	CRSKIFF
Chief Scientist	Hex mensfuld
Sampling Technician	Mile Walle
Vessel Captain	Ship Pensmere
Other Personnel	
Weather conditions	Clay/guma

Date	10/16/06
Page	/ of /

Tide information					
High	0421				
Low	1105				
High	1645				
Low					

						•						A.R.
STATIONISD OUTHRIBICOG	Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO My/L	Temp	Notes WQ-XXX-001-101606 WQ-XXX-002-101606	TPG DPG
Sout	hket	0852	2705747 2706627	815539 815489	3.2-	0.5 21	3.5	25.45	8.22	162	WQ-XXX-001-101606	ms,msD
5NTU 16160 6	, , (, , ,	1671	×1060×1	00.01	10,0	U,2 34	- 71-0	74.16	1.31	13.42	WAT ARK TOO THINKING	TSS, TUR
												TPC, DPC,
												Value 1
							<u></u>					

,	Date: 16/17/16 Weather: 16/17/16 Tides: @ 15/2 > 3.5'	
	1154 7 0.7' Hays @ 1734 7 3.7'	
	Monitoring Period: From: <u>0630</u> To: ユスリ	
	Tidal Stage: HWS Ebb LWS Flood	N. Res
	Dredging Activity: No Debris Comount 2/2 Dredging stopped for Schools backup @ 1125	345
) '	Turbidity Summary Location Turbidity Sensor/water (NTU) Depth (ft) S. Ref S. 6 12/4.0 12/4.6 Oil sheen/Debris:	Sheer Sheer Sheer Legend Teet O 200 400 Legend dredge_area_a_2006 Leddge area unit the pump broke
	Fish Passage: Fish actively feed	ling 5 of work area ~ 1900
	Samples Collected for Laboratory An TSS (1L)	
\	Notes: Dredging activities start no visible steen and turbidit Values increase to ~25 NTU str	ted buck up around sluck tribe w/ SE wind. y values remained ~ 10. 50' from the dredge ght sheen
	Sampling Crew: Mwd44 M Fitz Chief Scientist Signature: Mid Mi	while Ken Thomason

Buttelle

Water Quand Monitoring In situ Data Field Form

Dredging Location	
Dredging Description	
Survey Vessel	CR Skiff.
Chief Scientist	Matt Atreatrick
Sampling Technician	Mike Walsh
Vessel Captain	Ku Thomson
Other Personnel	
Weather conditions	Partly Cloudy

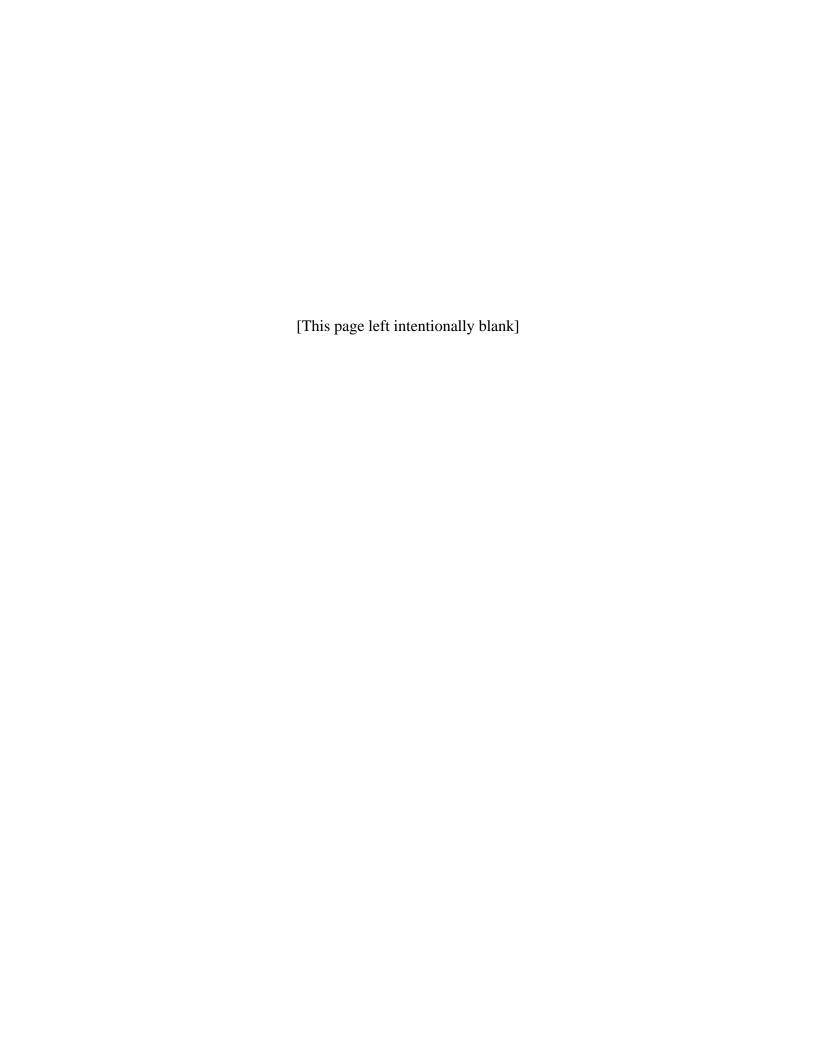
Date	10/17/06
Page	/ of

Tide inf	ormation	
High	0512	
Low	1154	
High	1734	
Low		

Station	Time	Latitude	Longitude	Water	Sample	Turbidity	Salinity	DO	Temp	DO Notes % Sムト
Number	_			depth	Depth			my/L		% 52t
5. Rof NRof	0833	2705740.7 2707215.5	815546.3 815723.5	4.0	0.9/	5.6	21.01	my/c	15.11	101.6
N Rof	0840	2707215.5	815723.5	4.6	1.2	7.7	21.55	7.12	15.98	82.6
									1.5	
			•							
						·				
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	-									
			···							
			1							
	-		" "			•				

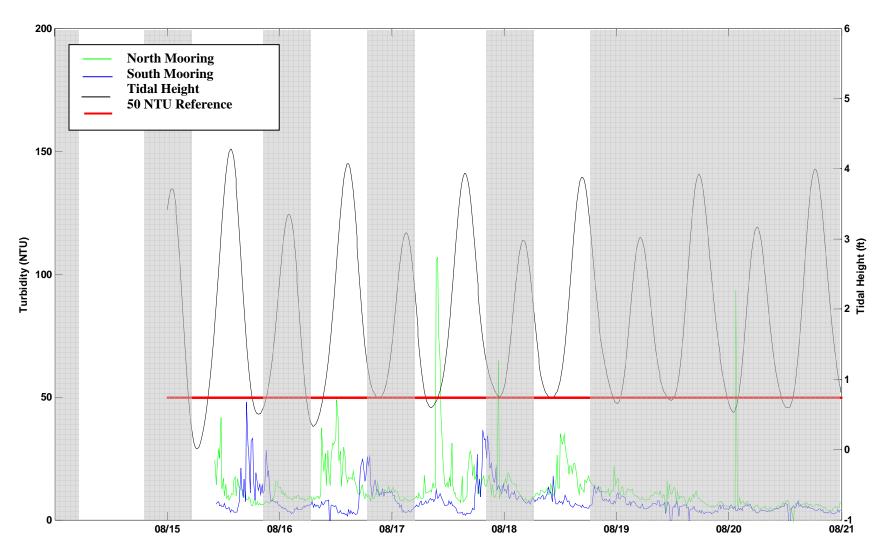
Appendix B

Continuous In Situ Water Quality Data



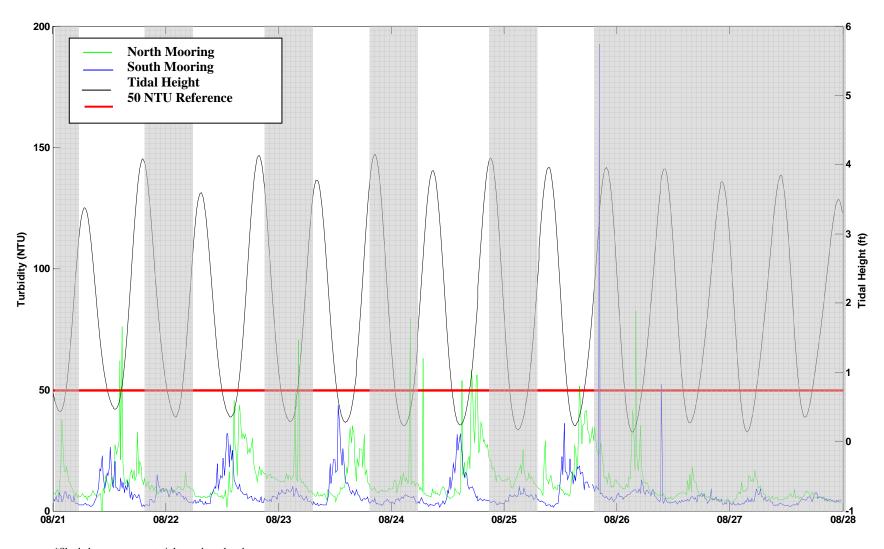
Note:

A red line is indicated on each plot representing 50 NTU. The water quality criteria for the New Bedford Harbor Environmental Monitoring program has been established at 50NTU above background, or natural, turbidity. The background turbidity signal in the river is influenced by tidal conditions, stream flow, wind, and other factors. As a result the background turbidity signal can fluctuate on scales from minutes to days. In general, the background turbidity signal was between 3 and 10 NTU. The continuous data presented in the following plots does not subtract out background values. As a result, the 50NTU line should be viewed strictly as a guideline. For example, a value of 50 NTU represents a turbidity reading that is approximately 40-47 NTU above background.



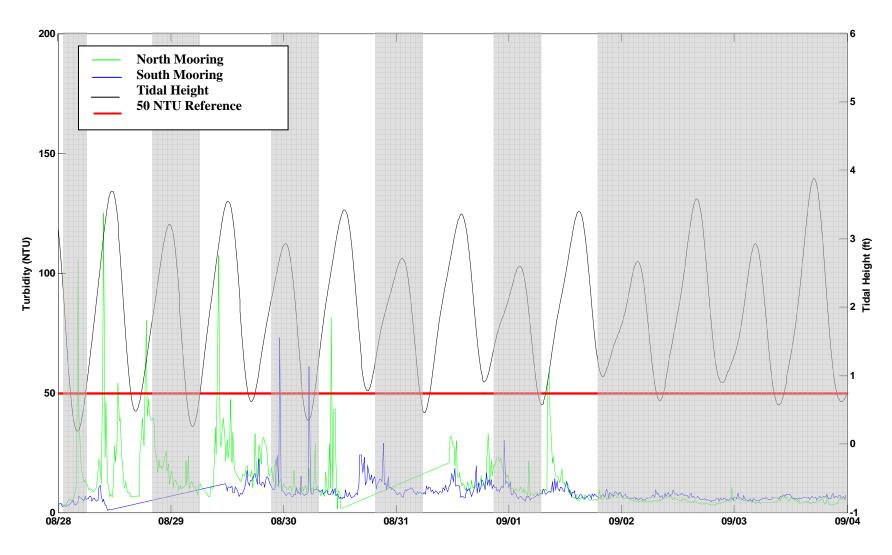
^{*}Shaded areas represent nights and weekends.

Figure B-1. Turbidity Monitoring at New Bedford Harbor Superfund Site 8/14/2006 to 8/21/2006.



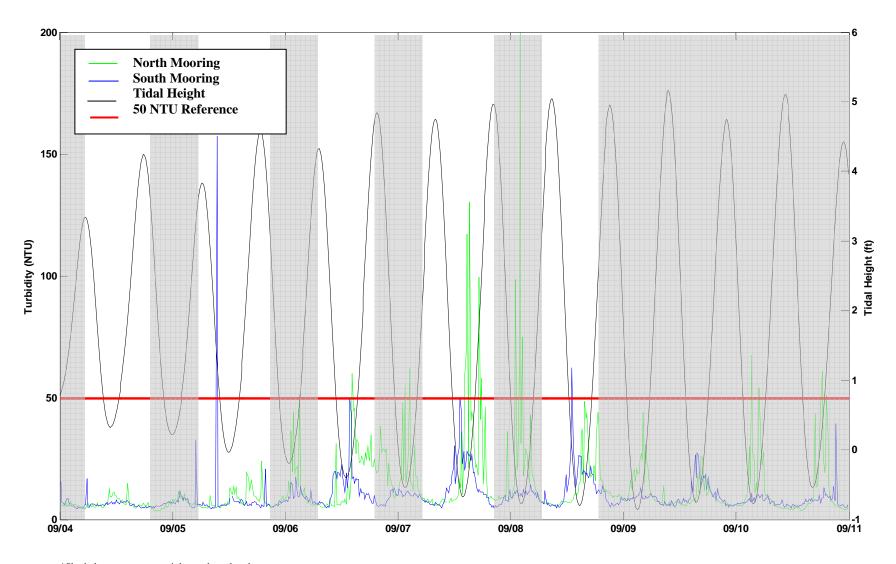
^{*}Shaded areas represent nights and weekends.

Figure B-2. Turbidity Monitoring at New Bedford Harbor Superfund Site 8/21/2006 to 8/28/2006.



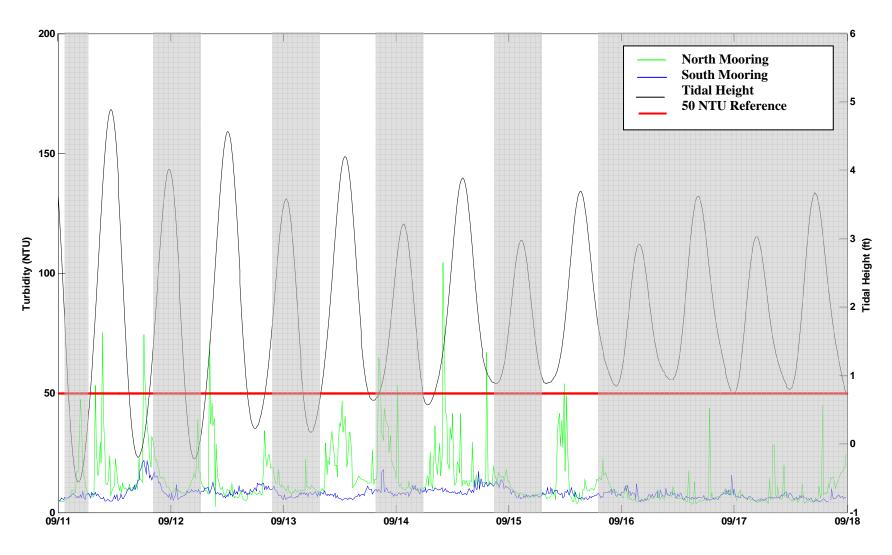
^{*}Shaded areas represent nights and weekends.

Figure B-3. Turbidity Monitoring at New Bedford Harbor Superfund Site 8/28/2006 to 9/4/2006.



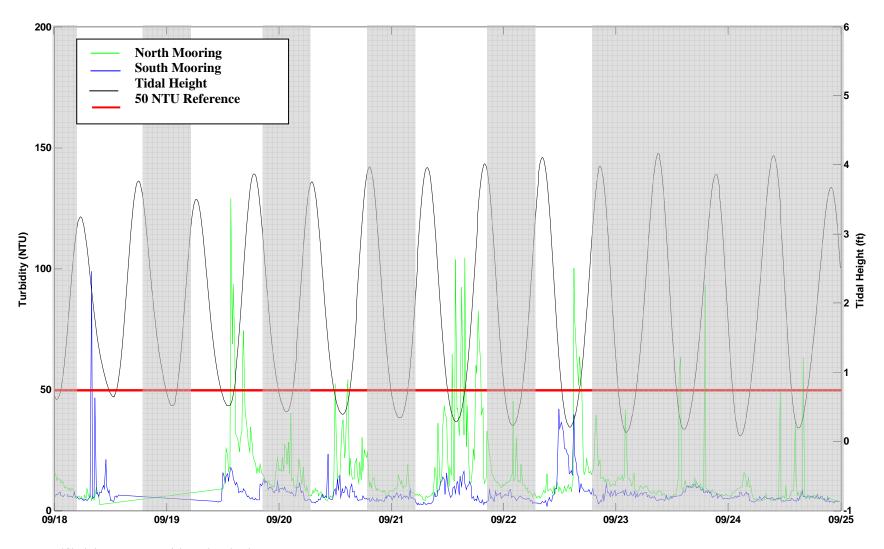
^{*}Shaded areas represent nights and weekends.

Figure B-4. Turbidity Monitoring at New Bedford Harbor Superfund Site 9/4/2006 to 9/11/2006.



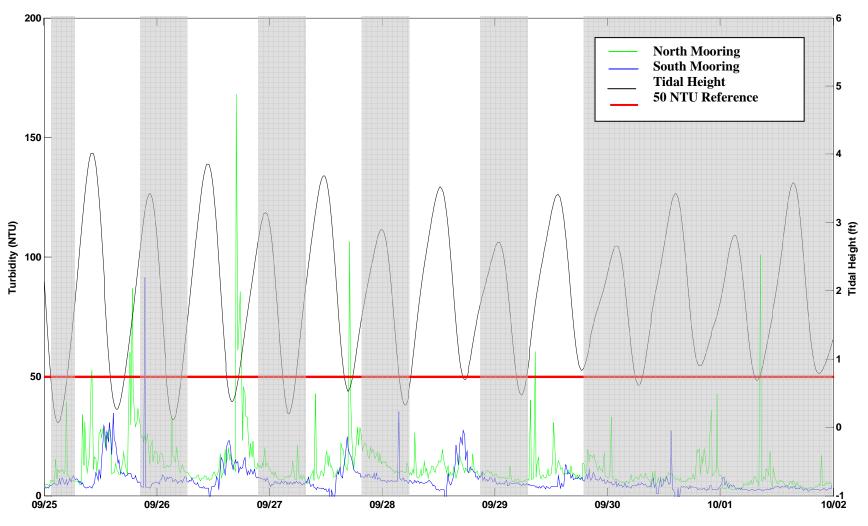
^{*}Shaded areas represent nights and weekends.

Figure B-5. Turbidity Monitoring at New Bedford Harbor Superfund Site 9/11/2006 to 9/18/2006.



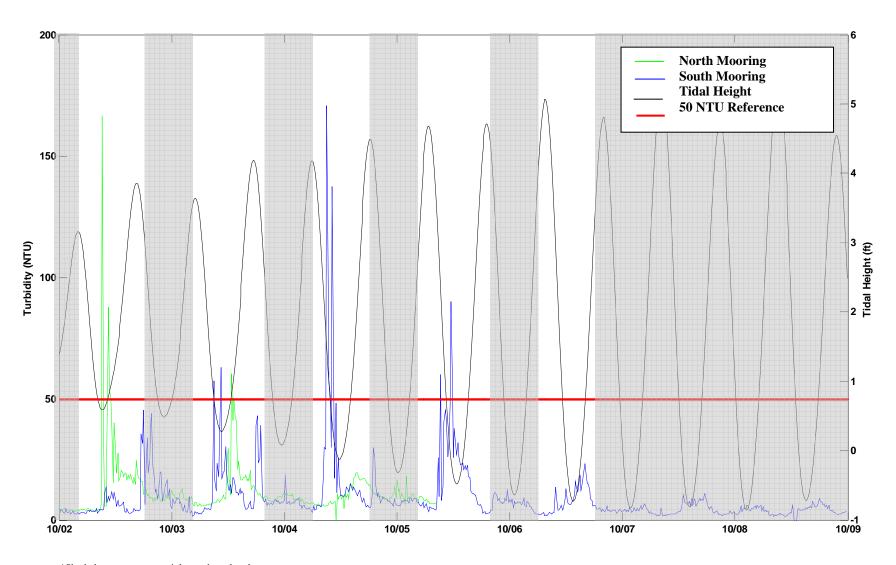
*Shaded areas represent nights and weekends.

Figure B-6. Turbidity Monitoring at New Bedford Harbor Superfund Site 9/18/2006 to 9/25/2006.



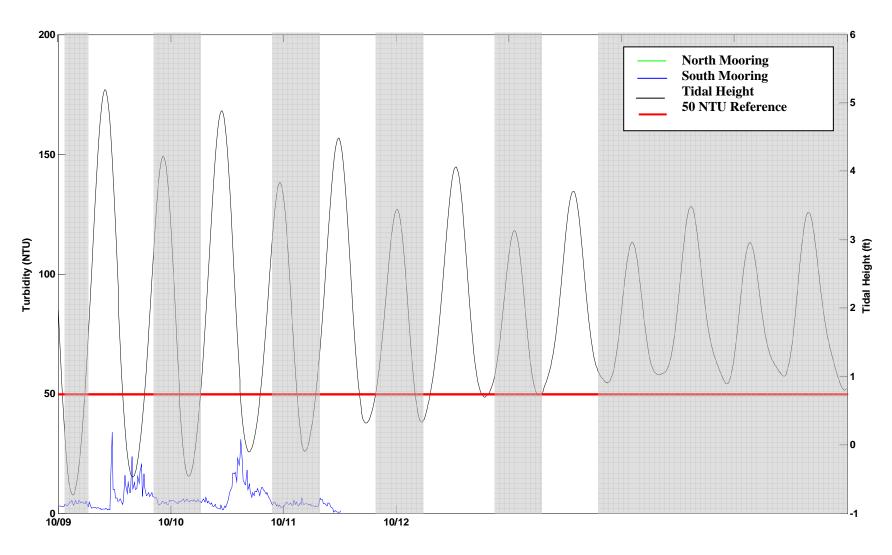
*Shaded areas represent nights and weekends.

Figure B-7. Turbidity Monitoring at New Bedford Harbor Superfund Site 9/25/2006 to 10/2/2006.



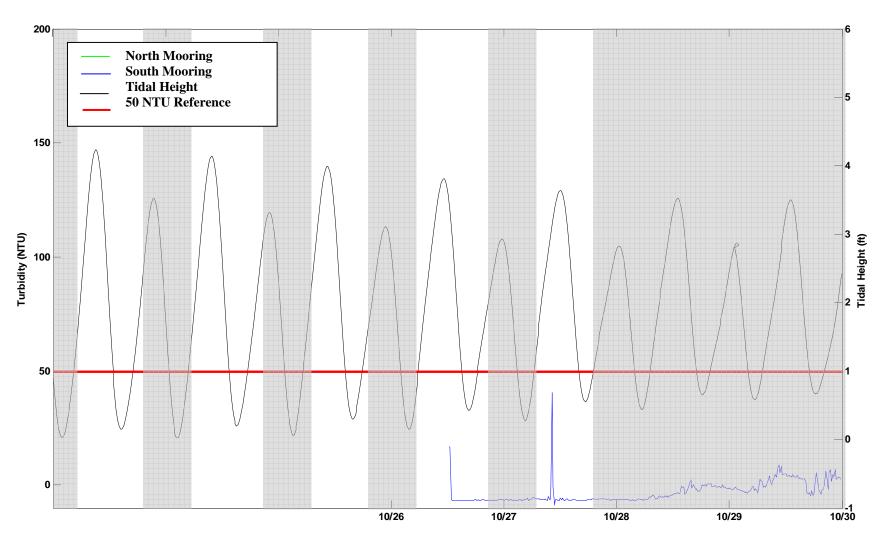
^{*}Shaded areas represent nights and weekends.

Figure B-8. Turbidity Monitoring at New Bedford Harbor Superfund Site 10/2/2006 to 10/9/2006.



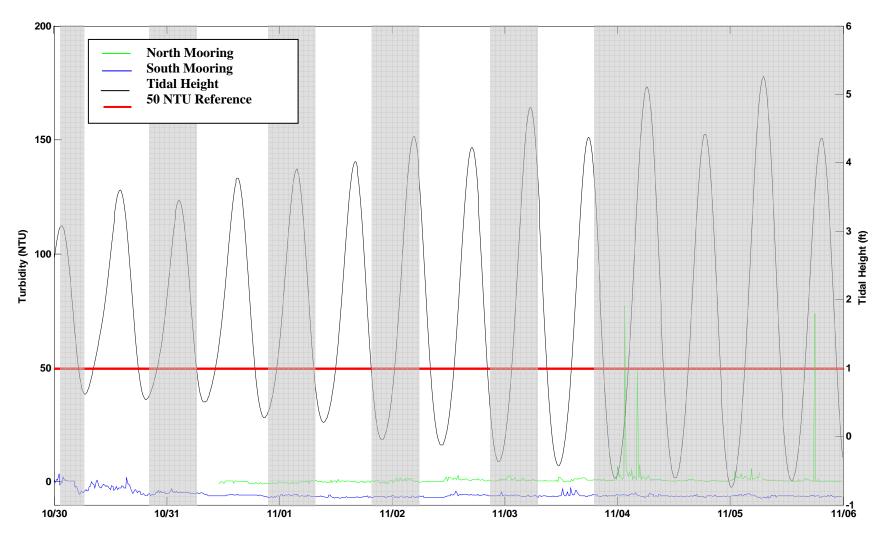
^{*}Shaded areas represent nights and weekends.

Figure B-9. Turbidity Monitoring at New Bedford Harbor Superfund Site 10/9/2006 to 10/16/2006.



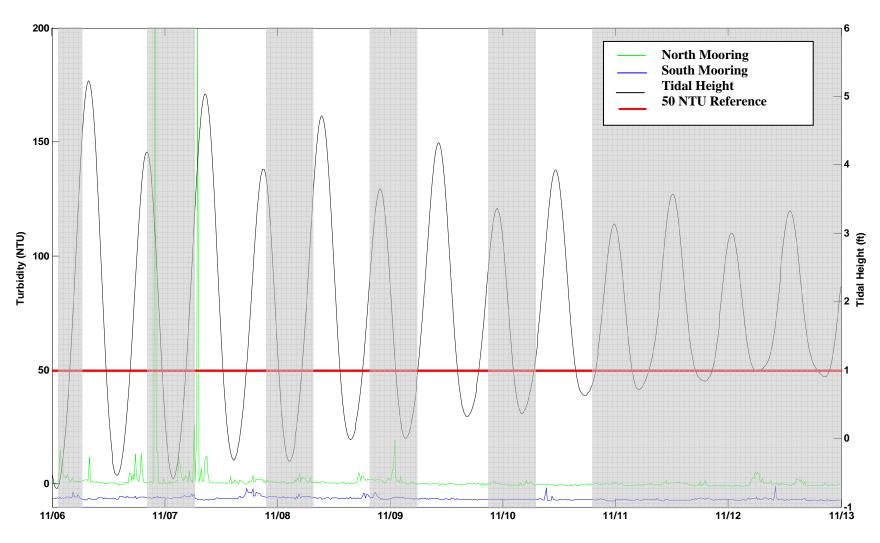
^{*}Shaded areas represent nights and weekends.

Figure B-10. Turbidity Monitoring at New Bedford Harbor Superfund Site 10/23/2006 to 10/30/2006.



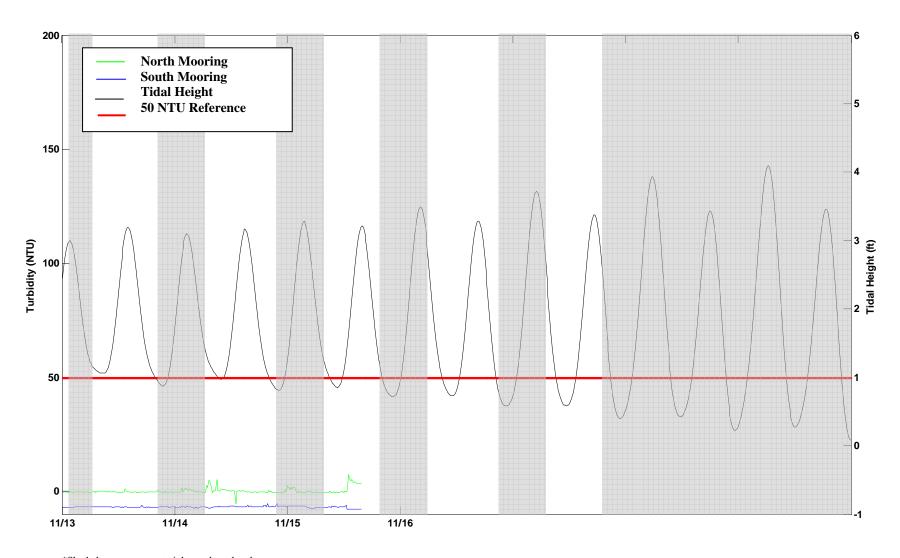
^{*}Shaded areas represent nights and weekends.

Figure B-11. Turbidity Monitoring at New Bedford Harbor Superfund Site 10/30/2006 to 11/6/2006.



^{*}Shaded areas represent nights and weekends.

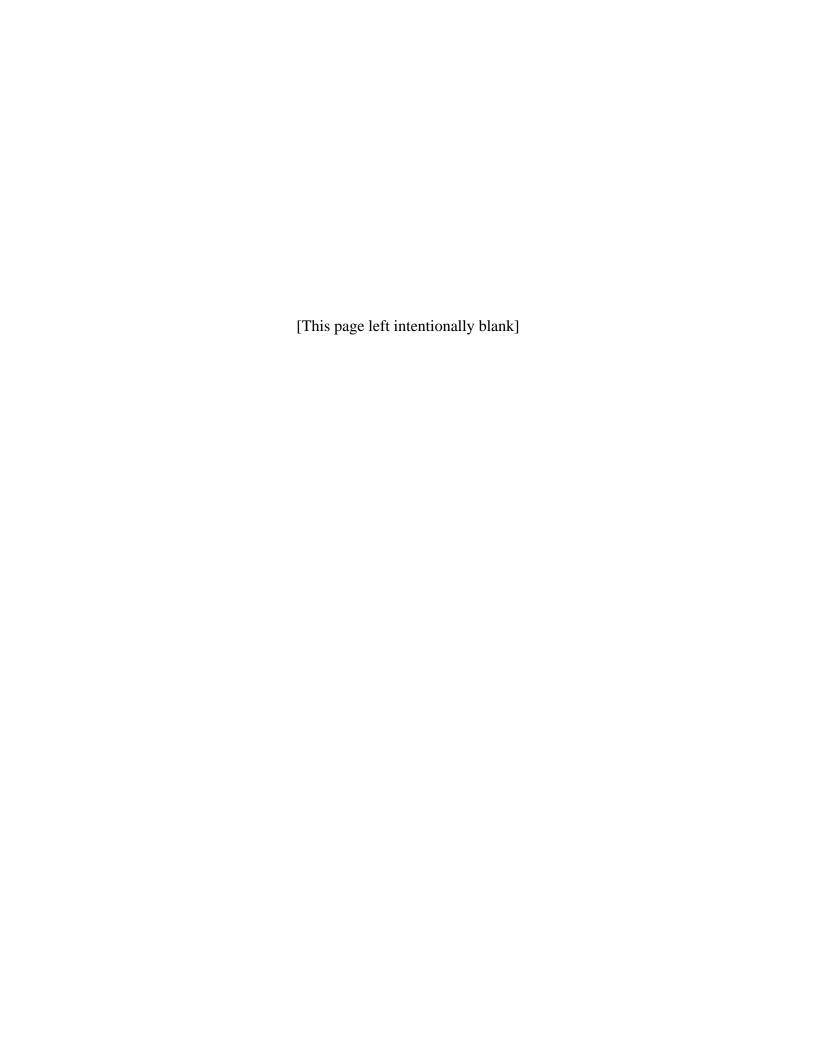
Figure B-12. Turbidity Monitoring at New Bedford Harbor Superfund Site 11/6/2006 to 11/13/2006.



^{*}Shaded areas represent nights and weekends.

Figure B-13. Turbidity Monitoring at New Bedford Harbor Superfund Site 11/13/2006 to 11/20/2006.

Appendix C Total and Dissolved PCB Analytical Data



Station ID	Station ID	REF081406			REF081406			BOUND081	406		BOUND081	406		
Collected	Collected		8/	14/2006		8/	/14/2006		8.	/14/2006	3	8/	/14/2006	
Fraction	Fraction	TOTAL			DISS			TOTAL			DISS			
QC Code	QC Code	SA			SA			SA			SA			
Sample ID	Sample ID	WQ-TPC-00	1-08140	06	WQ-DPC-00	1-0814	06	WQ-TPC-00	2-0814	06	WQ-DPC-00	2-0814	06	
Param Name	Param Code	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	
2,4'-Dicb (PCB 8)	34883-43-7	0.5186	UG/L	D	0.2746	UG/L	D	0.1518	UG/L	D	0.0935	UG/L	D	
2,2',5-Tricb (PCB 18)	37680-65-2	0.7721	UG/L	D	0.4583	UG/L	D	0.2214	UG/L	D	0.1046	UG/L	D	
2,4,4'-Tricb (PCB 28)	7012-37-5	0.6152	UG/L	D	0.3721	UG/L	D	0.2125	UG/L	D	0.0638	UG/L	D	
2,2',3,5'-Tetracb (PCB 44)	41464-39-5	0.1925	UG/L	D	0.1217	UG/L	D	0.0657	UG/L	D	0.0175	UG/L	D	
2,2',5,5'-Tetracb (PCB 52)	35693-99-3	0.6703	UG/L	D	0.4013	UG/L	D	0.2037	UG/L	D	0.05	UG/L	D	
2,3',4,4'-Tetracb (PCB 66)	32598-10-0	0.0443	UG/L	D	0.0245	UG/L	D	0.0159	UG/L	D	0.0009	UG/L	D	
2,2',4,5,5'-Pentacb (PCB 101)	37680-73-2	0.0977	UG/L	D	0.0534	UG/L	D	0.0365	UG/L	D	0.0028	UG/L	D	
2,3,3',4,4'-Pentacb (PCB 105)	32598-14-4	0.0035	UG/L	Dp	0.0029	UG/L	Dp	0.0027	UG/L	Dp	0.0009	UG/L	DU	
2,3',4,4',5-Pentacb (PCB 118)	31508-00-6	0.0438	UG/L	D	0.0292	UG/L	D	0.022	UG/L	D	0.0031	UG/L	D	
2,2',3,3',4,4'-Hexacb (PCB 128)	38380-07-3	0.0035	UG/L	D	0.0028	UG/L	D	0.0025	UG/L	D	0.0009	UG/L	DU	
2,2',3,4,4',5'-Hexacb (PCB 138)	35065-28-2	0.0279	UG/L	D	0.0178	UG/L	D	0.0138	UG/L	D	0.0021	UG/L	D	
2,2',4,4',5,5'-Hexacb (PCB 153)	35065-27-1	0.0544	UG/L	D	0.0327	UG/L	D	0.0243	UG/L	D	0.0022	UG/L	D	
2,2',3,3',4,4',5-Heptacb (PCB 170)	35065-30-6	0.0045	UG/L	D	0.0039	UG/L	Dp	0.0031	UG/L	Dp	0.0009	UG/L	DU	
2,2',3,4,4',5,5'-Heptacb (PCB 180)	35065-29-3	0.0056	UG/L	Dp	0.0037	UG/L	Dp	0.003	UG/L	Dp	0.0005	UG/L	DpJ	
2,2',3,4',5,5',6-Heptacb (PCB 187)	52663-68-0	0.0078	UG/L	D	0.004	UG/L	Dp	0.0027	UG/L	Dp	0.0009	UG/L	DU	
2,2',3,3',4,4',5,6-Octacb (PCB 195)	52663-78-2	0.0021	UG/L	Dp	0.0021	UG/L	Dp	0.0017	UG/L	Dp	0.0009	UG/L	DU	
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	40186-72-9	0.0028	UG/L	Dp	0.0028	UG/L	Dp	0.0023	UG/L	Dp	0.0009	UG/L	DU	
DecaCB (PCB 209)	2051-24-3	0.0022	UG/L	Dp	0.0024	UG/L	Dp	0.0008	UG/L	DÜ	0.0009	UG/L	DU	
Sum of 18 NOAA Congeners (SUM 18 CONG)		3.1	UG/L		1.8	UG/L		0.99	UG/L		0.34	UG/L		

Station ID	Station ID		300	0081406	j	30	0081406		60	0081406	6	60	0081406	
Collected	Collected		8/	14/2006		8/	/14/2006		8.	/14/2006	3	8/	14/2006	
Fraction	Fraction	TOTAL			DISS			TOTAL			DISS			
QC Code	QC Code	SA			SA			SA			SA			
Sample ID	Sample ID	WQ-TPC-00	3-08140)6	WQ-DPC-00	3-0814	06	WQ-TPC-00	4-0814	06	WQ-DPC-00	4-0814	06	
Param Name	Param Code	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	
2,4'-Dicb (PCB 8)	34883-43-7	0.1084	UG/L	D	0.0798	UG/L	D	0.1472	UG/L	D	0.1047	UG/L	D	
2,2',5-Tricb (PCB 18)	37680-65-2	0.1638	UG/L	D	0.1007	UG/L	D	0.1693	UG/L	D	0.128	UG/L	D	
2,4,4'-Tricb (PCB 28)	7012-37-5	0.1684	UG/L	D	0.0673	UG/L	D	0.2047	UG/L	D	0.0957	UG/L	D	
2,2',3,5'-Tetracb (PCB 44)	41464-39-5	0.0576	UG/L	D	0.0177	UG/L	D	0.0887	UG/L	D	0.0251	UG/L	D	
2,2',5,5'-Tetracb (PCB 52)	35693-99-3	0.1697	UG/L	D	0.0513	UG/L	D	0.2584	UG/L	D	0.0729	UG/L	D	
2,3',4,4'-Tetracb (PCB 66)	32598-10-0	0.0165	UG/L	D	0.0015	UG/L	D	0.0307	UG/L	D	0.0027	UG/L	D	
2,2',4,5,5'-Pentacb (PCB 101)	37680-73-2	0.0351	UG/L	D	0.0024	UG/L	D	0.0694	UG/L	D	0.0045	UG/L	D	
2,3,3',4,4'-Pentacb (PCB 105)	32598-14-4	0.0027	UG/L	Dp	0.0008	UG/L	DU	0.0038	UG/L	Dp	0.0013	UG/L	Dp	
2,3',4,4',5-Pentacb (PCB 118)	31508-00-6	0.0233	UG/L	D	0.0025	UG/L	D	0.0436	UG/L	D	0.0034	UG/L	D	
2,2',3,3',4,4'-Hexacb (PCB 128)	38380-07-3	0.0025	UG/L	D	0.0008	UG/L	DU	0.0036	UG/L	D	0.0008	UG/L	DU	
2,2',3,4,4',5'-Hexacb (PCB 138)	35065-28-2	0.014	UG/L	D	0.0016	UG/L	D	0.023	UG/L	D	0.0021	UG/L	D	
2,2',4,4',5,5'-Hexacb (PCB 153)	35065-27-1	0.0245	UG/L	D	0.0014	UG/L	D	0.0431	UG/L	D	0.0018	UG/L	D	
2,2',3,3',4,4',5-Heptacb (PCB 170)	35065-30-6	0.0025	UG/L	Dp	0.0008	UG/L	DU	0.0048	UG/L	D	0.0008	UG/L	DU	
2,2',3,4,4',5,5'-Heptacb (PCB 180)	35065-29-3	0.0031	UG/L	Dp	0.0008	UG/L	DU	0.0052	UG/L	D	0.0008	UG/L	DU	
2,2',3,4',5,5',6-Heptacb (PCB 187)	52663-68-0	0.0028	UG/L	Dp	0.0008	UG/L	DU	0.0051	UG/L	D	0.0008	UG/L	DU	
2,2',3,3',4,4',5,6-Octacb (PCB 195)	52663-78-2	0.0016	UG/L	Dp	0.0008	UG/L	DU	0.0019	UG/L	Dp	0.0008	UG/L	DU	
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	40186-72-9	0.0022	UG/L	Dp	0.0008	UG/L	DU	0.0025	UG/L	Dp	0.0008	UG/L	DU	
DecaCB (PCB 209)	2051-24-3	0.0007	UG/L	DU	0.0008	UG/L	DU	0.002	UG/L	Dp	0.0008	UG/L	DU	
Sum of 18 NOAA Congeners (SUM 18 CONG)		0.8	UG/L		0.33	UG/L		1.1	UG/L		0.44	UG/L		

Station ID	Station ID	REF081606			REF081606			BOUND081	606		BOUND081	606		
Collected	Collected		8/	16/2006		8/	/16/2006		8	16/2006	6	8/	16/2006	
Fraction	Fraction	TOTAL			DISS			TOTAL			DISS			
QC Code	QC Code	SA			SA			SA			SA			
Sample ID	Sample ID	WQ-TPC-00	1-08160)6	WQ-DPC-00	1-0816	06	WQ-TPC-00	2-0816	06	WQ-DPC-00	2-0816	06	
Param Name	Param Code	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	
2,4'-Dicb (PCB 8)	34883-43-7	0.1219	UG/L	D	0.0968	UG/L	D	0.7968	UG/L	D	0.2529	UG/L	D	
2,2',5-Tricb (PCB 18)	37680-65-2	0.222	UG/L	D	0.1297	UG/L	D	1.0222	UG/L	D	0.3585	UG/L	D	
2,4,4'-Tricb (PCB 28)	7012-37-5	0.3039	UG/L	D	0.1075	UG/L	D	0.8767	UG/L	D	0.2701	UG/L	D	
2,2',3,5'-Tetracb (PCB 44)	41464-39-5	0.1005	UG/L	D	0.0325	UG/L	D	0.4422	UG/L	D	0.0735	UG/L	D	
2,2',5,5'-Tetracb (PCB 52)	35693-99-3	0.3595	UG/L	D	0.0884	UG/L	D	1.1146	UG/L	D	0.2517	UG/L	D	
2,3',4,4'-Tetracb (PCB 66)	32598-10-0	0.0305	UG/L	D	0.0051	UG/L	D	0.0715	UG/L	D	0.0083	UG/L	D	
2,2',4,5,5'-Pentacb (PCB 101)	37680-73-2	0.0675	UG/L	D	0.0065	UG/L	D	0.1441	UG/L	D	0.0173	UG/L	D	
2,3,3',4,4'-Pentacb (PCB 105)	32598-14-4	0.0053	UG/L	Dp	0.0012	UG/L	Dp	0.0071	UG/L	Dp	0.0012	UG/L	DU	
2,3',4,4',5-Pentacb (PCB 118)	31508-00-6	0.0429	UG/L	D	0.0045	UG/L	D	0.0917	UG/L	D	0.0099	UG/L	D	
2,2',3,3',4,4'-Hexacb (PCB 128)	38380-07-3	0.0046	UG/L	D	0.0012	UG/L	DU	0.0138	UG/L	Dp	0.0012	UG/L	DU	
2,2',3,4,4',5'-Hexacb (PCB 138)	35065-28-2	0.0314	UG/L	D	0.0054	UG/L	Dp	0.0727	UG/L	D	0.0094	UG/L	Dp	
2,2',4,4',5,5'-Hexacb (PCB 153)	35065-27-1	0.0523	UG/L	D	0.0031	UG/L	D	0.1273	UG/L	D	0.0089	UG/L	D	
2,2',3,3',4,4',5-Heptacb (PCB 170)	35065-30-6	0.0062	UG/L	D	0.0012	UG/L	DU	0.0264	UG/L	Dp	0.0012	UG/L	DU	
2,2',3,4,4',5,5'-Heptacb (PCB 180)	35065-29-3	0.0065	UG/L	D	0.0012	UG/L	DU	0.0142	UG/L	D	0.001	UG/L	DpJ	
2,2',3,4',5,5',6-Heptacb (PCB 187)	52663-68-0	0.0068	UG/L	D	0.0012	UG/L	DU	0.0226	UG/L	Dp	0.0009	UG/L	DpJ	
2,2',3,3',4,4',5,6-Octacb (PCB 195)	52663-78-2	0.0017	UG/L	Dp	0.0012	UG/L	DU	0.0038	UG/L	D	0.0012	UG/L	DU	
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	40186-72-9	0.0022	UG/L	Dp	0.0012	UG/L	DU	0.0087	UG/L	Dp	0.0012	UG/L	DU	
DecaCB (PCB 209)	2051-24-3	0.0017	UG/L	Dp	0.0012	UG/L	DU	0.0104	UG/L	Dp	0.0012	UG/L	DU	
Sum of 18 NOAA Congeners (SUM 18 CONG)		1.4	UG/L		0.48	UG/L		4.9	UG/L		1.3	UG/L		

Station ID	Station ID		300	081606		30008	81606		3	00081606	6		300081606	
Collected	Collected		8/1	6/2006		8/16	/2006			8/16/2006	5		8/16/2006	
Fraction	Fraction	TOTAL			DISS			TOTAL			DISS			
QC Code	QC Code	SA			SA			REP			REP			
Sample ID	Sample ID	WQ-TPC-00	03-0816	06	WQ-DPC-00	3-08160	06	WQ-TPC-0	03-0816	06-DUP	WQ-DPC-	003-081	606-DUP	
Param Name	Param Code	Result	Unit	FinQ	Result	Unit	Fin Q	Result	Unit	FinQ	Result	Unit	FinQ	
2,4'-Dicb (PCB 8)	34883-43-7	0.8506	UG/L	D	0.1115	UG/L	D	0.8006	UG/L	D	0.4909	UG/L	D	
2,2',5-Tricb (PCB 18)	37680-65-2	1.0718	UG/L	D	0.2785	UG/L	D	0.603	UG/L	D	0.5655	UG/L	D	
2,4,4'-Tricb (PCB 28)	7012-37-5	0.8783	UG/L	D	0.3556	UG/L	D	0.8518	UG/L	D	0.2736	UG/L	D	
2,2',3,5'-Tetracb (PCB 44)	41464-39-5	0.3448	UG/L	D	0.0912	UG/L	D	0.4383	UG/L	Dp	0.1106	UG/L	D	
2,2',5,5'-Tetracb (PCB 52)	35693-99-3	1.3161	UG/L	D	0.4401	UG/L	D	1.1592	UG/L	D	0.327	UG/L	D	
2,3',4,4'-Tetracb (PCB 66)	32598-10-0	0.0675	UG/L	D	0.0095	UG/L	D	0.0683	UG/L	D	0.0129	UG/L	D	
2,2',4,5,5'-Pentacb (PCB 101)	37680-73-2	0.1844	UG/L	D	0.0181	UG/L	D	0.1833	UG/L	D	0.0289	UG/L	D	
2,3,3',4,4'-Pentacb (PCB 105)	32598-14-4	0.0079	UG/L	Dp	0.0013	UG/L	Dp	0.0068	UG/L	Dp	0.0014	UG/L	Dp	
2,3',4,4',5-Pentacb (PCB 118)	31508-00-6	0.0896	UG/L	D	0.0103	UG/L	D	0.0903	UG/L	D	0.015	UG/L	D	
2,2',3,3',4,4'-Hexacb (PCB 128)	38380-07-3	0.0076	UG/L	D	0.0011	UG/L	DU	0.007	UG/L	D	0.0015	UG/L	D	
2,2',3,4,4',5'-Hexacb (PCB 138)	35065-28-2	0.0816	UG/L	D	0.0107	UG/L	Dp	0.0762	UG/L	D	0.0129	UG/L	D	
2,2',4,4',5,5'-Hexacb (PCB 153)	35065-27-1	0.1412	UG/L	D	0.0104	UG/L	D	0.1366	UG/L	D	0.0167	UG/L	D	
2,2',3,3',4,4',5-Heptacb (PCB 170)	35065-30-6	0.0122	UG/L	D	0.0011	UG/L	DU	0.013	UG/L	D	0.0018	UG/L	Dp	
2,2',3,4,4',5,5'-Heptacb (PCB 180)	35065-29-3	0.0153	UG/L	D	0.0012	UG/L	Dp	0.0164	UG/L	D	0.0019	UG/L	Dp	
2,2',3,4',5,5',6-Heptacb (PCB 187)	52663-68-0	0.0233	UG/L	D	0.0013	UG/L	Dp	0.0222	UG/L	D	0.0028	UG/L	Dp	
2,2',3,3',4,4',5,6-Octacb (PCB 195)	52663-78-2	0.003	UG/L	D	0.0011	UG/L	DU	0.0031	UG/L	D	0.0011	UG/L	Dp	
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	40186-72-9	0.0039	UG/L	Dp	0.0011	UG/L	DU	0.0054	UG/L	Dp	0.0015	UG/L	Dp	
DecaCB (PCB 209)	2051-24-3	0.0021	UG/L	Dp	0.0011	UG/L	DU	0.0023	UG/L	Dp	0.001	UG/L	DU	
Sum of 18 NOAA Congeners (SUM 18 CONG)		5.1	UG/L		1.3	UG/L		4.5	UG/L		1.9	UG/L		

Station ID	Station ID	SOUTHR08	2806		SOUTHR08	2806		50NTU0828	06		50NTU0828	06	
Collected	Collected		8/	28/2006		8/	28/2006		8/	28/2006	6	8/	28/2006
Fraction	Fraction	TOTAL			DISS			TOTAL			DISS		
QC Code	QC Code	SA			SA			SA			SA		
Sample ID	Sample ID	WQ-TPC-00	1-08280)6	WQ-DPC-00	1-0828	06	WQ-TPC-00	2-08280	06	WQ-DPC-00	2-0828	06
Param Name	Param Code	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
2,4'-Dicb (PCB 8)	34883-43-7	0.3222	UG/L	D	0.306	UG/L	D	2.0772	UG/L	D	0.556	UG/L	D
2,2',5-Tricb (PCB 18)	37680-65-2	0.4909	UG/L	D	0.3791	UG/L	D	3.3159	UG/L	D	0.602	UG/L	D
2,4,4'-Tricb (PCB 28)	7012-37-5	0.5114	UG/L	D	0.211	UG/L	D	3.3881	UG/L	D	0.3413	UG/L	D
2,2',3,5'-Tetracb (PCB 44)	41464-39-5	0.1821	UG/L	D	0.0574	UG/L		1.4127	'UG/L	D	0.1057	UG/L	D
2,2',5,5'-Tetracb (PCB 52)	35693-99-3	0.5862	UG/L	D	0.166	UG/L	D	5.5406	UG/L	D	0.3742	UG/L	D
2,3',4,4'-Tetracb (PCB 66)	32598-10-0	0.0471	UG/L		0.0073	UG/L		0.2813	UG/L	D	0.0141	UG/L	
2,2',4,5,5'-Pentacb (PCB 101)	37680-73-2	0.1092	UG/L	D	0.0122	UG/L		0.8239	UG/L	D	0.0355	UG/L	
2,3,3',4,4'-Pentacb (PCB 105)	32598-14-4	0.0056	UG/L	р	0.0007	UG/L	р	0.0262	UG/L	р	0.001	UG/L	р
2,3',4,4',5-Pentacb (PCB 118)	31508-00-6	0.0609	UG/L		0.0063	UG/L		0.5416	UG/L	D	0.0173	UG/L	
2,2',3,3',4,4'-Hexacb (PCB 128)	38380-07-3	0.0048	UG/L		0.0007	UG/L	р	0.0275	UG/L	р	0.0016	UG/L	
2,2',3,4,4',5'-Hexacb (PCB 138)	35065-28-2	0.0445	UG/L		0.0034	UG/L		0.3447	'UG/L	D	0.013	UG/L	
2,2',4,4',5,5'-Hexacb (PCB 153)	35065-27-1	0.085	UG/L		0.0049	UG/L		0.6257	UG/L	D	0.0197	UG/L	
2,2',3,3',4,4',5-Heptacb (PCB 170)	35065-30-6	0.0079	UG/L		0.0007	UG/L	р	0.0614	UG/L	р	0.0015	UG/L	
2,2',3,4,4',5,5'-Heptacb (PCB 180)	35065-29-3	0.0093	UG/L		0.0004	UG/L	рJ	0.0787	'UG/L	р	0.0018	UG/L	
2,2',3,4',5,5',6-Heptacb (PCB 187)	52663-68-0	0.0114	UG/L		0.0004	UG/L	рJ	0.078	UG/L	D	0.0025	UG/L	
2,2',3,3',4,4',5,6-Octacb (PCB 195)	52663-78-2	0.0018	UG/L		0.0005	UG/L	U	0.0104	UG/L	р	0.0011	UG/L	р
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	40186-72-9	0.0018	UG/L	р	0.0005	UG/L	U	0.0133	UG/L	p	0.001	UG/L	p
DecaCB (PCB 209)	2051-24-3	0.0009	UG/L	p	0.0005	UG/L	U	0.0043	UG/L	p	0.0007	UG/L	p
Sum of 18 NOAA Congeners (SUM 18 CONG)		2.5	UG/L		1.2	UG/L		19	UG/L		2.1	UG/L	-

Station ID	Station ID	25NTU0828	06		25NTU0828	06		1NTU09190	6		1NTU09190	6		
Collected	Collected		8/	28/2006		8/	/28/2006		9	/19/2006	6	9/	19/2006	
Fraction	Fraction	TOTAL			DISS			TOTAL			DISS			
QC Code	QC Code	SA			SA			SA			SA			
Sample ID	Sample ID	WQ-TPC-00	3-08280)6	WQ-DPC-00	3-0828	06	WQ-TPC-00	1-0919	06	WQ-DPC-00	1-0919	06	
Param Name	Param Code	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	
2,4'-Dicb (PCB 8)	34883-43-7	0.5903	UG/L	D	0.3223	UG/L	D	0.3954	UG/L	D	0.2056	UG/L	D	
2,2',5-Tricb (PCB 18)	37680-65-2	0.9557	UG/L	D	0.3523	UG/L	D	0.4392	UG/L	D	0.2108	UG/L	D	
2,4,4'-Tricb (PCB 28)	7012-37-5	0.882	UG/L	D	0.1805	UG/L	D	0.3703	UG/L	D	0.163	UG/L	D	
2,2',3,5'-Tetracb (PCB 44)	41464-39-5	0.3763	UG/L	D	0.0615	UG/L		0.1139	UG/L	D	0.0561	UG/L	D	
2,2',5,5'-Tetracb (PCB 52)	35693-99-3	1.3136	UG/L	D	0.1666	UG/L	D	0.3651	UG/L	D	0.1555	UG/L	D	
2,3',4,4'-Tetracb (PCB 66)	32598-10-0	0.0688	UG/L		0.0083	UG/L		0.0343	UG/L	D	0.0149	UG/L	D	
2,2',4,5,5'-Pentacb (PCB 101)	37680-73-2	0.202	UG/L	D	0.0134	UG/L		0.0603	UG/L	D	0.0235	UG/L	D	
2,3,3',4,4'-Pentacb (PCB 105)	32598-14-4	0.0079	UG/L	р	0.0007	UG/L	р	0.0056	UG/L	Dp	0.0021	UG/L	Dp	
2,3',4,4',5-Pentacb (PCB 118)	31508-00-6	0.1387	UG/L	D	0.0075	UG/L		0.0401	UG/L	D	0.0163	UG/L	D	
2,2',3,3',4,4'-Hexacb (PCB 128)	38380-07-3	0.0073	UG/L		0.0007	UG/L	р	0.004	UG/L	D	0.0017	UG/L	D	
2,2',3,4,4',5'-Hexacb (PCB 138)	35065-28-2	0.0945	UG/L	р	0.0069	UG/L	р	0.0241	UG/L	D	0.0091	UG/L	D	
2,2',4,4',5,5'-Hexacb (PCB 153)	35065-27-1	0.1589	UG/L	D	0.0056	UG/L		0.0413	UG/L	D	0.0155	UG/L	D	
2,2',3,3',4,4',5-Heptacb (PCB 170)	35065-30-6	0.0149	UG/L	р	0.0009	UG/L	р	0.0034	UG/L	D	0.0015	UG/L	Dp	
2,2',3,4,4',5,5'-Heptacb (PCB 180)	35065-29-3	0.0183	UG/L	р	0.0006	UG/L	р	0.0048	UG/L	D	0.0018	UG/L	Dp	
2,2',3,4',5,5',6-Heptacb (PCB 187)	52663-68-0	0.0243	UG/L	р	0.0004	UG/L	J	0.0047	UG/L	D	0.0015	UG/L	D	
2,2',3,3',4,4',5,6-Octacb (PCB 195)	52663-78-2	0.0046	UG/L	р	0.0006	UG/L	U	0.0014	UG/L	Dp	0.0009	UG/L	Dp	
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	40186-72-9	0.0048	UG/L	р	0.0006	UG/L	U	0.0018	UG/L	Dp	0.0013	UG/L	Dp	
DecaCB (PCB 209)	2051-24-3	0.0015	UG/L		0.0006	UG/L	U	0.0013	UG/L	Dp	0.0011	UG/L	Dp	
Sum of 18 NOAA Congeners (SUM 18 CONG)		4.9	UG/L		1.1	UG/L		1.9	UG/L		0.88	UG/L		

Station ID	Station ID	50NTU0919	06		50NTU0919	06		25NTU0919	06		25NTU0919	06		
Collected	Collected		9/	19/2006		9/	/19/2006		9	/19/2006	6	9/	19/2006	
Fraction	Fraction	TOTAL			DISS			TOTAL			DISS			
QC Code	QC Code	SA			SA			SA			SA			
Sample ID	Sample ID	WQ-TPC-00	2-09190	06	WQ-DPC-00	2-0919	06	WQ-TPC-00	3-0919	06	WQ-DPC-00	3-0919	06	
Param Name	Param Code	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	
2,4'-Dicb (PCB 8)	34883-43-7	5.4142	UG/L	D	1.8178	UG/L	D	2.4142	UG/L	D	0.9705	UG/L	D	
2,2',5-Tricb (PCB 18)	37680-65-2	6.8231	UG/L	D	1.171	UG/L	D	2.8582	UG/L	D	0.6774	UG/L	D	
2,4,4'-Tricb (PCB 28)	7012-37-5	6.5643	UG/L	D	0.4751	UG/L	D	2.2552	UG/L	D	0.2694	UG/L	D	
2,2',3,5'-Tetracb (PCB 44)	41464-39-5	2.7497	UG/L	D	0.1124	UG/L	D	0.9307	UG/L	D	0.0775	UG/L	D	
2,2',5,5'-Tetracb (PCB 52)	35693-99-3	8.2866	UG/L	D	0.4137	UG/L	D	3.601	UG/L	D	0.3242	UG/L	D	
2,3',4,4'-Tetracb (PCB 66)	32598-10-0	1.4684	UG/L	D	0.022	UG/L	D	0.3055	UG/L	D	0.0139	UG/L	D	
2,2',4,5,5'-Pentacb (PCB 101)	37680-73-2	1.6581	UG/L	D	0.0162	UG/L	D	0.4496	UG/L	D	0.0139	UG/L	D	
2,3,3',4,4'-Pentacb (PCB 105)	32598-14-4	0.2543	UG/L	Dp	0.0018	UG/L	Dp	0.0449	UG/L	Dp	0.0016	UG/L	Dp	
2,3',4,4',5-Pentacb (PCB 118)	31508-00-6	1.2353	UG/L	D	0.0099	UG/L	D	0.3144	UG/L	D	0.0087	UG/L	D	
2,2',3,3',4,4'-Hexacb (PCB 128)	38380-07-3	0.0799	UG/L	Dp	0.0012	UG/L	D	0.0229	UG/L	Dp	0.0011	UG/L	D	
2,2',3,4,4',5'-Hexacb (PCB 138)	35065-28-2	0.7576	UG/L	D	0.0046	UG/L	D	0.1958	UG/L	D	0.0053	UG/L	D	
2,2',4,4',5,5'-Hexacb (PCB 153)	35065-27-1	1.2104	UG/L	D	0.0065	UG/L	D	0.3311	UG/L	D	0.0075	UG/L	D	
2,2',3,3',4,4',5-Heptacb (PCB 170)	35065-30-6	0.0887	UG/L	Dp	0.0013	UG/L	Dp	0.0292	UG/L	Dp	0.0011	UG/L	Dp	
2,2',3,4,4',5,5'-Heptacb (PCB 180)	35065-29-3	0.1347	UG/L	Dp	0.0008	UG/L	DpJ	0.043	UG/L	Dp	0.0009	UG/L	DpJ	
2,2',3,4',5,5',6-Heptacb (PCB 187)	52663-68-0	0.1389	UG/L	Dp	0.0005	UG/L	DpJ	0.0593	UG/L	Dp	0.0007	UG/L	DpJ	
2,2',3,3',4,4',5,6-Octacb (PCB 195)	52663-78-2	0.0148	UG/L	Dp	0.0011	UG/L	DU	0.0061	UG/L	D	0.001	UG/L	DU	
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	40186-72-9	0.0181	UG/L	Dp	0.0015	UG/L	Dp	0.0082	UG/L	Dp	0.0014	UG/L	Dp	
DecaCB (PCB 209)	2051-24-3	0.0074	UG/L	Dp	0.0011	UG/L	DU	0.0043	UG/L	Dp	0.001	UG/L	DU	
Sum of 18 NOAA Congeners (SUM 18 CONG)		37	UG/L		4.1	UG/L		14	UG/L		2.4	UG/L		

Station ID	Station ID	75NTU091	906		75NTU0919	06		75N10090	6		75N100906			
Collected	Collected		9	/19/2006		9/	/19/2006			10/9/2006		1	0/9/2006	
Fraction	Fraction	TOTAL			DISS			TOTAL			DISS			
QC Code	QC Code	SA			SA			SA			SA			
Sample ID	Sample ID	WQ-TPC-0	04-0919	906	WQ-DPC-00	04-0919	06	WQ-TPC-	001-100	906	WQ-DPC-00	1-1009	06	
Param Name	Param Code	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	
2,4'-Dicb (PCB 8)	34883-43-7	36.5802	UG/L	D	2.4943	UG/L	D	3.4626	UG/L	D	2.0431	UG/L	D	
2,2',5-Tricb (PCB 18)	37680-65-2	48.4419	UG/L	D	1.6969	UG/L	D	4.7199	UG/L	D	1.6811	UG/L	D	
2,4,4'-Tricb (PCB 28)	7012-37-5	40.2884	UG/L	D	0.6812	UG/L	D	3.9345	UG/L	D	0.716	UG/L	D	
2,2',3,5'-Tetracb (PCB 44)	41464-39-5	14.4464	UG/L	D	0.1328	UG/L	D	1.3607	UG/L	D	0.1747	UG/L	D	_
2,2',5,5'-Tetracb (PCB 52)	35693-99-3	53.0245	UG/L	D	0.619	UG/L	D	4.4809	UG/L	D	0.5314	UG/L	D	_
2,3',4,4'-Tetracb (PCB 66)	32598-10-0	6.6374	UG/L	D	0.0194	UG/L	D	0.3325	UG/L	Dp	0.0342	UG/L	Dp	_
2,2',4,5,5'-Pentacb (PCB 101)	37680-73-2	8.5996	UG/L	D	0.0178	UG/L	D	0.5182	UG/L	D	0.0095	UG/L	DJ	_
2,3,3',4,4'-Pentacb (PCB 105)	32598-14-4	1.3748	UG/L	Dp	0.0015	UG/L	Dp	0.0952	UG/L	DU	0.019	UG/L	DU	_
2,3',4,4',5-Pentacb (PCB 118)	31508-00-6	6.6537	UG/L	D	0.0108	UG/L	D	0.2979	UG/L	D	0.0192	UG/L	DU	_
2,2',3,3',4,4'-Hexacb (PCB 128)	38380-07-3	0.1272	UG/L	Dp	0.0013	UG/L	D	0.0962	UG/L	DU	0.0192	UG/L	DU	_
2,2',3,4,4',5'-Hexacb (PCB 138)	35065-28-2	4.355	UG/L	D	0.0059	UG/L	D	0.2161	UG/L	D	0.0192	UG/L	DU	_
2,2',4,4',5,5'-Hexacb (PCB 153)	35065-27-1	6.9396	UG/L	D	0.0088	UG/L	D	0.3467	UG/L	D	0.0192	UG/L	DU	_
2,2',3,3',4,4',5-Heptacb (PCB 170)	35065-30-6	0.2688	UG/L	Dp	0.0014	UG/L	Dp	0.0962	UG/L	DU	0.0192	UG/L	DU	_
2,2',3,4,4',5,5'-Heptacb (PCB 180)	35065-29-3	0.5985	UG/L	D	0.0009	UG/L	DpJ	0.024	UG/L	DpJ	0.0192	UG/L	DU	_
2,2',3,4',5,5',6-Heptacb (PCB 187)	52663-68-0	0.6339	UG/L	D	0.0009	UG/L	DpJ	0.0952	UG/L	DU	0.019	UG/L	DU	_
2,2',3,3',4,4',5,6-Octacb (PCB 195)	52663-78-2	0.1248	UG/L	Dp	0.0011	UG/L	DU	0.0962	UG/L	DU	0.0192	UG/L	DU	_
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	40186-72-9	0.1807	UG/L	Dp	0.0015	UG/L	Dp	0.0952	UG/L	DU	0.019	UG/L	DU	_
DecaCB (PCB 209)	2051-24-3	0.0401	UG/L	Dp	0.0011	UG/L	DU	0.0952	UG/L	DU	0.019	UG/L	DU	_
Sum of 18 NOAA Congeners (SUM 18 CONG)		230	UG/L		5.7	UG/L		20	UG/L		5.2	UG/L		

Station ID	Station ID	25\$100906)		25S10090	6		25\$21009	06		25S2100906			
Collected	Collected		1	0/9/2006	5		10/9/2006			10/9/200	10/9/2006			
Fraction	Fraction				DISS			TOTAL			DISS			
QC Code	QC Code				SA			SA			SA			
Sample ID	Sample ID	WQ-TPC-002-100906			WQ-DPC-	002-100	906	WQ-TPC-003-100906			WQ-DPC-003-100906			
Param Name	Param Code	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	
2,4'-Dicb (PCB 8)	34883-43-7	3.3734	UG/L	D	0.0219	UG/L	DU	1.8391	UG/L	D	2.1899	UG/L	D	
2,2',5-Tricb (PCB 18)	37680-65-2	8.2917	UG/L	D	0.0666	UG/L	Dp	2.3361	UG/L	D	1.7964	UG/L	D	
2,4,4'-Tricb (PCB 28)	7012-37-5	11.3165	UG/L	D	0.0595	UG/L	D	2.1193	UG/L	D	0.8596	UG/L	D	
2,2',3,5'-Tetracb (PCB 44)	41464-39-5	6.7228	UG/L	D	0.0912	UG/L	D	0.8119	UG/L	D	0.2085	UG/L	D	
2,2',5,5'-Tetracb (PCB 52)	35693-99-3	16.0066	UG/L	D	0.2387	UG/L	D	1.9352	UG/L	D	0.5585	UG/L	D	
2,3',4,4'-Tetracb (PCB 66)	32598-10-0	3.6724	UG/L	D	0.096	UG/L	Dp	0.4905	UG/L	D	0.0395	UG/L	Dp	
2,2',4,5,5'-Pentacb (PCB 101)	37680-73-2	4.6752	UG/L	D	0.0122	UG/L	DpJ	0.4637	UG/L	D	0.0187	UG/L	DJ	
2,3,3',4,4'-Pentacb (PCB 105)	32598-14-4	0.4717	UG/L	DU	0.0216	UG/L	DU	0.0962	UG/L	DU	0.0192	UG/L	DU	
2,3',4,4',5-Pentacb (PCB 118)	31508-00-6	3.2407	UG/L	D	0.0219	UG/L	DU	0.3213	UG/L	D	0.0037	UG/L	DpJ	
2,2',3,3',4,4'-Hexacb (PCB 128)	38380-07-3	0.4764	UG/L	DU	0.0219	UG/L	DU	0.0971	UG/L	DU	0.0194	UG/L	DU	
2,2',3,4,4',5'-Hexacb (PCB 138)	35065-28-2	1.2473	UG/L	D	0.0219	UG/L	DU	0.1181	UG/L	D	0.0194	UG/L	DU	
2,2',4,4',5,5'-Hexacb (PCB 153)	35065-27-1	3.1812	UG/L	D	0.0219	UG/L	DU	0.2263	UG/L	D	0.0194	UG/L	DU	
2,2',3,3',4,4',5-Heptacb (PCB 170)	35065-30-6	0.4764	UG/L	DU	0.0219	UG/L	DU	0.0971	UG/L	DU	0.0194	UG/L	DU	
2,2',3,4,4',5,5'-Heptacb (PCB 180)	35065-29-3	0.4764	UG/L	DU	0.0219	UG/L	DU	0.0117	UG/L	DpJ	0.0194	UG/L	DU	
2,2',3,4',5,5',6-Heptacb (PCB 187)	52663-68-0	0.4717	UG/L	DU	0.0216	UG/L	DU	0.0962	UG/L	DU	0.0192	UG/L	DU	
2,2',3,3',4,4',5,6-Octacb (PCB 195)	52663-78-2	0.4764	UG/L	DU	0.0219	UG/L	DU	0.0971	UG/L	DU	0.0194	UG/L	DU	
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	40186-72-9	0.4717	UG/L	DU	0.0216	UG/L	DU	0.0962	UG/L	DU	0.0192	UG/L	DU	
DecaCB (PCB 209)	2051-24-3	0.4717	UG/L	DU	0.0216	UG/L	DU	0.0962	UG/L	DU	0.0192	UG/L	DU	
Sum of 18 NOAA Congeners (SUM 18 CONG)		62	UG/L		0.56	UG/L		11	UG/L		5.7	UG/L		

Station ID	Station ID	200S1090	906		200\$109090)6		SOUTHR10	SOUTHR101606			SOUTHR101606			
Collected	Collected	SA				10	0/9/2006			/16/2006					
Fraction	Fraction				DISS			TOTAL		DISS					
QC Code	QC Code				SA			SA	SA						
Sample ID	Sample ID				WQ-DPC-00	4-1009	06	WQ-TPC-00	WQ-TPC-001-101606			WQ-DPC-001-101606			
Param Name	Param Code	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ		
2,4'-Dicb (PCB 8)	34883-43-7	1.8628	UG/L	D	0.685	UG/L	D	0.5227	UG/L	D	0.341	UG/L	D		
2,2',5-Tricb (PCB 18)	37680-65-2	2.2523	UG/L	D	0.6924	UG/L	D	0.6257	UG/L	D	0.3809	UG/L	D		
2,4,4'-Tricb (PCB 28)	7012-37-5	1.8874	UG/L	D	0.3867	UG/L	D	0.4527	UG/L	D	0.2061	UG/L	D		
2,2',3,5'-Tetracb (PCB 44)	41464-39-5	0.6284	UG/L	D	0.0928	UG/L	D	0.1619	UG/L	D	0.0718	UG/L	D		
2,2',5,5'-Tetracb (PCB 52)	35693-99-3	1.7	UG/L	D	0.2652	UG/L	D	0.3688	UG/L	D	0.1584	UG/L	D		
2,3',4,4'-Tetracb (PCB 66)	32598-10-0	0.2476	UG/L	Dp	0.0313	UG/L	Dp	0.0654	UG/L	D	0.0254	UG/L	Dp		
2,2',4,5,5'-Pentacb (PCB 101)	37680-73-2	0.2764	UG/L	D	0.0066	UG/L	DJ	0.0944	UG/L	D	0.0217	UG/L	D		
2,3,3',4,4'-Pentacb (PCB 105)	32598-14-4	0.0952	UG/L	DU	0.0192	UG/L	DU	0.0007	UG/L	DpJ	0.0098	UG/L	DU		
2,3',4,4',5-Pentacb (PCB 118)	31508-00-6	0.1672	UG/L	D	0.0194	UG/L	DU	0.0612	UG/L	D	0.0091	UG/L	DpJ		
2,2',3,3',4,4'-Hexacb (PCB 128)	38380-07-3	0.0962	UG/L	DU	0.0194	UG/L	DU	0.0124	UG/L	DU	0.0099	UG/L	DU		
2,2',3,4,4',5'-Hexacb (PCB 138)	35065-28-2	0.0645	UG/L	DpJ	0.0194	UG/L	DU	0.0263	UG/L	D	0.0025	UG/L	DpJ		
2,2',4,4',5,5'-Hexacb (PCB 153)	35065-27-1	0.1324	UG/L	D	0.0194	UG/L	DU	0.0549	UG/L	D	0.0089	UG/L	DpJ		
2,2',3,3',4,4',5-Heptacb (PCB 170)	35065-30-6	0.0962	UG/L	DU	0.0194	UG/L	DU	0.0006	UG/L	DpJ	0.0099	UG/L	DU		
2,2',3,4,4',5,5'-Heptacb (PCB 180)	35065-29-3	0.0962	UG/L	DU	0.0194	UG/L	DU	0.0039	UG/L	DpJ	0.0099	UG/L	DU		
2,2',3,4',5,5',6-Heptacb (PCB 187)	52663-68-0	0.0952	UG/L	DU	0.0192	UG/L	DU	0.0016	UG/L	DpJ	0.0098	UG/L	DU		
2,2',3,3',4,4',5,6-Octacb (PCB 195)	52663-78-2	0.0962	UG/L	DU	0.0194	UG/L	DU	0.0124	UG/L	DU	0.0099	UG/L	DU		
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	40186-72-9	0.0952	UG/L	DU	0.0192	UG/L	DU	0.0123	UG/L	DU	0.0098	UG/L	DU		
DecaCB (PCB 209)	2051-24-3	0.0952	UG/L	DU	0.0192	UG/L	DU	0.0123	UG/L	DU	0.0098	UG/L	DU		
Sum of 18 NOAA Congeners (SUM 18 CONG)		9.2	UG/L		2.2	UG/L		2.4	UG/L		1.2	UG/L			

Station ID	Station ID	SOUTHR1	01606		SOUTHR10	1606		25NTU1016	06		25NTU101606					
Collected	Collected			0/16/2006		10)/16/2006		10/16/2006			10/16/2006				
Fraction	Fraction	TOTAL			DISS			TOTAL	TOTAL				DISS			
QC Code	QC Code	REP			REP			SA	SA			SA				
Sample ID	Sample ID	WQ-TPC-0	01-10160	6-DUP	WQ-DPC-0	01-10160	6-DUP	WQ-TPC-00	06	WQ-DPC-002-101606						
Param Name	Param Code	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ			
2,4'-Dicb (PCB 8)	34883-43-7	0.6205	UG/L	D	0.4977	UG/L	D	4.8438	UG/L	D	2.1941	UG/L	D			
2,2',5-Tricb (PCB 18)	37680-65-2	0.7272	UG/L	D	0.7622	UG/L	D	6.0945	UG/L	D	1.9325	UG/L	D			
2,4,4'-Tricb (PCB 28)	7012-37-5	0.5453	UG/L	D	0.4004	UG/L	D	4.9166	UG/L	D	1.1539	UG/L	D			
2,2',3,5'-Tetracb (PCB 44)	41464-39-5	0.1998	UG/L	D	0.204	UG/L	D	2.0637	UG/L	D	0.4359	UG/L	D			
2,2',5,5'-Tetracb (PCB 52)	35693-99-3	0.4389	UG/L	D	0.4254	UG/L	D	4.2743	UG/L	D	0.9946	UG/L	D			
2,3',4,4'-Tetracb (PCB 66)	32598-10-0	0.0877	UG/L	D	0.0499	UG/L	D	1.166	UG/L	D	0.2421	UG/L	D			
2,2',4,5,5'-Pentacb (PCB 101)	37680-73-2	0.1128	UG/L	D	0.0794	UG/L	D	1.4782	UG/L	D	0.2109	UG/L	D			
2,3,3',4,4'-Pentacb (PCB 105)	32598-14-4	0.0012	UG/L	DpJ	0.0003	UG/L	DpJ	0.017	UG/L	DpJ	0.0495	UG/L	DU			
2,3',4,4',5-Pentacb (PCB 118)	31508-00-6	0.0739	UG/L	D	0.0349	UG/L	D	1.0401	UG/L	D	0.0971	UG/L	D			
2,2',3,3',4,4'-Hexacb (PCB 128)	38380-07-3	0.0123	UG/L	DU	0.0099	UG/L	DU	0.0097	UG/L	DpJ	0.05	UG/L	DU			
2,2',3,4,4',5'-Hexacb (PCB 138)	35065-28-2	0.0335	UG/L	D	0.017	UG/L	D	0.5056	UG/L	D	0.0067	UG/L	DpJ			
2,2',4,4',5,5'-Hexacb (PCB 153)	35065-27-1	0.0639	UG/L	D	0.0466	UG/L	D	0.8415	UG/L	D	0.079	UG/L	D			
2,2',3,3',4,4',5-Heptacb (PCB 170)	35065-30-6	0.001	UG/L	DpJ	0.0099	UG/L	DU	0.0481	UG/L	DpJ	0.05	UG/L	DU			
2,2',3,4,4',5,5'-Heptacb (PCB 180)	35065-29-3	0.0052	UG/L	DpJ	0.003	UG/L	DpJ	0.08	UG/L	Dp	0.05	UG/L	DU			
2,2',3,4',5,5',6-Heptacb (PCB 187)	52663-68-0	0.003	UG/L	DpJ	0.0022	UG/L	DpJ	0.0658	UG/L	Dp	0.0495	UG/L	DU			
2,2',3,3',4,4',5,6-Octacb (PCB 195)	52663-78-2	0.0123	UG/L	DU	0.0099	UG/L	DU	0.0486	UG/L	DU	0.05	UG/L	DU			
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	40186-72-9	0.0121	UG/L	DU	0.0098	UG/L	DU	0.0481	UG/L	DU	0.0495	UG/L	DU			
DecaCB (PCB 209)	2051-24-3	0.0121	UG/L	DU	0.0098	UG/L	DU	0.0481	UG/L	DU	0.0495	UG/L	DU			
Sum of 18 NOAA Congeners (SUM 18 CONG)		2.9	UG/L		2.5	UG/L		27	UG/L		7.4	UG/L				

Qualifiers:

- D Dilution run. Initial run outside linear range of instrument
- J Analyte detected below the sample specific reporting limit
- p The relative percent difference (RPD) between the values obtained from the dual columns is >40%.
- U Analyte not detected at 3:1 signal:noise ratio. Reporting limit is reported.

Appendix D Toxicity Analytical Data



Biomonitoring of Surface Water Samples New Bedford Harbor New Bedford, Massachusetts

Fall 2006

Prepared for

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Prepared by

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August-September 2006 Reference Number:Battele14877,14886,14925,15007

Biomonitoring of Surface Water Samples New Bedford Harbor, New Bedford, Massachusetts

Fall 2006

1.0 INTRODUCTION

This report provides a summarization of data generated from a series of acute and chronic exposure screening assays evaluating surface water samples collected from New Bedford Harbor. Toxicity tests were conducted on grab surface water samples collected from the specified areas in the harbor. Assay design included a laboratory control treatment and one or more surface water samples. Samples were evaluated "As Received" without dilutions. Assays were conducted based on water quality levels in the vicinity of dredging operations. Samples were collected by Battelle personnel from the Duxbury, Massachusetts office. Testing was based on programs and protocols developed by the US EPA (2002) and included the following assays; modified 2 day acute and 7 day chronic assays conducted with the mysid shrimp, *Americamysis bahia*, and the red macro alga, *Champia parvula*, and 60 minute chronic fertilization assays conducted with the purple sea urchin, *Arbacia punctulata*. All mysid and urchin fertilization assays and a portion of the algal assays were conducted by ESI at its Hampton, New Hampshire facility. Additionally, the algal assays were conducted by the Saskatchewan Research Council, SRC, Saskatoon, Saskatchewan, Canada.

2.0 MATERIALS AND METHODS

2.1 General Methods

Toxicological and analytical protocols used in this program followed procedures primarily designed by the EPA to provide standard approaches for the evaluation of toxicological effects of discharges on aquatic organisms, and for the analysis of water samples.

2.2 Test Species

A. bahia, \le 5 days, were obtained from cultures maintained by Aquatic Research Organisms (ARO), Hampton, New Hampshire. Juvenile shrimp were collected daily, isolated, and placed in a rearing tank for up to 6 days. Holding tanks were maintained in a flow-through culture mode at a temperature of 25 \pm 2°C. At the start of the assays the mysids were 7 days old. Juveniles were fed \le 24 hour old brine shrimp on a daily basis. Water temperature, salinity, and pH were monitored on a daily basis. Prior to testing organisms were siphoned from the rearing tanks to a holding vessel, and then transferred to test chambers using a large bore pipet, minimizing the amount of water added to test solutions.

A. punctulata adults were from cultures maintained by ESI. Original stock was obtained from commercial supply. Male and female urchins are maintained in separate chambers as recommended by protocol (EPA 2002) and ESI. Adult urchins were induced to spawn by the injection of a potassium chloride solution. The viability of gametes obtained was determined prior to their addition to the test solutions. Eggs and/or sperm that would not result in a fertilized egg were rejected from the pool of gametes used in the assay.

C. parvula biomass was obtained from stock cultures maintained by the Saskatchewan Research Council. Original stocks were obtained from the University of Texas algal collection. The male and female plants are maintained in separate culture vessels under sterile conditions. Algal cultures were maintained on an orbital shaker (100 rpm) at 23±2°C under 16 hour light: 8 hours dark at 40 to 75 foot candles light intensity. Cultures are "cropped" and transferred to fresh nutrient solutions on a weekly basis.

2.3 Surface Water Samples and Laboratory Control Water

Grab surface water samples were collected by Battelle staff on four occasions in the Harbor, Table 1. Samples were placed in polyethylene cubitainers for shipment to the laboratory. Two, 2.5 gallon cubitainers were collected for each of the chronic assays. Prior to testing, samples were evaluated to document salinity, conductivity, and total residual chlorine. Total residual chlorine was measured by amperometric titration (MDL

0.05 mg/L). Prior to use in the assays the salinity of the samples was adjusted, if necessary, to predetermined levels using artificial sea salts for *A. bahia* and *A. punctulata* assays, and GP-2 salts (EPA 2002) for the *C. parvula* assays. The salinity of samples for the *A. bahia* acute and chronic exposure assays were adjusted to 25±2‰ while samples used for the *A. punctulata* and *C. parvula* assays were adjusted to 30±2‰. Samples with as received salinity above these levels were not adjusted.

Laboratory control water used for mysid and sea urchin assays was collected from the Hampton/Seabrook Estuary. This water is classified as SA-1 and has been used to culture marine test organisms since 1981. The laboratory control water used in the algal assay, collected from Rye, New Hampshire, is the same water used in culture maintenance. Prior to use, seawater used in the algal assays was filtered through glass fiber filters and sterilized. Dilution water used in the algal assays conducted by SRC was natural seawater collected from the West Coast of Canada. Salinity of the surface water samples was adjusted using commercial sea salts.

2.4 Bioassays

2.4.1 Americamysis bahia Modified Acute and Chronic Exposure Bioassays

Modified acute and chronic exposure screening assays were conducted in a static renewal test mode with renewals made at 24-hour intervals. The 7 day assays were conducted at a temperature of 26±1°C with a photoperiod of 16:8 hours light:dark. Mysids were maintained in 250 mL beakers containing 150 mL of test solution. Approximately 100 mL of the test solution were replaced each day. The assay incorporated 8 replicates with 5 organisms/replicate. Survival and dissolved oxygen were measured daily in each replicate prior to test solution renewal. Salinity, temperature and pH were recorded in a composite sample of the "old" test solution and in the "new" test solution prior to being added to the test chamber. Incubator temperatures were also recorded on a daily basis.

During the test, mysids were fed \le 24 hour old *Artemia* nauplii. On Day 7 of the assay, surviving mysids were removed from test solutions, rinsed to remove any surface detritus and salts, and transferred to tared foils and dried for 24 hours at 103°C. Foils were weighed to the nearest 0.01 mg. Mean dry weights per individual were obtained by dividing the net dry weight of all surviving organisms by the number of organisms added at the start of the assay.

2.4.2 Arbacia punctulata Chronic Exposure Fertilization Assays

Gametes were obtained by potassium chloride injection to induce spawning. Sperm were collected dry, diluted to achieve a concentration of approximately 5.0 x 10⁷ sperm/mL in the surface water treatments. Actual sperm concentrations are provided on laboratory bench sheets in Appendix A. Sperm solutions were added to 5 mL aliquots of each sample being evaluated and allowed to remain in the test solutions for 60 minutes before the addition of unfertilized eggs. Each treatment incorporated a total of four (4) replicates. After 20 minutes exposure the assay was terminated by the addition of 0.2 mL of preservative. Aliquots of preserved solution were counted to determine numbers of fertilized and unfertilized eggs. Fertilization was accepted based on the presence or absence of a fertilization membrane around the egg.

2.4.3 Champia parvula Modified Acute and Chronic Exposure Assays

The 7 day red algae assay was conducted with a 2 day exposure period to the surface waters and laboratory control treatments. Each treatment used four replicates with five female branches and one male branch per replicate. Temperature was maintained at 23±1°C. The light source was cool white and fluorescent bulbs set on a 16:8 hours light:dark cycle, with a light intensity of 40 to 75 foot candles. Light intensity was checked at the start of each assay. Temperatures were monitored on a daily basis. Test chambers were 200 mL borosilicate glass fleakers. After 2 days exposure, female branch tips were transferred to approximately 100 mL of recovery medium with added nutrients and allowed to recover and mature for 5 days. During transfer, plants were examined to determine the physical condition of the individual branches. Branches showing signs of degeneration were noted and used to establish an acute endpoint. After the recovery period, the number of cystocarps (reproductive bodies) on each female branch were counted.

2.5 Data Analysis

Statistical analysis of acute and chronic exposure data was completed using CETIS, Comprehensive Environmental Toxicity Testing System, software. The program computes acute and chronic exposure endpoints based on EPA decision tree guidelines specified in individual test methods. For chronic exposure endpoints statistical significance was accepted at \approx <0.05.

2.6 Quality Control

As part of the laboratory quality control program, standard reference toxicant assays are conducted on a regular basis for each test species. These results, summarized in Table 10, provide relative health and response data while allowing for comparison with historic data sets. Review of reference toxicant data associated with the August and September 2006 Arbacia punctulata test documents that the fertilization C-NOEC, 5.0 mg/L copper, was outside the acceptable range of 20 to 80 mg/L copper. The acceptable NOEC range for this assay is defined as ±1 concentration of the central tendency. For the same series of assays the fertilization IC-25 was within the acceptable range of for the endpoint. A review of the data collected with the urchin development assays documented no deviation from protocol and no changes in the analysis technique used in the assessment of fertilization.

2.7 Protocol Deviations and Unacceptable Assays

Review of data collected from the four sets of assays conducted during the monitoring period documented no protocol deviations.

3.0 RESULTS SUMMARY

Table 2 provides a summary of test acceptability for the six rounds of assays conducted during this monitoring period. Tables 3-8 provide summaries of survival, growth, development and reproduction endpoints and associated statistical analyses. Table 9 provides a summary of basic water quality data associated with the assays. Support data, including laboratory bench sheets, are provided in Appendix A.

4.0 REFERENCES

APHA. 1998. Standard Methods for the Examination of Water and Wastewater, 20th edition. Washington D.C.

US EPA. 2002. *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms.* Fourth Edition. EPA-821-R-02-012.

US EPA. 2002. Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. EPA-821-R-02-013.

Table 1. Summary of Sample Collection Data. New Bedford Harbor Surface Water Monitoring Program. Fall 2006.

Sample ID	Lab Code	Collec	eted	Recei	ved	Temperature °C
WQ-TOX-001-081406	14877-001	08/14/06	0849	08/14/06	1510	4
WQ-TOX-002-081406	14877-002	08/14/06	1305	08/14/06	1510	4
WQ-TOX-003-081406	14877-003	08/14/06	1320	08/14/06	1510	4
WQ-TOX-004-081406	14877-004	08/14/06	1345	08/14/06	1510	4
WQ-TOX-001-081606	14886-001	08/16/06	1330	08/17/06	0825	4
WQ-TOX-002-081606	14886-002	08/16/06	1400	08/17/06	0825	4
WQ-TOX-003-081606	14886-003	08/16/06	1415	08/17/06	0825	4
WQ-TOX-001-082806	14925-001	08/28/06	0930	08/28/06	1600	4
WQ-TOX-002-082806	14925-002	08/28/06	0950	08/28/06	1600	4
WQ-TOX-003-082806	14925-003	08/28/06	1015	08/28/06	1600	4
WQ-TOX-001-091906	15007-001	09/19/06	0900	09/19/05	1415	4
WQ-TOX-002-091906	15007-002	09/19/06	1000	09/19/05	1415	4
WQ-TOX-003-091906	15007-003	09/19/06	1007	09/19/05	1415	4
WQ-TOX-004-091906	15007-004	09/19/06	1022	09/19/05	1415	4

Table 2. Summary of Assay Acceptability. New Bedford Harbor Surface Water Monitoring Program. Fall 2006.

	American	nysis bahia	Champia	parvula	Arbacia punctulata
Lab Code	Acute Exposure	Chronic Exposure	Acute Exposure	Chronic Exposure	Chronic Exposure
14877-001	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
14877-002	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
14877-003	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
14877-004	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
14886-001	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
14886-002	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
14886-003	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
14925-001	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
14925-002	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
14925-003	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
15007-001	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
15007-002	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
15007-003	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
15007-004	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable

Table 3. Endpoint Summary Table - New Bedford Harbor Water Quality Monitoring August 14, 2006 Sampling Event. New Bedford Harbor Surface Water Monitoring Program. Fall 2006.

Sample ID	Reps	Mean	Min	Max	CV	Sigi	nificant D	ifference v	'S
						p Value	Lab	p Value	Ref
Autoria accessorato da ta			Dantian E	اء ـــانانـــــــا					
Arbacia punctulata			Portion F	ertilizea					
Lab Control		96.2%	94.5%	99.0%	2.05%	-	-	-	-
TOX-001-081406		91.7%	89.3%	94.6%	2.63%	0.0178	YES	-	-
TOX-002-081406	4	94.2%	92.6%	95.3%	1.21%	0.0074	YES	0.9457	NO
TOX-003-081406		87.3%	86.2%	89.3%	1.61%	0.0008	YES	0.0126	YES
TOX-004-081406		90.9%	85.5%	93.8%	4.10%	0.0199	YES	0.3898	NO
Americamysis bahia	3								
			Day 2 S	urvival					
Lab Control		100.0%	100.0%	100.0%	0.00%	-	-	-	-
TOX-001-081406		100.0%	100.0%	100.0%	0.00%	0.4796	NO	-	-
TOX-002-081406	8	100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO
TOX-003-081406		100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO
TOX-004-081406		100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO
			Day 7 S	urvival					
Lab Control		100.0%	100.0%	100.0%	0.00%	-	-	-	-
TOX-001-081406		95.0%	80.0%	100.0%	9.75%	0.2209	NO	-	-
TOX-002-081406	8	100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.7791	NO
TOX-003-081406		100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.7791	NO
TOX-004-081406		100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.7791	NO
		Day 7	Dry Weigh	nt Biomass	s - mg				
Lab Control		0.330	0.278	0.372	8.76%	-	-	-	-
TOX-001-081406		0.427	0.334	0.496	12.96%	0.9997	NO	-	-
TOX-002-081406	8	0.465	0.404	0.504	7.69%	1.0000	NO	0.9376	NO
TOX-003-081406		0.474	0.452	0.504	3.37%	1.0000	NO	0.9756	NO
TOX-004-081406		0.436	0.386	0.502	9.70%	1.0000	NO	0.6326	NO
Champia parvula									
				Day 2 Su	ırvival				
Lab Control		100.0%	100.0%	100.0%	0.00%	-	-	-	-
TOX-001-081406		100.0%	100.0%	100.0%	0.00%	0.4796	NO	-	-
TOX-002-081406	4	100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO
TOX-003-081406		100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO
TOX-004-081406		100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO
		Da	y 7 Mean #	# Cystocai	ps				
Lab Control		21.73	17.00	25.80	20.42%	-	-	-	-
TOX-001-081406		28.00	27.20	29.00	2.80%	0.9822	NO	-	-
TOX-002-081406	4	28.70	24.20	32.60	13.06%	0.9633	NO	0.6364	NO
TOX-003-081406		24.70	20.20	32.20	22.73%	0.7566	NO	0.1642	NO
TOX-004-081406		15.35	11.00	20.00	24.80%	0.0476	YES	0.0003	YES

Table 4. Endpoint Summary Table - New Bedford Harbor Water Quality Monitoring August 16, 2006 Sampling Event. New Bedford Harbor Surface Water Monitoring Program. Fall 2006.

Sample ID	Reps	Mean	Min	Max	CV	Sig	nificant D	ifference v	'S
						p Value	Lab	p Value	Ref
Arbacia punctulata			Portion F	ertilized					
Lab Control		97.6%	96.2%	98.1%	0.98%	_	_	_	_
TOX-001-081606		93.1%	91.7%	94.3%	1.18%	0.0004	YES	-	-
TOX-002-081606	4	91.5%	90.1%	92.6%	1.24%	0.0001	YES	0.0202	YES
TOX-003-081606		90.2%	87.0%	92.9%	2.72%	0.0003	YES	0.0370	YES
Americamysis bahia	Э								
			Day 2 S						
Lab Control		97.5%	80.0%	100.0%	7.25%	-	-	-	-
TOX-001-081606		100.0%	100.0%	100.0%	0.00%	0.7791	NO	-	-
TOX-002-081606	8	100.0%	100.0%	100.0%	0.00%	0.7791	NO	0.4796	NO
TOX-003-081606		100.0%	100.0%	100.0%	0.00%	0.7790	NO	0.4796	NO
			Day 7 S	urvival					
Lab Control		95.0%	80.0%	100.0%	9.75%	-	-	-	-
TOX-001-081606		100.0%	100.0%	100.0%	0.00%	0.7791	NO	-	-
TOX-002-081606	8	100.0%	100.0%	100.0%	0.00%	0.7791	NO	0.4796	NO
TOX-003-081606		97.5%	80.0%	100.0%	7.25%	0.6395	NO	0.3605	NO
		Day 7	Dry Weigh	t Biomass	- mg				
Lab Control		0.429	0.322		50.74%	-	-	-	-
TOX-001-081606		0.448	0.406	0.552	10.93%	0.9948	NO	-	-
TOX-002-081606	8	0.465	0.136	0.984	56.97%	0.8016	NO	0.6106	NO
TOX-003-081606		0.456	0.378	0.648	18.70%	0.9948	NO	0.4796	NO
Champia parvula									
			Day 2 S						
Lab Control		100.0%	100.0%	100.0%	0.00%	-	-	-	-
TOX-001-081606		100.0%	100.0%	100.0%	0.00%	0.4796	NO	-	-
TOX-002-081606	4	100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO
TOX-003-081606		100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO
		Day	y 7 Mean #	-					
Lab Control		80.27	76.20	84.80	5.38%	-	-	-	-
TOX-001-081606		85.15	70.80	95.20		0.7573	NO	-	-
TOX-002-081606	4	86.40	80.00	98.20		0.8535	NO	0.5722	NO
TOX-003-081606		82.75	62.40	102.20	19.67%	0.5945	NO	0.4060	NO

Table 5. Endpoint Summary Table - New Bedford Harbor Water Quality Monitoring August 28, 2006 Sampling Event. New Bedford Harbor Surface Water Monitoring Program. Fall 2006.

Sample ID	Reps	Mean	Min	Max	CV	Sigi	nificant D	ifference v	S
						p Value	Lab	p Value	Ref
Arbacia punctulata			Portion F	ertilized					
Lab Control		90.3%	88.5%	93.5%	2.42%	-	-	-	_
TOX-001-082806		91.0%	87.0%	94.3%	3.53%	0.6442	NO	-	-
TOX-002-082806	4	85.3%	81.3%	90.9%	4.85%	0.0392	YES	0.0633	NO
TOX-003-082806		86.7%	83.3%	90.1%	4.03%	0.0650	NO	0.0582	NO
Americamysis bahia	Э								
			Day 2 S						
Lab Control		100.0%	100.0%	100.0%	0.00%	-	-	-	-
TOX-001-082806	•	100.0%	100.0%	100.0%	0.00%	0.4796	NO	-	-
TOX-002-082806	8	97.5%	80.0%	100.0%	7.25%	0.3605	NO	0.3605	NO
TOX-003-082806		100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO
			Day 7 S	Survival					
Lab Control		100.0%	100.0%	100.0%	0.00%	-	-	-	-
TOX-001-082806		100.0%	100.0%	100.0%	0.00%	0.4796	NO	-	-
TOX-002-082806	8	97.5%	80.0%	100.0%	7.25%	0.3605	NO	0.3605	NO
TOX-003-082806		100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO
		Day 7	Dry Weigh	nt Riomass	s - ma				
Lab Control		0.284	0.248	0.318	-	_	_	_	_
TOX-001-082806		0.204	0.254	0.380		0.9629	NO	_	_
TOX-001-002000	8	0.325	0.280	0.378		0.9905	NO	0.9991	NO
TOX-002-002000 TOX-003-082806	O	0.323	0.250	0.452		1.0000	NO	0.6193	NO
Champia parvula				Day 2 Su	ırvival				
Lab Control		100.0%	100.0%	100.0%	0.00%	-	_	_	-
TOX-001-082806		100.0%	100.0%	100.0%		0.4796	NO	_	-
TOX-002-082806	4	100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO
TOX-003-082806		100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO
			y 7 Mean #	-	-				
Lab Control		25.07	17.80	37.60	43.48%	-	-	-	-
TOX-001-082806		29.40	23.00	37.80	21.96%	0.7326	NO	-	-
TOX-002-082806	4	27.35	20.80	35.80	23.85%	0.6296	NO	0.3354	NO
TOX-003-082806		29.35	19.60	40.80	35.65%	0.6897	NO	0.4969	NO

Table 6. Endpoint Summary Table - New Bedford Harbor Water Quality Monitoring September 19, 2006 Sampling Event. New Bedford Harbor Surface Water Monitoring Program. Fall 2006.

Sample ID	Reps	Mean	Min	Max	CV	Significant Difference vs				
						p Value	Lab	p Value	Ref	
Arbacia punctulata			Portion Fe	ertilized						
		00.00/	00.00/	400.00/	0.050/					
Lab Control		99.3%	98.0%	100.0%	0.95%	-	-	-	-	
TOX-001-091906		94.0%	91.0%	98.0%	3.22%	0.0050	YES	-	-	
TOX-002-091906	4	95.6%	92.9%	97.1%	1.96%	0.0035	YES	0.7624	NO	
TOX-003-091906	-	94.0%	92.7%	95.2%	1.20%	0.0003	YES	0.4252	NO	
TOX-004-091906		92.7%	91.8%	93.5%	0.73%	0.0001	YES	0.1926	NO	
Americamysis bahia	7									
			Day 2 S							
Lab Control		100.0%	100.0%	100.0%	0.00%	-	-	-	-	
TOX-001-091906		100.0%	100.0%	100.0%	0.00%		NO	-	-	
TOX-002-091906	8	97.5%	80.0%	100.0%	7.25%	0.3605	NO	0.3605	NO	
TOX-003-091906		100.0%	100.0%	100.0%	0.00%		NO	0.4796	NO	
TOX-004-091906		95.0%	80.0%	100.0%	9.75%	0.2209	NO	0.2209	NO	
			Day 7 Si							
Lab Control		92.5%	80.0%	100.0%	11.19%	-	-	-	-	
TOX-001-091906		97.5%	80.0%	100.0%	7.25%	0.7791	NO	-	-	
TOX-002-091906	8	95.0%	80.0%	100.0%	9.75%	0.6395	NO	0.3605	NO	
TOX-003-091906		100.0%	100.0%	100.0%	0.00%	0.8828	NO	0.6395	NO	
TOX-004-091906		75.0%	60.0%	80.0%	12.34%	0.0074	YES	0.0005	YES	
		Day 7	Dry Weigh	t Biomass	- mg					
Lab Control		0.241	0.180	0.272	14.06%		-	-	1	
TOX-001-091906		0.511	0.416	0.586	11.23%	1.0000	NO	-	-	
TOX-002-091906	8	0.462	0.320	0.516	14.78%	0.9999	NO	0.0684	NO	
TOX-003-091906		0.623	0.452	0.944	25.42%	0.9999	NO	0.9589	NO	
TOX-004-091906		0.696	0.200	2.174	100.49%	0.9476	NO	0.2209	NO	
Champia parvula										
			·	Day	2 Survival					
Lab Control		100.0%	100.0%	100.0%	0.00%	-	-	-	-	
TOX-001-091906		100.0%	100.0%	100.0%	0.00%	0.4796	NO	-	-	
TOX-002-091906	4	100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO	
TOX-003-091906		100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO	
TOX-004-091906		100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO	
			7 Mean #	Cystocar	ps					
Lab Control		23.93	14.60	34.00	40.62%	-	-	-	-	
TOX-001-091906		24.50	17.60	36.20	33.20%	0.5320	NO	-	-	
TOX-002-091906	4	0.80	0.40	1.80	84.16%	0.0272	YES	0.0051	YES	
TOX-003-091906	1	0.20	0.00	0.40	81.65%	0.0258	YES	0.0047	YES	
TOX-004-091906	1	0.15	0.00	0.60	200.00%	0.0257	YES	0.0047	YES	

Table 7. Summary of "As Received" Sample Physical and Chemical Characteristics. New Bedford Harbor Surface Water Monitoring Program. Fall 2005.

Sample ID	Lab Code	Ammonia (mg/L)	pH (SU)	Salinity (‰)	Specific Conductance (µmhos/cm)	Total Residual Chlorine (mg/L)
WQ-TOX-001-081406	14877-001	<0.1	7.42	24	31700	<0.05
WQ-TOX-002-081406	14877-002	<0.1	8.00	25	37700	<0.05
WQ-TOX-003-081406	14877-003	<0.1	7.89	25	37000	<0.05
WQ-TOX-004-081406	14877-004	<0.1	7.86	25	36500	<0.05
WQ-TOX-001-081606	14886-001	<0.1	7.60	30	36400	<0.05
WQ-TOX-002-081606	14886-002	<0.1	7.91	30	35100	<0.05
WQ-TOX-003-081606	14886-003	<0.1	7.85	30	35400	<0.05
WQ-TOX-001-082806	14925-001	<0.1	7.53	27	42210	<0.05
WQ-TOX-002-082806	14925-002	0.14	7.33	16	26200	<0.05
WQ-TOX-003-082806	14925-003	<0.1	7.35	18	28750	< 0.05
WQ-TOX-001-091906	15007-001	<0.1	7.89	28	42790	0.05
WQ-TOX-002-091906	15007-002	<0.1	7.79	24	37390	<0.05
WQ-TOX-003-091906	15007-003	0.20	7.89	23	36050	<0.05
WQ-TOX-004-091906	15007-004	0.17	7.80	23	36190	<0.05

Table 8. Reference Toxicant Summary. New Bedford Harbor Surface Water Monitoring Program. Fall 2006.

Date	Endp	point	Value	Historic Mean/ Central Tendency	Acceptable Range	Reference Toxicant
A. bahia						
08/30/06	Survival	LC-50	20.8	20.4	15.2 - 25.7	SDS (mg/L)
08/24/06	Survival	C-NOEC	15.0	10.0	5.0 - 15.0	SDS (mg/L)
08/24/06	Growth	C-NOEC	15.0	10.0	5.0 - 15.0	SDS (mg/L)
09/28/06	Survival	LC-50	21.1	20.4	15.2 - 25.5	SDS (mg/L)
09/28/06	Survival	C-NOEC	15.0	15.0	10.0 - 25.0	SDS (mg/L)
09/28/06	Growth	C-NOEC	15.0	10.0	5.0 - 15.0	SDS (mg/L)
A. Punctula	ata					
08/10/06	Fertilization	C-NOEC	5.0	40.0	20.0 - 80.0	Copper (µg/L)
08/10/06	Fertilization	IC-25	52.2	71.4	0.0 - 153.9	Copper (µg/L)
09/28/06	Fertilization	C-NOEC	5.0	40.0	20.0 - 80.0	Copper (µg/L)
09/28/06	Fertilization	IC-25	10.1	67.0	0.0 - 152.9	Copper (µg/L)

Mean and Acceptable Ranges based on most recent 20 reference toxicant assays (NELAP standard)

APPENDIX A SUPPORT DATA

Contents	# Pages
Methods Summary	1
Study 14877: Sample Date 08/14/06	
A. bahia Bench Sheets & Statistical Analysis Report	14
A. punctulata Bench Sheets and Statistical Analysis Report	6
C. parvula Bench Sheets and Statistical Analysis Report	9
Water Quality Bench Sheets and Dilution Prep Sheets	4
Study 14886: Sample Date 08/16/06	
A. bahia Bench Sheets & Statistical Analysis Report	16
A. punctulata Bench Sheets and Statistical Analysis Report	8
C. parvula Bench Sheets and Statistical Analysis Report	7
Water Quality Bench Sheets and Dilution Prep Sheets	4
Study 14925: Sample Date 08/28/06	
A. bahia Bench Sheets & Statistical Analysis Report	10
A. punctulata Bench Sheets and Statistical Analysis Report	9
C. parvula Bench Sheets and Statistical Analysis Report	7
Water Quality Bench Sheets and Dilution Prep Sheets	4
Study 15007: Sample Date 09/19/06	
A. bahia Bench Sheets & Statistical Analysis Report	26
A. punctulata Bench Sheets and Statistical Analysis Report	10
C. parvula Bench Sheets and Statistical Analysis Report	9
Water Quality Bench Sheets and Dilution Prep Sheets	
"As Received" Ammonia Data Report	1
Sample Receipt Records	4
Chain of Custody	4
Total Appendix Pages	153

METHODS USED IN NPDES PERMIT BIOMONITORING TESTING

Method
EPA-821-R-02-012
EPA-821-R-02-012
EPA-821-R-02-012
EPA-821-R-02-012
EPA-821-R-02-013 1002.0
EPA-821-R-02-013 1000.0
EPA-821-R-02-014 1004.0
EPA-821-R-02-014 1006.0
EPA-821-R-02-014 1008.0
EPA-821-R-02-014 1009.0
EPA 200.7/SW 6010
Standard Methods 20 th Edition - Method 2340 B
EPA 310.2
Standard Methods 20th Edition - Method 4500CLD
Standard Methods 20th Edition - Method 5310C
Standard Methods 20th Edition - Method 2510B
Standard Methods 20 th Edition - Method 4500NH3G
Standard Methods 20 th Edition - Method 4500H+B
Standard Methods 20 th Edition - Method 2540.B
Standard Methods 20 th Edition - Method 2540D
Standard Methods 20 th Edition - Method 4500-O G

Americamysis bahia 7 DAY CHRONIC ASSAY SURVIVAL & OLD WATER QUALITIES

STUDY: โห ช 7	1	CLIEN Batteil					TION: BEDFC	ORD			CONTR PTON	ROL: ESTUA	\RY	ORGANISM BATCH/LOT#		
			!	NUMBE	R OF	SURVI	VORS				OLD [DISSOL	VED C	XYGE	N (mg/l	_)
SAMPLE	Rep	0	1	2	3	4	5	6	7	1	2	3	4	5	6	7
	Α	5	5	5	5	ち	5	5	5	6.1	5,4	5.9	5,8	6.3	6.2	5,9
	В	5	5	5_	5	5	5_	5	5	6.2	5.8	6.4	6.0.	6.3	6.2	[أم]
	С	5	5	5_	5	5	5	5	5	64	6,0	6.4	6.0	6.3	6.2	ا فا
Lab	D	3	5	5	5	5	5	5	5	6.5	6.0	6,4	60	6.2	6.0	6.0
Control	Е	5	5	5	5	5	5	5	5	الالا	5.8	6.4	le.2	6.4	6.3	lo.1
	ᄪ	5	5	5	5	J	5	5	5	6-1	6.0	6.3	6.1	6.2	6.0	6.2
	G	5	5	5	5	5	5)	5	Ŋ	ا <u>.</u> ا	5.9	6.3	60	6.2	6.1	6.1
	Н	5	5	5	5	5	5	5	5	6-1	5.9	63	6.0	6.2	6.3	6-1
	Α	5	5	5	5	4	4	4	니	5,5	5.4	5.8	5.9	5.7	6.0	6.7
	В	5	5	5	5	5	5	5	5	51	5.1	5,5	5.6	\$5.6	5.7	6.1
	С	5	5	5	5	5	5	5	5	5.1	5.0	5.4	5.3	5.2	5.4	55
004	D	5	5	5	5	5	5	5	5	5.3	5.0		5.4	5.2	5.2	5.4
-001	E	5	5	5	5	5	5	5	5	5.1	5.0		5,4	5.3	5.5	6.3
	F	5	5	5	S	5	5	5	5	5,3	5.2	5,3	5.4	5.3	ما ،5	6.0
İ	G	5	5	5	5	5	5	5	<u>Ч</u>	र्ज ।	5.1	5.3	5.3	5,4	5.3	5.4
	Н	5	5	5	5	5	5	5	5	5.4	53	5.3	5.4	5.1	5.4	55
	Α	5	5	5	5	5	5	5	5	51	4.9	 	5,4	5.3	4.9	6.1
	В	5	5	5	5	5	5	5	5	5,2	4.9	5.6	5.3	4.7	4.7	5.0
	С	5	5	5	5	5	5	5	5	5,4	4.9	5,5		5.1	5.0	4.9
000	D	5	5	Ŋ	5	3	5	5	S	5,5	4.9	5.6	5.3	5.2	5.2	5.1
-002	Е	5	ئ	5	Ŋ	5	5	5	5	513	4.8	5.3	5.4	5.2	5.0	5.2
	F	5	5	3	5	5	5	5	5	5,4	4.9	5.4	5.0	5.0	4.7	5.1
	G	5	ર્જ	5	5	7	5	5	ภ	515	4.9	5,4	5.2	4.9	50	5.1
	Н	5	5	5	5	5	5	5	5	515	5.0	5,4	5.3	4.9	4.9	5.1
INC TEMP:		75	25	25	25	25	25	25	25							ē
DATE:	_	8115	8/16	8/17	8/18	8/19	8/20	8/21	8/22							
TIME:		1630	Olyot	1030	1100	1110		1235								
INITIALS:		m	W	G	Yh	૧૯	SS	SJ	CP							

Americamysis bahia 7 DAY CHRONIC ASSAY SURVIVAL & OLD WATER QUALITIES

La		CLIEN Battel					TION: BEDF	ORD			CONTI PTON	ROL: ESTU <i>A</i>	ARY	ſ	NISM H/LOT	#
				NUMBI	ER OF	SURV	VORS				OLD [DISSOL	VED C	XYGE	N (mg/l	_)
SAMPLE	Rep	0	1	2	3	4	5	6	7	1	2	3	4	5	6	7
- "	Α	5	5	5	5	5	5	5	5	6.4	12-1	6.3	6.1	6,0		5.8
į	В	5	5	5	5	5	5	5	5	6.4	6.1	6.3	5,8	5.8	量	5.8
	С	5	5	5_	5	5	5_	5	5	6.4	6.0	6.0	5.8	5.8	5,7	5.8
-003	D	5	5	5_	5	5	5	5	5	G.4	5.9	6.2	5.9	5.7	5.7	57
1000	E	5	5	5	5	5	5	5	5	6.4	5.9	5,9	59	5.8	5.8	5.8
	F	5	5	5	5	5	5	5	5	6.4	6.0	6,0	5.8	5.8	55	5.9
1	G	5	5	5	5	5	5	5	5	63	6.0	6,0	5.8	5.8	5.6	5.7
	Н	5	5	5	5	5	5	5	5	64	5.9	5.8	5.8	5.6	5.7	57
	Α	5	5	5	5	5	5	5	5	6.4	6.0	(p, Z	6.0	6.0	6.0	0،ما
	В	5	5	<u>ත</u>	5	5	5	5	5	6.4	6.1	le.l	6.0	6.0	5.9	le.1
 	С	5	5	5	5	5	5	5	5	6.4	6.1	6.1	6.0	6.2	6.4	6.1
-004	D	5	5	5	5	5	5	5	5	6.3	6.0	10,0	6.0	6.2	5.1	5.7
-004	Е	5	5	5	5	5	5	5	5	ઉ. મ	6.1	(P.O)	61	6.3	6.2	6.3
	F	5	5	5	5	5	5	5	5	64	6.0	6,0	6.0	6.0	6.1	6.3
	G	5	5	5	5	5	5	5	5	6.4	5.6	5.6	5.9	5.9	6.0	6.0
	Н	5	3	5	5	5	5	5	5	6.4	5.9	6.0	6.0	6.0	5.9	5.7
		ļ											ļ 			
							_									
INC TEMP:		र्द	25	25	Z5	15	25	25	25				e de la composition della comp	27.5		
DATE:		8115		8/11	8/18	8/19	8/20	8/21	8/22.							
TIME:		1630	ONO	1030	1165	1110		1235	1250							
INITIALS:		w	w	eo	yn	96	55	55	cf							

Americamysis bahia 7 DAY CHRONIC ASSAY ORGANISM WEIGHTS

CLIENT: BATT	ELLE - NE	EW BEDFORD		TEST DATES	:			-
STUDY#: \V	877			SPECIES: A.	bahia			
CONC	REP	TARE WEIGHT (g)	SHRIMP + FOIL (g)	NET WEIGHT (mg)	# SHRIMP DAY 0	MEAN WEIGHT (mg) DAY 0	# SHRIMP DAY 7	MEAN WEIGHT (mg) DAY 7
	Α	206.05	207.68					
	В	206.81	208.20					
	С	201.90	209.34					
lab	D	201.82	209.68					
<u>-</u>	E	205.16	206.90					
	F	210.49	212.08					
	G	208.14	209.87					
	Ξ	205.90	207.51					
	Α	208.10	209.90					
	В	212.43	214.61	L = .				II
	С	207.69	210.17					
\	D	205.68	207.87					
-00/	Ε	206.68	209.00					
	F	213.62	215.71					
	G	208.03	209,70		-			
	Н	201.43	209.78					
	Α	210.06	212.18					
	В	209.32	211.60					
	С	207.73	209.75					
-002	D	203.98	20650					
	E	209.99	212.46					
	F	208.97	211.28					
	G	206.84	209,30					
	Н	209.32	211,74					
DATE Blag			8/23/06			•		
TIME (3:			1340			- 1111		
INITIALS &	L		NT					

Americamysis bahia 7 DAY CHRONIC ASSAY ORGANISM WEIGHTS

CLIENT: BATT	ELLE - NE	W BEDFORD		TEST DATES	•		·	-
STUDY#: しい	877			SPECIES: A.	bahia			
CONC	REP	TARE WEIGHT (g)	SHRIMP + FOIL (g)	NET WEIGHT (mg)	# SHRIMP DAY 0	MEAN WEIGHT (mg) DAY 0	# SHRIMP DAY 7	MEAN WEIGHT (mg) DAY 7
	Α	208.29	210.58					
	В	209.38	209.77					
·	C	210,94	213.29					
022	D	208.13	210,99					
-803	E	297,99	210.31					
	F	208.43	210.84					
	G	209.91	212.32					
	Н	212.17	214.69					
	Α	210.01	212,39					
	В	208,53	210,89					
	С	207.79	209.77					
-15	D	209.49	212.00			_		
-004	E	208.64	210.57					
		206:\$3	208.78					
	G	212.07	214.19					
	H	207.8]	209.90					
	A							
	В							
	С							
	<u>D</u>							
	E							:
	F		<u> </u>					
	G	-			-			
DATE O	H	-	o la al		<u> </u>			
DATE 8 a	2106		8 23/06		<u> </u>			
TIME 12			1340					
INITIALS (<u> </u>		MT		<u> </u>	<u> </u>	L	!

CETIS Test Summary

Report Date:

24 Aug-06 3:05 PM

Link:

03-1434-2699

Mysidopsis 7-0	d Survival, Growth and	Fecundity Te	st				EnviroSystems, Inc.
Test No: Start Date: Ending Date: Setup Date:	09-3630-1743 15 Aug-06 04:30 PM 22 Aug-06 12:50 PM 15 Aug-06 04:30 PM	Test Type: Protocol: Dil Water: Brine:		·02-014 (2002) ble)	Duration: Species: Source:	6d 20h Mysidopsis bahia ARO - Aquatic Research Organisms, N
•	07-8329-2830 15 Aug-06 10:00 AM 15 Aug-06 10:00 AM 7h	Material: Code: Source: Station:	14877-000	itoring Sample d Harbor Drec ab Control		Client: Project:	Battelle Labs Ecological Risk Assessment
•	17-9585-5914 14 Aug-06 08:49 AM 14 Aug-06 03:10 PM 32h	Material: Code: Source: Station:	14877-001	nitoring Sample of Harbor Drec		Client: Project:	Battelle Labs Ecological Risk Assessment
•	18-0466-2689 14 Aug-06 01:05 PM 14 Aug-06 03:10 PM 27h	Material: Code: Source: Station:	14877-002	nitoring Samplord Harbor Drec 02		Client: Project:	Battelle Labs Ecological Risk Assessment
•	09-3579-7416 14 Aug-06 01:20 PM 14 Aug-06 03:10 PM 27h	Material: Code: Source: Station:	14877-003	nitoring Samplord d Harbor Drec 03		Client: Project:	Battelle Labs Ecological Risk Assessment
-	18-0725-4579 14 Aug-06 01:45 PM 14 Aug-06 03:10 PM 27h	Material: Code: Source: Station:	14877-004 New Bedfor	Marine Monitoring Sample 14877-004 New Bedford Harbor Dredge Monitorin WQ-TOX-004			Battelle Labs Ecological Risk Assessment
7d Proportion	Survived Summary					····	
Sample Code 14877-000 14877-001 14877-002 14877-003	Reps 8 8 8 8	Mean 1.00000 0.95000 1.00000 1.00000	Minimum 1,00000 0.80000 1,00000 1,00000	Maximum 1.00000 1.00000 1.00000 1.00000	SE 0.00000 0.03273 0.00000 0.00000	0.00000 0.09258 0.00000 0.00000	CV 0.00% 9.75% 0.00% 0.00%
14877-004 Mean Dry Bior	mass-mg Summary	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
Sample Code 14877-000 14877-001 14877-002 14877-003 14877-004	Reps 8 8 8 8 8	Mean 0.32975 0.42700 0.46500 0.47425 0.43550	Minimum 0.27800 0.33400 0.40400 0.45200 0.38600	Maximum 0.37200 0.49600 0.50400 0.50400 0.50200	SE 0.01021 0.01955 0.01264 0.00565 0.01494	O.02887 O.05529 O.03575 O.01598 O.04225	CV 8.76% 12.95% 7.69% 3.37% 9.70%

CETIS Test Summary

Report Date: Link: 24 Aug-06 3:05 PM 03-1434-2699

7d Proportion Survive	ed Detail							
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
14877-000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
14877-001	0.80000	1.00000	1.00000	1.00000	1.00000	1.00000	0.80000	1.00000
14877-002	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
14877-003	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
14877-004	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Mean Dry Biomass-m	g Detail							
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
14877-000	0.32600	0.27800	0.30800	0.37200	0.34800	0.31800	0.34600	0.34200
14877-001	0.36000	0.43600	0.49600	0.43800	0.46400	0.41800	0.33400	0.47000
14877-002	0.42400	0.45600	0.40400	0.50400	0.49400	0.46200	0.49200	0.48400
14877-003	0.46200	0.47800	0.47000	0.45200	0.46400	0.48200	0.48200	0.50400
14877-004	0.47600	0.47200	0.39600	0.50200	0.38600	0.41000	0.42400	0.41800

Comparisons: Report Date:

Page 4 of 7

Analysis:

24 Aug-06 3:07 PM 09-4759-8890

rganisms, N
026
MSDp
, m.
SD
Rep 10
7.

Comparisons: Report Date:

Page 6 of 7 24 Aug-06 3:07 PM

Analysis:

13-7875-4310

Mysidopsis 7-	d Survival, Gro	wth and F	ecundity Te	st							EnviroSystems,	, Inc.
Test No: Start Date: Ending Date: Setup Date:	09-3630-1743 15 Aug-06 04:2 22 Aug-06 12:5 15 Aug-06 04:2	50 PM	Test Type: Protocol: Dil Water: Brine:	Growth-Surv EPA/821/R-t Not Applicat Not Applicat	02-014 (200 ole	12)		Spe	cies: M	l 20h ysidopsis b RO - Aquali	ahia ic Research Organisi	ms, N
Endpoint			ysis Type		Sample			ntrol Link	Date An		Version	
Mean Dry Biom	ass-mg	Com	parison		03-1434	-2699	03-	1434-2699	24 Aug-	06 3:04 PM	CETISv1.026	
Method		Alt F		ransform	Z	NO	DEL	LOEL	Toxic L	<u> Inits C</u>	hV MSDp	
Equal Variance		62	Untran	Islamea		<u>_L_</u>		· · · · · · · · · · · · · · · · · · ·	N/A			
ANOVA Assun	•											
Attribute	Test	- · ·		Statistic	Critical		P Lev		Decision			
Variances	Variance			1.53278	8.88539		0.586		Equal Var			
Distribution	Shapiro-	Wilk W		0.93944	0.84420		0.333	305	Normal D	stribution		
ANOVA Table												
Source	Sum of S		Mean Squa		F Statis	tic	P Lev		Decision			
Between	0.073172		0.073172	1	69.31		0.000	000	Significan	t Effect		
Error	0.014779		0.0010557	14 15								
Total	0.08795	134	0.0742277									
Group Compa	risons											
Sample	vs Sample		Statistic	Critical	P Level	l	MSD	_	Decision	(0.05)		
14877-000	14877-00	2	-8.3255	1.76131	1.0000		0.028	361	Non-Signi	ficant Effec	ા	
Data Summar	y			Origi	nal Data			······································		Transfori	med Data	
Sample Code		Count	Mean	Minimum	Maximur	n S	D	— Meai	1 M	inimum	Maximum SD	
14877-000		8	0.32975	0.27800	0.37200		.02887					
14877-002		8	0.46500	0.40400	0.50400		.03575					
Data Detail												
Sample Code		Rep 1	Rep 2	Rep 3	Rep 4	Rep :	5	Rep 6 _	Rep 7	Rep 8	Rep 9 Rep	10
14877-000		0.32600	0.27800	0.30800	0.37200	0.348		0.31800	0.34600	0.34200		
14877-002		0.42400	0.45600	0.40400	0.50400	0.494		0.46200	0.49200	0.48400		
Graphics												
0.67							0.06	_				
0.67							0.00	1		1		
P 0.5			1				0.04	1		1	o o	
1-55			Ŷ			eg	0.07]		0000	9/6	
E 0.4-			i				0.02	1		0000		
Mean Dry Blomass-mg	ŀ					Centered Untransformed	0.00	1				
0.3	1					탈	0.00	<u> </u>		1		
Mea 1						_	-0.02]	9	1		
0.2-							-0.04	1 /	0	1		
0.1-							-0.06			1		
							-0.00	1		l I		
0.0 1	14877-000		14877-	-002			-0.08	 	-1.0 -0.5	0.0 0.5	1.0 1.5 2.0	
	2,0,, 000	Sample C								enkits		
									,			

Comparisons: Report Date:

Page 2 of 7

24 Aug-06 3:07 PM 03-0337-2875

Analysis:

Mysidopsis 7-d Survival, Growth and Fecundity Test EnviroSystems, Inc. 6d 20h Test No: 09-3630-1743 Test Type: Growth-Survival (7d) Duration: Start Date: 15 Aug-06 04:30 PM Protocol: EPA/821/R-02-014 (2002) Species: Mysidopsis bahia ARO - Aquatic Research Organisms, N Ending Date: 22 Aug-06 12:50 PM Dil Water: Not Applicable Source: Setup Date: 15 Aug-06 04:30 PM Brine: Not Applicable Control Link Date Analyzed **Endpoint** Analysis Type Sample Link Version 03-1434-2699 24 Aug-06 3:04 PM Mean Dry Biomass-mg Comparison 03-1434-2699 **CETISv1.026 Data Transform** NOEL LOEL **Toxic Units** ChV Method Alt H MSDp C > TUntransformed N/A Equal Variance t **ANOVA Assumptions** Attribute Statistic Critical P Level Decision(0.01) Variance Ratio 3.26437 Equal Variances Variances 8.88539 0.14130 Normal Distribution Distribution Shapiro-Wilk W 0.97892 0.84420 0.93154 ANOVA Table Source Sum of Squares Mean Square DF F Statistic P Level Decision(0.05) 1 153.40 Significant Effect Between 0.0835227 0.0835227 0.00000 Error 0.0076228 0.0005445 14 15 Total 0.09114549 0.0840672 **Group Comparisons** Sample Decision(0.05) Sample Statistic Critical P Level MSD 14877-003 -12.385 1.76131 1.0000 Non-Significant Effect 14877-000 0.02055 **Data Summary Original Data Transformed Data** Sample Code Count Mean <u>Minimum</u> Maximum SD Mean Minimum Maximum SD 14877-000 8 0.32975 0.27800 0.37200 0.02887 14877-003 8 0.47425 0.45200 0.50400 0.01598 Data Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Rep 6 Rep 7 Rep 8 Rep 9 Rep 10 14877-000 0.32600 0.27800 0.30800 0.37200 0.34800 0.31800 0.34600 0.34200 14877-003 0.46200 0.47800 0.47000 0.45200 0.46400 0.48200 0.48200 0.50400 Graphics 0.05 0.6~ 0.04 Mean Dry Biomass-mg 0.5-0.03 0.02 0.4 0.01 0.00 0.3~ -0.01 -0.02-0.2--0.03 -0.04 0.1--0.05 0 0.0 -0.05 14877-003 -1.0 -0.5 0.0 1.0 1.5 ວ່າ 14877-000 0.5 Sample Code Rankits

Comparisons:

Page 7 of 7

Report Date:

24 Aug-06 3:07 PM

Analysis:

19-1792-7168

	Protocol: Dil Water: Brine: lysis Type nparison H Data 1	Not Applica Not Applica Not Applica Fransform Insformed Statistic 2.14107 0.96386 Instead	Critical 8.88538 0.84420 F Statis 34.17 P Level 1.0000	Link C -2699 03 NOEL P L 9 0.33 0 0.69 stic P L 0.00	Spe Sou ontrol Link 3-1434-2699 LOEL evel 3657 9861	cies: Mys rce: ARG Date Ana 24 Aug-00 Toxic Un N/A Decision(0 Equal Variat Normal Dis Decision(0 Significant Decision(0 Non-Signifi	nits Chinits C	Version CETISv1	Organisms, N
Alt	Mean Squa 0.0447338 0.0013092 0.046043 Statistic -5.8454	Statistic 2.14107 0.96386 are DF 1 14 15 Critical 1.76131 Orig	03-1434 Z Critical 8.88539 0.84420 F Statis 34.17 P Level 1.0000	P L 9 0.33 0 0.69 0.00 0.00 0.00 0.00 0.00 0.00 0.	evel 3657 9861 evel	24 Aug-01 Toxic Un N/A Decision(0 Equal Variation Normal Distriction (0) Significant Decision(0) Non-Signifi	6 3:04 PM nits Ch 0.01) ances stribution 0.05) Effect	CETISv1	
Alt C > ons Test Variance Ratio Shapiro-Wilk W Sum of Squares 0.0447338 0.0183288 0.06306261 as Sample 14877-004 Count	Mean Squa 0.0447338 0.0013092 0.046043 Statistic -5.8454	Statistic 2.14107 0.96386 are DF 1 14 15 Critical 1.76131 Orig	Z Critical 8.88539 0.84420 F Statis 34.17 P Level 1.0000	NOEL 1 PL 9 0.33 0 0.66 stic PL 0.00	evel 3657 9861 evel	Toxic Un N/A Decision(0 Equal Varia Normal Dis Decision(0 Significant Decision(0 Non-Signifi	nits Ch	V	
C > Test Variance Ratio Shapiro-Wilk W Sum of Squares 0.0447338 0.0183288 0.06306261 as Sample 14877-004 Count	Mean Squa 0.0447338 0.0013092 0.046043 Statistic -5.8454	Statistic 2.14107 0.96386 are DF 1 14 15 Critical 1.76131 Orig	Critical 8.88539 0.84420 F Statis 34.17 P Level 1.0000	P & 0.33 0 0.69 stic P L 0.00	evel 3657 9861 evel 0004	N/A Decision(0 Equal Variation Normal Distriction (0 Significant Decision(0 Non-Signifi	0.01) ances stribution 0.05) Effect 0.05) cant Effect		MSDp
Test Variance Ratio Shapiro-Wilk W Sum of Squares 0.0447338 0.0183288 0.06306261 as Sample 14877-004 Count	Mean Squa 0.0447338 0.0013092 0.046043 Statistic -5.8454	Statistic 2.14107 0.96386 are DF 1 14 15 Critical 1.76131 Orig	8.88539 0.84420 F Statis 34.17 P Level 1.0000	9 0.33 0 0.69 stic PL 0.00	3657 9861 evel 0004	Decision(0 Equal Varia Normal Dis Decision(0 Significant Decision(0 Non-Signifi	ences etribution 1.05) Effect 1.05) cant Effect	ed Data	
Test Variance Ratio Shapiro-Wilk W Sum of Squares 0.0447338 0.0183288 0.06306261 as Sample 14877-004 Count	0.0447338 0.0013092 0.046043 Statistic -5.8454	2.14107 0.96386 are DF 1 14 15 Critical 1.76131 Orig	8.88539 0.84420 F Statis 34.17 P Level 1.0000	9 0.33 0 0.69 stic PL 0.00	3657 9861 evel 0004	Equal Variation Normal Discussion (0) Significant Decision (0) Non-Signifi	ences etribution 1.05) Effect 1.05) cant Effect	ed Data	
Variance Ratio Shapiro-Wilk W Sum of Squares 0.0447338 0.0183288 0.06306261 as Sample 14877-004 Count	0.0447338 0.0013092 0.046043 Statistic -5.8454	2.14107 0.96386 are DF 1 14 15 Critical 1.76131 Orig	8.88539 0.84420 F Statis 34.17 P Level 1.0000	9 0.33 0 0.69 stic PL 0.00	3657 9861 evel 0004	Equal Variation Normal Discussion (0) Significant Decision (0) Non-Signifi	ences etribution 1.05) Effect 1.05) cant Effect	ed Data	
Shapiro-Wilk W Sum of Squares 0.0447338 0.0183288 0.06306261 as Sample 14877-004 Count	0.0447338 0.0013092 0.046043 Statistic -5.8454	0.96386 nre DF 1 14 15 Critical 1.76131 Orig	0.84420 F Statis 34.17 P Level 1.0000	0 0.69 stic P L 0.00	evel 0004	Decision(0 Significant Decision(0 Non-Signifi	0.05) Effect 0.05) cant Effect	ed Data	
Sum of Squares 0.0447338 0.0183288 0.06306261 as Sample 14877-004 Count	0.0447338 0.0013092 0.046043 Statistic -5.8454	re DF 1 14 15 Critical 1.76131	F Statis 34.17 P Leve 1.0000	stic PL 0.00	evet 0004	Decision(0 Significant Decision(0 Non-Signifi	0.05) Effect 0.05) cant Effect	ed Data	
0.0447338 0.0183288 0.06306261 as Sample 14877-004	0.0447338 0.0013092 0.046043 Statistic -5.8454	1 14 15 Critical 1.76131	9 Level 1.0000 linal Data	0.00 I MS	D004	Significant Decision(0 Non-Signifi	Effect 0.05) cant Effect	ed Data	
0.0447338 0.0183288 0.06306261 as Sample 14877-004	0.0447338 0.0013092 0.046043 Statistic -5.8454	1 14 15 Critical 1.76131	9 Level 1.0000 linal Data	0.00 I MS	D004	Significant Decision(0 Non-Signifi	Effect 0.05) cant Effect	ed Data	
0.0447338 0.0183288 0.06306261 as Sample 14877-004	0.0447338 0.0013092 0.046043 Statistic -5.8454	1 14 15 Critical 1.76131	9 Level 1.0000 linal Data	0.00 I MS	D004	Significant Decision(0 Non-Signifi	Effect 0.05) cant Effect	ed Data	
0.06306261 s Sample 14877-004 Count	0.046043 Statistic -5.8454	15 Critical 1.76131 Orig	1.0000 linal Data			Non-Signifi	cant Effect	ed Data	
Sample 14877-004 - Count	<u>Statistic</u> -5.8454	Critical 1.76131 Orig	1.0000 linal Data			Non-Signifi	cant Effect	ed Data	
Sample 14877-004 - Count	-5.8454	1.76131 Orig	1.0000 linal Data			Non-Signifi	cant Effect	ed Data	
14877-004 	-5.8454	1.76131 Orig	1.0000 linal Data			Non-Signifi	cant Effect	ed Data	
Count		Orig	inal Data	0.03	3186			ed Data	
	Mean						Transforms	d Data	
	Mean	Minimum	M				<u>Transforme</u>		
8		171111111111111111111111111111111111111	<u>Maxim</u> un	n SD_	Mear	<u>Mir</u>	imumM	aximum	SD
	0.32975	0.27800	0.37200	0.0288	37				
8	0.43550	0.38600	0.50200	0.042	25				
Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0.32600	0.27800	0.30800	0.37200	0.34800	0.31800	0.34600	0.34200		
0.47600	0.47200	0.39600	0.50200	0.38600	0.41000	0.42400	0.41800		
ł	ļ			7.0- 0.0 Centered 0.0 .0 0.0 .0 0.0- 0.0-	26- 202- 201				
	0.32600	0.32600 0.27800	0.32600 0.27800 0.30800	0.32600 0.27800 0.30800 0.37200	0.32600 0.27800 0.30800 0.37200 0.34800 0.47600 0.47200 0.39600 0.50200 0.38600 0.4 by the state of the sta	0.32600 0.27800 0.30800 0.37200 0.34800 0.31800 0.47600 0.47200 0.39600 0.50200 0.38600 0.41000	0.32600 0.27800 0.30800 0.37200 0.34800 0.31800 0.34600 0.47600 0.47200 0.39600 0.50200 0.38600 0.41000 0.42400	0.32600 0.27800 0.30800 0.37200 0.34800 0.31800 0.34600 0.34200 0.47600 0.47200 0.39600 0.50200 0.38600 0.41000 0.42400 0.41800	0.32600 0.27800 0.30800 0.37200 0.34800 0.31800 0.34600 0.34200 0.47600 0.47200 0.39600 0.50200 0.38600 0.41000 0.42400 0.41800

Comparisons: Report Date:

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Analysis:

09-4447-9932

Test No. D8-3630-1743 Test Type: Growth-Survival (7rd) Start Date: 15 Aug-06 04:30 PM Dil Water: No.1 Applicable Source: ARO - Aqualic Research Organisms Steut Date: 15 Aug-06 04:30 PM Dil Water: No.1 Applicable Source: ARO - Aqualic Research Organisms Steut Date: 15 Aug-06 04:30 PM Dil Water: No.1 Applicable Source: ARO - Aqualic Research Organisms Steut Date: 15 Aug-06 04:30 PM Dil Water: No.1 Applicable Source: ARO - Aqualic Research Organisms No.1 Applicable No.1 Ap	Mysidopsis 7-d Su	vival, Growth and F	ecundity Tes	st			<u> </u>			EnviroSy	stems, Inc.
Method	Start Date: 15 / Ending Date: 22 /	Aug-06 04:30 PM Aug-06 12:50 PM	Protocol: Dil Water:	EPA/821/R-0 Not Applicable	2-014 (2002 le	·)	Spe	cies: My	sidopsis bah		rganisms, N
Method					Sample L	ink Co	ontrol Link				
Equal Variance C > T	Mean Dry Biomass-	mg Com	parison		03-1434-2	2699 03	1-1434-2699	24 Aug-0	6 3:05 PM	CETISv1.	026
ANOVA Assumptions Attribute Test Statistic Critical P Level Decision(0.01) Variances Variance Ratio 2.39269 8.88539 0.27245 Equal Variances Distribution Shapiro-Wilk W 0.94003 0.84420 0.33978 Normal Distribution ANOVA Table Source Sum of Squares Mean Square DF F Statistic P Level Decision(0.05) Between 0.0057759 0.0057759 1 2.66 0.12487 Non-Significant Effect From 0.0303445 0.00274755 14 Total 0.03812053 0.0079434 15 Group Comparisons Sample vs Sample Statistic Critical P Level MSD Decision(0.05) A877-001 14877-002 -1.8324 1.76131 0.9376 0.041 Non-Significant Effect Data Summary Original Data Transformed Data Sample Code Count Mean Minimum Maximum SD Mean Minimum Maximum SD 14877-001 8 0.42700 0.33400 0.49600 0.055529 Data Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Rep 6 Rep 7 Rep 8 Rep 9 Rep 10 14877-001 0.36000 0.43500 0.49600 0.43600 0.49400 0.46200 0.33400 0.47000 Graphics Data Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Rep 6 Rep 7 Rep 8 Rep 9 Rep 10 14877-001 0.36000 0.43500 0.49600 0.49400 0.49400 0.49200 0.39400 0.49200 0.39400 0.49200 0.49400 0.49200 0.49200 0.49400 0.49200 0.49200 0.49400 0.49200 0.49200 0.49200 0.49400 0.49200 0.49200 0.49400 0.49200 0				ransform	Z	NOEL	LOEL		nits Ch	<u> </u>	<u>//SDp</u>
Attribute Test	Equal Variance t	C > -	T Untran	sformed]		N/A			
Variances	ANOVA Assumption	ns									
Distribution Shapiro-Wilk W 0.94003 0.84420 0.33978 Normal Distribution	Attribute	Test		Statistic	Critical	PL	evel	Decision().01 <u>)</u>		
Source Sum of Squares Mean Square DF F Statistic P Level Decision(0.05)	Variances	Variance Ratio		2.39269	8.88539	0.27	7245				
Source Sum of Squares Mean Square DF F Statistic P Level Decision(0.05)	Distribution	Shapiro-Wilk W		0.94003	0.84420	0.33	3978	Normal Dis	tribution		
Between	ANOVA Table										
Between		Sum of Squares	Mean Soua	re DF	F Statist	ic PL	evel	Decision/().05)		
Total											
Group Comparisons Sample vs Sample Statistic Critical P Level MSD Decision(0.05)	Error	0.0303446	0.0021675	14							
Sample vs Sample Statistic Critical P Level MSD Decision (0.05)	Total	0.03612053	0.0079434	15	_						
Sample vs Sample Statistic Critical P Level MSD Decision (0.05)	Group Comparisor	ıs									-
14877-001 14877-002			Statistic	Critical	D I aval	MSI	D.	Decision/(1 05)		
Data Summary									•		
Sample Code							=				
14877-001 14877-002 8 0.46500 0.40400 0.50400 0.05529 Data Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Rep 6 Rep 7 Rep 8 Rep 9 Rep 10 14877-001 14877-002 0.36000 0.43600 0.49600 0.43800 0.46400 0.41800 0.33400 0.47000 14877-002 0.42400 0.45600 0.40400 0.50400 0.49400 0.46200 0.49200 0.48400 Graphics 0.6 0.6 0.7 0.06 0.7 0.06 0.7 0.06 0.7 0.06 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7	·	-		·	·						
Data Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Rep 6 Rep 7 Rep 8 Rep 9 Rep 10 14877-001								<u>1 Mi</u> i	<u>nimum M</u>	aximum	SD
Data Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Rep 6 Rep 7 Rep 8 Rep 9 Rep 10 14877-001 0.36000 0.43600 0.43600 0.49800 0.43800 0.49400 0.45600 0.49400 0.50400 0.49400 0.46200 0.49200 0.48400 0.48400 0.48400 0.48400 0.48400 0.49200 0.484000 0.484000 0.484000 0.484000 0.484000 0.484000 0.484000 0.484	1										
Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Rep 6 Rep 7 Rep 8 Rep 9 Rep 10			0, (0000		0.00100	0.000					
14877-001 14877-002 0.42400 0.43600 0.49600 0.43800 0.49600 0.43800 0.46400 0.41800 0.33400 0.49200 0.49200 0.48400 0.48400 0.48400 0.49200 0.48400 0.49200 0.48400 0.49200 0.48400 0.49200 0.4920			_						_		
14877-002		•						-		Rep 9	Rep 10
Graphics 0.6 0.7 0.8 0.06 0.06 0.07 0.00											
0.6 0.06 0.00 0.00 0.00 0.00 0.00 0.00		0.42400	0.43000	0.40400	0.30400	J.4340U	0.40200	0.43200	0.40400		
	0.6 0.5 6 0.4 0.4 0.3 0.2 0.1	14071 001	1487	003		2.0 Centered Contered	06 04 05 05 05 05 05 05 05	000	/ 		7.0
		14877-001	14877-	002			-2.0 -1.5	-1.0 -0.5		1.0 1.5	2.0
Sample Code Rankits		Sample C	ođe					Ra	nkits		

Comparisons: Report Date:

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13-0071-7158

	Analysis:	13-00/1-/158
Mysidopsis 7-d Survival, Growth and Fecundity Test		EnviroSystems, Inc.

Test No: Start Date: 09-3630-1743

15 Aug-06 04:30 PM

Test Type: Growth-Survival (7d)

Duration: 6d 20h

EPA/821/R-02-014 (2002)

Species: Mysidopsis bahia

Ending Date: 22 Aug-06 12:50 PM Dil Water: Not Applicable

Setup Date: 15 Aug-06 04:30 PM Brine:

Not Applicable

Source: ARO - Aquatic Research Organisms, N

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	03-1434-2699	03-1434-2699	24 Aug-06 3:05 PM	CETISv1.026

Method	Alt H	Data Transform	<u>Z</u>	NOEL	LOEL	Toxic Units	ChV_	MSDp
Unequal Variance t	C > T	Untransformed				N/A		

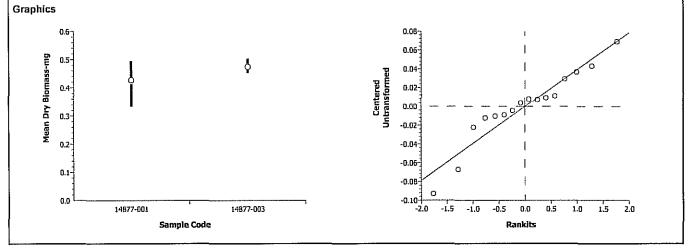
ANOVA Assum	ptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	11.97200	8.88539	0.00406	Unequal Variances	
Distribution	Shapiro-Wilk W	0.93004	0.84420	0.24050	Normal Distribution	

ANOVA Table							
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0089301	0.0089301	1	5.39	0.03582	Significant Effect	
Error	0.0231880	0.0016563	14	_			
Total	0.03211813	0.0105864	15				

Group Companisons											
Sample	Vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)				
14877-001		14877-003	-2.322	1.85955	0.9756	0.03784	Non-Significant Effect				

Data Summary	Original Data				_	Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	\$D	Mean	Minimum	Maximum	SD
14877-001	8	0.42700	0.33400	0.49600	0.05529				
14877-003	8	0.47425	0.45200	0.50400	0.01598				

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
14877-001	0.36000	0.43600	0.49600	0.43800	0.46400	0.41800	0.33400	0.47000		
14877-003	0.46200	0.47800	0.47000	0.45200	0.46400	0.48200	0.48200	0.50400		



Comparisons:

Page 1 of 7 24 Aug-06 3:07 PM 02-6032-0854

Analysis:

Report Date:

Test No: 09-3630-1743 Test Type: Growth-Survival (7d) Duration: 6d 20h										
Start Date: 15 Aug-06 04:30 PM Protocol: EPA/821/R-02-014 (2002) Species: Mysidopsis bahia Ending Date: 22 Aug-06 12:50 PM Dil Water: Not Applicable Source: ARO - Aquatic Resea Setup Date: 15 Aug-06 04:30 PM Brine: Not Applicable	rch Organisms, N									
Endpoint Analysis Type Sample Link Control Link Date Analyzed Vers										
Mean Dry Biomass-mg Comparison 03-1434-2699 03-1434-2699 24 Aug-06 3:05 PM CETI	ISv1.026									
Method Alt H Data Transform Z NOEL LOEL Toxic Units ChV	MSDp									
Equal Variance t C > T Untransformed N/A										
ANOVA Assumptions										
Attribute Test Statistic Critical P Level Decision(0.01)										
Variances Variance Ratio 1.71291 8.88539 0.49452 Equal Variances										
Distribution Shapiro-Wilk W 0.96462 0.84420 0.71201 Normal Distribution										
ANOVA Table										
Source Sum of Squares Mean Square DF F Statistic P Level Decision(0.05)										
Between 0.000289 0.000289 1 0.12 0.73486 Non-Significant Effect										
Error 0.0338941 0.0024210 14										
Total 0.03418311 0.0027100 15										
Group Comparisons										
Sample vs Sample Statistic Critical P Level MSD Decision(0.05)										
14877-001 14877-004 -0.3455 1.76131 0.6326 0.04333 Non-Significant Effect										
Data Summary Original Data Transformed Data	a									
Sample Code Count Mean Minimum Maximum SD Mean Minimum Maximu	ım SD									
14877-001 8 0.42700 0.33400 0.49600 0.05529										
14877-004 8 0.43550 0.38600 0.50200 0.04225										
Data Detail										
Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Rep 6 Rep 7 Rep 8 Rep	9 Rep 10									
14877-001 0.36000 0.43600 0.49600 0.43800 0.46400 0.41800 0.33400 0.47000										
<u>14877-004</u>										
Graphics										
0.67	/ o									
Centered Untransformed Contrans Contra Cont										
Centered 0.04 0.02 0.04 0.02 0.03 0.02 0.03										
0.04										
-0.06										
0.1-										
0.10	. <u></u>									
14877-001 14877-004 -2.0 -1.5 -1.0 -0.5 0.0 0.5 1.0 1	.5 2.0									
Sample Code Rankits										

2ec:8/15/06

Aquatic Research Organisms

DATA SHEET

1.	Organism E	listory
	Species:	AMERICAMYSIS BALIA
	Source:	Lab reared Hatchery reared Field collected
		Hatch date 8-12-06 Receipt date
		Lot number <u>08/206/15</u> Strain
	-	Brood Origination Flore DA
и.	Water Qua	lity
		Temperature 25 °C Salinity ≈30 ppt DO
		pH7.8/ Hardness ppm
ш.	Culture Co	_
		System: RECITEC
		Diet: Flake Food Phytoplankton Trout Chow
		Brine Shrimp Rotifers Other Every Diet
		Prophylactic Treatments:
		Comments:
IV.	Shipping I	nformation
		Client: ESI # of Organisms: 320 f
		Carrier: Date Shipped: 8-15-06
Pio	logist:	Hask Voxenzoval
ייני		

1 - 800 - 927 - 1650

Arbacia punctulata Chronic Fertilization Assay Water Quality and Gamete Preparation Data

STUDY: 14877	CLIENT: BATTELLE	LOCATION: New Bedford		DATE: 8 15 OC						
SALINITY ADJUSTMENT RECORD: 200 ml -001 + 14 g SALT 200 ml -004 + 12 gSalt										
SALINITY ADJUSTMENT RECORD: 200 mL -002 + 12 g SALT										
SALINITY ADJUSTMENT RECORD: <u>200</u> mL -003 + <u>12</u> g SALT										
SALINITY ADJUSTED SAMPLE	D.O. (mg/L)	pH (SU)	SPEC COND (µmhos)	TEMP (°C)	SALINITY (ppt)					
Lab Control	6.8	8.07	39200	20	31					
-001	7.6	7.63	36000	20	31					
-002	8.6	8.03	38600	20	31					
-003	7.7	7,93	39300	20	31					
-004	7.4	7.88	40400	20	30					

METERS USED

DO meter # 19 DO probe # 12 pH meter # 170 pH probe # 48 S/C meter #33616 S/C probe # 3 3016 SALINITY meter # 33016

DATE & INITIALS FOR GAMETE PREPARATION: 8/15/06 ST SPERM DILUTIONS:

HEMACYTOMETER COUNT, E: SPERM CONCENTRATIONS:

SOLUTION E X 40 = SOLUTION E = $\frac{1.11 \times 10^7}{4.44 \times 10^7}$ SPM SOLUTION E X 20 = SOLUTION B = $\frac{2.22 \times 10^7}{2.22 \times 10^7}$ SPM

SOLUTION EX 5 = SOLUTION C = $\frac{5.55 \times 10^{12}}{5.55 \times 10^{12}}$ SPM

FINAL COUNTS:

FINAL SPERM COUNT: FINAL EGG COUNT:

111

TEST TIMES:

SPERM COLLECTED: 1050 EGGS COLLECTED: 1050

SPERM ADDED: EGGS ADDED:

1115

FIXATIVE ADDED:

1235

Arbacia punctulata Chronic Fertilization Assay

SAMPLE USE RECORD

STUDY: 14877	CLIENT: B Bedford	CLIENT: Battelle - New Bedford							
SPECIES: A. punctulata									
	Day: 0								
SAMPLE	Volume Used (mL)	ESI Cube ID							
Lab Control	200mL								
-001	1	14877-001							
-002		14877-002							
-003		14877-003							
-004	9	14877-004							
INITIALS:	SJ								
TIME:	1005								
DATE:	8/15/06								

FERTILIZATION COUNTS

STUDY 14877	CLIENT BATTELLE	LOCATION New Bedford		DATE 8/15/06 INITIALS ST						
	REPLICATE VIAL									
	1	_2_	3	4						
SAMPLE	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL						
Lab Control	100 /105	100/101	103/109	100/104						
-001	101/109	100/111	100/112	104/110						
-002	100 /106	102/107	100/108	101/107						
-003	102/117	100/116	102/118	100/112						
-004	105/112	102/110	100/109	100/117						

CETIS Test Summary

Report Date:

16 Aug-06 10:49 AM

Link:

07-4932-2517

Echinoid Speri	m Cell Fertilization Test						EnviroSystems, Inc.
-	03-1122-1664 15 Aug-06 11:15 AM 15 Aug-06 12:35 PM 15 Aug-06 11:15 AM	Protocol:	Fertilization EPA/600/R-95/136 (1995) Receiving Water Generic commercial salts			Duration: Species: Source:	80m Arbacia punctulata In-House Culture
Receive Date:	07-8329-2830 15 Aug-06 10:00 AM 15 Aug-06 10:00 AM 75m	Material: Code: Source: Station:	Marine Monitoring Sample 14877-000 New Bedford Harbor Dredge Monitorin WQ-TOX-Lab Control 081506			Client: Project:	Battelle Labs Ecological Risk Assessment
Receive Date:	17-9585-5914 14 Aug-06 08:49 AM 14 Aug-06 03:10 PM 26h	Material: Code: Source: Station:	Marine Monitoring Sample 14877-001 New Bedford Harbor Dredge Monitorin WQ-TOX-001 081406			Client: Project:	Battelle Labs Ecological Risk Assessment
*	18-0466-2689 14 Aug-06 01:05 PM 14 Aug-06 03:10 PM 22h	Material: Code: Source: Station:	Marine Monitoring Sample 14877-002 New Bedford Harbor Dredge Monitorin WQ-TOX-002 081406			Client: Project:	Battelle Labs Ecological Risk Assessment
•	09-3579-7416 14 Aug-06 01:20 PM 14 Aug-06 03:10 PM 22h	Material: Code: Source: Station:	Marine Monitoring Sample 14877-003 New Bedford Harbor Dredge Monitorin WQ-TOX-003 081406			Client: Project:	Battelle Labs Ecological Risk Assessment
<u>-</u>	18-0725-4579 14 Aug-06 01:45 PM 14 Aug-06 03:10 PM 22h	Material: Code: Source: Station:	14877-004	nitoring Sample rd Harbor Dred 04 081406		Client: Project:	Battelle Labs Ecological Risk Assessment
Proportion Fe	rtilized Summary						
Sample Code	Reps	Mean	Minimum	Maximum	SE	SD	cv
14877-000 14877-001 14877-002 14877-003 14877-004	4 4 4 4	0.96224 0.91645 0.94163 0.87278 0.90923	0.94495 0.89286 0.92593 0.86207 0.85470	0.99010 0.94545 0.95327 0.89286 0.93750	0.00989 0.01205 0.00570 0.00701 0.01863	0.01977 0.02410 0.01141 0.01401 0.03726	2.05% 2.63% 1.21% 1.61% 4.10%
Proportion Fe		0.30320	J.00470	0.20(00	3.01000	0.00120	-T. 1 U / U
Sample Code 14877-000 14877-001 14877-002	Rep 1 0.95238 0.92661 0.94340 0.87179	0.90090 0.95327	Rep 3 0.94495 0.89286 0.92593 0.86441	Rep 4 0.96154 0.94545 0.94393 0.89286			
14877-003 14877-004	0.93750		0.86441	0.85470			

Comparisons: Report Date:

Page 2 of 3 16 Aug-06 10:49 AM

Analysis:

13-4721-6943

EnviroSystems, Inc.

Echinoid Sperm Cell Fertilization Test

03-1122-1664

Test Type: Fertilization

Protocol: EPA/600/R-95/136 (1995) Duration: 80m

Species: Arbacia punctulata

Ending Date: 15 Aug-06 12:35 PM Setup Date:

Test No:

Start Date:

15 Aug-06 11:15 AM

15 Aug-06 11:15 AM

Dil Water: Receiving Water Source:

In-House Culture

Brine: Generic commercial salts

Endpoint	 Analysis Type	 Sample Link	Control Link	Date Analyzed	Version
Proportion Fertilized	 Comparison	 07-4932-2517	07-4932-2517	16 Aug-06 10:49 AM	CETISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Angular (Corrected)				N/A		-

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	3.48544	47.46723	0.33246	Equal Variances	-
Distribution	Shapiro-Wilk W	0.94791	0.74935	0.65350	Normal Distribution	

ANOVA Table

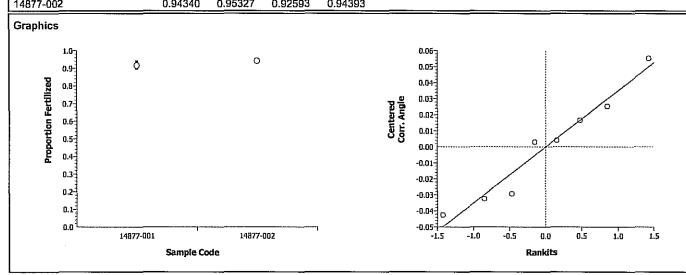
•	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
en	0.0045585	0.0045585	1	3.55	0.10865	Non-Significant Effect	•
	0.0077110	0.0012852	6				
	0.01226950	0.0058437	7	•			
	0.01226950	0.0058437	7				

Group Comparisons

Sample	٧s	Sample_	Statistic	Critical	P Level	MSD	Decision(0.05)	
14877-001		14877-002	-1.8833	1.94318	0.9457	0.04926	Non-Significant Effect	

Data Summary			Origi	nal Data		Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
14877-001	4	0.91645	0.89286	0.94545	0.02410	1.27985	1.23732	1.33507	0.04469	
14877-002	4	0.94163	0.92593	0.95327	0.01141	1.32759	1.29515	1.35291	0.02394	

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
14877-001	0.92661	0.90090	0.89286	0.94545						
14977-002	0.04340	n 05327	0.02503	0.04303						



Comparisons: Report Date:

Page 1 of 3 16 Aug-06 10:49 AM

Analysis:

03-7442-8180

EnviroSystems, Inc.

Echinoid Sperm Cell Fertilization Test

Test No:	03-1122-1664		Test Type:	Fertilization			Duratio	n: 80m		
Start Date:	15 Aug-06 11:		Protocol:	EPA/600/R-	95/136 (1995))	Species	: Arbacia pur	nctulata	
Ending Date:	15 Aug-06 12:		Dil Water:				Source:	In-House C	ulture	
Setup Date:	15 Aug-06 11:	15 AM	Brine:	Generic con	nmercial salts					
Endpoint		Anal	ysis Type		Sample Li	nk Contr	el Link D	ate Analyzed	Version	1
Proportion Fert	tilized	Com	parison		07-4932-2	517 07-49	32-2517 1	6 Aug-06 10:49	AM CETISV	1.026
Method		Alt I	ł Data T	ransform	Z	NOEL	LOEL 7	Toxic Units	ChV	MSDp
Equal Variance	e t	C > 7	Angula	ar (Corrected))		1	V/A		
ANOVA Assur	mptions									-
Attribute	Test			Statistic	Critical	P Level	l De	cision(0.01)		
Variances	Variance	Ratio	.	4.34054	47.46723	0.25909		ual Variances	···	
Distribution	Shapiro-	Wilk W		0.96884	0.74935	0.87101	l No	rmal Distribution	1	
ANOVA Table	······································									
Source		Squares	Mean Squa	re DF	F Statisti	c PLevel	l De	cision(0.05)		
Between	0.01076		0.0107665	1	8.76	0.02528		nificant Effect		
Error	0.00737	23	0.0012287	6						
Total	0.01813	880	0.0119952	7	······································					
Group Compa	risons									
Sample	vs Sample		Statistic	Critical	P Level	MSD	Dec	cision(0.05)		
14877-001	14877-00	3	2.96012	1.94318	0.0126	0.04816		nificant Effect	· · · · · · · · · · · · · · · · · · ·	
Data Summar				Origi	inal Data			Transfo	rmed Data	
Sample Code	-	Count -	Mean	Minimum	Maximum	SD	Mean	Minimum		SD
14877-001		4	0.91645	0.89286	0,94545	0.02410	1.27985	1.23732	Maximum 1.33507	0.04469
14877-001		4	0.87278	0.86207	0.89286	0.01401	1.20648	1.19029	1.23732	0.02145
Data Detail				<u> </u>					····	
Sample Code		Rep 1	Rep 2	Rep 3	Rep 4 F	lep5 R	ep 6 Re	ep 7 Rep 8	Rep 9	Rep 10
14877-001	· · ·	0.92661	0.90090	0.89286	0.94545	icho i	еро по	spr (tep o	Керэ	1/eb 10
14877-003		0.87179	0.86207	0.86441	0.89286					
Graphics										
1.0- - 0.9-	٥					0.06				0
	v		0			0.04-				
B.0 12c										
						9 de 0.02				
, 5 0,6-						Centered Corr. Angle			Ø	
Proportion Pertilized 0.4						3 g 0.01				
E 0.4						-0.01-		/ °		
0.3						-0.02	,	<i>P</i> •		
0.2						-0.03	ø			
0,1						-0.04				
]						10				

1.0

1.5

-0.5

0.0

Rankits

0.0

14877-001

Sample Code

14877-003

Test No: Start Date: Comparisons: Report Date: Page 3 of 3 16 Aug-06 10:49 AM

Analysis:

Aug-ub 10:49 AM 14-3895-4091

EnviroSystems, Inc.

Echinoid Sperm Cell Fertilization Test

Ending Date: 15 Aug-06 12:35 PM

15 Aug-06 11:15 AM

03-1122-1664 Test Type: Fertilization

Protocol: EPA/600/R-95/136 (1995)

5/136 /1006\

Dil Water: Receiving Water

Duration: 80m

Species: Arbacia punctulata Source: In-House Culture

Setup Date: 15 Aug-06 11:15 AM Brine: Generic commercial salts

Endpoint	s Type	Sample Link Control Link			Date Analyzed	l	Version	
Proportion Fertilized	Comparison		07-4932-2517		7-4932-2517	16 Aug-06 10:49 AM		CETISv1.026
Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Angular (Corrected)		\\		N/A		

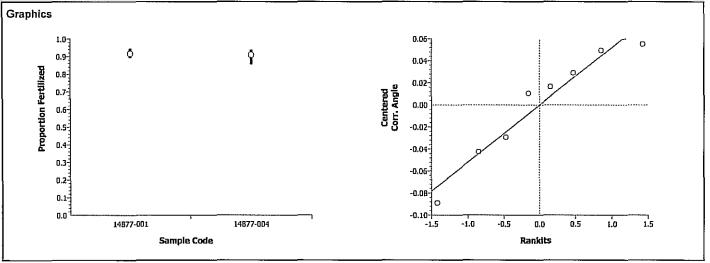
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	1.88842	47.46723	0.61464	Equal Variances
Distribution	Shapiro-Wilk W	0.92997	0.74935	0.48173	Normal Distribution

Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
0.0002473	0.0002473	1	0.09	0.77952	Non-Significant Effect	
0.0173071	0.0028845	6				
0.01755442	0.0031319	7				
	0.0002473 0.0173071	0.0002473	0.0002473	0.0002473 0.0002473 1 0.09 0.0173071 0.0028845 6	0.0002473 0.0002473 1 0.09 0.77952 0.0173071 0.0028845 6	0.0002473 0.0002473 1 0.09 0.77952 Non-Significant Effect 0.0173071 0.0028845 6

Group Comparisons									
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)		
14877-001		14877-004	0.29283	1.94318	0.3898	0.0738	Non-Significant Effect		

Data Summary			Origi	nai Data		Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
14877-001	4	0.91645	0.89286	0.94545	0.02410	1.27985	1.23732	1.33507	0.04469	
14877-004	4	0.90923	0.85470	0.93750	0.03726	1.26873	1.17972	1.31812	0.06141	

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
14877-001	0.92661	0.90090	0.89286	0.94545					,	
14877-004	0.93750	0.92727	0.91743	0.85470						



CETIS Test Summary

Report Date: Link: 25 Aug-06 11:45 AM 08-3041-0233

Champia parvi	ula Red Macroalga Sex	ual Reproduc	tion Test			Saskatchewan Research Council		
Test No: Start Date: Ending Date: Setup Date:	10-1428-4432 17 Aug-06 12:00 PM 22 Aug-06 12:00 PM 17 Aug-06 12:00 PM		EPA/600/4- Laboratory	91/003 (1994) Seawater mmercial salts		Duration: Species: Source:	5d 0h Champia parvula In-House Culture	
•	07-8329-2830 15 Aug-06 10:00 AM 15 Aug-06 10:00 AM 50h	Material: Code: Source: Station:	14877-000	altoring Sampl d Harbor Dred ab Control		Client: Project:	Battelle Labs Ecological Risk Assessment	
	17-9585-5914 14 Aug-06 08:49 AM 14 Aug-06 03:10 PM 75h	Material: Code: Source: Station:	14877-001	nitoring Sampl rd Harbor Dred 01		Client: Project:	Battelle Labs Ecological Risk Assessment	
	18-0466-2689 14 Aug-06 01:05 PM 14 Aug-06 03:10 PM 71h	Material: Code: Source: Station:	14877-002	nitoring Sampl d Harbor Dred 02		Client: Project:	Battelle Labs Ecological Risk Assessment	
Sample No: Sample Date: Receive Date: Sample Age:	09-3579-7416 14 Aug-06 01:20 PM 14 Aug-06 03:10 PM 71h	Material: Code: Source: Station:	Marine Monitoring Sample 14877-003 New Bedford Harbor Dredge Monitorin WQ-TOX-003			Client: Project:	Battelle Labs Ecological Risk Assessment	
1	18-0725-4579 14 Aug-06 01:45 PM 14 Aug-06 03:10 PM 70h	Material: Code: Source: Station:	Marine Monitoring Sample 14877-004 New Bedford Harbor Dredge Monitorin WQ-TOX-004			Client: Project:	Battelle Labs Ecological Risk Assessment	
Mean Cystoca	rps Summary							
Sample Code	Reps	Mean	Minimum	Maximum	SE	SD	CV	
14877-000 14877-001 14877-002 14877-003 14877-004	3 4 4 4 4	21.733 28 28.7 24.7 15.35	17 27.2 24.2 20.2 11	25.8 29 32.6 32,2 20	2.5621 0.3916 1.8735 2.8065 1.9033	4.4377 0.7832 3.747 5.6131 3.8066	20.42% 2.80% 13.06% 22.73% 24.80%	
Mean Cystoca	rps Detail							
Sample Code 14877-000 14877-001 14877-002 14877-003 14877-004	Rep 1 17 29 30.8 32.2 16.4	Rep 2 25.8 28.2 24.2 25.8 20	Rep 3 22.4 27.6 32.6 20.6	27.2 27.2 20.2 14		·		

Comparisons: Report Date:

Page 7 of 7

25 Aug-06 11:45 AM

Analysis:

14-0640-8491

Test No. 10-1428-4432 Test Type: Chample Start Date Trace	Champia parvul	la Red Macroalga Sexu	al Reproduc	tion Test						Saskatch	newan Rese	arch Council
Method	Start Date:	17 Aug-06 12:00 PM 22 Aug-06 12:00 PM	Protocol: Dil Water:	EPA/600/4- Laboratory	Seawater			Spe	cies:	Champia pa		
Equal Variance C > T												
National					Z	NC	DEL L	OEL_			ChV	MSDp
Variances												
Distribution												
Source Sum of Squares Mean Square DF F Statistic P Level Decision(0.05)						5						
Source Sum of Squares Mean Squares DF F Statistic P Level Decision(0.05)	Distribution	Shapiro-Wilk W		0.92642	0.72991		0.48440		Norma	l Distribution		
Between	ANOVA Table											
Total	Source	Sum of Squares	Mean Squa	are DF	F Statist	ic	P Level		Decisi	on(0.05)		
Total	Between	67.32191	67.32191	1	8.16		0.03551		Signific	cant Effect		
Sample vs Sample vs	Error	41.22667	8.245334	5								
Sample vs Sample Vs Sample Statistic Critical P Level MSD Decision(0.05)	Total	108.548573	75.567241	6								
Sample vs Sample Statistic Critical P Leve MSD Decision (0.05) 14877-001 14877-001 14877-001 14877-001 14877-001 14877-001 14877-001 14877-001 14877-001 14877-001 14877-001 15 14877-001 15 14877-001 16 15 14877-001 16 16 16 16 16 16 16	Group Compari	sons										
14877-000			Statistic	Critical	D I aval		MSD		Decisi	na(0.05)		
Data Summary Sample Code Count Mean Minimum Maximum SD Mean Minimum Maximum SD Mean Minimum Maximum M											ct	
Sample Code Count Mean Minimum Maximum SD Mean Minimum Maximum SD							1.110E1		110,10,	grillourit Eric		
14877-000 3 21.733 17 25.8 4.4377 14877-001 4 28.000 27.2 29 0.7832 Data Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Rep 6 Rep 7 Rep 8 Rep 9 Rep 10 14877-000 17 25.8 22.4 14877-001 29 28.2 27.6 27.2 Graphics 40 10 10 14877-000 14877-000 1 10 10 10 10 10 10 10 10 10	Data Summary			Orig	inal Data					Transfor	med Data	
Data Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Rep 6 Rep 7 Rep 8 Rep 9 Rep 10 14877-000 17 25.8 22.4 14877-001 29 28.2 27.6 27.2 Graphics Application of the control of the con			The state of the s					Mear	<u>!</u>	Minimum	Maximum	SD
Data Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Rep 6 Rep 7 Rep 8 Rep 9 Rep 10 14877-000 17 25.8 22.4 14877-001 29 28.2 27.6 27.2 Graphics The sample of t												
Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Rep 6 Rep 7 Rep 8 Rep 9 Rep 10 14877-000 17 25.8 22.4 14877-001 29 28.2 27.6 27.2 Graphics 40 10 10 14877-000 14877-001 10 10 14877-000 14877-001 10 14877-001 17 14877-001 17 14877-001 17 14877-001 17 14877-001 17 14877-001 17 14877-001 17 14877-001 17 15 16 17 18 18 18 18 18 18 18 18 18	14877-001	4	28.000	27.2	29	U.	7832					
17 25.8 22.4 14877-000 29 28.2 27.6 27.2 Graphics 17 25.8 22.4 1877-000 17 25.8 22.4 18877-000 17 25.8 22.4 1987-000 19 28.2 27.6 27.2	Data Detail											
Graphics	Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep :	5 Rep	6	Rep 7	Rep 8	Rep 9	Rep 10
Graphics The state of the stat	14877-000	17	25.8	22.4								_
Wear Cystocarps Contrarsformed 14877-000 14877-001 Table 14877-001 Again Cystocarbs 14877-001 Again Cystocarbs 14877-001 14877-001 Again Cystocarbs 14	14877-001	29	28.2	27.6	27.2							
Wear Cost Cost Cost Cost Cost Cost Cost Cost							57			ı		0
14877-000 £4877-001 -1.5 -1.0 -0.5 0.0 0.5 1.0 1.5	10-	ł	0			Centered Untransformed	3-1 2-1 1-1 0	- - 0	- 0	 - - 		9/
Sample Code Rankits	0	14877-000	t4877-	001				-1.0	-0.5	0.0 0.5	1.0	1.5
		Sample (Code							Rankits		
	L							·····				

Comparisons:

Page 2 of 7

Report Date:

25 Aug-06 11:45 AM 04-0778-1118

Analysis:

Saskatchewan Research Council

Champia parvula	Red Macroalga	Sexual R	eproduction Test	

10-1428-4432

Test Type: Champia

Duration: 5d 0h

17 Aug-06 12:00 PM

Start Date: Ending Date: 22 Aug-06 12:00 PM Protocol: EPA/600/4-91/003 (1994) Dil Water: Laboratory Seawater

Species: Champia parvula

Setup Date:

Test No:

17 Aug-06 12:00 PM

Brine: Generic commercial salts Source: In-House Culture

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version	
Mean Cyslocarps	Comparison	08-3041-0233	08-3041-0233	25 Aug-06 11:45 AM	CETISv1.026	
	······································	1				Ξ

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	1.40266	49.79928	0.74297	Equal Variances	
Distribution	Shapiro-Wilk W	0.89384	0.72991	0.27950	Normal Distribution	

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	83.2019	83.2019	1	5.10	0.07343	Non-Significant Effect	
Error	81.50667	16.30133	5				
Total	164.708572	99.503237	6				

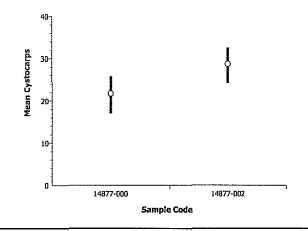
Group Comparisons

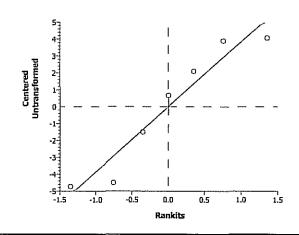
Sample	V5	Sample	<u>Statistic</u>	Critical	P Level	MSD	Decision(0.05)	
14877-000		14877-002	-2.2592	2.01505	0.9633	6.21377	Non-Significant Effect	

Data Summary			Original Data				Transfo	rmed Data		
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
14877-000	3	21.733	17	25.8	4.4377					
14877-002	4	28.7	24.2	32.6	3.747					

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
14877-000	17	25.8	22.4							
14877-002	30.8	24.2	32.6	27.2						

Graphics





Comparisons: Page 1 of 7
Report Date: 25 Aug-06 11:45 AM
Analysis: 01-7321-3339
Saskatchewan Research Council

CL	ula Dad Maa	nlma Cavii	el Don	tion To-t					Caalea		D	
Champia parvi	ula ved Macto	aiga Sexu	aı Keproduci	non lest					за ѕка	cnew	an Kesea	rch Council
Test No: Start Date: Ending Date: Setup Date:	10-1428-4432 17 Aug-06 12: 22 Aug-06 12: 17 Aug-06 12:	00 PM 00 PM	Test Type: Protocol: Dil Water: Brine:	EPA/600/4-1	91/003 (1994) Seawaler nmercial salts		Spe	ation: cies: rce:	5d 0h Champia In-House	•		
Endpoint		Ana	lysis Type		Sample L		ntrol Link		Analyzed		Version	
Mean Cystocar	ps	Con	рагіѕол		08-3041-0	233 08-	3041-0233	25 A	ug-06 11:4	5 AM	CETISv1	.026
Method		Alt		ransform	<u>Z</u>	NOEL	LOEL		ic Units	ChV	<u>'</u>	MSDp
Equal Variance	: I 	C >	ı untran	sformed				N/A				
ANOVA Assun	nptions											
Attribute	Test			Statistic	Critical	P Le	vel	Decisi	on(0.01)			
Variances	Variance	Ratio		1.59986	199.1664	0 0.813	392	Equal	Variances			
Distribution	Shapiro-	Wilk W		0.89544	0.72991	0.287	743	Norma	l Distributio	п		
ANOVA Table												
Source	Sum of	Squares	Mean Squa	re DF	F Statisti	ic PLe	vel	Decisi	on(0.05)			
Belween	15.0876		15.08762	1	0.56	0.486			ignificant E	ffect		
Error	133.906	7	26.78133	5					-			
Total	148.994	281	41.868953	6	_						_	
Group Compa	risons		<u> </u>				<u></u>					
Sample	vs Sample		Statistic	Critical	P Level	MSD		Decisi	on(0.05)			
14877-000	14877-00)3	-0.7506	2.01505	0.7566	7.964	453	Non-S	ignificant E	ffect		
Data Summary	y			Origi	inal Data				Trans	forme	d Data	
Sample Code		Count	Mean	Minimum	Maximum	SD	Mea	n	Minimum	Ma	aximum	SD
14877-000		3	21.733	17	25.8	4.4377						
14877-003		4	24.700	20.2	32.2	5.6131						
Data Detail												
Sample Code		Rep 1	Rep 2	Rep 3	Rep4 F	Rep 5	Rep 6	Rep 7	Rep	88	Rep 9	Rep 10
14877-000		17	25.8	22.4								
14877-003		32.2	25.8	20.6	20.2							
Graphics Wean Cystocarbs 10	14077-000) 	003		-6-1			 			- 1.5
	14877-000	Sample (14877- Code	uus		-t.5	-1.0	-0,5	0.0 Rankits	0.5	1.0	1.5

Comparisons:

Page 6 of 7

Report Date:

25 Aug-06 11:45 AM

Analysis:

12-8260-0149

	JOIO D'OLOII						Anaiy	/sis:		12-8260-0149
Champia parvula F	Red Macroalga Sexu	al Reproduc	tion Test					Saskatcl	newan Resea	ırch Council
Start Date: 17 a Ending Date: 22 a	1428-4432 Aug-06 12:00 PM Aug-06 12:00 PM Aug-06 12:00 PM	Test Type: Protocol: Dil Water: Brine:	EPA/600/4-9 Laboratory S	91/003 (1994) Seawaler nmercial salts		-	cies: C	i Oh hampia pa -House Cu		
Endpoint	Ana	lysis Type		Sample Li	ink Cor	ntrol Link	Date Ar	nalyzed	Version	
Mean Cystocarps	Com	parison		08-3041-0	233 08-	3041-0233	25 Aug	06 11:45 /	AM CETISV	1.026
Method	Alt 1		ransform	<u> z</u>	NOEL	LOEL	Toxic	Jnits (ChV	MSDp
Equal Variance t	C > `	T Untrar	sformed				N/A			
ANOVA Assumption	ons									
Attribute	Test		Statistic	Critical	P Lev	vel	Decision	(0.01)		
Variances	Variance Ratio		1.35910	49.79928	0.760	002	Equal Va	riances		
Distribution	Shapiro-Wilk W	· · · · · · · · · · · · · · · · · · ·	0.92107	0.72991	0.444	111	Normal D	istribution		
ANOVA Table									,	
 Source	Sum of Squares	Mean Squa	are DF	F Statisti	c PLe	vel	Decision	(0.05)		
Between	69.85191	69.85191	1	4.22	0.095	527	Non-Sign	ificant Effe	ect	
Error	82.85667	16.57133	5							
Total	152.708572	86.423239	6							
Group Compariso	ns									
Sample vs	Sample	Statistic	Critical	P Level	MSD		Decision	(0.05)		
14877-000	14877-004	2.05310	2.01505	0.0476	6.265	502	Significar	t Effect		
Data Summary			Origi	nal Data				Transfor	med Data	
Sample Code	Count	Mean	Minimum	Maximum	SD	Mear) <u>M</u>	<u>inimum</u>	Maximum	SD
14877-000	3	21.733	17	25.8	4.4377					
14877-004	4	15.35	11	20	3.8066					
Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4 F	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
14877-000	17	25.8	22.4							i
14877-004	16.4	20	11	14				w		
Graphics 30-7 25-7 We am with the second se					Centered Untransformed			 		

Comparisons:

Page 5 of 7

Report Date:

25 Aug-06 11:45 AM

Analysis:

12-3658-9214

	<u> </u>									
Champia parv	rula Red Macroalga Sexu	al Reproduc	tion Test					Saskato	hewan Rese	arch Council
Test No: Start Date: Ending Date: Setup Date:	10-1428-4432 17 Aug-06 12:00 PM 22 Aug-06 12:00 PM 17 Aug-06 12:00 PM	Laboratory 5	Champia EPA/600/4-91/003 (1994) Laboratory Seawater Generic commercial salts			Duration: 5d 0h Species: Champia parvula Source: In-House Culture				
Endpoint		lysis Type		Sample Li	_	ontrol L		Analyzed	Version	
Mean Cysloca	rps Con	nparison		08-3041-0	233 00	B-3041-0	233 25 8	.ug-06 11:45	AM CETISV	7.020
Method	Alt_			Z	NOEL	NOEL LOEL		Toxic Units ChV		MSDp
Equal Variance	et C>	T Untrar	sformed				N/A			
ANOVA Assu	mptions									
<u>Attribute</u>	Test		Statistic	Critical	PL	.evel	Decis	ion(0.01)		
Varianc <u>es</u>	Variance Ratio	22.89130			47.46723 0.02871		Equal Variances			
Distribution	Shapiro-Wilk W		0.98195	0.74935	0.9	7065	Norma	al Distribution) 	
ANOVA Table										
Source	Sum of Squares	Mean Squa	ire <u>D</u> F	F Statisti	c PL	.evel	Decis	ion(0.05)		
Belween	0.98	0.98	1	0.13	0.7	2712	Non-S	ignificant Eff	ect	
Error	43,96	7.326667	6	_						
Total	44.9399991	8,3066669	7							
Group Compa	arisons									
Sample	vs Sample	Statistic	Critical	P Level	MS	D	Decis	ion(0.05)		
14877-001	14877-002	-0.3657	1.94318	0.6364	3.7	1922	Non-S	ignificant Eff	ect	
Data Summar	у	Origi	inal Data			Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD		<u>Mean</u>	Minimum	Maximum	SD
14877-001	4	28.000	27.2	29	0.783					
14877-002	4	28.7	24.2	32.6	3.747					
Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4 F	ep 5	Rep 6	Rep	7 Rep 8	Rep 9	Rep 10
14877-001	29	28.2	27.6	27.2						
14877-002	30.8	24.2	32.6	27.2						
Mean Cystocarps 20-	14877-002 Sample Code				Centered Centered 1- 1- 1- 2- 2- 3- 3- 4- 5	0	.0 -0.5	 	.5 1.0	
	Rankits									

Comparisons:

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Report Date: .

25 Aug-06 11:45 AM

Analysis: 07-9324-3240

Saskatchewan Research Council

10-1428-4432

Test Type: Champia

Duration: 5d 0h

Start Date: 17 Aug-06 12:00 PM **Ending Date:** 22 Aug-06 12:00 PM

Protocol: EPA/600/4-91/003 (1994)
Dil Water: Laboratory Seawater

Species: Champia parvula

Setup Date: 17 Aug-06 12

Test No:

17 Aug-06 12:00 PM Brine:

rine: Generic commercial salts

Source: In-House Culture

Endpoint	. •	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Cystocaros		Comparison	08-3041-0233	08-3041-0233	25 Aug-06 11:45 AM	CETISv1.026

(Modifi & Jotoscips	Compani		40 00 11 0		0011 0200	zeriog co i i.i	57 HV. OL	11011.020
Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Unequal Variance t	C>T	Untransformed				N/A		

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	51,36956	47.46723	0.00891	Unequal Variances	
Distribution	Shapiro-Wilk W	0.88892	0.74935	0.21999	Normal Distribution	

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	21.78	21.78	1	1.36	0.28841	Non-Significant Effect	
Error	96.36	16.06	6				
Total	118.140001	37.840000	7	_			

Group Comparisons

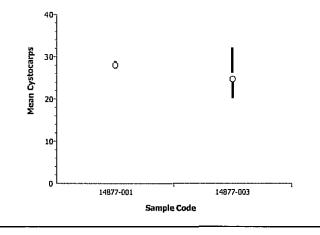
Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
14877-001		14877-003	1.16455	2.35336	0.1642	6.66879	Non-Significant Effect

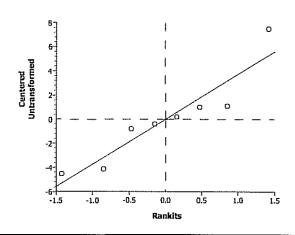
Data Summary	,		Origi	nal Data			Transfo	rmed Data	
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
14877-001	4	28.000	27.2	29	0.7832				
14877-003	4	24.700	20.2	32.2	5.6131				

Data Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
14877-001	29	28.2	27.6	27.2						
14877-003	32.2	2 <u>5.8</u>	20.6	20.2						

Graphics





Comparisons: Report Date:

Page 4 of 7 25 Aug-06 11:45 AM

Analysis:

11-3099-7487

Champia parvu	ıla Red Macro	alga Sexu	al Reproduc	tion Test						Saskato	chewan Re	esearch Council
	10-1428-4432		Test Type:					Dura	ation:	5d Oh	• "	
	17 Aug-06 12:		Protocol:		91/003 (1994)			Spe	cies:	Champia p		
	22 Aug-06 12:		Dil Water:	-				Sou	rce:	In-House C	Culture	
Setup Date:	17 Aug-06 12:	00 PM	Brine:	Generic cor	nmercial salts							
Endpoint			lysis Type	***************************************	Sample L	ink	Contro	ol Lin <u>k</u>		Analyzed	Vers	
Mean Cyslocarp	os	Com	parison		08-3041-0	233	08-304	1-0233	25 Aı	u g-06 11: 45	AM CET	ISv1.026
Method		Ait		<u>Fransform</u>	Z	NO	EL	LOEL		ic Units	ChV	MSDp
Equal Variance	t	C > `	T Untrar	rsformed				···	N/A			
ANOVA Assum	ptions											
Attribute	Test			Statistic	Critical		P Level		Decisi	on(0.01)		
Variances	Variance	Ratio		23.62500	47.46723		0.02744		Equal '	Variances		
Distribution	Shapiro-	Wilk W		0.94790	0.74935	- 1	0.65332		Norma	l Distribution	1	
ANOVA Table												
Source	Sum of	Squares	Mean Squa	are DF	F Statisti	с	P Level		Decisi	on(0.05)		
Between	320.045		320.045	1	42.38	1	0.00063		Signific	cant Effect		,
Error	45.31		7.551667	6	_							
Total	365.355	015	327.59668	7								
Group Compar	risons				<u> </u>							
l_ '. '	vs Sample		Statistic	Critical	P Level		MSD		Decisi	on(0.05)		
14877-001	14877-00	14	6.51005	1.94318	0.0003		3.77589			ant Effect		
								···	-,5,,,,,			
Data Summary	•	•		Orig	inal Data						ormed Dat	
Sample Code		Count	Mean	Minimum	Maximum	SD		Mean	1	Minimum	Maximu	ım SD
14877-001		4	28.000	27.2	29		7832					
14877-004		4	15.35	11	20	3.8	3066					
Data Detail												
Sample Code		Rep 1	Rep 2	Rep 3	Rep 4 F	lep 5	Re	p 6	Rep 7	Rep 8	Rep	9 Rep 10
14877-001		29	28.2	27.6	27.2							
14877-004		16.4	20	11	14							
Graphics												
40-1							5-1					
]							4-			1		o
							3-			- [
Mean Cystocarps	٥					를				1		
#]	Ü					Centered Untransformed	1			ہ ا	5 0	
\$ 1						哥哥				100	, ,	
ig 20-1						Ĕ	of -		0/			#AP-00
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10			ł				·2-			ı		
"							-3			1		
							40			l		
"	14877-001	Т	14877-	004			- 5 -1.5	-1.0	-0.5	0.0 0	0.5 1.0	1.5
\		Sample (**	-	•	Rankits	-7-	-

SALTWATER ASSAYS

A. bahia, A. punctulata, C. parvula

STUDY: いろフフ	LOCATION: New	Bedford Harbor			
CHEMISTRY	Lab Salt Control	-001	-002	-003	-004
AMMONIA	14876 -035	-005	-006	-007	-008
AS RECEIVED WATER QUALITIES	Lab Salt Control	-001	-002	-003	-004
SALINITY (ppt)	26	24	25	25	25
pH (SU)	8.00	7.42	8.00	7.89	7.86
TRC (mg/L)	20.05	20.05	20.05	40.05	20.05
DO (mg/L)	7.0	7.0	7.0	7,3	7.1
S/C (µmhos/cm)	22700	31700	37700	37000	36500
WQ STATION USED	ک	ĺ	l l	1	l
INITIALS	m	lu	in	⁴ N	n
A L-L:- CALINITY					
A. bahia SALINITY ADJUSTMENT RECORD	Lab Salt Control	-001	-002	-003	-004
SAMPLE (mLs)					
SEA SALT (g)					
DATE:					
TIME:					
INITIALS:					

Sample ID	ESI Cube ID
-001	-001
-002	-002
-003	-003
-004	-004

Americamysis bahia 7 DAY CHRONIC ASSAY NEW WATER QUALITIES

STUDY:	14877 BATTELLE					LOCATION: NEW BEDFORD				LAB CONTROL: HAMPTON ESTUARY					
			NEW D	ISSOL\	/ED O	YGEN	(mg/L)	• '	NEW SALINITY (ppt)						
CONC	REP	0	1	2	3	4	5	6	0	1	2	3	4	5	6
LAB	Α	7.0	6.q	6.8	7,0	6.9	6.9	6.5	9٤	26	26	25	25	25	
-001	Α	7,0	ч.7	6.4	6.0	5.6	6.2	6.0	4	26	26	2 %	26	26	
-002	Α	7,0	5.3	ر _ب ي	6.0	5.6	5.5	6.1	25	3 ¢	26	26	26	26	
-003	Α	7,3	(y.O	7.0	6.9	7.0	7.2	6.7	ጋፕ	ĴĠ	26	۵۵	26	26	
-004	Α	7.1	<i>ن</i> .ى	7.1	ንብ	7.2	7.4	68	るら	J C	26	26	26	26	
			NEV	V pH (S	U)					N	EW TEN	/IPERA	ΓURE (°	,C)	
CONC	REP	0	1	2	3	4	5	6	0	1	2	3	4	5	6
LAB	Α	&,OO	789	7.85	7.94	7,14	7.43	7.93	74	75	24	24	24	25	25
-001	А	7,45	7.15	7.03	7,25	691	7.06	7.23	24	38	24	24	24	25	25
-002	Α	7,97	7.32	7.23	기, 시	7.11	7.28	7,40	24	25	24	24	24	25	25
-003	А	7,87	7,51	7.39	7.61	7,40	7.60	7.59	24	25	24	254	24	25	25
-004	Α	ره، د	٦٬٧٩	7.41	7,60	7.47	7.69	7.64	٦ ⁴	35	24	24	24	25	25
INC TEM	INC TEMP: 25 25 25			25	25	25									
DATE:	DATE: 8/15 8/14 8/17 8/18		8/18	8./19		8/21									
			1115	1130	1.00	1345									
INIT:		m	m	୧୯	m	୧୦	55	SI	L						

-				METERS U			,	
	0	1	2	3	4	5	6	7
Water Quality Station #	1/12///	1	1	J		2	2	
Initials	199///	کیم	EG	m	80	SJ	SJ	
Date	8115166	8/16	8/17	8118	8/19	8/20	8/21	

Americamysis bahia 7 DAY CHRONIC ASSAY OLD WATER QUALITIES

STUDY:		CLIEN	ENT: LOCATION: TELLE NEW BEDFORD						LAB CONTROL:						
148	17	BATT	ELLE		NEW	BEDFO	ORD		HAM	PTON	ESTU	ARY			ı
		OL	D SAL	INITY (ppt)						OI	D pH (SU)		
Conc	Rep	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Control	A	ე6	ملھ	26	26	26	26	26	7,88	7.66	7.83	7.67	781	7.79	7.72
-001	Α	٦6	24	24	26	26	26	26	7.64	7.57	7.67	7.61	7.62	7.69	7.86
-002	Α	26	26	26	24	26	26	26	7.44	7.52	7.67	7.63	7.58	7.62	7.54
-003	A	76	26	ZLQ	26	26	26	26	7.90	773	7.87	7.72	7.18	7.84	1.73
-004	Α	26	26	26	240	26	<u> با 2</u>	26	7.90	7,74	7.82	7.73	7.82	7.90	7.76
		OLD 1	OLD TEMPERATURE (°C)							4 4	1.				
Conc	Rep	1	2	3 _	4	5	6	7							
Control	Α	24	24	24	24	24	25	24							
-001	A	24	24	24	24	24	25	24			. 1				
-002	Α	24	24	24	24	24	25	24							
-003	Α	124	24	25	24	25	25	24							
-004	Α	ત્રમ	24	25	24	25	25	24							
										1,1					
INC TEMP): 	25	25	25	25	25	25	25							
DATE:		8,16	8/17	8/18	8/19	8/20	8/21	8 22		***					
TIME:		10NO	1020	1030	1055	1305		1220			And the second				
INITIALS:		m	€G-	ym	ec	SI	55	CP							1. 11.44

GENERAL NOTES - for additional information refer to SOP #1411 or EPA manual 600/4-91/003

- •Test vessels will be 250 mL glass beakers containing a minimum of 150 mL of solution
- •8 replicates per site with 5 organisms each

•Test Temperature: 26±1°C

•Salinity: 25 ±2ppt

•Dissolved Oxygen: >4.3 mg/L

- •Photoperiod will be 16 hours light and 8 hours dark.
- •Passing criteria require ≥80% survival and average dry weight of ≥0.20 mg/organism in the control vessels.

			ER QUALITY OLD WATER	METERS USI QUALITIES	ΞD	***************************************		-
	0	1	2	3	4	5	6	7
Water Quality Station #	//////	አ		Z	1 _	2	4	- X
Initials		m	E Gr	yr	EG	SJ	55	CP
Date	8,5,0G	816	8/17	8/18/04	8/19	8/20	8/21	8 22

Americamysis bahia 7 DAY CHRONIC ASSAY SAMPLE USE RECORD

•	_				SE RECORL		•		1			
STUDY: 1487		CLIENT: BAT										
SPECIES: A. bah	ia		TEST:	chron	ic renewal	1	_		}			
	Day: 0		Day: 1			Day: 2	2					
Sample	Volume Used (mL)	ESI Cube ID	Volu Used		ESI Cube ID	1 1	ume I (mL)	ESI Cube ID	Day	Date	Time	Init
Lab Control	1600	n/a	120	0	n/a	120	90	n/a	0	8/15	1100	m
-001	}	-00	i		-601			-001	1	8116	1130	щ
-002		-002			-002			-002	2	8/17	1045	ଫ
-003		-003			500-			-003	3	8/18	1110	ye
-004	1	-004	V	/	-004	`	,	-004	4	8/19	1120	ج
								- 1	5	8/20	1340	SJ
					: : : : : : : : : : : : : : : : : : :				6	8/21	1345	ST
	Day: 3		Day: 4	}		Day:	5					
Sample	Volume Used (mL)	ESI Cube ID	Volu Used		ESI Cube ID	11	ume I (mL)	ESI Cube ID				
Lab Control	1200	n/a	120	20	n/a	12	00	n/a				
-001		-001			-001			-001				
-002		-002			-002			-002				
-003		-003			-003			-003				
-004	V	-004		1	-004	W		-004				
	Day: 6	roi Cub-										
Sample	Volume Used (ml.)	ESI Cube ID										
Lab Control	1200	n/a										
-001		-001										
-002		-062										
-003		-603										
-004	1	-004										

Americamysis bahia 7 DAY CHRONIC ASSAY SURVIVAL & OLD WATER QUALITIES

STUDY: いみ そらり	Co	CLIEN Battell		LOCATION: NEW BEDFORD NUMBER OF SURVIVORS							CONTR PTON	ROL: ESTUA	.RY		NISM H/LOT:	#
			1							OLD E	ISSOL	VED C	XYGE	N (mg/l	_)	
SAMPLE	Rep	0	1	2	3	4	5	6	7	1	2	3	4	5	6	7
	Α	3	5	J.	5	5	5	5	5	5,9	5.9	59	કે.વ	6.1	SiO	4.8
	В	5	5	5	5	5	\$	5	5	<i>6</i> .0	5,9	5,9	\$18	6.0	ય, જ	4.1
	С	5	5	5	5	٦	4	ч	T	5.9	6.0	6.0	5.8	\$. 9	4,6	3,9
Lab	D	5	5	5	5	\5	5	5	ษ	5.9	ص نة	6.0	60	G, O	4.9	4.2
Control	E	5	5	5	5	5	ક	5	5	5.9	s. q	6,2	5,6	0.	೭೦	4.1
	F	5	5	5	5	5	5	5	IJ	5.9	5.9	6.1	G.O	60	5.1	4.1
	G	5	Ч	니	4	기	4	4	4	5.9	6.0	6.1	6.0	5.9	5.0	3.7
	Н	5	J.	5	5	5	5	5	5	3.9	6.0	6.2	6.0	6,0	5,0	4.0
	А	5	5	5	5	5	5	5	5	5,5	6.0	6.6	G.O	6.3	515	4.5
	В	5	5	5	5	5	5	5	5	5,6	5,6	6.5	6.0	6.0	ราร์	4.6
	С	5	5	5	5	5	5	5	5	5.8	5.9	6.4	6,0	6.0	517	5.1
	D	5	5	5	5	5	5	5	5	\$. 9	5.9	6.1	6.0	<i>ن.0</i>	5,8	52
-001	Е	5	5	5	5	5	5	5	5	6.0	6.0	6.2	6.0	6.0	5,7	4.9
l	F	5	5	5	5	5	5	5	5	6.0	6.0	6.3	5.9	6.1	518	52
	G	5	5	5	5	5	5	5	5	6.0	6.0	6.2	6.0	6.0	5.9	5.3
	Н	5	5	5	5	5	. 5	5	5	5.9	6.0	6.2	<i>6</i> ,0	59	5.9	5,4
	Α	5	5	5	5	5	5	5	5	5.5	6.0	6.2	6.0	6.0	5.4	5.2
	В	5	5	5	5	5	5	5	5	5.5	5.9	5.9	6.0	6.0	5.4	5.3
	С	5	5	5	5	5	5	5	5	515	5,6	5.8	5,9	515	5.0	5.3
000	D	5	5	5	5	5	5	5	5	515	5.6	5.7	5.9	515	5.0	5.3_
-002	E	5	5	5	5	5	5	5	5	5,5	5.6	6.0	5.G	5.6	5.6	5.6
	F	5	5	5	5	5	5	5	5	5,5	5.6	6.0	5.7	516	515	5.4
	G	5	5	5	5	5	5	5	5	5,5	5.6	5.7	5.7	3,3	5.0	5.3
,	Н	5	5.	5	5	5	5	5	5	5,5	5.6	5.8	5.5	5.4	510	53
INC TEMP:		25	ጋኝ	2 5	25	ነኅ	ነና	ኢ ኖ	25			1,128 1 1				
DATE:		817	818	8/19	8/20	४२।	<u>ዓ</u> / <u>ን</u> ት	8/23	8/24		. d 111					1
TIME:		1530	1000	1030	1350	1110	1135	1200	1330							
INITIALS:		m	w	w	SJ		w	w	СР							

Americamysis bahia 7 DAY CHRONIC ASSAY SURVIVAL & OLD WATER QUALITIES

STUDY:	· ρ	CLIEN Battel	IENT: LOCATION:					EKG	LAB	CONTI		ARY		ANISM CH/LOT	#	
				NUMB	ER OF	SURV	IVORS				OLD [oissoi	VED (OXYGE	N (mg/	L)
SAMPLE	Rep	0	1	2	3	4	5	6	7	1	2	3	4	5	6	7
	Α	5	5	5	5	닉	ч	ч	Ц	5.6	5,5	5.9	5,7	60	5,17	6.0
	В	5	5	5	5	5	5	5	5	5,6	5.6	6.1	515	5.4	5.6	5. ₆
	С	5	5	5	5	\$	5	5	5	5,7	517	5.9	515	5,0	512	ھا،5
-003	D	5	5	5	5	5	5	5	5	5.9	5,8	5.9	જ્ય	5,7	512	5.6
000	Е	5	5	5	5	5	5	5	5	6.0	60	6.1	5.7	5,5	9,7	6.1
	F	5	5	5	5	5	5	5	5	6.0	6.0	6,2	518	5.1	5.6	10.0
	G	5	5	5	5	5	5	5	5	5.9	5.8	6.1	5.6	51	5,5	5.7
	Н	5	5	5	5	5	5	5	5	3.9	5.8	6.1	3.6	5.6	5,6	5.8
	Α															
	В															
	С							<u> </u>		1			ļ			
-004	D															
-00-	Е	5.0												<u></u>		
	F															
	G													<u> </u>		
	Н															
									!							
INC TEMP:		35	<mark>አ</mark> ኖ	25	25	አ ና	<u>ጋ</u> ኇ	75	25							9 + 14 4 + 14
DATE:		8-17	જ/18	ļ	8/20	8/3	<u> የ</u> ሌን	843	8/24							
TIME:		1530	1000	1030	1350	mo	1175	1208	330							
INITIALS:		w	w	w	SJ	~	w_	m	CP	<u> </u>			<u> </u>	<u> </u>		

Americamysis bahia 7 DAY CHRONIC ASSAY ORGANISM WEIGHTS

CLIENT: BATT	ELLE - NF	EW BEDFORD		TEST DATES	::						
	G86			SPECIES: A.							
CONC	REP	TARE WEIGHT (g)	SHRIMP + FOIL (g),	NET WEIGHT (mg)	# SHRIMP DAY 0	MEAN WEIGHT (mg) DAY 0	# SHRIMP DAY 7	MEAN WEIGHT (mg) DAY 7			
	Α	206.59	211,54								
	В	209.86	211.54								
	С	210.42	212.03								
ا	D	207.14	211.97								
Lab	E	208.60	210.46								
	F	204.79	206.45	5							
	G	208,74	210.56								
	Н	206.56	208.42								
	Α	211.65	214.41								
	В	207.44	209.63								
	С	Z07.30	209.70								
-001	D	206,36	208.39								
	E	208.08	210,22				,				
	F	208,98	211.27				10,000				
	G	209.12	211.18								
	Н	206.62	208.68								
	Α	210,26	212.47								
	В	207.60	208,28								
	С	210.89	209.82								
- 007	D	208, 33	213.25								
-002	E	208.77	211,17								
	F	209.53	210.84								
	G	209,32	211.6								
	Н	208,99	211,44								
DATE		8/24/06	325/06								
TIME		1050	13,23								
INITIALS		NT	GL		:						

Americamysis bahia 7 DAY CHRONIC ASSAY ORGANISM WEIGHTS

CLIENT: BATT	ELLE - NE	W BEDFORD		TEST DATES	 ::			
STUDY#: \v	886			SPECIES: A.	bahia			
CONC	REP	TARE WEIGHT (g)	SHRIMP + FOIL (g)	NET WEIGHT (mg)	#SHRIMP DAY 0	MEAN WEIGHT (mg) DAY 0	# SHRIMP DAY 7	MEAN WEIGHT (mg) DAY 7
	Α	201.02	210,26					
	В	208,23	210.32			<u>_</u>		
	С	208.60	210,69					
	D	2/2,0	214.26			<u></u>		
-003	E	210,52	212.87			! <u></u>		<u> </u>
	F	208.74	210.70					
	G	211.91	213,80	<u> </u>				
	H	208.73	થાા.10					
	А							
\	В							
	С							
	D							
l	E							
	F							
	G						, , , , , , , , , , , , , , , , , , , ,	
	Н						<u></u>	
	A							
	В					<u> </u>		
	С						<u></u>	
	D	<u> </u>						
	E		 		<u></u>		<u> </u>	
	F				<u> </u>		ļ <u>.</u>	
	G				;			
	Н	<u> </u>					 	
DATE		8/24/06	8/25/06					
TIME		1050	13:23				<u> </u>	
INITIALS		74	GL	<u></u>			<u> </u>	

Page 1 of 1 Date: 25 Aug-06 3:08 PM

Link:

06-9147-1245

Mysidopsis 7-d	Survival, Growth and	Fecundity Te	st						EnviroSystems, Inc.
Start Date: 1 Ending Date: 2	0-9546-2606 7 Aug-06 03:30 PM 4 Aug-06 03:45 PM 7 Aug-06 03:30 PM	Test Type: Protocol: Dii Water: Brine:	Growth-Sur EPA/821/R- Not Applica Not Applica	-02-014 (200 ble	2)	Spe	cies:	7d 0h Mysidopsis bah ARO - Aquatic l	ia Research Organisms, N
Sample Date: 1 Receive Date: 1	0-7795-7304 7 Aug-06 12:00 PM 7 Aug-06 12:00 PM h	Material: Code: Source: Station:	14886-000	nitoring Samp rd Harbor Dro ab Control		Clie Proj rin		Battelle Labs Ecological Risk	Assessment
Sample Date: 1 Receive Date: 1	6-5244-5492 6 Aug-06 01:30 PM 7 Aug-06 08:25 AM 6h	Material: Code: Source: Station:	14886-001	nitoring Samp rd Harbor Dro 01		Clie Proj rin		Battelle Labs Ecological Risk	Assessment
Sample Date: 1 Receive Date: 1	8-8134-1954 6 Aug-06 02:00 PM 7 Aug-06 08:25 AM 6h	Material: Code: Source: Station:	14886-002	nitoring Samp d Harbor Dro		Clie Proj		Battelle Labs Ecological Risk	Assessment
Sample Date: 1	5-5951-2491 6 Aug-06 02:15 PM 7 Aug-06 08:25 AM 5h	Material: Code: Source: Station:	14886-003	nitoring Samp rd Harbor Dro 03		Clie Proj rin		Battelle Labs Ecological Risk	Assessment
7d Proportion S	urvived Summary								
Sample Code	Reps	Mean	Minimum	Maximum	SE	SD_		:v	
14886-000	8	0.95000	0.80000	1.00000	0.03273	0.092	5 8 9	.75%	
14886-001	8	1.00000	1.00000	1.00000	0.00000	0.000	00 0	.00%	
14886-002	8	1.00000	1.00000	1.00000	0.00000	0.000		.00%	
14886-003	8	0.97500	0.80000	1.00000	0.02500	0.070	71 7	.25%	
Mean Dry Bioma	iss-mg Summary								
Sample Code	Reps	Mean	Minimum	Maximum	SE	SD	C	V	
14886-000	8	0.42925	0.32200	0.96600	0.07701	0.217		0.74%	
14886-001	8	0.44825	0.40600	0.55200	0.01732	0.048		0.93%	
14886-002	8	0.46457	0.13600	0.98400	0.10003	0.264		6.97%	
14886-003 7d Proportion S	8 undered Detail	0.45550	0.37800	0.64800	0.03012	0.085	19 1	8.70%	
· ·		Bon ?	Don 3	Dan 4	Don 5	Don 6	Pop 7	Don 0	
Sample Code 14886-000	Rep 1 1.00000	Rep 2	Rep 3 0.80000	Rep 4 1.00000	Rep 5 1.00000	Rep 6 1.00000	Rep 7 0.8000	Rep 8	
14886-001	1.00000		1.00000	1.00000	1.00000	1.00000	1.0000		
14886-002	1.00000		1.00000	1.00000	1.00000	1.00000	1.0000		
14886-003	0.80000		1.00000	1.00000	1.00000	1.00000	1.0000		
Mean Dry Bioma	ass-mg Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	
14886-000	0.37000		0.32200	0.96600	0.37200	0.33200	0.3640		
14886-001	0.55200	0.43800	0.48000	0.40600	0.42800	0.45800	0.4120	0.41200	
14886-002	0.44200		N/A	0.98400	0.48000	0.26200	0.4580		
14886-003	0.64800	0.41800	0.41400	0.45000	0.47000	0.39200	0.3780	0.47400	

Comparisons:

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25 Aug-06 3:09 PM 11-2085-4336

Report Date: Analysis:

Mysidopsis 7-	d Surv	ival, Grov	vth and F	ecundity Te	st							ı	EnviroSy	stems, inc.
Test No: Start Date: Ending Date: Setup Date:	17 AL 24 AL	46-2606 ig-06 03:3 ig-06 03:4 ig-06 03:3	5 PM	Test Type: Protocol: Dil Water: Brine:	Growth-Surv EPA/821/R-0 Not Applicab Not Applicab)2-014 (200 le	2)			cies: N	d Oh lysidopsis RO - Aqu			organisms, N
Endpoint				ysis Type		Sample l	Link	Contro	l Link		nalyzed		Version	
Mean Dry Biom	nass-m	9	Comp	parison		06-9147-	1245	06-9147	7-1245	25 Aug	-06 3:07 F	PM I	CETISv1.	026
Method			Alt ⊦		ransform	Z	NO	EL 1	LOEL	Toxic	Units	ChV		VISDp
Mann-Whitney	U		C > T	Untran	sformed					N/A				
ANOVA Assun	nption	s												
Attribute		Test			Statistic	Critical		P Level		Decision	(0.01)			
Variances		Variance	Ratio		19.77144	8.88539		0.00083		Unequal	Variances	3		
Distribution		Shapiro-V	Vilk W		0.58034	0.84420		0.00000		Non-norr	nal Distrib	ution		
ANOVA Table														
Source		Sum of S	quares	Mean Squa	are DF	F Statis	tic	P Level		Decision	(0.05)			
Between		0.001444		0.0014440	1	0.06		0.81326			ificant Ef	ect		
Error		0.348876		0.0249197	14									
Total		0.350320	04	0.0263637	15	_								
Group Compa	risons												····	
		Sample		Statistic	Critical	P Level		Ties		Decision	/n ne\			
14886-000		14886-001		8	Citical	0.9948		2		Non-Sign		ect		
14000-000		14000-001		Ψ		0.0010				Non-orgi	micant En			
Data Summary	у		•		Origi	nal Data					Transfo	ormed	Data	
Sample Code			Count	Mean	Minimum	Махітип	1 SI)	Mean	<u>1</u>	linimum	Ma	ximum	SD
14886-000			8	0.42925	0.32200	0.96600	0.2	21781						
14886-001		·· · · · · · · · · · · · · · · · · · ·	8	0.44825	0.40600	0.55200	0.0	04898						
Data Detail														
Sample Code			Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rej	p 6	Rep 7	Rep 8	l i	Rep 9	Rep 10
14886-000			0.37000	0.33600	0.32200	0.96600	0.372	00 0.3	3200	0.36400	0.372	00		
14886-001			0.55200	0.43800	0.48000	0.40600	0.428	00 0.4	5800	0.41200	0.412	00		
Graphics														
Mean Dry Blomase-mg		0		1			Centered Untransformed	0.5 0.4 0.3 0.2 0.1 0.0 -0.1 0.0	0	0000			0	
0.0 ¹		14886-000		14886-	100			-2.0	-1.5	1.0 -0.5	0.0 0.5	1.0) I.5	2.0
0.0 ¹		14886-000	Sample C		100				-1.5 -		0.0 0.5 Lankits	1.0	1.5	2.0

Comparisons: Report Date:

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Analysis:

25 Aug-06 3:09 PM 07-1776-2013

J						Allaly	/515.	·	07-1770-201
urvival, Growth and F	ecundity Tes	st						Enviros	Systems, Inc.
-9546-2606 Aug-06 03:30 PM Aug-06 03:45 PM Aug-06 03:30 PM	Test Type: Protocol: Dil Water: Brine:	EPA/821/R-0 Not Applicab)2-014 (200 le	2)	Spe	cies: M	ysidopsis ba		Organisms, N
Ana	ysis Type		Sample	Link Co	ntroi Link	Date Ar	alyzed	Version	1
s-mg Com	parison		06-9147-	1245 06	<u>-9147-1245</u>	25 Aug-	06 3:07 PM	CETISV	1.026
			<u>Z</u>	NOEL	LOEL		Units Cl	1V	MSDp
		D4-4!-4!-	0-1411	Б.1.	1	Danist	(0.04)		
Shapiro-Wilk W		0.7 3002	0.03320	0.00		NOTHOR	iai Distributio	<u></u>	
			-0				to 0.51		
			0.06	0.70	2111	Null-Sign	mcam eneci		
			<u></u> -		·····				
		Critical			<u> </u>		· · · · · · · · · · · · · · · · · · ·		
14886-002	20		0.8016	1		Non-Sign	ificant Effect		
		Origi	nal Data				Transform	ed Data	
Count	Mean	Minimum	Maximun	n SD	Mear	<u>м</u>	inimum 1	Maximum	SD
8	0.42925	0.32200	0.96600	0.2178	31				
7	0.46457	0.13600	0.98400	0.2646	i5 				
		•••			-				
Rep 1	Rep 2	Rep 3	Rep_4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0.37000	0.33600	0.32200	0.96600	0.37200	0.33200	0.36400	0.37200		
0.44200	0.13600	0.98400	0.48000	0.26200	0.45800	0.49000			
								··· ·	
	0			Centered 0.5 0.4 0.1 0.1 0.0 0.0 0.1 0.2 0.2 0.3		0000	 		
				_D. 4			·		
14886-000	14886-	002		-0.4	-2.0 -1.5 -	1.0 -0.5	0.0 0.5	1.0 1.5	2.0
	9546-2606 Aug-06 03:30 PM Aug-06 03:45 PM Aug-06 03:30 PM Anal -mg Com Alt I C > 1 ons Test Variance Ratio Shapiro-Wilk W Sum of Squares 0.0046576 0.7523184 0.75697595 ons Sample 14886-002 Count 8 7 Rep 1 0.37000 0.44200	9546-2606 Test Type: Aug-06 03:30 PM Protocol: Aug-06 03:45 PM Dil Water: Aug-06 03:30 PM Brine: Analysis Type Comparison Alt H Data T C > T Untran Ons Test Variance Ratio Shapiro-Wilk W Sum of Squares Mean Squa 0.0046576 0.0046576 0.7523184 0.0578707 0.75697595 0.0625282 Ons Sample Statistic 14886-002 20 Count Mean 8 0.42925 7 0.46457 Rep 1 Rep 2 0.37000 0.33600 0.44200 0.13600	Aug-06 03:30 PM	P546-2606	Test Type: Growth-Survival (7d)	-9546-2606 Test Type: Growth-Survival (7d)	Statistic Critical P P P P P P P P P	Post	Part

Comparisons:

Page 1 of 5

Report Date: Analysis: 25 Aug-06 3:09 PM 05-3820-3215 EnviroSystems, Inc.

Mysidopsis 7-d Survival, Growth and F	ecundity Test					EnviroSystems, Inc
Test No: 10-9546-2606 Start Date: 17 Aug-06 03:30 PM Ending Date: 24 Aug-06 03:45 PM Setup Date: 17 Aug-06 03:30 PM	Test Type: Growth-Su Protocol: EPA/821/F Dil Water: Not Applic Brine: Not Applic	R-02-014 (2002) able		Species: M	d 0h lysidopsis bal RO - Aquatic	nia Research Organisms, I
	lysis Type parison	Sample Li 06-9147-1			nalyzed -06 3:07 PM	Version CETISv1.026
Method Alt Mann-Whitney U C >		Z	NOEL L	OEL Toxic N/A	Units Ch	V MSDp
ANOVA Assumptions Attribute Test	Statistic	Critical	P Level	Decision		
Variances Variance Ratio Distribution Shapiro-Wilk W	6,53631 0,59989	8.88539 0.84420	0.02418 0.00000	Equal Va Non-norn	riances nal Distributio	n
Source Sum of Squares Between 0.0027562 Error 0.3828855 Total 0.38564170	Mean Square DF 0.0027562 1 0.027349 14 0.0301051 15	F Statisti 0.10	c <u>P Level</u> 0.75558	<u>Decision</u> Non-Sign	(0.05) ificant Effect	
Group Comparisons Sample vs Sample 14886-000 14886-003	Statistic Critical	P Level 0.9948	Ties 1	Decision Non-Sign	(0.05) ificant Effect	
Data Summary	Ori	ginal Data			Transforme	ed Data
Sample Code Count 14886-000 8 14886-003 8	Mean Minimum 0.42925 0.32200 0.45550 0.37800	0.96600 0.64800	SD 0.21781 0.08519	Mean M	linimum M	aximum SD
Sample Code Rep 1 14886-000 0.37000 14886-003 0.64800	Rep 2 Rep 3 0.33600 0.32200 0.41800 0.41400	0.96600 0	ep 5 Rep .37200 0.33 .47000 0.39	200 0.36400	Rep 8 0.37200 0.47400	Rep 9 Rep 10
Graphics 1.0 50 0.8 0.8 0.6 0.0 14885-000 Sample 6	 		0.6 0.5 0.5 0.5 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		Q

Comparisons:

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Report Date:

25 Aug-06 3:09 PM

Analysis:

20-5945-3042

Mysidopsis 7-d St	ırvival, Growth and F	ecundity Te	st						EnviroS	ystems, Inc.
Start Date: 17 Ending Date: 24	9546-2606 Aug-06 03:30 PM Aug-06 03:45 PM Aug-06 03:30 PM	Test Type: Protocol: Dil Water: Brine:	Growth-Surv EPA/821/R-4 Not Applicat Not Applicat	02-014 (2002) de)		-	opsis bah Aqualic i		Organisms, N
Endpoint Mean Dry Biomass		ysis Type		Sample Li 06-9147-1		troi Link	Date Analyz		Version	000
Wean Dry Blomass	-mg Com	parison		UD-9147-1	245 UD-1	147-1245 	25 Aug-06 3	UB PIVI	CETISv1	.026
Method Mann-Whitney U	Alt 1 C > '		ransform sformed	Z	NOEL	LOEL	Toxic Units N/A	Ch\	<i>!</i>	MSDp
ANOVA Assumpti	ons									
Attribute	Test		Statistic	Critical	P Lev	rel	Decision(0.01)		
Variances	Variance Ratio		29.19027	9.15534	0.000	26	Unequal Varia	nces		
Distribution	Shapiro-Wilk W		0.76567	0.83526	0.000	81	Non-normal D	istributior	ו	•
ANOVA Table										
Source	Sum of Squares	Mean Squa	re DF	F Statisti	c PLev	rel	Decision(0.05	i)		
Between	0.0009944	0.0009944	1	0.03	0.866	10	Non-Significar	nt Effect		
Error	0.4370343	0.0336180	13	_						
Total	0.43802873	0.0346124	14							
Group Compariso	ns									
Sample vs	Sample	Statistic	Critical	P Level	Ties		Decision(0.05	3		
14886-001	14886-002	24.5		0.6106	2		Non-Significan			
Data Summary			Origi	nal Data			Tra	nsforme	d Data	
Sample Code	Count	Mean	Minimum	Maximum	SD	— —— Mear			aximum	SD
14886-001	8	0.44825	0,40600	0.55200	0.04898		31118111	min IAI	axiiiiuiii	30
14886-002	7	0.46457	0.13600	0.98400	0.26465					
Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4 F	Rep 5	Rep 6	Rep 7 R	ep 8	Rep 9	Rep 10
14886-001	0.55200	0.43800				0.45800		41200		
14886-002	0.44200	0.13600	0.98400	0.48000 0	.26200	0.45800	0.49000			
Graphics										
Mean Dry Biomass-mg 0.8 0.7		14886-	002		Centered Cuttered Cut	0	 	0.5 1	0 1.5	2.0

Comparisons: Report Date: Page 2 of 5 25 Aug-06 3:09 PM

Analysis:

06-9132-2437

Mysidopsis 7-	d Surviv	al, Growth and F	ecundity Te	st							Enviros	ystems, Inc.
Test No: Start Date: Ending Date: Setup Date:	24 Aug	6-2606 -06 03:30 PM -06 03:45 PM -06 03:30 PM	Test Type: Protocol: Dil Water: Brine:	Growth-Sur EPA/821/R- Not Applica Not Applica	02-014 (200 ble	2)			cies: My	0h sidopsis ba O - Aquatio		Organisms, N
Endpoint			ysis Type		Sample	<u>Link</u>	Contr	ol Link	Date An		Version	<u> </u>
Mean Dry Biom	nass-mg	Com	parison		06-9147-	1245	06-914	17-1245	25 Aug-0	6 3:07 PM	CETISv	1.026
Method		Alt		ransform	Z	NC	DEL	LOEL	Toxic U	nits C	hV	MSDp
Mann-Whitney	U	C > `	T Untrar	sformed				···	N/A			
ANOVA Assur	mptions											
Attribu <u>te</u>	T	est		Statistic	Critical		P Level		Decision(0.01)		
Variances	V	ariance Ratio		3.02486	8.88539	<u> </u>	0.16742		Equal Vari	ances		
Distribution	S	hapiro-Wilk W		0.82384	0.84420)	0.00465	i	Non-norm	al Distributi	on	
ANOVA Table												
Source		um of Squares	Mean Squa	ire DF	F Statis	tic	P Level		Decision(0.05)		
Between		.0002102	0.0002102	1	0.04		0.83773		Non-Signil		t	
Error	0	.0676014	0.0048287	14								
Total	0	.06781162	0.0050389	15								
Group Compa	risons			THE THEORY			11 11 11 11					
Sample	vs Sa	ample	Statistic	Critic <u>al</u>	P Level		Ties		Decision(0.05)		
14886-001	14	1886-003	33		0.4796		1		Non-Signif	icant Effec	t	
Data Summar	v			Orig	inal Data					Transform	ned Data	
Sample Code	_	Count	Mean	Minimum	Maximun	n S	D	Mear	n Mi		Maximum	SD
14886-001		8	0.44825	0.40600	0.55200		.04898	111,441			<u> </u>	
14886-003		8	0.45550	0.37800	0.64800	0.	.08519					
Data Detail		<u></u>										
Sample Code		Rep 1	Rep 2	Rep 3	Rep 4	Rep :	5 R	ep 6	Rep 7	Rep 8	Rep 9	Rep 10
14886-001		0.55200	0.43800	0.48000	0.40600	0.428		45800	0.41200	0.41200		7,07
14886-003		0.64800	0.41800	0.41400	0.45000	0.470	000 o.	39200	0.37800	0.47400		
Graphics												
0.87							0.207					
[V.20]				•	מ
5 E							0.15-			l ,		
넑 0.6-						Centered Untransformed	1			ļ		
		1	I			rerect Sfort	0.10			1	_ ^_	
<u> </u>		Ŷ	Ŷ			Cent	0.55		•	J		
Mean Dry Blomass-mg			•			5	0.05-			1 /	(0	
¥							0.00			<u></u>		_
0.2-							1		0 9000	0,0		
]							-0.05 - }	ره		1		
0.0							-0.10-		_ ,,	·		
		14886-001	14886-	003			-2.0	-1.5	-1.0 -0.5	0.0 0.5	1.0 1.5	2.0
		Sample (Code						Ra	nkits		
			····									

Comparisons: Report Date:

Page 1 of 5 27 Dec-06 2:46 PM

03-6541-4975 Analysis: Mysidopsis 7-d Survival, Growth and Fecundity Test EnviroSystems, Inc. Test Type: Growth-Survival (7d) 7d Oh Test No: **Duration:** 10-9546-2606 Start Date: 17 Aug-06 03:30 PM Protocol: EPA/821/R-02-014 (2002) Species: Mysidopsis bahia Ending Date: 24 Aug-06 03:45 PM Dil Water: Not Applicable Source: ARO - Aquatic Research Organisms, N Setup Date: 17 Aug-06 03:30 PM Brine: Not Applicable **Endpoint Analysis Type** Sample Link **Control Link Date Analyzed** Version 7d Proportion Survived Comparison 06-9147-1245 06-9147-1245 24 Aug-06 4:22 PM CETISv1.026

74 F Toportion Survived	Compai		00-51-11-1	240 00-	3177-1270	24.70g 00 4.22		1071.020
Method	Ait H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Mann-Whitney U	C > T	Angular (Corrected)				N/A		
								

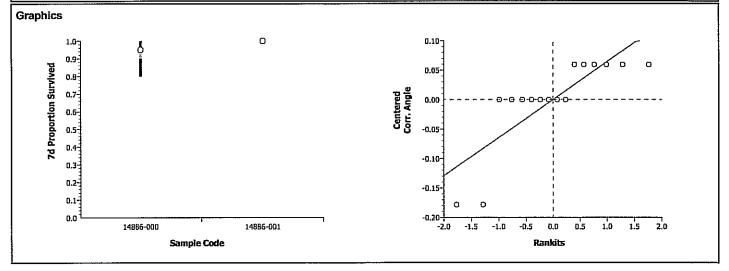
ANOVA Assumptions									
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)				
Variances	Modified Levene	2.33333	8.86159	0.14890	Equal Variances				
Distribution	Shapiro-Wilk W	0.67657	0.84420	0.00001	Non-normal Distribution				

Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
0.014177	0.014177	1	2.33	0.14890	Non-Significant Effect
0.0850619	0.0060758	14			
0.09923882	0.0202528	15	-		
	0.014177 0.0850619	0.014177 0.014177 0.0850619 0.0060758	0.014177 0.014177 1 0.0850619 0.0060758 14	0.014177 0.014177 1 2.33 0.0850619 0.0060758 14	0.014177 0.014177 1 2.33 0.14890 0.0850619 0.0060758 14

16	Group Comparisons										
S	ample	VS	Sample	Statistic	Critical	P Level	Ties	Decision(0.05)			
1	4886-000		14886-001	24		0.7791	2	Non-Significant Effect			

Data Summary		Original Data				Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
14886-000	8	0.95000	0.80000	1.00000	0.09258	1.28575	1.10715	1.34528	0.11023	
14886-001	8	1.00000	1.00000	1.00000	0.00000	1.34528	1.34528	1.34528	0.00019	

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
14886-000	1.00000	1.00000	0.80000	1.00000	1.00000	1,00000	0.80000	1.00000		
14886-001	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000		



Comparisons: Report Date: Analysis:

Page 4 of 5

27 Dec-06 2:46 PM 10-7409-9426

EnviroSystems, Inc.

		<u> </u>		
Mysidopsis	7-d Survival,	Growth and	Fecundit	/ lest

10-9546-2606

Test Type: Growth-Survival (7d)

17 Aug-06 03:30 PM Ending Date: 24 Aug-06 03:45 PM

Protocol: Dil Water: Not Applicable

EPA/821/R-02-014 (2002)

Duration: 7d 0h Species:

Mysidopsis bahia

Source: ARO - Aquatic Research Organisms, N

Setup Date:

Endpoint

Test No:

Start Date:

17 Aug-06 03:30 PM

Brine:

Analysis Type

Not Applicable

Control Link	Date Analyzed	Version							

70 Proportion Surviveu	Compan		00-9147-1	1	· · · · · · · · · · · · · · · · · · ·	24 Mug-00 4:22		CE115V1.026
Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp

Sample Link

N/A Mann-Whitney U C > TAngular (Corrected)

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Modified Levene	2.33333	8.86159	0.14890	Equal Variances
Distribution	Shapiro-Wilk W	0.67657	0.84420	0.00001	Non-normal Distribution

ANOVA Table

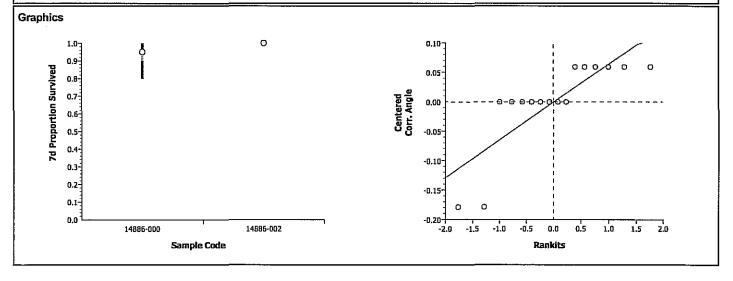
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.014177	0.014177	1	2.33	0.14890	Non-Significant Effect
Error	0.0850619	0.0060758	14			
Total	0.09923882	0.0202528	15	_		

Group Comparisons

Sample	vs	Sample	Statistic	Critical	P Level	Ties	Decision(0.05)
14886-000		14886-002	24		0.7791	2	Non-Significant Effect

Data Summary			Origi	nal Data		Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
14886-000	8	0.95000	0.80000	1.00000	0.09258	1.28575	1.10715	1.34528	0.11023	
14886-002	8	1.00000	1.00000	1.00000	0.00000	1.34528	1.34528	1.34528	0.00019	

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
14886-000	1.00000	1.00000	0.80000	1.00000	1.00000	1.00000	0.80000	1.00000		
14886-002	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000		



Comparisons: Report Date: Analysis:

Page 2 of 5 27 Dec-06 2:46 PM 06-0480-5688

EnviroSystems, Inc.

Mysidopsis 7-d Survival, Growth and Fecundity Test Test No:

7d 0h

10-9546-2606 Test Type: Growth-Survival (7d) Duration:

EPA/821/R-02-014 (2002) Mysidopsis bahia Start Date: 17 Aug-06 03:30 PM Protocol: Species:

Dil Water: Not Applicable ARO - Aquatic Research Organisms, N Ending Date: 24 Aug-06 03:45 PM Source: 17 Aug-06 03:30 PM Not Applicable Setup Date: Brine:

Endpoint Analysis Type Sample Link **Control Link Date Analyzed** Version 06-9147-1245 06-9147-1245 24 Aug-06 4:22 PM CETISv1.026 7d Proportion Survived Comparison

Data Transform Z NOEL **Toxic Units** ChV Method Alt H LOEL MSDp Angular (Corrected) C > T Mann-Whitney U N/A

ANOVA Assumptions

	F				
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	1.71429	8.88539	0.49388	Equal Variances
Distribution	Shapiro-Wilk W	0.61116	0.84420	0.00000	Non-normal Distribution

ANOVA Table

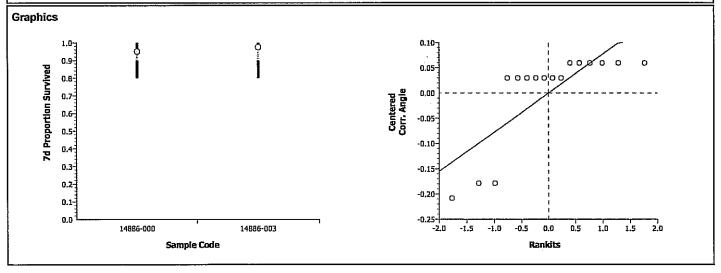
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.0035442	0.0035442	1	0.37	0.55358	Non-Significant Effect
Error	0.1346813	0.0096201	14			
Total	0.1382255	0.0131643	15			

Group Comparisons

Sample	VS	Sample	Statistic	Critical	P Level	Ties	Decision(0.05)
14886-000		14886-003	28		0.6395	2	Non-Significant Effect

Data Summary	Original Data				Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
14886-000	8	0.95000	0.80000	1.00000	0.09258	1.28575	1.10715	1.34528	0.11023
14886-003	8	0.97500	0.80000	1.00000	0.07071	1.31552	1.10715	1.34528	0.08419

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
14886-000	1.00000	1.00000	0.80000	1.00000	1.00000	1.00000	0.80000	1.00000		
14886-003	0.80000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000		



Comparisons: Report Date:

Rankits

Page 1 of 1 27 Dec-06 2:49 PM

Analysis:

16-0115-3389

Mysidopsis 7-d Survival, Growth and Fecundity Test EnviroSystems, Inc. 7d 0h Test No: 10-9546-2606 Test Type: Growth-Survival (7d) Duration: Start Date: 17 Aug-06 03:30 PM EPA/821/R-02-014 (2002) Species: Mysidopsis bahia Ending Date: 24 Aug-06 03:45 PM Dit Water: Not Applicable ARO - Aquatic Research Organisms, N Source: Setup Date: 17 Aug-06 03:30 PM Brine: Not Applicable **Endpoint** Sample Link **Control Link Analysis Type Date Analyzed** Version 7d Proportion Survived Comparison 06-9147-1245 06-9147-1245 27 Dec-06 2:49 PM CETISv1.026 Method Alt H **Data Transform** Z, **NOEL** LOEL **Toxic Units** ChV MSDp Mann-Whitney U C > T Angular (Corrected) N/A **ANOVA Assumptions** Attribute Critical Test Statistic P Level Decision(0.01) Variances Modified Levene 65535.00000 8.86159 0.00000 Unequal Variances **ANOVA Table** Source **Sum of Squares** Mean Square DF F Statistic P Level Decision(0.05) Between 0 0 1 65535.0 0.00000 Significant Effect Error 0 0 14 Total 0 0 15 **Group Comparisons** Sample Sample Statistic Critical P Level Ties Decision(0.05) 14886-002 0.4796 14886-001 32 Non-Significant Effect **Data Summary Original Data Transformed Data** Sample Code Count Mean Minimum Maximum SD Mean Minimum Maximum SD 14886-001 8 1.00000 1.00000 1.00000 0.00000 1.34528 1.34528 1.34528 0.00019 14886-002 8 1.00000 1.00000 1.00000 0.00000 1.34528 0.00019 1.34528 1.34528 Data Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Rep 6 Rep 7 Rep 8 Rep 9 **Rep 10** 14886-001 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 14886-002 1.00000 1.00000 1.00000 1.00000 1.00000 1,00000 1.00000 1.00000 Graphics Q o 1.07 1.0-0.9 7d Proportion Survived a.8-0.8-0.7 0.6 0.6-0.4 0.4 0,3-0.2 0.2 0.1 0.0 14896-001 14885-002 -1.5 -1,0 1.0 1.5 0.0 0.5

Sample Code

Comparisons: Report Date:

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Analysis:

27 Dec-06 2:46 PM 13-3285-7813

EnviroSystems, Inc.

Mysidopsis	7-d	Survival,	Growth and	Fecundity Test
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10-9546-2606 Start Date: 17 Aug-06 03:30 PM **Ending Date:** 24 Aug-06 03:45 PM

Protocol:

Test Type: Growth-Survival (7d) EPA/821/R-02-014 (2002)

Dil Water: Not Applicable

7d Oh **Duration:** Species:

Source:

Mysidopsis bahia

ARO - Aquatic Research Organisms, N

Setup Date:

Endpoint

Test No:

17 Aug-06 03:30 PM

Brine:

Not Applicable

Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Comparison	06-9147-1245	06-9147-1245	24 Aug-06 4:22 PM	CETISv1.026

Method	Alt H	Data Transform	z	NOEL	LOEL	Toxic Units	ChV	MSDp
Mann-Whitney U	C > T	Angular (Corrected)				N/A		

ANOVA Assumptions

7d Proportion Survived

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Modified Levene	1.00000	8.86159	0.33428	Equal Variances	
Distribution	Shapiro-Wilk W	0.46890	0.84420	0.00000	Non-normal Distribution	

ANOVA Table

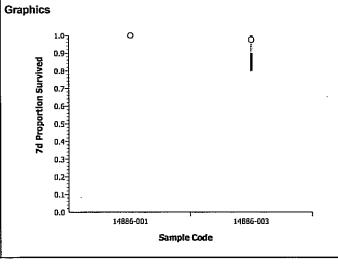
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.0035442	0.0035442	1	1.00	0.33428	Non-Significant Effect
Error	0.0496194	0.0035442	14			
Total	0.05316365	0.0070885	15	_		

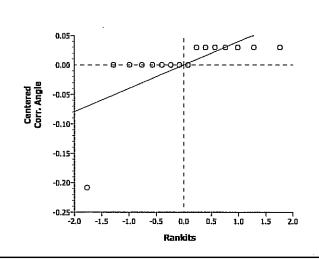
Group Comparisons

Sample	VS	Sample	Statistic	Critical	P Level	Ties	Decision(0.05)
14886-001		14886-003	36		0.3605	1	Non-Significant Effect

Data Summary	Original Data				Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
14886-001	8	1.00000	1.00000	1.00000	0.00000	1.34528	1.34528	1.34528	0.00019
14886-003	8	0.97500	0.80000	1.00000	0.07071	1.31552	1.10715	1.34528	0.08419

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
14886-001	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000		
14886-003	0.80000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000		







Aquatic Research Organisms

DATA SHEET

I.	Organism I	listory
	Species:	AMERICAMYSIS GALIA
	Source:	Lab reared Hatchery reared Field collected
		Hatch date 8-10-06 Receipt date
		Lot number 08/006HS Strain
		Brood Origination Flore 124
II.	Water Qua	lity
		Temperature 25 °C Salinity ~30 ppt DO
		pH 7-8 Hardness ppm
III.	Culture Co	onditions
		System: PECITEC
		Diet: Flake Food Phytoplankton Trout Chow
		Brine Shrimp Rotifers Other Every Shrimp DIE 7
		Prophylactic Treatments:
		Comments:
IV.	Shipping I	nformation
		Client: EST # of Organisms: /PO+
		Carrier: Date Shipped: 8-/7-06
- ירד	Jamiate	Mark Boxesonout
D 10	nogiar-	Mark Voxescovist

1 - 800 - 927 - 1650

Arbacia punctulata Chronic Fertilization Assay Water Quality and Gamete Preparation Data

STUDY:	CLIENT: BATTELLE	LOCATION: New Bedford		DATE: 7	
SALINITY ADJUSTMENT I	RECORD:	mL -001 + _	g SALT		
SALINITY ADJUSTMENT	RECORD:	mL -002 + _	g SALT		
SALINITY ADJUSTMENT	RECORD:	mL -003+_	g SALT		
SALINITY ADJUSTED SAMPLE	D.O. (mg/L)	pH (SU)	SPEC COND (µmhos)	TEMP (°C)	SALINITY (ppt)
Lab Control	6.9	7.88	39000	20	30
-001	B .3	7.60	36400	20	30
-002	8.7	7.91	35100	20	30
-003	8.7	7.82	35400	20	30
-004					

METERS USED

DO meter # 3 DO probe # 13 pH meter # 1097 pH probe # 44 S/C meter # 330 LBS/C probe # 3 30 LB SALINITY meter # 330 LB

DATE & INITIALS FOR GAMETE PREPARATION: 8/17/06 SJ SPERM DILUTIONS:

HEMACYTOMETER COUNT, E: SPERM CONCENTRATIONS:

128 x 10⁴ SPM SOLUTION E = 1.28×10^7 SOLUTION E X 40 = SOLUTION A = 5.12×10^7 SPM

SOLUTION E X 40 = SOLUTION A = 5. 12 7107 SPM SOLUTION E X 20 = SOLUTION B = 2.56 X 107 SPM SOLUTION E X 5 = SOLUTION C = 6.4 × 107 SPM

FINAL COUNTS:

FINAL SPERM COUNTY 1240 128 FINAL EGG COUNT: 1240 30

TEST TIMES:

SPERM COLLECTED: 1240
EGGS COLLECTED: 1240
SPERM ADDED: 1325
EGGS ADDED: 1425
FIXATIVE ADDED: 1445

Arbacia punctulata Chronic Fertilization Assay

SAMPLE USE RECORD

STUDY: १५८४		CLIENT: Battelle - New Bedford				
SPECIES: A. punctu	lata					
	Day: 0					
SAMPLE	Volume l	Jsed (mL)	ESI Cube ID			
Lab Control	20	MML				
-001			14886001			
-002			14886-002			
-003			14886-003			
-004	-					
INITIALS:						
TIME:						
DATE:						

FERTILIZATION COUNTS

STUDY	CLIENT BATTELLE	LOCATION New Bedford		DATE 8/17/06 INITIALS ST
		REPLICA	ATE VIAL	
	1	_2_	3	4
SAMPLE	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL
Lab Control	100/104	100/102	100/102	103/105
-001	100/109	100 / 106	102/110	100/107
-002	100/108	100/111	103/115	101/111
-003	102/113	100/115	100/110	104/112
-004				

CETIS Test Summary

Report Date:

27 Dec-06 2:37 PM

Link:

09-1277-6133

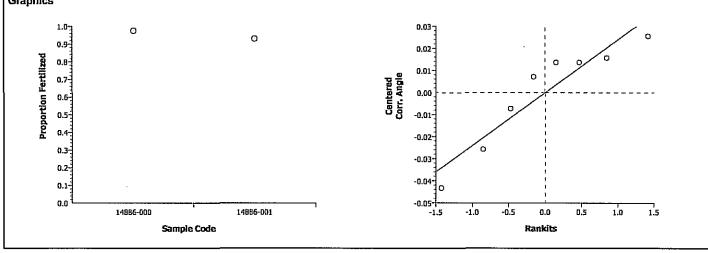
Echinoid Spen	Echinoid Sperm Cell Fertilization Test EnviroSystems, Inc.										
Test No: Start Date: Ending Date: Setup Date:	14-3537-6163 17 Aug-06 01:25 PM 17 Aug-06 02:45 PM 17 Aug-06 01:25 PM	Test Type: Protocol: Dil Water: Brine:	Fertilization EPA/600/R-95/136 (1995) Receiving Water Generic commercial salts			Duration: Species: Source:	80m Arbacia punctulata In-House Culture				
-	10-7795-7304 17 Aug-06 12:00 PM 17 Aug-06 12:00 PM 85m	Material: Code: Source: Station:	Marine Monitoring Sample 14886-000 New Bedford Harbor Dredge Monitorin WQ-TOX-Lab Control			Client: Project:	Battelle Labs Ecological Risk Assessment				
•	06-5244-5492 16 Aug-06 01:30 PM 17 Aug-06 08:25 AM 24h	Material: Code: Source: Station:	Marine Monitoring Sample 14886-001 New Bedford Harbor Dredge Monitorin WQ-TOX-001			Client: Project:	Battelle Labs Ecological Risk Assessment				
-	18-8134-1954 16 Aug-06 02:00 PM 17 Aug-06 08:25 AM 23h	Material: Code: Source: Station:	Marine Monitoring Sample 14886-002 New Bedford Harbor Dredge Monitorin WQ-TOX-002			Client: Project:	Battelle Labs Ecological Risk Assessment				
	15-5951-2491 16 Aug-06 02:15 PM 17 Aug-06 08:25 AM 23h	Material: Code: Source: Station:	14886-003	nitoring Sampl rd Harbor Dred 103		Client: Project:	Battelle Labs Ecological Risk Assessment				
Proportion Fe	rtilized Summary										
Sample Code 14886-000 14886-001 14886-002 14886-003	Reps 4 4 4 4	Mean 0.97582 0.93067 0.90810 0.90247	Minimum 0.96154 0.91743 0.89565 0.86957	Maximum 0.98095 0.94340 0.92593 0.92857	SE 0.00476 0.00551 0.00663 0.01227	0.00952 0.01102 0.01326 0.02455	CV 0.98% 1.18% 1.46% 2.72%				
Proportion Fe	rtilized Detail					* *					
Sample Code 14886-000 14886-001 14886-002 14886-003	Rep 1 0.9615 0.9174 0.9259 0.9026	3 0.94340 3 0.90090	Rep 3 0.98039 0.92727 0.89565 0.90909	Rep 4 0.98095 0.93458 0.90991 0.92857							

Comparisons: Report Date:

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27 Dec-06 2:37 PM

Analysis: 19-5458-7059 Echinoid Sperm Cell Fertilization Test EnviroSystems, Inc. 14-3537-6163 Test Type: Fertilization **Duration:** 80m Test No: EPA/600/R-95/136 (1995) Start Date: 17 Aug-06 01:25 PM Protocol: Species: Arbacia punctulata In-House Culture **Ending Date:** 17 Aug-06 02:45 PM Dil Water: Receiving Water Source: 17 Aug-06 01:25 PM Setup Date: Brine: Generic commercial salts Endpoint Analysis Type Sample Link **Control Link Date Analyzed** Version Proportion Fertilized Comparison 09-1277-6133 09-1277-6133 27 Dec-06 2:36 PM **CETISv1.026** Method Alt H **Data Transform** z NOEL LOEL **Toxic Units** ChV MSDp Equal Variance t C > T Angular (Corrected) N/A ANOVA Assumptions Attribute Statistic Critical Test P Level Decision(0.01) Variance Ratio Variances 1.75765 47.46723 0.65464 Equal Variances Shapiro-Wilk W 0.88356 Distribution 0.74935 0.19758 Normal Distribution **ANOVA Table** Sum of Squares Decision(0.05) Source Mean Square DF F Statistic P Level Between 0.0249265 0.0249265 1 38.29 0.00082 Significant Effect Error 0.0039062 0.0006510 6 0.02883266 0.0255775 7 Total **Group Comparisons** Sample Sample Statistic Critical P Level MSD Decision(0.05) 14886-000 14886-001 6.18768 1.94318 0.0004 0.03506 Significant Effect **Data Summary Original Data Transformed Data** Sample Code Count Mean Minimum Maximum SD Mean Minimum Maximum SD 0.96154 0.98095 14886-000 4 0.97582 0.00952 1.41659 1.37340 1.43234 0.02881 14886-001 4 0.93067 0.91743 0.94340 0.01102 1.30495 1.27934 1.33058 0.02173 Data Detail Sample Code Rep 3 Rep 4 Rep 1 Rep 2 Rep 5 Rep 6 Rep 7 Rep 8 Rep 9 Rep 10 14886-000 0.98039 0.98095 0.96154 0.98039 14886-001 0.91743 0.94340 0.92727 0.93458 Graphics



Comparisons: Report Date:

Page 4 of 5

Analysis:

27 Dec-06 2:37 PM 16-6499-6590

Echinoid Spe	rm Ce	ell Fertiliza	tion Test									EnviroS	ystems, inc.
Test No: Start Date: Ending Date: Setup Date:	17 A	537-6163 Aug-06 01:2 Aug-06 02:4 Aug-06 01:2	5 PM	Test Type: Protocol: Dil Water: Brine:	Receiving W	95/136 (1995) /ater imercial salts			Dura Spec Sour		80m Arbacia pur In-House C		
Endpoint			Anal	ysis Type		Sample Li	ink	Contro	Link	Date	Analyzed	Version	
Proportion Fer	tilized		Com	parison		09-1277-6	133	09-1277	7-6133	27 D	ec-06 2:36 P	M CETISV	1.026
Method			Alt i	l Data 1	ransform	Z	NO	EL L	OEL	Тох	ic Units	ChV	MSDp
Equal Variance	e t		C > T	Angula	r (Corrected)					N/A			
ANOVA Assu	mptio	ns											
Attribute		Test			Statistic	Critical		P Level		Decis	ion(0.01)		
Variances		Variance	Ratio		1.51487	47.46723		0.74116		Equal	Variances		
Distribution		Shapiro-V	Vilk W		0.94237	0.74935		0.59714		Norma	al Distribution	1	
ANOVA Table)												
Source		Sum of S	Squares	Mean Squa	ire DF	F Statisti	ic	P Level		Decis	ion(0.05)		
Between		0.046946	2	0.0469462	1	68.15		0.00017		Signifi	cant Effect		
Error		0.004133	2	0.0006889	6								
Total		0.051079	42	0.0476351	7								
Group Comp	arisor	ns											
Sample	VS	Sample		Statistic	Critical	P Level		MSD		Decis	ion(0.05)		
14886-000		14886-002	2	8.25527	1.94318	0.0001		0.03606			cant Effect		
Data Summar	ry			***************************************	Origi	nal Data					Transfo	rmed Data	
 Sample Code	9		Count	Mean	Minimum	Maximum	SI	<u> </u>	Меаг	1	Minimum	Maximum	SD
14886-000			4	0.97582	0.96154	0.98095	0.0	00952	1.416	59	1.37340	1.43234	0.02881
14886-002			4	0.90810	0.89565	0.92593	0.0	01326	1.263	38	1.24187	1.29515	0.02341
Data Detail				-					· · · · · · · · · · · · · · · · · · ·				
Sample Code	9		Rep 1	Rep 2	Rep 3	Rep 4 F	Rep 8	5 Re	p 6	Rep 7	7 Rep 8	Rep 9	Rep 10
14886-000			0.96154	0.98039	0.98039	0.98095							
14886-002			0.92593	0.90090	0.89565	0.90991							
Graphics													
0.9- 0.9- 0.6- 0.6- 0.6- 0.6- 0.6- 0.6- 0.6- 0.6		0		0			Centered Corr, Angle	0.04 0.03 0.02 0.01 0.00 -0.01 -0.02 -0.03 -0.04 0				9 "	·
		14886-000	Sample C	14886-	002			-1.5	-1.0	-0.5	0,0 Rankits	0.5 1.0	1.5
			sample C	<u>-</u>		4					ROSE S		

Comparisons: Report Date: Analysis:

Page 2 of 5 27 Dec-06 2:37 PM 11-8621-3612

EnviroSystems, Inc.

Echinoid Sperm Cell Fertilization Test

14-3537-6163

17 Aug-06 01:25 PM

Test Type: Fertilization

17 Aug-06 01:25 PM Ending Date: 17 Aug-06 02:45 PM

Brine:

Protocol: EPA/600/R-95/136 (1995)

Dil Water: Receiving Water

Duration:

80m Species:

Arbacia punctulata

Source:

In-House Culture

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Fertilized	Comparison	09-1277-6133	09-1277-6133	27 Dec-06 2:36 PM	CETISv1.026

Generic commercial salts

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
				11——				

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Angular (Corrected)				N/A		

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	2.01835	47.46723	0.57872	Equal Variances
Distribution	Shapiro-Wilk W	0.88175	0.74935	0.19048	Normal Distribution

ANOVA Table

Test No:

Start Date:

Setup Date:

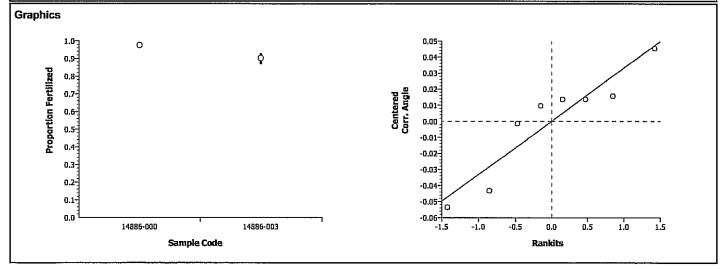
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.0522946	0.0522946	1	41.75	0.00065	Significant Effect
Error	0.0075148	0.0012525	6			
Total	0.05980946	0.0535471	7	-		

Group Comparisons

Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
14886-000		14886-003	6.46167	1.94318	0.0003	0.04863	Significant Effect	

Data Summary			Original Data			Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
14886-000	4	0.97582	0.96154	0.98095	0.00952	1.41659	1.37340	1.43234	0.02881
14886-003	4	0.90247	0.86957	0.92857	0.02455	1.25489	1.20129	1.30025	0.04093

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
14886-000	0.96154	0.98039	0.98039	0.98095						
14886-003	0.90265	0.86957	0.90909	0.92857						



Comparisons: Report Date:

Page 3 of 5 27 Dec-06 2:37 PM

Analysis: 14-0617-2639 **Echinoid Sperm Cell Fertilization Test** EnviroSystems, Inc. Test No: 14-3537-6163 Test Type: Fertilization **Duration:** 80m Start Date: 17 Aug-06 01:25 PM EPA/600/R-95/136 (1995) Arbacia punctulata Protocol: Species: Ending Date: 17 Aug-06 02:45 PM Source: In-House Culture Dil Water: Receiving Water Setup Date: 17 Aug-06 01:25 PM Brine: Generic commercial salts **Endpoint Analysis Type** Sample Link Control Link **Date Analyzed** Version Proportion Fertilized 09-1277-6133 09-1277-6133 27 Dec-06 2:37 PM CETISv1.026 Comparison Method Alt H **Data Transform** Z NOEL LOEL **Toxic Units** ChV MSDp C > T Equal Variance t Angular (Corrected) N/A **ANOVA Assumptions** Attribute Test Statistic Critical P Level Decision(0.01) Variance Ratio Variances 1.16026 47.46723 0.90563 **Equal Variances** Shapiro-Wilk W Distribution 0.94179 0.74935 0.59137 Normal Distribution **ANOVA Table** Source Sum of Squares Mean Square DF F Statistic P Level Decision(0.05) Significant Effect Between 0.0034562 6.78 0.04049 0.0034562 1 Error 0.0030600 0.0005100 6 Total 0.00651623 0.0039662 7 **Group Comparisons** Sample VS Sample Statistic Critical P Level MSD Decision(0.05) 14886-001 14886-002 2.60324 1.94318 0.0202 0.03103 Significant Effect **Data Summary Original Data Transformed Data** Sample Code Count Mean Minimum Maximum SD Mean Minimum Maximum SD 14886-001 4 0.93067 0.91743 0.94340 0.01102 1.30495 1.27934 1.33058 0.02173 14886-002 4 0.90810 0.89565 0.92593 0.01326 1.26338 1.24187 1.29515 0.02341 Data Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Rep 6 Rep 7 Rep 8 Rep 9 Rep 10 14886-001 0.91743 0.94340 0.92727 0.93458 14886-002 0.92593 0.90090 0.90991 0.89565 Graphics 1.0-3 0.04-0 O 0.9 0.03-Proportion Fertilized 0.8 0.02 0.7 0.6 0.01 0.5 0.00 0.4 0.3 -0.01 0.2 -0.02 0.1-0.0 -0.03 14886-001 -0.5 0.5 1.0 1.5 14886-002 -1.0 0.0

Sample Code

Rankits

Comparisons: Report Date: Analysis:

Page 1 of 5 27 Dec-06 2:37 PM

04-8183-1101

EnviroSystems, Inc.

Echinoid Sperm Cell Fertilization Test

Ending Date: 17 Aug-06 02:45 PM

14-3537-6163

Test Type: Fertilization

Protocol:

EPA/600/R-95/136 (1995) Dil Water: Receiving Water

Duration: 80m

Arbacia punctulata

In-House Culture

Setup Date:

Proportion Fertilized

Test No:

Start Date:

17 Aug-06 01:25 PM

17 Aug-06 01:25 PM

Brine: Generic commercial salts

Species: Source:

Endpoint	Analysis Type

Analysis Type Comparison

Sample Link	Control Link	Date Analyzed	Version
09-1277-6133	09-1277-6133	27 Dec-06 2:37 PM	CETISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Angular (Corrected)				N/A		

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	3.54756	47.46723	0.32602	Equal Variances
Distribution	Shapiro-Wilk W	0.98165	0.74935	0.96908	Normal Distribution

ANOVA Table

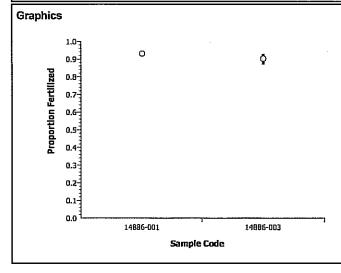
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.0050125	0.0050125	1	4.67	0.07400	Non-Significant Effect
Error	0.0064416	0.0010736	6			
Total	0.01145413	0.0060861	7	_		

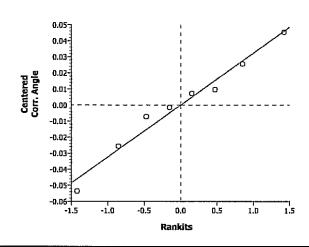
Group Comparisons

Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
14886-001		14886-003	2.16076	1.94318	0.0370	0.04502	Significant Effect

Data Summary			Origi	nal Data		Transformed Data					
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD		
14886-001	4	0.93067	0.91743	0.94340	0.01102	1.30495	1.27934	1.33058	0.02173		
14886-003	4	0.90247	0.86957	0.92857	0.02455	1.25489	1.20129	1.30025	0.04093		

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
14886-001	0.91743	0.94340	0.92727	0.93458						
14886-003	0.90265	0.86957	0.90909	0.92857						





Report Date:

28 Aug-06 8:14 PM

Link: 04-1112-4602

Champia parv	ula Red Macroalga Sex	ual Reproduc	tion Test				Saskatchewan Research Council
Test No: Start Date: Ending Date: Setup Date:	10-5436-8989 21 Aug-06 12:00 PM 28 Aug-06 12:00 PM 21 Aug-06 12:00 PM	Test Type: Protocol: Dil Water: Brine:	EPA/600/4- Not Applica	91/003 (1994) ble mmercial salts		Duration: Species: Source:	7d 0h Champia parvula In-House Culture
-	10-7795-7304 17 Aug-06 12:00 PM 17 Aug-06 12:00 PM 96h	Material: Code: Source: Station:	14886-000	nitoring Sample rd Harbor Dred ab Control		Client: Project:	Battelle Labs Ecological Risk Assessment
•	06-5244-5492 16 Aug-06 01:30 PM 17 Aug-06 08:25 AM 4d 22h	Material: Code: Source: Station:	14886-001	nitoring Sample rd Harbor Drec 01		Client: Project:	Battelle Labs Ecological Risk Assessment
•	18-8134-1954 16 Aug-06 02:00 PM 17 Aug-06 08:25 AM 4d 22h	Material: Code: Source: Station:	14886-002	nitoring Sample rd Harbor Drec 02		Client: Project:	Battelle Labs Ecological Risk Assessment
•	15-5951-2491 16 Aug-06 02:15 PM 17 Aug-06 08:25 AM 4d 21h	Material: Code: Source: Station:	14886-003	nitoring Sample rd Harbor Drec 03		Client: Project:	Battelle Labs Ecological Risk Assessment
Mean Cystoca	rps Summary						
Sample Code 14886-000 14886-001 14886-002 14886-003	Reps 3 4 4 4	Mean 80.2667 85.15 86.4 82.75	76.2 70.8 80 62.4	Maximum 84.8 95.2 98.2 102.2	SE 2.49355 5.19126 4.04557 8.13854	4.31895 10.3825 8.09115 16.2771	CV 5.38% 12.19% 9.36% 19.67%
Mean Cystoca	rps Detail	****		<u> </u>		**************************************	
Sample Code 14886-000 14886-001 14886-002 14886-003	Rep 1 79.8 85.4 82.8 62.4	Rep 2 76.2 70.8 98.2 82.2	Rep 3 84.8 95.2 84.6 84.2	Rep 4 89.2 80 102.2			

Comparisons: Report Date: Analysis: Page 1 of 5 28 Aug-06 8:16 PM 05-8364-6719

Champia parvula F	Red Macroalga Sexi	ual Reproduction Test			Saskatch	newan Research Council
Endpoint	Ana	alysis Type	Sample Li	nk Control Link	Date Analyzed	Version
Mean Cystocarps		nparison	04-1112-46			
Method	Alt	H Data Transform	Z	NOEL LOEL	Toxic Units (ChV MSDp
Equal Variance t	C >	T Untransformed			N/A	
ANOVA Assumption	ons					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	14.20354	199.16640		Equal Variances	
Distribution	Shapiro-Wilk W	0.92169	0.72991	0.44859	Normal Distribution	
ANOVA Table						
Source	Sum of Squares	Mean Square DF	F Statistic	c P Level	Decision(0.05)	
Between	10.57191	10.57191 1	0.06	0.81104	Non-Significant Effe	ct
Error	832.1367	166.4273 5				
Total	842.708563	176.99924 6				
Group Comparisor	ns					
Sample vs	Sample	Statistic Critical	P Level	MSD	Decision(0.05)	
14886-000	14886-003	-0.2520 2.01505	0.5945	19.8544	Non-Significant Effe	ct
Data Summary		Orig	jinal Data		Transfor	med Data
Sample Code	Count	Mean Minimum		SD Mea	n Minimum	Maximum SD
14886-000	3	80.2667 76.2	84.8	4.31895		
14886-003	4 	82.75 62.4	102.2	16.2771		
Data Detail						
Sample Code	Rep 1	Rep 2 Rep 3	Rep 4 R	ep 5 Rep 6	Rep 7 Rep 8	Rep 9 Rep 10
14886-000	79.8	76.2 84.8				
14886-003	62.4	82.2 84.2	102.2			
Graphics						
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	1			-25	<u> </u>	· · · · · · · · · · · · · · · · · · ·
	14866-000 Sample Co	14886-003		-1.5 -1.0	-0,5 0,0 0,5 Rankits	i 1.0 1.5
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Comparisons: Report Date: Analysis:

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06-1010-4027

Red Macro	alga Sexu	ıal Reproduc	tion Test					Sask	atchewa	an Resea	arch Council
· · · · · · · · · · · · · · · · · · ·	Ana	lysis Type		Sample L	ink	Control L	ink Da	Date Analyzed Version			
	Com	parison		04-1112-4	602	04-1112-4	602 28	Aug-06 8:1	3 PM	CETISv	1.026
	Alt	H Data T	ransform	Z	NOE	L LO	EL To	xic Units	ChV	,	MSDp
	C >	T Untran	sformed				N/	A			
ins											
Test			Statistic	Critical	F	Level	Deci	sion(0.01)			
Variance	Ratio		5.77895	199.1664	0 0	.30212	Equa	l Variances	i		
Shapiro-	Wilk W		0.94353	0.72991	0	.63104	Norn	nal Distribul	ion		
Sum of	Squares	Mean Squa	re DF	F Statist	ic F	Level	Deci	sion(0.05)			
40.8804	8	40.88048	1	0.57	O	.48549	Non-	Significant	Effect		
360.6967	7	72.13934	5								
401.577	133	113.01981	6								
15											
Sample		Statistic	Critical	P Level	N	ISD	Deci	sion(0.05)			
14886-00	11	-0.7528	2.01505	0.7573	1	3.0716	Non-	Significant	Effect		,
			Orig	inal Data				Trans	sformed	d Data	
	Count	Mean	Minimum	Maximum	SD	3	Mean	Minimu	n Ma	ximum	SD
	3	80.2667	76.2	84.8	4.3	1895					
	4	85.15	70.8	95.2	10.3	3825					
	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	i Rep	7 Rej	8 0	Rep 9	Rep 10
	79.8										
**	85.4	70.8	95.2	89.2							· · · · · · · · · · · · · · · · · · ·
¢		ļ			Centered Untransformed	5	•		0/0		
	Test Variance Shapiro- Sum of 40.8804 360.696 401.577 ns Sample 14886-00	Ana Com Alt C > Ins Test Variance Ratio Shapiro-Wilk W Sum of Squares 40.88048 360.6967 401.577133 Ins Sample 14886-001 Count 3 4 Rep 1 79.8 85.4	Analysis Type	Comparison C Data Transform C T Untransformed	Analysis Type Comparison O4-1112-4	Analysis Type	Analysis Type	Analysis Type	Analysis Type	Analysis Type	Analysis Type

Sample Code

Comparisons: Report Date:

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Analysis: 06-9312-8160

-	•							,			
Champia parvula	Red Macroalga Sex	cual Reproduc	tion Test					Saska	tchew	an Resea	rch Coun
ndpoint	An	alysis Type		Sample L	.ink	Control L	ink Date	Analyzed		Version	
lean Cystocarps	Co	mparison		04-1112-4	602	04-1112-4	1602 28 A	ug-06 8:14	PM	CETISv1	.026
/lethod	Alt	H Data Transform		Z	Z NOE		EL Tox	ic Units	ChV	,	MSDp
qual Variance t	C:	T Untrar	sformed				N/A				
NOVA Assumpti	ons										
ttribute	Test		Statistic	Critical		P Level	Decis	ion(0.01)			
ariances	Variance Ratio		2.45781	47.46723		0.47956		Variances			
Distribution	Shapiro-Wilk W	Marie	0.95485	0.74935		0.72666	Norma	ıl Distributi	ion		
NOVA Table											
ource	Sum of Squares	Mean Squa	are DF	F Statist	ic	P Level	Decis	ion(0.05)			
Between	11.52	11.52	1	0.06		0.81194	Non-S	ignificant E	Effect		
rror	1118.22	186.37	6	_							
otal	1129.73997	197.89	7								
Froup Compariso	ons										
Sample vs	Sample	Statistic	Critical	P Level		MSD	Decis	ion(0.05)			
4886-001	14886-003	0,24862	1.94318	0.4060		18.758	Non-S	ignificant E	Effect		
ata Summary			Orig	inal Data				Trans	forme	d Data	
iample Code	Count	Mean	Minimum	Maximum	SE) !	Mean	Minimun	n Ma	aximum	SD
4886-001	4	85.15	70.8	95.2	10	.3825	•				
4886-003	4	82.75	62.4	102.2	16	.2771					
Data Detail											
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	i Rep (Rep :	7 Rep	8	Rep 9	Rep 10
4886-001	85.4	70.8	95.2	89.2							
4886-003	62.4	82.2	84.2	102.2							
Sraphics											
150-7						207					ov.
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an Cys	ł	ļ			2 5	0}		-c-i			
Mean Cystocarps	ł	ł			Centered Untransformed	5	·	-¢-i-^			
Mean Cys	ł					-5-		-0-12			
	\$	ļ				1 /	,	-0-1			
	Ì	ļ				-15		-0-1			
	Ì	ļ				1 /	,				
	14866-001	14886-	1 2023			-15		0.0	0.5	1.0	

14886-000

Sample Code

14886-002

Comparisons: Report Date: Analysis:

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t Date: 28 Aug-06 8:16 PM sis: 14-8952-5838

JE I IQ Allaly	1313 Detail							Analys	is:		14-8952-58
Champia parvula i	Red Macroalga Sex	ual Reprodu	ction Test					;	Saskatch	newan Resea	arch Counci
Endpoint	Ana	alysis Type		Sample L	ink	Control	Link	Date Ana	alyzed	Version	
Mean Cystocarps	Cor	nparison		04-1112-4	602	04-1112	-4602	28 Aug-0	6 8:13 Pi	M CETISV	1.026
Method	Alt		Fransform	Z	NOE	EL L	OEL.	Toxic U	nits (ChV	MSDp
Equal Variance t	C >	T Untra	nsformed					N/A			
ANOVA Assumption	ons					•					
Attribute	Test		Statistic	Critical	F	Level		Decision(0).01)		
Variances	Variance Ratio		3.50965	199.1664).45924		Equal Varia			
Distribution	Shapiro-Wilk W		0.88600	0.72991).24340		Normal Dis	tribution		
ANOVA Table											
Source	Sum of Squares	Mean Squ	are DF	F Statist		Level		Decision(0			
Between	64.48762	64.48762	1	1.38	C	.29305		Non-Signifi	icant Effe	ct	
Error	233.7067	46.74133	5								
Total	298.194283	111.22895	6								
Group Compariso	ns										
Sample vs	Sample	Statistic	Critical	P Level		VISD		Decision(0			
14886-000	14886-002	-1.1746	2.01505	0.8535	1	0.5219		Non-Signifi	icant Effe	ct	
Data Summary			Orig	inal Data					Transfor	med Data	
Sample Code	Count	Mean	Minimum	Maximum	SD		Mear	n Mir	nimum	Maximum	SD
14886-000	3	80,2667	76.2	84.8		1895					
14886-002	4	86.4	80	98.2	8.0	9114					
Data Detail											
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep	6	Rep 7	Rep 8	Rep 9	Rep 10
14886-000	79.8	76.2	84.8								
14886-002	82.8	98.2	84.6	80							
Graphics											
1007					:	15-ղ			•		
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Comparisons: Report Date: Analysis: Page 5 of 5 28 Aug-06 8:16 PM

28 Aug-06 8:16 PM 16-3396-8179

Champia parvula F	Red Macro	alga Sexu	ial Reproduc	tion Test					Saska	tchewa	an Resea	rch Council
Endpoint		Ana	lysis Type		Sample L	.ink	Contro	l Link	Date Analyzed		Version	
Mean Cystocarps		Con	parison	<u></u>	04-1112-4	602	04-111	2-4602	28 Aug-06 8:14	PM	CETISv1	.026
Method		Alt	H Data T	ransform	Z	NC	DEL I	LOEL	Toxic Units	ChV		MSDp
Equal Variance t		C >		sformed					N/A			· · · · · ·
ANOVA Assumption	ns					- 13						
Attribute	Test			Statistic	Critical		P Level		Decision(0.01)			
Variances	Variance	Ratio		1.64659	47.46723	3	0.69206		Equal Variances			
Distribution	Shapiro-	Wilk W		0.97215	0.74935		0.90129		Normal Distributi	on		
ANOVA Table			140									
Source	Sum of	Squares	Mean Squa	re DF	F Statist	ic	P Level		Decision(0.05)			
Between	3.125		3.125	1	0.04		0.85563		Non-Significant E	ffect		,
Error	519.79		86.63167	6								
Total	522.9149	978	89.756668	7	-							
Group Comparison	ns				•							
Sample vs	Sample		Statistic	Critical	P Level		MSD		Decision(0.05)			
14886-001	14886-00	2	-0.1899	1.94318	0.5722		12.789		Non-Significant E	ffect		-
Data Summary				Orig	inal Data				Trans	formed	l Data	
Sample Code		Count	Mean	Minimum	Maximum	s	D	Mear	n Minimun	ı Ma	ximum	SD
14886-001		4	85.15	70.8	95.2	10	0.3825					
14886-002		4	86.4	80	98.2	8.	.09114					
Data Detail												
Sample Code		Rep 1	Rep 2	Rep 3	Rep 4	₹ер :	5 Re	p 6	Rep 7 Rep	8	Rep 9	Rep 10
14886-001		85.4	70.8	95.2	89.2							
14886-002		82.8	98.2	84.6	80							
Graphics												
100-]	_		ı				157		1			
	Į		Ţ						!			6
50-	Ĭ		I				10-				۰/	
<u> </u>	i					뒒	5-		į			1
Mean Cystocarps						Centered Untransformed	- -		/	0		
<u>a</u>						2 5	1		هـ لا			
∑] 40-						_	:					
							-5-		<i>)</i>			
							}	^/				
["]							-10-					
_ ;									į			
0 1	14886-001	1	14586-0	122			-15-	-1.0	-0.5 0.0	0.5	1.0	1.5
		Sample Co	ie						Rankits			

SALTWATER ASSAYS

A. bahia, A. punctulata, C. parvula

STUDY: 1486	LOCATION: New	/ Bedford Harbor			
				<u>.</u>	
CHEMISTRY 14826	Lab Salt Control	-001	-002	-003	004
AMMONIA	-027	-004	-005	-006	
AS RECEIVED WATER QUALITIES	Lab Salt Control	-001	-002	-003	-004
SALINITY (ppt)	30	30	30	30	
pH (SU)	7.88	7.60	7.91	7.85	
TRC (mg/L)	20.05	20:05	20.05	20.05	
DO (mg/L)	6.9	8.3	8.7	8.7	
S/C (µmhos/cm)	39000	36400	35100	35400	
WQ STATION USED	ı		١	1	
INITIALS	SJ	57	SJ	SJ	
A L-L:- CALINITY					
A. bahia SALINITY ADJUSTMENT RECORD	Lab Salt Control	-001	-002	-003	-004
SAMPLE (mLs)					
SEA SALT (g)					
DATE:					
TIME:					
INITIALS:					

Sample ID	ESI Cube ID
-001	-001
-002	-002
-003	-003
-004	-004

Americamysis bahia 7 DAY CHRONIC ASSAY NEW WATER QUALITIES

STUDY:	86	CLIEN BATTE				LOCA NEW E	TION: BEDFOI	RD			ONTRO		Y		
	* * *		NEW D	DISSOL	VED OX	YGEN	(mg/L)				NEW S	SALINIT	ΓΥ (ppt)		
CONC	REP	0	1	2	3	4	5	6	0	1	2	3	4	5	6
LAB	Α	7,0	6.5	6.7	6.6	6.6	G.5	G.O	29	30	19	29	30	30	31
-001	Α	6.3	6.5	7.0	6.9	5,0	6.6	6.4	29	30	29	29	30	29	२९
-002	А	7.1	6.5	6.9	6.8	5.4	6.2	60	29	29	29	29	19	79	29
-003	Α	7,0	6.01	6.8	6.8	(g. l	6.6	6.4	29	٦9	29	29	31	29	29
-004	А														
			NEV	V pH (S	U)					N	EW TEN	MPERA	TURE (°C)	
CONC	REP	0	1	2	3	4	5	6	0	1	2	3	4	_5	6
LAB	А	7.73	7.81	7.94	7.95	7,85	7.95	7.78	25	25	75	25	25	25	25
-001	А	7.22	7.51	7,39	7.58	7,59	7.68	7,55	35	25	え き	25	25	35	35
-002	А	7.48	7.60	7.51	7.50	7.37	7.35	724	እs	25	ጋዳ	25	35	25	35
-003	Α	7,47	7.65	7,63	7.62	754	7,56	7,44	25	36	15	25	25	35	75
-004	A								35						
INC TEM	/P:	25	25	25	25	72	35	ጋጉ	1 N.S. (3						
DATE:		8/17	8118	8/19	8/20	ዌ/ እ	8/213,	8123							
TIME:		1320	1100	1055	1520	1150	1200	1740							
INIT:		m_	m	W.	55	<u>ы</u>	m	ių_				r Piv			

			ER QUALITY EW WATER			· · · · · · · · · · · · · · · · · · ·		
	0	1	2	3	4	5	6	7
Water Quality Station #	V//X///	3)	2		J	1	
Initials		W	u,	SJ	-41	u	٧	
Date	8/17	8118	8/19	8/20	821	8117	823	

Americamysis bahia 7 DAY CHRONIC ASSAY SAMPLE USE RECORD

-			OAIIII		SE RECURL	<u>,</u>			Į			
STUDY: 1489	\$ 6	CLIENT: BAT	TELLE	- New	v Bedford							
SPECIES: A. bah	ia		TEST:	chror	nic renewal	1						
	Day: 0	_	Day: 1			Day:	2					
Sample	Volume Used (mL)	ESI Cube ID	Volu Used		ESI Cube ID	••	lume d (mL)	ESI Cube ID	Day	Date	Time	Init
Lab Control	1600	n/a	120	00	n/a	13	.00	n/a	0	8/17	1315	in
-001	j	-001	١		-001			-co 1	1	8118	1025	m
-002		-00J			-003			-007	2	819	1050	m
-003		-003	J		-003		V	-003	3	8/20	1415	SJ
-004									4	8/21	1140	hy
									5	877	1155	h
			1. 1. 1.						6		1375	in
	Day: 3		Day: 4			Day:	5	T				•
Sample	Volume Used (mL)	ESI Cube ID	Volu Used	ıme (mL)	ESI Cube ID	11	lume d (mL)	ESI Cube ID				
Lab Control	1200	n/a	120	0	n/a	iλ	ල	n/a				
-001	1	-00]	<u> </u>		-001)	-001				
-002		-002			-007			-00J				
-003		-∞3	1	/	-003	\		-003				
-004				:								
	Day: 6	ľ							•			
Sample	Volume Used (mL)	ESI Cube ID										
Lab Control	1200	n/a				-						
-001		-00)										
-002		~00]										
-603	7	-013										

Americamysis bahia 7 DAY CHRONIC ASSAY OLD WATER QUALITIES

STUDY:	,	CLIEN BATT				TION: BEDFO	ORD			CONTI PTON		ARY			
		OL	D SAL	INITY (ppt)						OL	D pH (SU)		
Conc	Rep	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Control	Α	30	30	30	٦9	29	30	31	7.64	7,74	7.78	7.76	7.67	7.75	7.73
-001	Α	30	30	30	30	30	30	30	7.56	7.68	7.74	7.73	7.87	7.79	7.64
-002	Α	29	29	29	29	29	29	28	7.57	7.63	7.77	7.73	7.80	7.67	7.57
-003	Α	29	29	29	29	29	29	28	7,64	7.68	7.79	7.7%	7.83	7.81	7.70
-004	Α														
		OLD 7	TEMPE	RATU	RE (°C))			٠.	A .					
Conc	Rep	1	2	3	4	5	6	7							
Control	Α	25	25	25	25	25	75	25				1.1.1			
-001	Α	25°	25	25	74	25	25	25							
-002	Α	25	25	25	วร	75	25	Z 5	, A 47 J. 47	7. 1 2. 1 2. 1					
-003	A	25	スゔ	25	25	25	25	2 5							
-004	Α														
INC TEMP) <u>:</u>	25	25	25	วร	25	25	25		-¥ .5*					
DATE:		8/18	8/19	8/20	ઉ/ ፯\	8/33	803	824							
TIME:		1000	1630	1350	1110	1135	1200	1340					Atria A		
INITIALS:		m	щ	ಽ೮	W.	m	m	CP							147 - 144 15 - 1

GENERAL NOTES - for additional information refer to SOP #1411 or EPA manual 600/4-91/003

•Test vessels will be 250 mL glass beakers containing a minimum of 150 mL of solution

•8 replicates per site with 5 organisms each

•Test Temperature: 26±1°C

•Salinity: 25 ±2ppt

•Dissolved Oxygen: >4.3 mg/L

•Photoperiod will be 16 hours light and 8 hours dark.

•Passing criteria require ≥80% survival and average dry weight of ≥0.20 mg/organism in the control vessels.

			ER QUALITY OLD WATER				. 	
	0	1	2	3	4	5	6	7
Water Quality Station #		1		2	΄λ	<u> 3</u>	7	2
Initials		l w	in	SJ	W	w	س	CP
Date	8/17	4118	8/19	8/20	8/3.1	8.13	843	8 24

Americamysis bahia 7 DAY CHRONIC ASSAY SURVIVAL & OLD WATER QUALITIES

STUDY:	25	CLIEN Battel					TION: BEDF		,		CONT PTON		ARY		ANISM H/LOT	
				NUMBI	ER OF	SURV	IVORS					ISSOL	.VED C	XYGE	N (mg/	L)
SAMPLE	Rep	0	1	2	3	4	5	6	7	1	2	3	4	5	6	7
	Α	5	5	5	5	5	5		5	6.1	6,2	6.0	6.0	5.9		6.3
	В	5	5	5	5	5	5		5	6.0	6.2	6.0	5.7	5.9		63
	С	5	5	6	5	5	5		5	6.0	5.9	5.7	5.7	5.8		6.3
Lab	D	5	5	5	5	5	ษ		5	6,0	6.0	5.7	5.7	5.9		G. 2
Control	E	5	5	5	5	5	5		5	6.1	6.1	5.9	5.7	5.8		6.2
	F	5	5	5_	5_	5	5		5	6.2	6.0	5.4	5.3	6.0		6.1
	G	5	5	5_	5	5	5		5	6.0	5,8	5.4	5.3	5.0		6.1
	Н	5	5	S	5	5	5		5	6.0	5.9	55	5.6	5.1		6.1
	Α	5	5	5	5	5	5		5	6.3	6.0	6.0	6.1	6.1		6.0
	_B	5	5	<u>র্</u>	5	5	5		5	6.4	6.1	6,0	ا،ها	6.0		6.1
	C	5	5	5_	5	5	5		5	6.1	6.1	le.1	6.1	6.0		6.0
-001	D	5	5	5	5	5	5		5	6.2	60	6.1	6,1	6.1		60
	E	5	5	5_	5	5	5		5	6.4	60	6,0	6.1	6.2		6.0
	F	5	5	5_		5	5		5	6.3	6.1	6.0	6.1	60		6.0
	G	0	5	5	5	5	5		5	4.3	6,0	6.1	10.1	6.1		5.9
	Н	5	5	5	5	5	5		5	6.3	6.0	6.0	6.1	6.0		5.9
i (Α	5	5	5	5	5	5		5	6,2	5.9	6.0	6.0	4.0		5.6
	В	り	ч.	4	식	2	4		ч	6.0	60	6.0	10.0	6.0		5,8
	С	5	5	5_	5	5	5		5	6.0		6,0	10.1	6.0		5,5
-002	D	5	5	5	5	5_	5		5_	6.0	5.9	6.1	6.1	60		5,3
]	E	5	5	5	5	5	5		5	6.0	6.0	6.0	6.0	60		5,5
	F	5	5	5	5	5	J J		5	6.1	59	6.0	Q.0	60		5.1
	G	5	5	5	5	5	5		5	6.0	5.9	6.0	10.0	6.0		5,3
	H	り	5	5	5	5	5		5	6.0	5,9	6.0	5.9	6.0		5.]
INC TEMP:		25	25	25	25	25	25		र्३इ							
DATE:		8/29	9/30		9/1		93		1/5							
TIME:			1085		1145	1230	1340		0915							
INITIALS:		C	6	90	96	yr!	CP		~		The second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second			A Property of the Arts of the		And the second s

Americamysis bahia 7 DAY CHRONIC ASSAY SURVIVAL & OLD WATER QUALITIES

study: <i>1492</i>	25	CLIEN Battel				LOCA	TION: BEDF				CONT	ROL: ESTU	ARY		ANISM H/LOT	
				NUMBI	ER OF	SURV	IVORS				OLD [DISSOL	VED C	XYGE	N (mg/	L)
SAMPLE	Rep	0	1	2	3	4	5	6	7	1	2	3	4	5	6	7
	Α	5	5	5	5	5	5		5	60	 	5.7	5.7	5.8		5.8
	В	5	5	5	5	5	5		5	5,8	5.6	55	5.6	5.8		5.4
	С	5	5	5	5	5	5		5		1	5.3	5.4	5.5		515
-003	D	5	5	5	5	5)	5		5	5.8		5,3	5.4	55		\$,7
	E	5	5	5	5	5	3		5	5.9	54	5.4	5.4	5.3		5.6
	F	5	5	5	5	5	5		5	5.8		5,4	 ` 	50		5.6
	G	5	5	5	5	5	5		5	કઃઇ	5.6	5.4	5.4	5, i		5,5
	Н	5	5	5	5	5	5		5	5.6	5.6	5.3	54	5,3		5,5
	A B															
	O															
	D															
	G											The state of the s			min by a basic to the con- money of the party of the con- person of the con- person of the con- person of the con- person of the con- person of the con- person of the con- transport of the con- tran	
											THE REPORT OF THE PARTY AND ADDRESS OF THE PAR	STATE OF THE PARTY				
													The state of the s			
												The body and the second of the	Chicago de Caracia de			
INC TEMP:		25	<u>৯</u>	25	25	Z 5			አ <i>ና</i>							
DATE:		8/29		8/31	9/1		25 93		1/5		The state of the s					
TIME:		140	1005	1100	1145	1230			બાર્ડ		Total Control of the					
INITIALS:		2G	w	60	9G	in	<u>اعوں</u> ح		<u> </u>						The state of the s	

Americamysis bahia 7 DAY CHRONIC ASSAY ORGANISM WEIGHTS

CLIENT: BATT	ELLE - NE	W BEDFORD		TEST DATES	:			
STUDY#: /	4925	7		SPECIES: A.	bahia			
CONC	REP	TARE WEIGHT (g)~9	SHRIMP + FOIL (g)	NET WEIGHT (mg)	# SHRIMP DAY 0	MEAN WEIGHT (mg) DAY 0	# SHRIMP DAY 7	MEAN WEIGHT (mg) DAY 7
	Α	310.13	211.43					
	В	207,17	208.56					
	С	210.97	212.45					
/a/p	D	207.91	209.15					
(31	Е	208.84	210.43					
ĺ	F	208.66	210.19				1	
	G	210.34	211.73					
	Н	208.09	209.52					
	Α	210,46	212.04					
	В	208.09	209.50					
	С	212114	213.55					
-31	D	708.74	210.01					
-∞,	Е	210,07	211.95					
	F	208,39	210.29					
	G	20777	209.50			_		
	Н	207.75	209.32					
	Α	ないふて	212.72					
	В	209,63	211.07					
_	С	209,56	211.18					
-003	D	210,23	211.86					
	Е	207,03						
	F	210,23	211.95					
	G	709.01	210,41					
	Н	208.43	210.52			-		
DATE		4/1/04	9/6/06					
TIME		1310	1015					
INITIALS		M	દક			•		

Americamysis bahia 7 DAY CHRONIC ASSAY ORGANISM WEIGHTS

CLIENT: BATT	ELLE - NE	W BEDFORD	*	TEST DATES				
STUDY#: /	4925	į		SPECIES: A.	bahla			
CONC	REP	TARE WEIGHT (g)	SHRIMP + FOIL (g)	NET WEIGHT (mg)	# SHRIMP DAY 0	MEAN WEIGHT (mg) DAY 0	# SHRIMP DAY 7	MEAN WEIGHT (mg) DAY 7
	Α	209.94	211.95					
	В	708.38	210.15					
	O	210,30	212.08					
0	ם	209,20	211.28					
_G03	E	209.15	211.34					
	뚜	208,41	210.27	_				
	G	210.23	212.48					
	Н	208.38	210,36					
	Α							
	В							
	С							
	D							
	Е			<u>,</u>				
	F				<u> </u>			
	G							
	Н					<u> </u>		
	Α							
	В					_		
	С							
	D							
	E							
i :	F							
	G							
	H							
DATE		91106	9/6/06					
TIME		१३१०	1015					
INITIALS		w	EG-				<u></u>	

CETIS Test Summary

Report Date: Link: 08 Sep-06 10:03 AM

12-2827-6446

Mysidopsis 7-	d Survival, Gro	wth and F	ecundity Te	st					EnviroSystems, Inc.
Test No: Start Date: Ending Date: Setup Date:	18-0274-9001 29 Aug-06 02:1 05 Sep-06 09:1 29 Aug-06 02:1	5 AM	Test Type: Protocol: Dil Water: Brine:	Growth-Sur EPA/821/R- Not Applica Not Applica	02-014 (200 ble	2)	Durat Speci Sourc	es: M	d 19h lysidopsis bahía RO - Aquatic Research Organisms, N
Sample No: Sample Date: Receive Date: Sample Age:	04-2857-7808 29 Aug-06 11:0 29 Aug-06 11:0 3h		Material: Code: Source: Station:	14925-000	itoring Samp d Harbor Dro ab Control		Client Proje		attelle Labs cological Risk Assessment
-	09-8741-8251 28 Aug-06 09:3 26 Aug-06 04:0 29h		Material: Code: Source: Station:	14925-001	nitoring Samp d Harbor Dr 01		Clieni Proje rin		attelle Labs cological Risk Assessment
Sample No: Sample Date: Receive Date: Sample Age:	11-7877-8283 28 Aug-06 09:5 28 Aug-06 04:0 28h		Material: Code: Source: Station:	14925-002	nitoring Samp rd Harbor Dr 02		Clien Proje rin		attelle Labs cological Risk Assessment
	09-3982-0403 28 Aug-06 10:1 28 Aug-06 04:0 28h		Material: Code: Source: Station:	14925-003	nitoring Samp nd Harbor Dro 03		Clieni Proje rin		attelle Labs cological Risk Assessment
7d Proportion	Survived Sumr	nary							
Sample Code 14925-000		Reps 8	Mean 1.00000	Minimum 1.00000	Maximum 1.00000	0.00000	SD 0.0000		00%
14925-001 14925-002 14925-003		8 8 8	1.00000 0.97500 1.00000	1.00000 0.80000 1.00000	1.00000 1.00000 1.00000	0.00000 0.02500 0.00000	0.00000 0.0707 0.00000	7.2	00% 25% 00%
	mass-mg Sumn								
Sample Code 14925-000 14925-001		Reps 8 8	Mean 0.28375 0.31875	Minimum 0.24800 0.25400	Maximum 0.31800 0.38000	0.00816 0.01620	SD 0.02309 0.04582		/ 14% .37%
14925-002 14925-003		8 8	0.32525 0.39825	0.28000 0.35400	0.37800 0.45200	0.01336 0.01284	0.03780	11	.62% 12%
7d Proportion	Survived Detai	ı					_		
Sample Code 14925-000 14925-001		Rep 1 1.00000 1.00000	Rep 2 1.00000 1.00000	Rep 3 1.00000 1.00000	Rep 4 1.00000 1.00000	Rep 5 1.00000 1.00000	1.00000	Rep 7 1.00000 1.00000	
14925-002 14925-003		1.00000 1.00000	0.80000 1.00000	1.00000 1.00000	1.00000 1.00000	1.00000 1.00000		1.00000 1.00000	
Mean Dry Bio Sample Code	mass-mg Detail	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
14925-000 14925-001		0.26000 0.31600	0.27800 0.28200	0.29600 0.28200	0.24800 0.25400	0.31800 0.37600	0.30600 0.38000	0.27800 0.34600	0.28600 0.31400
14925-002 14925-003		0.29000	0.28800 0.35400	0.32400 0.35600	0.32600 0.41600	0.37200 0.43800		0,28000 0.45200	

Comparisons: Report Date:

Page 2 of 5

08 Sep-06 10:03 AM

Analysis:

06-6541-4524

Mysidopsis 7-	.d Su	vival, Gro	wth and F	ecundity Te	st							E	nviroS	ystems, inc.
Test No: Start Date: Ending Date: Setup Date:	29 A 05 S	274-9001 Jug-06 02:1 Jep-06 09:1 Jug-06 02:1	5 AM	Test Type: Protocol: Dil Water: Brine:	Growth-Surv EPA/821/R-I Not Applicat Not Applicat	02-014 (200) ole	2)			cies: M	19h /sidopsis RO - Aqua		search (Organisms, N
Endpoint			Anal	ysis Type		Sample l			ntrol Link	Date An			ersion	
Mean Dry Bion	nass-ı	ng	Com	parison		12-2827-	644	16 12-	2827-6446	08 Sep-	06 10:02	AM C	ETISv1	.026
Method			Alt 1	H Data T	ransform	Z	ı	NOEL	LOEL	Toxic l	Jnits	ChV		MSDp
Equal Variance	e t		C > -	r Untran	sformed					N/A				
ANOVA Assu	mptic	ns												
Attribute		Test			Statistic	Critical		P Le	vel	Decision	(0.01)			
Variances		Variance	Ratio		3.93797	8.88539)	0.09	102	Equal Var	iances			
Distribution		Shapiro-V	Vilk W		0.97045	0.84420)	0.811	156	Normal Di	istribution	1		
ANOVA Table	:- 				 									
Source		Sum of S	quares	Mean Squa	re DF	F Statis	tic	PLe	vel	Decision	(0.05)			
Between		0.0049	·········	0.0049	1	3.72		0.074	419	Non-Signi		ect		
Error		0.018426	9	0.0013162	14									
Total		0.023326	89	0.0062162	15									
Group Compa	arisor	ns												· ·
Sample	VS	Sample		Statistic	Critical	P Level	l	MSD	ı	Decision	(0.05)			
14925-000		14925-001	1	-1,9295	1.76131	0.9629		0.03	195	Non-Signi	ficant Eff	ect		
Data Summar	у				Origi	nal Data					Transfo	rmed	Data	
Sample Code			Count	Mean	Minimum	Maximun	n	SD	Mea	n M	inimum	Max	imum	SD
14925-000			8	0.28375	0.24800	0.31800		0.02309	9					
14925-001			8	0.31875	0.25400	0.38000		0.04582	2					
Data Detail														
Sample Code			Rep 1	Rep 2	Rep 3	Rep 4	Re	p 5	Rep 6	Rep 7	Rep 8	F	Rep 9	Rep 10
14925-000			0.26000	0.27800	0.29600			1800	0.30600	0.27800	0.2860			•
14925-001			0.31600	0.28200	0.28200	0.25400	0.3	7600	0.38000	0.34600	0.3140	00		
Graphics 0.4 6m-ssemoia Ado 0.2 0.2- 0.1-		14925-000	······································	14925-	001		Centered	0.06 0.06 0.06 -0.06 -0.06	0	,8 O	0.0 0.5	5 1.0	0 0	 2.0
		1,121 ⁻⁰⁰⁰	Sample C								ankits			_
1			sample C	.wc						К	acirci (3			

Comparisons: Report Date:

Page 5 of 5 08 Sep-06 10:03 AM

EnviroSystems, Inc.

Analysis:

15-3238-8272

Mysidopsis 7-d Survival, Growth and Fecundity Test

6d 19h Duration:

Test No: 18-0274-9001 Start Date:

29 Aug-06 02:10 PM

Test Type: Growth-Survival (7d)

Mysidopsis bahia Species:

Ending Date: 05 Sep-06 09:15 AM

EPA/821/R-02-014 (2002) Protocol: Dil Water: Not Applicable

29 Aug-06 02:10 PM Setup Date:

Brine: Not Applicable

ARO - Aquatic Research Organisms, N Source:

Endpoint	Analysis	Туре	Sample L	ink	Control Link	Date Analyzed	j	Version
Mean Dry Biomass-mg	Compari	son	12-2827-6	446	12-2827-6446	08 Sep-06 10:0)2 AM	CETISv1.026
Method	Alt H	Data Transform	Z	NOE	L LOEL	Toxic Units	ChV	MSDp

Equal Variance t C > T Untransformed N/A	Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
	Equal Variance t	C > T					N/A		

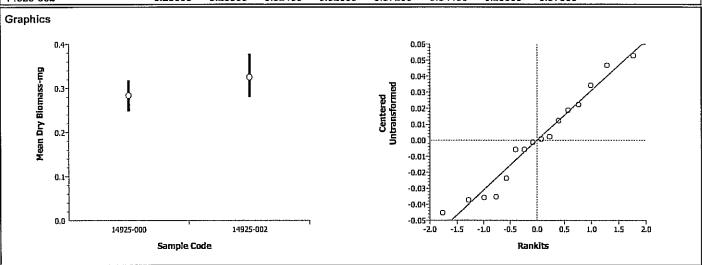
ANOVA Assum	ptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	2.67958	8.88539	0.21681	Equal Variances	
Distribution	Shapiro-Wilk W	0.95401	0.84420	0.53194	Normal Distribution	

ANOVA Table							
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0068893	0.0068893	1	7.02	0.01902	Significant Effect	
Error	0.0137310	80860000	14				
Total	0.02062032	0.0078701	15	_			

Group Comparisons												
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)					
14925-000		14925-002	-2.6503	1.76131	0.9905	0.02758	Non-Significant Effect					

Data Summary		Original Data Transformed Data					rmed Data	l		
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
14925-000	8	0.28375	0.24800	0.31800	0.02309					
14925-002	8	0.32525	0.28000	0.37800	0.03780					

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
14925-000	0.26000	0.27800	0.29600	0.24800	0.31800	0.30600	0.27800	0,28600		
14925-002	0.29000	0.28800	0.32400	0.32600	0.37200	0.34400	0.28000	0.37800		



Comparisons: Report Date:

Page 3 of 5 08 Sep-06 10:03 AM

07-7594-7432

Analysis:

CETIS Analysis Detail	
Mysidopsis 7-d Survival, Growth and Fe	CI

Test No:

cundity Test				Enviros	Systems	i, Inc.

Test Type: Growth-Survival (7d) 18-0274-9001 Duration: 6d 19h 29 Aug-06 02:10 PM Protocol: EPA/821/R-02-014 (2002) Species: Mysidopsis bahia

Start Date: Ending Date: 05 Sep-06 09:15 AM Dil Water: Not Applicable ARO - Aquatic Research Organisms, N Source:

29 Aug-06 02:10 PM Brine: Not Applicable Setup Date:

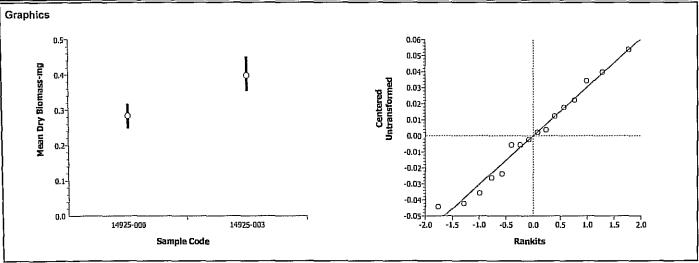
Endpoint	An	alysis]	Туре	_	Sample Lir	nk Control Link		Date Analyzed		Version
Mean Dry Bioma	iss-mg Co	mparisc	on		12 -2 827-64	46 12	2827-6446	08 Sep-06 10:02	2 AM	CETISv1.026
Method	Alt	Н	Data Trans	form	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	. C:	> T	Untransform	ned				N/A		
ANOVA Assum	ptions									
Attribute	Test		Stati	stic	Critical	P Le	vel	Decision(0.01)		
Variances	Variance Ratio		2.47	492	8.88539	0.25	484	Equal Variances		
Distribution	Shapiro-Wilk W		0.96	B13	0.84420	0.77	274	Normal Distribution	n	
ANOVA Table										
Source	Sum of Squares	Mea	n Square	DF	F Statistic	: PLe	vel	Decision(0.05)		

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0524410	0.0524410	1	56.62	0.00000.0	Significant Effect	
Error	0.0129673	0.0009262	14	_			
Total	0.06540836	0.0533673	15				

Group Comparisons Sample Statistic Critical P Level MSD Decision(0.05) Sample -7.5244 1.76131 1.0000 0.02680 14925-000 14925-003 Non-Significant Effect

Data Summary		Original Data					rmed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
14925-000	8	0.28375	0.24800	0.31800	0.02309					
14925-003	8	0.39825	0.35400	0.45200	0.03632					

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
14925-000	0.26000	0.27800	0.29600	0.24800	0.31800	0.30600	0.27800	0.28600		
14925-003	0.40200	0.35400	0.35600	0.41600	0.43800	0.37200	0,45200	0.39600		



Comparisons: Report Date:

Page 4 of 5 08 Sep-06 10:03 AM

Analysis:

10-5782-5786

rival, Growth and Fecundity Test

EnviroSystems, Inc.

Test No: Start Date:

18-0274-9001

29 Aug-06 02:10 PM

Test Type: Growth-Survival (7d)

Protocol: EPA/821/R-02-014 (2002) Duration: 6d 19h

Species: Mysidopsis bahia

Ending Date: Setup Date:

05 Sep-06 09:15 AM 29 Aug-06 02:10 PM

Brine:

Dil Water: Not Applicable Not Applicable

Source:

ARO - Aquatic Research Organisms, N

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2827-6446	12-2827-6446	08 Sep-06 10:02 AM	CETISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

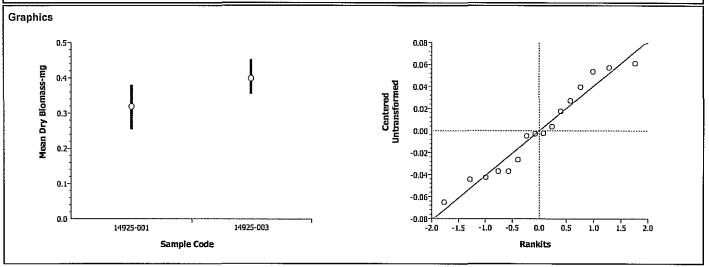
ANOVA Assumptions Attribute Statistic Critical Decision(0.01) Test P Level Variances Variance Ratio 1.59115 8.88539 0.55492 **Equal Variances** Distribution Shapiro-Wilk W 0.94436 0.84420 0.39248 Normal Distribution

ANOVA Table							
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0252811	0.0252811	1	14.79	0.00178	Significant Effect	
Error	0.0239309	0.0017093	14				
Total	0.04921201	0.0269905	15				

Group Comparisons										
Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)			
14925-001		14925-003	-3.8458	1.76131	0.9991	0.03641	Non-Significant Effect			

Data Summary	Original Data				Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
14925-001	8	0.31875	0.25400	0.38000	0.04582				
14925-003	8	0.39825	0.35400	0.45200	0.03632				

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
14925-001	0.31600	0.28200	0.28200	0.25400	0.37600	0.38000	0.34600	0.31400		
14925-003	0.40200	0.35400	0.35600	0.41600	0.43800	0.37200	0.45200	0.39600		



Comparisons: Report Date:

Page 1 of 5 08 Sep-06 10:03 AM 05-0057-9126

Analysis: Mysidopsis 7-d Survival, Growth and Fecundity Test

EnviroSystems, Inc.

Test No:

18-0274-9001

Test Type: Growth-Survival (7d)

Duration: 6d 19h

Start Date: 29 Aug-06 02:10 PM Ending Date: 05 Sep-06 09:15 AM Protocol: EPA/821/R-02-014 (2002)

Species: Mysidopsis bahia

Setup Date:

29 Aug-06 02:10 PM

Brine:

Dil Water: Not Applicable Not Applicable

Source: ARO - Aquatic Research Organisms, N

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2827-6446	12-2827-6446	08 Sep-06 10:02 AM	CETISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	1.46962	8.88539	0.62410	Equal Variances	
Distribution	Shapiro-Wilk W	0.92760	0.84420	0.22060	Normal Distribution	

ANOVA Table

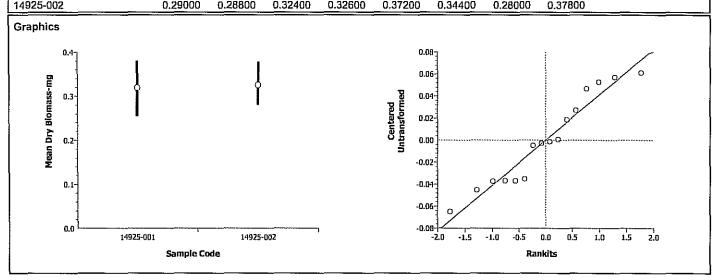
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0001691	0.0001691	1	0.10	0.76144	Non-Significant Effect	
Error	0.0246946	0.0017639	14				
Total	0.02486365	0.001933	15				

Group Comparisons

Sample v	vs S	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
14925-001	1	14925-002	-0.3096	1.76131	0.6193	0.03699	Non-Significant Effect

Data Summary		Original Data				Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
14925-001	8	0.31875	0.25400	0.38000	0.04582					
14925-002	8	0.32525	0.28000	0.37800	0.03780					

Data Detail										<u>-</u> : _
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
14925-001	0.31600	0.28200	0.28200	0.25400	0.37600	0.38000	0.34600	0.31400		
14025 002	0.0000	U 288UU	0.33400	บ ววยกก	0.37300	0.34400	ע מפטעע	A 270AA		





Aquatic Research Organisms

DATA SHEET

1.	Organism i	istory
	Species:	AMERICAMYSIS hahir
•	Source:	Lab reared Hatchery reared Field collected
		Hatch date 8-21-06 Receipt date
		Lot number 08 2106 MS Strain
		Brood Origination Florida
П.	Water Qua	lity
		Temperature 25 °C Salinity = 30 ppt DO
		pH7.8 Hardness ppm
III.	Culture Co	nditions
		System: \\Zecirec \.
		Diet: Flake Food Phytoplankton Trout Chow
		Brine Shrimp Rotifers Other Every Shrimp De 1
		Prophylactic Treatments:
		Comments:
		· · · · · · · · · · · · · · · · · · ·
IV.	Shipping I	nformation
٠		Client: EST # of Organisms: / (O)
		Carrier: Date Shipped: 8-28-06
		Mark Trocerograto
Bio	logist:	Mark Boxesquet

1 - 800 - 927 - 1650

Arbacia punctulata Chronic Fertilization Assay Water Quality and Gamete Preparation Data

STUDY: 14925	CLIENT: BATTELLE	LOCATION: New Bedford		DATE: 8/29/06 INITIALS: BB					
SALINITY ADJUSTMENT		o _mL -001 + _		drel DR					
SALINITY ADJUSTMENT RECORD: 500 mL -002 + 7.8 g SALT 8/28/06 BB SALINITY ADJUSTMENT RECORD: 500 mL -003 + 6.7 g SALT									
SALINITY ADJUSTED SAMPLE	D.O. (mg/L)	pH (SU)	SPEC COND (µmhos)	TEMP (°C)	SALINITY (ppt)				
Lab Control	7.3	8.01	47480	70	31				
-001	8.6	7.74	46270	20	30				
-002	8.3	7,84	45430	20	30				
-003	8.3	7.86	36960	20	29				

METERS USED

DO meter # 19 DO probe # 8 pH meter # 470 pH probe # 48 S/C meter # 130c S/C probe # (S£30c SALINITY meter # 45£30c

DATE & INITIALS FOR GAMETE PREPARATION: 8/29/06 BB SPERM DILUTIONS:

HEMACYTOMETER COUNT, E: SPERM CONCENTRATIONS:

 $\frac{116}{\text{SOLUTION E } \times 10^4} = \text{SPM SOLUTION E} = \frac{1.16 \times 10^6}{1.16 \times 10^7} \times 10^6$ $\frac{\text{SOLUTION E } \times 40 = \text{SOLUTION A} = \frac{4.64 \times 10^7}{1.00 \times 10^7} \times 10^6}{\text{SOLUTION E } \times 20 = \text{SOLUTION B} = \frac{2.32 \times 10^7}{2.50 \times 10^6} \times 10^6} \times 10^6$ $\text{SOLUTION E } \times 5 = \text{SOLUTION C} = \frac{5.50 \times 10^6}{1.00 \times 10^6} \times 10^6$

FINAL COUNTS:

FINAL SPERM COUNT: 4.64×107
FINAL EGG COUNT: 2800
TEST TIMES:

SPERM COLLECTED: 11 20
EGGS COLLECTED: 11 20
SPERM ADDED: 11 40
EGGS ADDED: 13 00

See ESI SOP #1412 for additional information

Arbacia punctulata Chronic Fertilization Assay

SAMPLE USE RECORD

STUDY: 1492	.5	CLIENT: Battelle - New Bedford								
SPECIES: A. punctu	SPECIES: A. punctulata									
	Day: 0									
SAMPLE	Volume l	Jsed (mL)	ESI Cube ID							
Lab Control	Si	o O	N/A							
-001	1		-001							
-002			-002							
-003	<u> </u>	_	-003							
INITIALS:	BB	1								
TIME:	183	o .								
DATE:	8/2	19/06								

FERTILIZATION COUNTS

STUDY 14925	CLIENT BATTELLE	LOCATION New Bedford	,	DATE 8/29/06 INITIALS CONS
		REPLIC/	ATE VIAL	
	1	_2_	3	4
SAMPLE	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL
Lab Control	100/111	100/112	100/113	100/107
-001	100 (11)	106/106	100/115	100/108
-002	100/110	100/117	100/123	100/120
-003	100/120	100/119	100 /11/	100/112

CETIS Test Summary

Report Date:

29 Aug-06 3:33 PM

Link:

12-0368-6234

Arbacia Sperm	n Cell Fertilization Test							EnviroSystems, Inc.
Test No: Start Date: Ending Date: Setup Date:	08-2788-9482 29 Aug-06 11:40 AM 29 Aug-06 01:00 PM 29 Aug-06 11:40 AM	Test Type: Protocol: Dil Water: Brine:	Fertilization EPA/821/R-02-014 (2002) Not Applicable Generic commercial salts			Duration: Species: Source:	80m Arbacia punctu In-House Cultu	
=	04-2857-7808 29 Aug-06 11:00 AM 29 Aug-06 11:00 AM 40m	Material: Code: Source: Station:	Marine Monitoring Sample 14925-000 New Bedford Harbor Dredge Monitorin WQ-TOX-Lab Control			Client: Project:	Battelle Labs Ecological Risk	: Assessment
•	09-8741-8251 28 Aug-06 09:30 AM 26 Aug-06 04:00 PM 26h	Material: Code: Source: Station:	Marine Monitoring Sample 14925-001 New Bedford Harbor Dredge Monitorin WQ-TOX-001			Client: Project:	Battelle Labs Ecological Risk	: Assessment
•	11-7877-8283 28 Aug-06 09:50 AM 28 Aug-06 04:00 PM 26h	Material: Code: Source: Station:	Marine Monitoring Sample 14925-002 New Bedford Harbor Dredge Monitorin WQ-TOX-002			Client: Project:	Battelle Labs Ecological Risk	: Assessment
	09-3982-0403 28 Aug-06 10:15 AM 28 Aug-06 04:00 PM 25h	Material: Code: Source: Station:	Marine Monitoring Sample 14925-003 New Bedford Harbor Dredge Monitorin WQ-TOX-003		Client: Project:	Battelle Labs Ecological Risk	: Assessment	
Proportion Fe	rtilized Summary					"" 		
Sample Code 14925-000 14925-001 14925-002 14925-003	Reps 4 4 4 4	Mean 0.90332 0.90995 0.85253 0.86686	Minimum 0.88496 0.86957 0.81301 0.83333	Maximum 0.93458 0.94340 0.90909 0.90090	SE 0.01092 0.01604 0.02068 0.01747	SD 0.02183 0.03208 0.04137 0.03494	2.42% 3.53% 4.85% 4.03%	
Proportion Fe	rtilized Detail							
Sample Code 14925-000 14925-001 14925-002 14925-003	Rep 1 0.90090 0.90090 0.90909 0.83333	0.94340 0.85470	Rep 3 0.88496 0.86957 0.81301 0.90090	Rep 4 0.93458 0.92593 0.83333 0.89286				

CETIS Test Summary

Report Date: Link:

29 Aug-06 3:33 PM 12-0368-6234

Arbacia Sperm	Cell Fertilization Te	st					EnviroSystems, Inc.
Test No: Start Date: Ending Date: Setup Date:	08-2788-9482 29 Aug-06 11:40 AM 29 Aug-06 01:00 PM 29 Aug-06 11:40 AM	Test Type: Protocol: Dil Water: Brine:	Not Applica	-02-014 (2002	,	Duration: Species: Source:	80m Arbacia punctulata In-House Culture
Sample No: Sample Date: Receive Date: Sample Age:	04-2857-7808 29 Aug-06 11:00 AM 29 Aug-06 11:00 AM 40m	Material: Code: Source: Station:	Marine Monitoring Sample 14925-000 New Bedford Harbor Dredge Monitorin WQ-TOX-Lab Control			Client: Project:	Battelle Labs Ecological Risk Assessment
Receive Date:	nple No: 09-8741-8251 Material: Marine Monitoring Sam nple Date: 28 Aug-06 09:30 AM Code: 14925-001 seive Date: 26 Aug-06 04:00 PM Source: New Bedford Harbor Dr nple Age: 26h Station: WQ-TOX-001			rd Harbor Dred		Client: Project:	Battelle Labs Ecological Risk Assessment
1 '	11-7877-8283 28 Aug-06 09:50 AM 28 Aug-06 04:00 PM 26h	Material: Code: Source: Station:	Marine Monitoring Sample 14925-002 New Bedford Harbor Dredge Monitorin WQ-TOX-002		Client: Project:	Battelle Labs Ecological Risk Assessment	
1 .	09-3982-0403 28 Aug-06 10:15 AM 28 Aug-06 04:00 PM 25h	Material: Code: Source: Station:	Marine Monitoring Sample 14925-003 New Bedford Harbor Dredge Monitorin WQ-TOX-003			Client: Project:	Battelle Labs Ecological Risk Assessment
Proportion Fe	rtilized Summary		<u> </u>				
Sample Code 14925-000 14925-001 14925-002 14925-003	Reps 4 4 4 4	Meaπ 0.90332 0.90995 0.85253 0.86686	Minimum 0.88496 0.86957 0.81301 0.83333	Maximum 0.93458 0.94340 0.90909 0.90090	SE 0.01092 0.01604 0.02068 0.01747	SD 0.02183 0.03208 0.04137 0.03494	CV 2.42% 3.53% 4.85% 4.03%
Proportion Fe	rtilized Detail						
Sample Code 14925-000 14925-001 14925-002 14925-003	Rep 0.900 0.900 0.900 0.833	090 0.89286 090 0.94340 009 0.85470	Rep 3 0.88496 0.86957 0.81301 0.90090	Rep 4 0.93458 0.92593 0.83333 0.89286			

Comparisons:

Page 2 of 5 29 Aug-06 3:35 PM 03-9702-6395

Report Date: Analysis:

								marysis:		03-9702-038
Arbacia Sperm	n Cell Fertil	ization Test							Enviros	iystems, Inc.
Test No: Start Date: Ending Date: Setup Date:	08-2788-94 29 Aug-06 29 Aug-06 29 Aug-06	11:40 AM 01:00 PM	Test Type: Protocol: Dil Water: Brine:	Not Applica	-02-014 (2002	•	Duration: Species: Source:	80m Arbacia pur In-House C		
Endpoint			ysis Type		Sample L			e Analyzed	Version	
Proportion Ferti	ilized	Com	parison		12-0368-6	234 12-036	8-6234 29 /	Aug-06 3:33 P	M CETISV	1.026
<u>Method</u> Equal Variance	e t	Alt I		ransform or (Corrected	<u>z</u>	NOEL	LOEL To N//	xic Units A	ChV	MSDp
ANOVA Assun	nptions									
Attribute	Test			Statistic	Critical	P Level	Decis	sion(0.01)		
Variances	Varia	ince Ratio		2.08552	47.46723	0.56148		Variances		
Distribution	Shap	oiro-Wilk W		0.94130	0.74935	0.58653	Norm	al Distribution		
ANOVA Table										
Source	Sum	of Squares	Mean Squa	re DF	F Statist	ic P Level	Decis	sion(0.05)		
Between	0.00	03485	0.0003485	1	0.15	0.71161	Non-	Significant Effe	ect	
Error	0.01	39081	0.0023180	6						
Total	0.01	425651	0.0026665	7						
Group Compa	risons									
Sample	vs Samp	ole	Statistic	Critical	P Level	MSD	Decis	sion(0.05)		
14925-000	1492		-0.3877	1.94318	0.6442	0.06615		Significant Effe	ect .	
Data Summary	v			Oria	inal Data			Transfo	rmed Data	
Sample Code	-	Count	Mean	Minimum	Maximum	SD SD	Mean	Minimum	Maximum	SD
14925-000	,	4	0.90332	0.88496	0.93458	0.02183	1.25619	1.22475	1.31215	0.03876
14925-001		4	0.90995	0.86957	0.94340	0.03208	1.26939	1.20129	1.33058	0.05598
Data Detail		***************************************						- 		
Sample Code		Rep 1	Rep 2	Rep 3	Rep 4	Rep 5 Re	p6 Rep	7 Rep 8	Rep 9	Rep 10
14925-000		0.90090	0.89286	0.88496	0.93458					
14925-001		0.90090	0.94340	0.86957	0.92593					
Graphics					,					
1.03						£-80.0				
0.9	í	5	¢			1		1		/
	·					0.06		1	0 /	^ 0
žiji d						_ = 0.04		1		
5 0.7						Corr. Angle		1 /	9/	
<u>"</u>						E E				
4.0 H						1101				_
aportion F						- [0.00 B				
# 1						-0.02	 9	- 10-		
Proportion F						-0.02-		- 		
3						-0.02-		0		
0.3						-0.02-				
0.3 0,2	- 447	E.000	14025			-0.02- -0.04- -0.05-		; 	1	<u>-</u>
0.3- 0.2- 0.1-	1492	5-000 Sample C	14925-	001		-0.02 -0.04 -0.05	-1.0 -0.3	; 	0.5 1.0	₁ 1.5

Comparisons:

Page 1 of 5

29 Aug-06 3:35 PM 02-2378-1815

Report Date: Analysis:

Arbacia Spern	n Cell	Fertilizati	on Test									Enviro	Systems, Inc.
Test No: Start Date: Ending Date: Setup Date:	29 A 29 A	.788-9482 .ug-06 11:4 .ug-06 01:0 .ug-06 11:4	10 PM	Test Type: Protocol: Dil Water: Brine:	Not Applica	-02-014 (2002			Dura Spec Soul		80m Arbacia pur In-House C		
Endpoint				ysis Type		Sample L		Contro			Analyzed	Version	
Proportion Fert	ilized		Com	parison		12-0368-6	234	12-036	8-6234	29 A	ug-06 3:33 P	M CETIS	1.026
Method Equal Variance			Alt F		ransform ar (Corrected	<u>Z</u>	NO	DEL	LOEL	Tox N/A		ChV	MSDp
	·		<u> </u>	711901	- (00)100(00		<u> </u>			1071			
ANOVA Assum	nptio												
Attribute		Test			Statistic	Critical		P Level			ion(0.01)		
Variances		Variance			2.48612	47.46723	<u> </u>	0.47414			Variances		
Distribution		Shapiro-V	Wilk W		0.89823	0.74935		0.26453		Norma	l Distribution		
ANOVA Table													
Source		Sum of S	Squares	Mean Squa	ire DF	F Statist	ic	P Level		Decis	ion(0.05)		
Between		0.011754	14	0.0117544	1	4.49		0.07844		Non-S	ignificant Effe	ect	
Error		0.015713	8	0.002619	6								
Total		0.027468	318	0.0143734	7								
Group Compa	rison	ıs											
Sample	vs	Sample		Statistic	Critical	P Level		MSD		Decis	ion(0.05)		
14925-000		14925-002	2	2.11854	1.94318	0.0392		0.07032			cant Effect		
Data Summar	v				Orio	inal Data	,				Transfo	rmed Data	
Sample Code	,		Count	Mean	Minimum	Maximum		D	Mean				en en
14925-000			4	0.90332	0.88496	0.93458		.02183	1.256		Minimum 1.22475	<u>Maximum</u> 1.31215	SD 0.03876
14925-002			4	0.85253	0.81301	0.90909		.04137	1.179		1.12362	1.26452	0.05670
													0.00112
Data Detail							_		_				
Sample Code			Rep 1	Rep 2	Rep 3		Rep	5 Re	p 6	Rep	Rep 8	Rep 9	Rep 10
14925-000			0.90090	0.89286	0.88496	0.93458							
14925-002	_		0.90909	0.85470	0.81301	0.83333							
Graphics													
1.03								F01.0					
0.9		Ō		ı				0.08-			1		0
B.0.8				¢				3			ŧ		/
胃 0.7							ㅠ쁨	0.06-			1	0 /	
							An	0.04-			1		
Proportion Fertilized						•	Centered Corr. Angle	0.02-			/		
DD 0.4							_	1				_	
0.3								0.00] -	 ***			· 	_
0.2-								-0.02-		/	0		
0.1								-0.04	0	/ "	1		
1 1]_			1		
0.01		14925-000		14925-	002			-0.0 5 0 -1.5	-1.0	-0.5	0.0 (),5 1.0	1.5
			Sample C	ode							Rankits		
L												··········	

Comparisons:

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29 Aug-06 3:35 PM

Report Date:

lysis Detail					·	Analysis:		09-5188-660
ell Fertilization Test							EnviroS	ystems, Inc.
3-2788-9482 9 Aug-06 11:40 AM 9 Aug-06 01:00 PM 9 Aug-06 11:40 AM	Test Type: Protocol: Dil Water: Brine:	EPA/821/R- Not Applicat	ole		Duration: Species: Source:	Arbacia pur		
Anai	ysis Type		Sample Li	nk Contro	Link Dat	te Analyzed	Version	
ed Com	parison		12-0368-62	12-0368	3-6234 29	Aug-06 3:33 P	M CETISv1	.026
			Z	NOEL L			ChV	MSDp
tions					•			
Test		Sta <u>tistic</u>	Critical	P Level	Deci	sion(0.01)		
Variance Ratio			47.46723	0.64619				
Shapiro-Wilk W		0.88182	0.74935	0.19074	Nогл	nal Distribution		
Sum of Squares	Mean Squa	reDF	F Statistic	P Level	Deci	sion(0.05)		
0.0064353	0.0064353	1	3.08	0.12996	Non-	Significant Effe	ect	
		6				•		
0.01898492	0.0085269							
ons								
Sample	Statistic	Critical	P Level	MSD	Deci	sion(0.05)		
14925-003	1.75406	1.94318	0.0650	0.06284	Non-	Significant Effe	ect	
····-	,	Origi	nal Data			Transfo	rmed Data	
Count	Mean	Minimum	Maximum	SD	Mean	<u>Minimum</u>	Maximum	SD
4	0.90332	0.88496	0.93458	0.02183	1.25619	1.22475	1.31215	0.03876
4	0.86686	0.83333	0.90090	0.03494	1,19947	1.15026	1.25055	0.05178
Rep 1	Rep 2	Rep 3	Rep 4 R	ep 5 Rej	6 Rep	7 Rep 8	Rep 9	Rep 10
0.90090	0.89286	0.88496	0.93458					
0.83333	0.84034	0.90090	0.89286					
δ	٥			0.05	·		°/	ó
	3-2788-9482 3 Aug-06 11:40 AM 3 Aug-06 01:00 PM 4 Aug-06 11:40 AM 4 Aug-06 11:40 AM Analed Com Alt I C > 1 C	ell Fertilization Test 3-2788-9482 Test Type: 9 Aug-06 11:40 AM Protocol: 9 Aug-06 01:00 PM Dit Water: 9 Aug-06 11:40 AM Brine:	### Part	Part Part		ell Fertilization Test 3-2788-9482	ell Fertilization Test 1-2788-9482	Ref Pertilization Test

Rankits

Sample Code

Comparisons:

Page 3 of 5

Analysis:

29 Aug-06 3:35 PM 04-3736-3126

CETIS Analysis Detail

Report Date:

Arbacia Sperm (Cell Fertilizat	ion Test							Enviro	Systems, Inc.
Start Date: 2 Ending Date: 2	98-2788-9482 99 Aug-06 11:4 99 Aug-06 01:6 99 Aug-06 11:	00 PM	Test Type: Protocol: Dil Water: Brine:	Not Applicat	02-014 (2002) ble nmercial salts		Duration Species: Source:			
Endpoint		Anal	ysis Type		Sample Li		ol Link Da	ite Analyzed	Versio	on
Proportion Fertiliz	zed	Com	parison	<u></u>	12-0368-6	234 12-036	68-6234 29	Aug-06 3:33 F	PM CETIS	v1.026
Method		Alt H		<u>ransform</u>	Z	NOEL		oxic Units	ChV	MSDp
Equal Variance t		C > 1	Anguia	ar (Corrected))		N	/A		
ANOVA Assump	otions									
Attribute	Test			Statistic	Critical	P Level	Dec	ision(0.01)		
Varianc <u>es</u>	Variance	Ratio		1.19209	47.46723	0.88857	Equ	al Variances		
Distribution	Shapiro-	Wilk W		0.95607	0.74935	0.73965	Nor	mal Distribution	n	
ANOVA Table										
Source	Sum of	Squares	Mean Squa	ire DF	F Statisti	c P Level	Dec	ision(0.05)		
Between	0.01615		0.0161505	1	4.70	0.07321		-Significant Ef	fect	
Error	0.02060	68	0.0034345	6				-		
Total	0.03675	727	0.019585	7	.					
Group Comparis Sample v: 14925-001)2	Statistic 2.16852	<u>Critical</u> 1.94318	P Level 0.0366	MSD 0.08052		ision(0.05) nificant Effect		
Data Summary		_		Origi	inal Data			Transfo	ormed Data	
Sample Code		Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximun	n SD
14925-001		4	0.90995	0.86957	0.94340	0.03208	1.26939	1.20129	1.33058	0.05598
14925-002		4	0.85253	0.81301	0.90909	0.04137	1.17953	1.12362	1.26452	0.06112
Data Detail										-
Sample Code		Rep 1	Rep 2	Rep 3	Rep 4	lep 5 Re	ep6 Re	p7 Rep8	Rep 9	Rep 10
14925-001		0.90090	0.94340	0.86957	0.92593					
14925-002	-	0.90909	0.85470	0.81301	0.83333	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
Graphics						-		-		
1.0 0.9 0.0 0.7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	¢		¢			Contered Con				-
	14925-001	ı .	14925 ode	-002		-1.5	-1.0 -	0.5 0.0 Rankits	0.5 1.0	1.5

Comparisons:

Page 5 of 5

Report Date: Analysis: 29 Aug-06 3:35 PM 15-0462-7071

Test No:	Arbacia Sperm C	ell Fertilization Test							EnviroS	ystems, Inc.
Proportion Fertilized Comparison	Start Date: 29 Ending Date: 29	Aug-06 11:40 AM Aug-06 01:00 PM	Protocol: Dil Water:	EPA/821/R-Not Applicat	ole		Species:	Arbacia pun		
Equal Variance t C > T Angular (Corrected)										.026
Attribute Test						NOEL			ChV	MSDp
Variances	ANOVA Assumpt	ions						····		
Distribution	Attribute	Test		Statistic	Critical	P Level	Decis	ion(0.01)		
Source Sum of Squares Mean Square DF F Statistic P Level Decision(0.05)	Variances	Variance Ratio		1.16891	47.46723	0.90094	Equal	Variances		
Source Sum of Squares Mean Square DF F Statistic P Level Decision(0.05)	Distribution	Shapiro-Wilk W		0.91022	0.74935	0.33382	Norm	al Distribution		
Between	ANOVA Table									
Error	Source	Sum of Squares	Mean Squa	re DF	F Statisti	c P Level	Decis	ion(0.05)		
Total	Between	0.0097786	0.0097786	1	3.36	0.11634	Non-S	Significant Effe	ect	
Group Comparisons Sample vs Sample 14925-001 14925-001 14925-001 14925-001 14925-001 14925-001 14925-001 14925-001 14925-001 14 0.86957 0.94340 0.03208 1.26939 1.20129 1.33058 0.05598 14925-003 14 0.86686 0.83333 0.90090 0.03494 1.19947 1.15026 1.25055 0.05178 Data Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Rep 6 Rep 7 Rep 8 Rep 9 Rep 10 14925-003 0.83333 0.84034 0.90090 0.89286 Graphics	Error	0.0174426	0.0029071	6	_					
Sample vs Sample Statistic Critical P Level MSD Decision(0.05) 14925-001 14925-003 1.83404 1.94318 0.0582 0.07408 Non-Significant Effect	Total	0.02722129	0.0126858	7						
14925-001 14925-003 1.83404 1.94318 0.0582 0.07408 Non-Significant Effect	Group Comparis	ons								
Data Summary	Sample vs	Sample	Statistic	<u>Critical</u>	P Level	MSD	Decis	ion(0.05)		
Sample Code	14925-001	14925-003	1.83404	1.94318	0.0582	0.07408	Non-S	Significant Effe	ct	
14925-001	Data Summary	-		Origi	nal Data			Transfo	rmed Data	
14925-003	Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	<u>Maxim</u> um	SD
Data Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Rep 6 Rep 7 Rep 8 Rep 9 Rep 10 14925-001 0.90090 0.94340 0.86957 0.92593 14925-003 0.83333 0.84034 0.90090 0.89286 Graphics 1.0 1.0 2.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3	14925-001	4	0.90995	0.86957	0.94340	0.03208	1.26939	1.20129	1.33058	0.05598
Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Rep 6 Rep 7 Rep 8 Rep 9 Rep 10 14925-001	14925-003	4	0.86686	0.83333	0.90090	0.03494	1.19947	1.15026	1.25055	0.05178
14925-003 0.90090 0.94340 0.86957 0.92593 14925-003 0.83333 0.84034 0.90090 0.89286 Graphics 1.0	Data Detail					•		-		,"
1.0	Sample Code	Rep 1	Rep 2	Rep 3	Rep 4 F	Rep 5 Re	p 6 Rep	7 Rep 8	Rep 9	Rep 10
Graphics 1.0 0.09 0.09 0.06 0.001 0.001 0.001 0.001 0.002 0.002 0.002 0.004 0.002 0.002 0.004 0.004 0.004 0.005 0.006 0.00	14925-001	0.90090	0.94340	0.86957	0.92593				1111	
Controduction of the property	14925-003	0.83333	0.84034	0.90090	0.89286					
0.0 14925-001 14925-003 -1.5 -1.0 -0.5 0.0 0.5 1.0 1.5	0.9- 0.9- 0.7- 0.7- 0.7- 0.7- 0.3- 0.4- 0.3- 0.4-	14925-001	14925-	003		Centered Centered Contract Angle Con	-1.0 -0.5			
Sample Code Rankits		sample t	.we					калків		

CETIS Test Summary

Report Date:

07 Sep-06 8:33 PM

Link:

04-1749-6359

Champia parvi	ula Red Macroalga	Sexual Reproduc	tion Test				Saskatchewan Research Counci
Test No: Start Date: Ending Date: Setup Date:	11-9941-0844 30 Aug-06 12:00 Pt 06 Sep-06 12:00 Pt 30 Aug-06 12:00 Pt	M Dil Water:	Champia EPA/600/4-91/003 (1994) Not Applicable Generic commercial salts			Duration: Species: Source:	7d 0h Champia parvula In-House Culture
-	04-2857-7808 29 Aug-06 11:00 Al 29 Aug-06 11:00 Al 25h		14925-000	nitoring Sampl rd Harbor Dred ab Control		Client: Project:	Battelle Labs Ecological Risk Assessment
Sample No: Sample Date: Receive Date: Sample Age:	09-8741-8251 28 Aug-06 09:30 Al 26 Aug-06 04:00 Pl 50h		14925-001	nitoring Sampl rd Harbor Dred 01		Client: Project:	Battelle Labs Ecological Risk Assessment
•	11-7877-8283 28 Aug-06 09:50 Al 28 Aug-06 04:00 Pl 50h		14925-002	nitoring Sampl rd Harbor Dred 02		Client: Project:	Battelle Labs Ecological Risk Assessment
	09-3982-0403 28 Aug-06 10:15 Al 28 Aug-06 04:00 Pl 50h		14925-003	nitoring Sampl rd Harbor Dred 03		Glient: Project:	Battelle Labs Ecological Risk Assessment
Mean Cystoca	rps Summary			".	~ .		
Sample Code 14925-000 14925-001 14925-002	Rej 3 4 4	25.0667 29.4 27.35	Minimum 17.8 23 20.8	37.6 37.8 35.8	SE 6.29321 3.22800 3.26126	10.9002 6.45600 6.52253	CV 43.48% 21.96% 23.85%
14925-003	4	29.35	19.6	40.8	5,23155	10.4631	35.65%
Mean Cystoca	rps Detail						
Sample Code 14925-000 14925-001 14925-002	Re 19. 37. 28.	8 17.8 8 30.8 8 20.8	Rep 3 37.6 26 24	23 35.8			
14925-003	19.	5 21.4	40.8	35.6			

Comparisons:

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07 Sep-06 8:36 PM 06-3581-6715

CETIS Analysis Detail

Report Date: Analysis:

	aryono Dotair						Analysis:			06-3581-67
Champia parvu	la Red Macroalga S	Sexual Reproduc	tion Test				Saska	tchewa	n Resea	rch Counc
Endpoint		Analysis Type		Sample L	ink Conti	rol Link	Date Analyzed		Version	
Mean Cystocarp	s	Comparison		04-1749-6	359 04-17	49-6359	07 Sep-06 8:32	PM (CETISv1	.026
Method		Alt H Data	Transform	Z	NOEL	LOEL	Toxic Units	ChV		MSDp
Equal Variance t		C > T Untrai	nsformed				N/A			
ANOVA Assum	ptions				' <u></u>					
Attribute	Test		Statistic	Critical	P Leve	l	Decision(0.01)			
Variances	Variance Ratio		2.85061	49.79928			Equal Variances			
Distribution	Shapiro-Wilk V	<u>^</u>	0.86984	0.72991	0.1819	8	Normal Distribution	מכ		
ANOVA Table										
Source	Sum of Squar	es Mean Squa	are DF	F Statist	c P Leve	1	Decision(0.05)			
Between	32.19048	32.19048	1	0.44	0.53479	9	Non-Significant E	ffect		
Error	362,6667	72.53333	5	_						
Total	394.857132	104.72381	6							
Group Comparis	sons									
Sample vs	s Sample	Statistic	Critical	P Level	MSD		Decision(0.05)			
14925-000	14925-001	-0.6662	2.01505	0.7326	13.107	3	Non-Significant E	ffect		
Data Summary			Orig	inal Data			Trans	formed	Data	
Sample Code	Соц	nt Mean	Minimum	Maximum	SD	Mea	n Minimum	Max	dmum	SD
14925-000	3	25.0667	17.8	37.6	10.9002					
14925-001	4	29.4	23	37.8	6.45601					
Data Detail		 								
Sample Code	Rep	1 Rep 2	Rep 3	Rep 4 F	Rep 5 R	lep 6	Rep 7 Rep	8	Rep 9	Rep 10
4925-000	19.8	17.8	37.6							
4925-001	37.8	30.8	26	23						
Graphics										
Mean Cystocarps		0			Untransformed Untransformed			0		
10-	14925-000	14925-0			5- 0	-1.0	0 1	0.5	1.0	—

Comparisons: Report Date: Analysis: Page 4 of 5 07 Sep-06 8:36 PM

07 Sep-06 8:36 PM 10-8129-7024

Champia parvula F	Red Macroa	lga Sexu	al Reproduc	tion Test					Sask	atchew	an Resea	rch Counc
Endpoint		Ana	lysis Type		Sample L	_ink	Contr	ol Link	Date Analyze	d	Version	
Mean Cystocarps		Con	parison		04-1749-6	3359	04-174	9-6359	07 Sep-06 8:3	2 PM	CETISv1	.026
Method		Alt	H Data T	ransform	Z	N	OEL	LOEL	Toxic Units	ChV	1	MSDp
Equal Variance t		C >	T Untran	sformed					N/A			
ANOVA Assumption	ns											
Attribute	Test			Statistic	Critical		P Level		Decision(0.01)			
Variances	Variance	Ratio		2,79276	49.79928	3	0.41311		Equal Variances			
Distribution	Shapiro-V	Vilk W		0.87026	0.72991		0.18339		Normal Distribu	lion		
ANOVA Table												
Source	Sum of S	quares	Mean Squa	re DF	F Statist	ic	P Level		Decision(0.05)			
Between	8.937619		8.937619	1	0.12		0.74075		Non-Significant	Effect		
Епог	365.2567		73.05133	5								
Total	374.1942	72	81.98895	6	_							
Group Compariso	15											
Sample vs	Sample		Statistic	Critical	P Level		MSD		Decision(0.05)			
14925-000	14925-002		-0.3498	2.01505	0.6296		13.154		Non-Significant	Effect		
Data Summary				Orig	inal Data				Tran	sformed	i Data	
Sample Code		Count	Mean	Minimum	Maximum	5	D	Mear	n Minimu	m Ma	ximum	SD
14925-000		3	25.0667	17.8	37.6	1	0.9002					
14925-002		4	27.35	20.8	35.8	6	.52252					
Data Detail												
Sample Code		Rep 1	Rep 2	Rep 3	Rep 4	Rep	5 Re	p 6	Rep 7 Rej	9 B	Rep 9	Rep 10
14925-000		19.8	17.8	37.6								
14925-002		28.8	20,8	24	35.8							
Graphics West Options 10-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	14925-000		14925-00	₁₂		Centered Untransformed	15-	-1.0	0 1	0.5		LIS
		Sample Coo							Rankits			

Comparisons:

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07 Sep-06 8:36 PM

Report Date: Analysis:

14-7654-4729

Champia parvula F	Red Macro	alga Sexu	al Reproduc	tion Test						Saska	tchew	an Resea	arch Council
Endpoint		Апа	lysis Type		Sample L	ink	Cont	rol Link	Date A	nalyzed		Version	
Mean Cystocarps		Con	parison		04-1749-6	359	04-17	49-6359	07 Sep	-06 8:32	PM	CETISv1	1.026
Method		Alt		ransform	Z	NO	DEL	LOEL	Toxic	Units	ChV		MSDp
Equal Variance t		C >	T Untran	sformed	· · · · · · · · · · · · · · · · · · ·				N/A				
ANOVA Assumption	ons												
Attribute	Test			Statistic	Critical		P Leve		Decision				
Variances	Variance			1.08528	49.79928	3	0.8839		Equal Va				
Distribution	Shapiro-	VVIIK VV		0.82905	0,72991 		0.0844		Normal [JISTNOUTH	ο π		
ANOVA Table													
Source	Sum of S		Mean Squa		F Statist	ic	P Leve		Decisio				
Between	31.4519		31.4519	1 -	0.28		0.6206	8	Non-Sig	nificant E	ffect		
Error Total	566.0566 597.508		113.2113 144.66324	<u>5</u>									
		U40	144,00324	<u> </u>	······································								
Group Compariso													
Sample vs	Sample		Statistic	Critical	P Level		MSD		Decision		-rr1		
14925-000	14925-00	3	-0.5271	2.01505	0.6897		16.375	3	Non-Sigi	nificant E	ttect		*****
Data Summary					inal Data			<u> </u>		Trans	forme	d Data	
Sample Code		Count	Mean	Minimum	Maximum		D	Meai	n N	Ainimun	ı Ma	ximum	SD
14925-000		3	25.0667	17.8	37.6		0.9002						
14925-003		4	29.35	19.6	40.8	11	0.4631						
Data Detail													
Sample Code		Rep 1	Rep 2	Rep 3	Rep 4	Rep	5 R	tep 6	Rep 7	Rep	8	Rep 9	Rep 10
14925-000		19.8	17.8	37.6									
14925-003		19.6	21.4	40.8	35.6								
Graphics ∞¬							15-7						
							1			1		, /	6
40-			ı				10-			1			
dean Cystocarps	Ì					Centered Untransformed	1			1	. /		
# * 3-			ļ			ansfo	5-			} c	·/		
Z -						불				$\pm Z$,		
20-	- 1		1				n}			- <i>-</i>			
	_						-						
10-							5			ф			
1							1	<i>/</i> 6	0	1			
	14925-000	ı	14925-0	23			-10	-1.0	-0.5	0.0	0.5	1.D	
	a lucus sout	Sample Co					•••			ankits		240	•••
		-											

Comparisons:

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CETIS Analy	sis Detail							Report Da Analysis:		07 S	ep-06 8:36 P 08-9845-562
Champia parvula F	Red Macroalga Sexu	al Reproduc	tion Test					Sas	katche	wan Resea	rch Council
Endpoint	Ana	lysis Type		Sample	Link	Control	Link	Date Analyz	ed	Version	
Mean Cystocarps	Соп	parison		04-1749	-6359	04-1749	-6359	07 Sep-06 8	32 PM	CETISv	1.026
Method	Alt	H Data	Transform	Z	NO	DEL L	.OEL	Toxic Units	: Cł	ı۷	MSDp
Equal Variance t	C>	T Untra	nsformed					N/A			
ANOVA Assumption	ons										
Attribute	Test		Statistic	Critica	I	P Level		Decision(0.01)		
Variances	Variance Ratio		1.02071	47.467	23	0.98695		Equal Varianc	es		
Distribution	Shapiro-Wilk W		0.87542	0.7493	5	0.16753		Normal Distrib	ution		
ANOVA Table				•••							
Source	Sum of Squares	Mean Squ	are DF	F Stati	stic	P Level		Decision(0.05	5)		
Between	8.405	8.405	1	0.20		0.67073		Non-Significar	t Effect		
Error	252.67	42.11167	6								
Total	261.074998	50.516667	7								
Group Compariso	ns										
Sample vs	Sample	Statistic	Critical	P Leve	ı	MSD		Decision(0.05	i)		
14925-001	14925-002	0.44675	1.94318	0.3354		8.91660		Non-Significar			
Data Summary			Orig	inal Data				Tra	nsform	ed Data	
Sample Code	Count	Mean	Minimum	Maximu	m S	D .	Mear	n Minim	um l	Vaximum	SD
14925-001	4	29.4	23	37.8	6	.45601	-				
14925-002	4	27.35	20.8	35.8	6	.52252					
Data Detail							<u></u>				
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep	5 Rep	6_	Rep 7 R	ep 8	Rep 9	Rep 10
14925-001	37.8	30.8	26	23							
14925-002	28.8	20.8	24	35.8							
Graphics											
40 7 £. 30 4]			-	10-7- 5-7- 5-7- 5-7- 5-7- 5-7- 5-7- 5-7-		: ! !		°/	,6
Mean Cystocarps	Ĭ	ļ			Centered Untransformed	2-	n war for was an		<i>_</i>		
10-						*	/。	6 0			
g <u> </u>	14925-001	14925-	003			n -1.5	-1.0	+0.5 0.0	0.5	1.0	1.5

Rankits

Sample Code

Comparisons:

Report Date:

Page 1 of 5

07 Sep-06 8:36 PM 05-8316-1394

Analysis:

CETIS Analysis Detail

Champia parvula F	Red Macros	iga Sexu	al Reproduc	tion Test				Sask	atchew	an Resea	arch Counci
Endpoint		Ana	lysis Type		Sample L	.lnk (Control Link	Date Analyze	d	Version	
Mean Cystocarps		Com	parison		04-1749-6	359 C	14-1749-635	9 07 Sep-06 8:3	2 PM	CETISv	1.026
Method		Alt	H Data T	ransform	z	NOEL	. LOEL	Toxic Units	ChV	,	MSDp
Equal Variance t		C > 1	T Untran	sformed				N/A			
ANOVA Assumption	ns										
Attribute	Test			Statistic	Critical	P	Level	Decision(0.01)			
Variances	Variance	Ratio		2.62660	47,46723	3 0.4	14870	Equal Variance:	3		
Distribution	Shapiro-	Wilk W		0.92471	0.74935	0.4	13802	Normal Distribu	lion		
ANOVA Table					'						
Source	Sum of S	Squares	Mean Squa	re DF	F Statist	ic PI	Level	Decision(0.05)			
Between	0.005		0.005	1	0.00	0.0	9377	Non-Significant	Effect		
Error	453.47		75.57833	6							
Total	453.4750	001	75.583331	7							
Group Comparison	ns										
Sample vs	Sample		Statistic	Critical	P Level	MS	SD	Decision(0.05)			
14925-001	14925-00	3	0.00813	1.94318	0.4969	11	.9453	Non-Significant	Effect		
Data Summary		_		Orig	inal Data			Tran	sforme	d Data	
Sample Code		Count	Mean	Minimum	Maximum	SD	Mea	an Minimu	m Ma	mumixe	SD
14925-001		4	29.4	23	37.8	6.456	501				
14925-003		4	29.35	19.6	40.8	10.46	331				
Data Detail											
Sample Code		Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7 Re	p 8	Rep 9	Rep 10
14925-001		37.8	30.8	26	23						
14925-003	<u></u>	19.6	21.4	40.8	35.6	-:-:					
Graphics											
50-7						15-	7				
							1	:			/
40-						10-		į			∕ 6
								(0/	
30 A						Centered ntransformed]	1	0/		
ean Cystocarps	Ĭ		Ĭ			ا قِالَ	-	!			
ž :	В					· .					
20~			•			u	[
10-						-5]				
l I							1 %	1			
							l. / °	4			
	14925-001		14925-0	Ea		-10-	1.5 -1.0	-0.5 0.0	0.5	t'0	1,5

SALTWATER ASSAYS

A. bahia, A. punctulata, C. parvula

STUDY: 14925	LOCATION: New Bedford Harbor								
CHEMISTRY	Lab Sait Control	-001	-002	-003					
AMMONIA	~ 004	-005	-006	-007					
AS RECEIVED									
WATER QUALITIES	Lab Salt Control	-001	-002	-003					
SALINITY (ppt)	25	27	(6	18					
pH (SU)	7.72	7.53	7,33	7.35					
TRC (mg/L)	40.05	<0.05	<0.05	<0.05					
DO (mg/L)	7.0	7.1	6.6	7.3					
S/C (µmhos/cm)	38820	42210	26200	28750					
WQ STATION USED			1	ı					
INITIALS	BB	BB	BB	BB					
A. bahia SALINITY									
ADJUSTMENT RECORD	Lab Salt Control	-001	-002	-003					
SAMPLE (mLs)	NIA	NA	15000	15000					
SEA SALT (g)	NA	NA	160	135					
DATE:	8/28/06								
TIME:	1625			, 					
INITIALS:	BB								

Sample ID	ESI Cube ID
-001	-001
-002	-002
-003	-003

Americamysis bahia 7 DAY CHRONIC ASSAY NEW WATER QUALITIES

STUDY:	25	CLIEN BATTE		•		LOCA NEW I	TION: BEDFO	RD		LAB CONTROL: HAMPTON ESTUARY						
			NEW C)ISSOL	VED O	(YGEN	(mg/L)				NEW S	SALINIT	Y (ppt)		 -	
CONC	REP	0	1	2	3	4	5	6	0	1	2	3	4	5	6	
LAB	Α	7.0	_ઉ .ડ	6.8	6.5	6.6	6.5		25	25	24	24	24	24		
-001	Α	7.1	6.9	69	69	7.0	6.8		27	27	a7	27	27	27		
-002	Α	6.7	6. 5	6.5	6.6	6.6	6.5		25	25	25	25	25	25		
-003	Α	6.8	6.1	6.0	6.1	(p. 0	6.3		25	25	25	25	25	25	TATAPUSTA LAT LY LIMPE OF	
			Vinite Control of the												OF THE PARTY OF TH	
			NEV	V pH (S	U)			***************************************		NE	W TEN	/IPERA	TURE (°C)		
CONC	REP	0	1	2	3	4	5	6	0	1	2	3	4	5	6	
LAB	Α	7.72	7,40	7.84	7,78	7.90	7.91		25	24	24	25	24	24		
-001	Α	7.50	7,59	7.48	7.49	7.60	757		25	76	24	25	24	24		
-002	Α	7.58	1.55	7.41	7.41	7.47	7.5%		25	25	25	25	25	24		
-003	Α	7.60	7.51	7,33	7.29	7.42	7,39		25	2 <i>5</i>	26	26	25	24		
															sia nii dha ha jamanay iyahi ya ika atti oʻsha atti bilasani ali atti oʻsha atti bilasani atti oʻsha atti oʻsha atti oʻsha atti ya atti oʻsha atti oʻsha atti oʻsha atti atti oʻsha atti oʻsha qosha atti oʻsha atti atti oʻsha atti oʻsha qosha atti oʻsha atti atti oʻsha atti oʻsha qosha atti oʻsha atti atti oʻsha atti oʻ	
INC TEM	1P:	25	スダ	25	25	25	25									
DATE:		8/29/06	B/30	8/31	9/1	9/2	93				The state of the s					
TIME:		1325	1115	1125	1206	1245	1425									
INIT:		ST	çu.	26	EG	w	CP									

		WATE N	R QUALITY EW WATER	METERS QUALITIE	USED S			
	0	1	2	3	4	5	6	7
Water Quality Station #	V///	l			2	2		
Initials		u	EG	ૡૡ	Ty.	CP		
Date	8/29/06	430	8131	9/1	912	93		

Americamysis bahia 7 DAY CHRONIC ASSAY OLD WATER QUALITIES

		, <u>.</u>				OLD I		IV WU											
STUDY:		CLIE	NT: ELLE			TION: BEDF				CONT	ROL: ESTU	ARY							
1493	<u> </u>																		
		OL	D SAL	INITY ((ppt)						OL	.D pH (SU)	•••					
Conc	Rep	1	2	3	4	5	6	7	1	2	3	4	5	6	7				
Control	Α	75	25	25	25	25	75	ユ ぢ	751	7.84	7.82	7.76	7.81		7.92				
-001	A	27	27	27	27	27		78	7,84	7.76		7.80			7.91				
-002	A	25	25	25	26	26		26					7.88		7,82				
-003	A	ふう	25	20	26	26		26	7,87	7:78	7.77	7.77	7.70		294				
		OLD 7	EMPE	RATU	RE (°C)													
Conc	Rep	1	2	3	4	5	6	7											
Control	Α	25	24	24	24	24	34	スリ											
-001	Α	25	24	24	24	24		221											
-002	Α	ኋና	24	24	24	24		25											
-003	Α	75	24	24	24	24		24											
INC TEMP):	75	25	25	25	25		วร											
DATE:		<i>G/</i> 30	B131	9/1	9/2	93		45											
TIME:		1005	1050	1115	1200	1346		0915											
INITIALS:		w	୧୯	EG	ML	CP		ک س											

GENERAL NOTES - for additional information refer to SOP #1411 or EPA manual 600/4-91/003

- $\bullet Test$ vessels will be 250 mL glass beakers containing a minimum of 150 mL of solution $\bullet 8$ replicates per site with 5 organisms each

•Test Temperature: 26±1°C

•Salinity: 25 ±2ppt

Dissolved Oxygen: >4.3 mg/L

•Photoperiod will be 16 hours light and 8 hours dark.

•Passing criteria require ≥80% survival and average dry weight of ≥0.20 mg/organism in the control vessels.

		WAT	ER QUALITY OLD WATER	/ METERS U R QUALITIES	ISED			
	0	1	2	3	4	5	6	7
Water Quality Station #	1//	i	ュ	1 2	Z	2		
Initials		m	86	EG	y	CP		m
Date	8/29	8/30	8/31	9/1	912	93		8,5

Americamysis bahia 7 DAY CHRONIC ASSAY SAMPLE USE RECORD

1/10	2 5	,		SE RECORL			ì			
STUDY: 149		CLIENT: BA			William					
SPECIES: A. bal			TEST: chro	nic renewai	l					
	Day: 0		Day: 1		Day: 2					
Sample	Volume Used (mL)	ESI Cube ID	Volume Used (mL)	ESI Cube ID	Volume Used (mL)	ESI Cube ID	Day	Date	Time	lnit
Lab Control	1600	n/a	1200	n/a	1200	n/a	0	8/29/06	1305	ST
-001	1	-00	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	-001	,	-001	1	8/30		in,
-002		- 002		-qo3		-002	2	8/31		દિલ્
-003	-			-003		-003	3		1115	EG-
		-003					4	<u> </u>	1240	yr
								9/2	1290	U
							5			
							6			
	Day: 3		Day: 4		Day: 5					
				<u> </u>			,			
Sample	Volume Used (mL)	ESI Cube ID	Volume Used (mL)	ESI Cube ID	Volume Used (mL)	ESI Cube ID				
Lab Control	1200	n/a	1200	n/a		n/a				
-001	1	-001)	-001						
-002		-002		-002						
-003		-003		-003						
]			
	Day: 6	- American kepingan pengangan pengangan pengangan pengangan pengangan pengangan pengangan pengangan pengangan				(ı			
Sample	Volume Used (mL)	ESI Cube ID								
Lab Control		n/a								
-001										
-002										
-003										
	U		ı			•				

Americamysis bahia 7 DAY CHRONIC ASSAY SURVIVAL & OLD WATER QUALITIES

STUDY:		CLIEN Battel				LOCA	TION: BEDF		LIV G		CONT	ROL: ESTU	A DV		ANISM CH/LOT	
1500		Datte		NUMBE	FR OF										N (mg/	
SAMPLE	Rep	0	1	2	3	4	5	6	7	<u>X</u>	2	3	4	5	6	7
OAW! EE	A			<u> </u>		لحصا								└	 	
	В	5	5	5	5	5	5 4	5	5	6.2	69	6.9	6.7	6.8	7.0	7.1
1	C	5	5		5	4		4	7	 	69	4.8	6.7	6.8	7.0	6.9
		5	5	5	4		4	<u>۲</u>	4	6.2	69	6.8	5.8	6.7		7.6
Lab Control		5	5	5		4	4	4	4	6.3		6.6	6.4	6.7	7.0	7.0
	E	5	5	5	5	5	5	5	5	6.3	 	69	66	6.8	7.0	7.0
	F	5	5	5	5	5	5	5	5	6.2	7.0	14.4	6.6	6.8	7.0	7.0
	G	5	5	5	5	5	5	5	ر ت	6.0	7.0	6.8	6.7	6.8	7.0	7.0
	H	5	5	5	5	5	5	5	6	5.9	7.0	Le.8	10.7	6.8	7.0	7.0
	Α	5	5	5	5	5	5	5	5	6.1	6.9	64	6.7	6.8	7.0	7.0
	В	5	5	5	5	5	5	5	5	5.2	6.9	10.60	6.6	6.8	7,0	7.0
	С	5	5	5	5	5	5	5	5	4.9	6.9	6.8	6.6	6.9	7.0	7.0
-001	D	5	5	5	H	4	4	4	4	5.5	69	6.8	6.5	6.8	6.9	7.0
]	Е	5	5	5	5	5	5	5	5	5.9	7.0	6.8	6.6	6.8	6.9	7.0
	F	કે	5	5	5	5	5	5	5	5.5	7.0	Ce-9	6.7	6.8	6.9	6.9
	G	5	5	5	5	5	5	5	5	5.6	7.0	6-9	6.6	6.8	5,3	7.0
	Н	5	5	5	5	5	5	5	Ŋ	5.7	7.0	6.9	6.6	6.8	6.7	7.0
	Α	S	5	5	5	5	4	21	4	4.7	5.4	6.8	6.6	5.3	6,8	6.8
	В	5	5	5	5	5	5	5	5	5.7	54	6-8	6.4	6.6	6.9	6.8
	С	5	5	5	J	5	5	5	5	5.8	5.7	6.8	6.4	6.6	6.9	6.8
-002	D	5	5	5	5	5	5	5	5	5.6	6.8	10.7	6.6	6.7	6.7	6.6
-002	E	5	4	4	4	4	4	4	4	5.3	6.9	62	6.6	6.7	6.9	le:7
	F	5	5	5	5	5	5	5	5	5.4	5.0	4.9	6.5	6.7	6.9	6.8
	G	5	5	5	5	5	5	5	5	5.3	6.8	6.60	6.6	6.6	69	6.8
	Н	5	5	5	5	5	5	5	5	5.5		6.8	6.6	·	6.9	6.8
INC TEMP:		15	25	25	25	25	25	ર્ગ્ડ	25							
DATE:		920	9/21	9/22	2/23		9/25		9/27							
TIME:		1330	1040	1430			1130	1450								
INITIALS:		n	ST	95	EG.	55	Š	in	CP							

* on air day 1

Americamysis bahia 7 DAY CHRONIC ASSAY SURVIVAL & OLD WATER QUALITIES

STUDY: しらの	รา_	CLIEN Battel			OI (VI)	LOCA	TION: BEDF		ILIV	LAB	CONT	ROL: ESTU	ARY		ANISM :H/LOT	
			1	NUMBI	ER OF	SURV	IVORS	i			OLD [ISSOL	VED C	XYGE	N (mg/	L)
SAMPLE	Rep	0	1	2	3	4	5	6	7	1	2	3	4	5	6	7
	Α	5	5	5	5	5	5	5	5	5.8	69	6.4	6.6	6.7	69	6.7
	В	5	5	5	5	5	5	5	5	5.8	6.9	6.8	6.6	6.7	6.9	6.7
	С	5	5	5	5	5	5	5	5	5.7		6.8	6.7	6.7	7,0	6.7
-003	D	5	5	5	5	5	5	5	5	5.7		6.8	6.6	6.8	6.9	6.7
	E	5_	5_		5	5	5	5	5	4.9	6.9	6.8	6.6	6.7	6.9	6.7
	F 	5	5	5	5	5_	5	5	5	5.1	6.9	6-8	6.5	6.7	69	le:T
	G	5	5_	5	5_	5	5	5	5	5.6	6.8	69	6,6	6.9	7.0	6.7
	H	5_	5	5	5	5	5	5	5	5.3	6.9	6.8	6.5	6.6	69	6.7
	A	5_	니	4	4	4	4	4	4	4.5	6.9	68	3.8	6.6	6.9	6.8
	В	5	5	5_	5	5_	5	Ч	4	4.3	6.9	67	6.2	6.6	6.9	6-8
	С	5	5	5	10	5	4	4	4	4.3	6.9	6.8	6.3	6.7	6.8	6.8
-004	D	<u>5</u>	5	5	5	5	5	4	3		%33	6.8	6.4	6.6	6.7	6.8
	LE.	5	5_	4	4	4	4	_	34	4.4	39	68	6.4	6,6	6.8	6.8
	F 	5	5	5	5	5	5	니	3	4.2	4.6	6.8	6.4	6.6	4,2	6.8
	G	5	5	5_	5	<u> </u>	4	৸	4	4.3	67	68	6.6	6.7	6.2	6.8
ellandores en en Provinción de	Н	5	5	5	4	4	4	니	Ц	4.4	(q.7	(o- (6.7	6.7	64	6.8
								A STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF T					The state of the s			
INC TEMP:		35	25	25	25	25	25	35	25							
DATE:		4/30	9/21	9/22	 	9/24	9/25	926	9 27				and the second s		The state of the s	
TIME:		1230	1040	 	1100	1030		1450								
INITIALS:		M	SJ	EG	60	55	27	m	cP_						and the second of the party of	The state of the s

Americamysis bahia 7 DAY CHRONIC ASSAY ORGANISM WEIGHTS

CLIENT: BATT	ELLE - NE	EW BEDFORD		TEST DATES	:			
STUDY #:	1500	,ר		SPECIES: A.	bahia			
CONC	REP	TARE WEIGHT (g) m3	211,59 SHRIMP + FOIL (g)	NET WEIGHT (mg)	# SHRIMP DAY 0	MEAN WEIGHT (mg) DAY 0	# SHRIMP DAY 7	MEAN WEIGHT (mg) DAY 7
	Α	210.28	212.450					
	В	210.43	211,33					
	С	208.48	209.64					
	D	211.09	212.45					
lab	E	201.48	208.69			7.1.1		
	F	२०१.४७	211.20					
	G	205,89	206.9N			•		
	Н	209.42	210.77			IETMET OF THE TOTAL		
	Α	209.76	212,20					
	В	208,99	211.76					
	С	210.23	212.57				·	
:	D	201.37	209,45					
1001	Е	207.50	210.43					
901	F	207.71	210.16					i
j	G		211,96					
	Н	207.69	210.55					
****	Α	208.95	210,93					
!	В	206,74	209.10					
	С	209.64	212.09					
	D	209.31	211.83					
009	E	210.40	212.00					
	F	209,19	211.77					
	G	206,11	208.58					
	H	209.87	212.37					
DATE 9/21	•	9127106	9 28/06					
TIME 11'.		11:40	11:36					
INITIALS &	<u>L</u>	GL	MPB					

Americamysis bahia 7 DAY CHRONIC ASSAY ORGANISM WEIGHTS

CLIENT: BATT				TEST DATES	:			
STUDY#:	1500	, 7	_	SPECIES: A.	bahia			
CONC	REP	TARE WEIGHT (g)	SHRIMP + FOIL (g)	NET WEIGHT (mg)	# SHRIMP DAY 0	MEAN WEIGHT (mg) DAY 0	# SHRIMP DAY 7	MEAN WEIGHT (mg) DAY 7
	Α	207.21	210, 25					
	В	207.28	204, 89					
	С	209.86	212,60					
	D	209,98	213,61					
003	E	209.83	212,36					
	F	209,67	213.05					
	G	209,48	214.20					
	Н	209.34	211,60					
	Α	207,28	213.16					
	В	208.14	212.75					
	С	210.17	211.40		·····			
004	D	211.89	212.89					
-	E	208.51	219.38					
:	F	210.47	211.67					
	G	208.44	209.90					
	<u>H</u>	208.60	210.20					
	A							
	В							
	С							
	D							
	E					:		,
	F							
	G							
	Н							
DATE		9/27/06	9/28/06					
TIME		11:40	11:53					
INITIALS	-	GL	MOB					

Page 1 of 3

CETIS Test Summary

Report Date:

27 Dec-06 2:05 PM 07-7578-8033

Link:

Americamysis	7-d Survival, Growth an	d Fecundity	Test		EnviroSystems, Inc.
Test No: Start Date: Ending Date: Setup Date:	14-5718-9210 20 Sep-06 12:30 PM 27 Sep-06 12:25 PM 20 Sep-06 12:30 PM	Test Type: Protocol: Dil Water: Brine:	Growth-Survival (7d) EPA/821/R-02-014 (2002) Not Applicable Generic commercial salts	Duration: Species: Source:	6d 23h Americamysis bahia ARO - Aquatic Research Organisms, N
Sample No: Sample Date: Receive Date: Sample Age:	16-3216-2814 20 Sep-06 09:00 AM 20 Sep-06 09:00 AM 4h	Material: Code: Source: Station:	Marine Monitoring Sample 15007-000 New Bedford Harbor Dredge Monitorin WQ-TOX-Lab Control	Client: Project:	Battelle Labs Ecological Risk Assessment
Sample No: Sample Date: Receive Date: Sample Age:	11-7565-0630 19 Sep-06 09:00 AM 19 Sep-06 02:15 PM 28h	Material: Code: Source: Station:	Marine Monitoring Sample 15007-001 New Bedford Harbor Dredge Monitorin WQ-TOX-001	Client: Project:	Battelle Labs Ecological Risk Assessment
Sample No: Sample Date: Receive Date: Sample Age:	06-1096-0183 19 Sep-06 10:00 AM 19 Sep-06 02:15 PM 27h	Material: Code: Source: Station:	Marine Monitoring Sample 15007-002 New Bedford Harbor Dredge Monitorin WQ-TOX-002	Client: Project:	Battelle Labs Ecological Risk Assessment
Sample No: Sample Date: Receive Date: Sample Age:	05-1252-8989 19 Sep-06 10:07 AM 19 Sep-06 02:15 PM 26h	Material: Code: Source: Station:	Marine Monitoring Sample 15007-003 New Bedford Harbor Dredge Monitorin WQ-TOX-003	Client: Project:	Battelle Labs Ecological Risk Assessment
Sample No: Sample Date: Receive Date: Sample Age:	11-4354-7682 19 Sep-06 10:22 AM 19 Sep-06 02:15 PM 26h	Material: Code: Source: Station:	Marine Monitoring Sample 15007-004 New Bedford Harbor Dredge Monitorin WQ-TOX-004	Client: Project:	Battelle Labs Ecological Risk Assessment

Analyst:___

Page 2 of 3

CETIS Test Summary

Report Date: Link: 27 Dec-06 2:05 PM 07-7578-8033

	···· ,						-IIIk.	01 1010-0000
2d Proportion Survived	Summary							
Sample Code	Reps	Mean	Minimum	Maximum	SE	SD	CV	
15007-000	8	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%	· · · · · · · · · · · · · · · · · · ·
15007-001	8	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%	
15007-002	8	0.97500	0.80000	1.00000	0.02500	0.07071	7.25%	
15007-003	8	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%	
15007-004	8	0.95000	0.80000	1.00000	0.03273	0.09258	9.75%	
7d Proportion Survived	l Summary	_						
Sample Code	Reps	Mean	Minimum	Maximum	SE	SD	CV	
15007-000	8	0.92500	0.80000	1.00000	0.03660	0.10351	11.19%	
15007-001	8	0.97500	0.80000	1.00000	0.02500	0.07071	7.25%	
15007-002	8	0.95000	0.80000	1.00000	0.03273	0.09258	9.75%	
15007-003	8	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%	
15007-004	8	0.75000	0.60000	0.80000	0.03273	0.09258	12.34%	
Mean Dry Biomass-mg	Summary							
Sample Code	Reps	Mean	Minimum	Maximum	SE	SD	CV	
15007-000	8	0.24100	0.18000	0.27200	0.01198	0,03389	14.06%	
15007-001	8	0.51125	0.41600	0.58600	0.02029	0.05740	11.23%	
15007-002	8	0.46150	0.32000	0.51600	0.02411	0.06819	14.78%	
15007-003	8	0.62275	0.45200	0.94400	0.05597	0.15831	25.42%	
15007-004	8	0.69625	0.20000	2.17400	0.24738	0.69970	100.49	
Mean Dry Weight-mg S	iummary							
Sample Code	Reps	Mean	Minimum	Maximum	SE	SD	CA	
15007-000	8	0.26238	0.20400	0.34000	0.01469	0.04154	15.83%	
15007-001	8	0.52425	0.46800	0.58600	0.01507	0.04262	8.13%	
15007-002	8	0.48388	0.40000	0.51600	0.01277	0.03613	7.47%	
15007-003	8	0.62275	0.45200	0.94400	0.05597	0.15831	25.42%	
15007-004	8	0.89323	0.30750	2.71750	0.30326	0.85774	96.03%	

Analyst:____

CETIS Test Summary

Report Date:

27 Dec-06 2:05 PM

Link: 07-7578-8033

2d Proportion Survived Deta	ail			•				
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
15007-000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
15007-001	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
15007-002	1.00000	1.00000	1.00000	1.00000	0.80000	1.00000	1.00000	1.00000
15007-003	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
15007-004	0.80000	1.00000	1.00000	1.00000	0.80000	1.00000	1.00000	1.00000
7d Proportion Survived Deta	ail							
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
15007-000	1.00000	0.80000	0.80000	0.80000	1.00000	1.00000	1.00000	1.00000
15007-001	1.00000	1.00000	1.00000	0.80000	1.00000	1.00000	1.00000	1.00000
15007-002	0.80000	1.00000	1.00000	1.00000	0.80000	1.00000	1.00000	1.00000
15007-003	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
15007-004	0.80000	0.80000	0.80000	0.60000	0.80000	0.60000	0.80000	0.80000
Mean Dry Biomass-mg Deta	il							
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
15007-000	0.26200	0.18000	0.23200	0.27200	0.24200	0.26600	0.20400	0.27000
15007-001	0.48800	0.55400	0.46800	0.41600	0.58600	0.49000	0.51600	0.57200
15007-002	0.39600	0.47200	0.49000	0.50400	0.32000	0.51600	0.49400	0.50000
15007-003	0.60800	0.52200	0.54800	0.72600	0.50600	0.67600	0.94400	0.45200
15007-004	1.17600	0.92200	0.24600	0.20000	2.17400	0.24000	0.29200	0.32000
Mean Dry Weight-mg Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
15007-000	0.26200	0.22500	0.29000	0.34000	0.24200	0.26600	0.20400	0.27000
15007-001	0.48800	0.55400	0.46800	0.52000	0.58600	0.49000	0.51600	0.57200
15007-002	0.49500	0.47200	0.49000	0.50400	0.40000	0.51600	0.49400	0.50000
15007-003	0.60800	0.52200	0.54800	0.72600	0.50600	0.67600	0.94400	0.45200
15007-004	1.47000	1.15250	0.30750	0.33333	2.71750	0.40000	0.36500	0.40000

Comparisons:

Page 4 of 4

Report Date:

27 Dec-06 2:07 PM

Analysis:

		Growth-Surv EPA/821/R- Not Applicat	02-014 (2002			Duration: Species: Source:	6d 23h Americamys ARO - Aqua	is bahia	oystems, Inc. Organisms, N
ep-06 12:30 PM ep-06 12:25 PM ep-06 12:30 PM Ana ed Com	Protocol: Dil Water: Brine: lysis Type	EPA/821/R- Not Applicat	02-014 (2002 ble nmercial salt			Species:	Americamys		Organisms, N
ed Com			Sample I						
Alt	parison			_ink Co	ontrol	 Link Dat	e Analyzed	Version	
			07-7578-6	3033 07	7-7578-	8033 27 0	Dec-06 2:04 PI	M CETISv1	1.026
ر ب 		F ransform ar (Corrected)	Z	NOEL	LO	DEL To:		ChV	MSDp
lS									
Test Modified Levene		Statistic 65535.00000	Critical 8.86159		evel 0000		sion(0.01) ual Variances		
					1				
Sum of Squares 0 0	Mean Squa 0 0	are DF 1 14	F Statis 65535.0						
0	0	15							
3									
Sample	Statistic	Critical	P Level	Ties	5				
15007-001	32		0.4796	1		Non-5	Significant Effe	ct	
		Origi	nal Data				Transfo	med Data	
Count	Mean	Minimum	Maximum	SD		Mean	Minimum	Maximum	SD
									0.00019
	1.00000	1.00000	1.00000	0.0000	JU	1.34528	1.34526	1.34528	0.00019
			***				···		Rep 10
1.00000	1.00000	1.00000							

O	0			ared Angle					
	Sum of Squares 0 0 0 5 Sample 15007-001 Count 8 8 8 Rep 1 1.00000 1.00000	Sum of Squares Mean Squares	Sum of Squares Mean Square DF 0 0 1 0 0 14 0 0 15 Sample Statistic Critical 15007-001 32 Origi Count Mean Minimum 8 1.00000 1.00000 8 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000	Sum of Squares Mean Square DF F Statism 0 0 1 65535.0 0 0 14 65535.0 0 0 15 65535.0 Sample Statistic Critical P Level 15007-001 32 0.4796 Count Mean Minimum Maximum 8 1.00000 1.00000 1.00000 8 1.00000 1.00000 1.00000 8 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000	Sum of Squares Mean Square DF F Statistic P L	Sum of Squares Mean Square DF F Statistic P Level	Sum of Squares Mean Square DF F Statistic P Level Decis 0 0 1 65535.0 0.00000 Signif 0 0 14 0 0 15 Sample Statistic Critical P Level Ties Decis 15007-001 32 0.4796 1 Non-Statistic Original Data Count Mean Minimum Maximum SD Mean 8 1.00000 1.00000 1.00000 0.00000 1.34528 8 1.00000 1.00000 1.00000 0.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 0 0 0 1.00000 1.00000 1.00000 1.00000 1.00000	Sum of Squares Mean Square DF F Statistic P Level Decision(0.05)	Sum of Squares

Sample Code

Rankits

Comparisons:

Page 1 of 4 27 Dec-06 2:07 PM 03-6917-5121

Report Date: Analysis:

	,								Allaly	212.		00-0311-0121
Americamysis :	7-d Survival, G	rowth and	d Fecundity	Test							EnviroS	ystems, Inc.
Start Date: Ending Date:	14-5718-9210 20 Sep-06 12:3 27 Sep-06 12:2 20 Sep-06 12:3	5 PM	Test Type: Protocol: Dil Water: Brine:	Growth-Surv EPA/821/R-6 Not Applicat Generic com	02-014 (2002			Durat Speci Sourc	ies: Ar	l 23h nericamy: RO - Aqua		Organisms, N
Endpoint		Anaiy	sis Type		Sample L	ink C	Control	Link	Date Ar	alyzed	Version	
2d Proportion S	urvived	Comp	parison		07-7578-8	033 0	7-7578	8-8033	27 Dec-	06 2:04 P	M CETISV	1.026
Method		Alt F	l Data T	ransform	Z	NOEL	- L	OEL_	Toxic I	Jnits	ChV	MSDp
Mann-Whitney U	<u> </u>	C > T	Angula	ar (Corrected)					N/A			
ANOVA Assum	ptions											
Attribute	Test			Statistic	Critical	P	Level		Decision	(0.01)		
Variances	Modified	Levene		1.00000	8.86159	0.3	33428		Equal Va	iances		
Distribution	Shapiro-V	Vilk W		0.46890	0.84420	0.0	00000	<u> </u>	Von-norn	ıal Distribi	ution	
ANOVA Table												
Source	Sum of S	Squares	Mean Squa	are DF	F Statist	ic P	Level	I	Decision	(0.05)		
Between	0.003544	2	0.0035442	1	1.00	0.3	33428		Von-Sign	ificant Effe	ect	
Error	0.049619		0.0035442	14								
Total	0.053163	65	0.0070885	15								
Group Compar	isons											
Sample v	vs Sample		Statistic	Critical	P Level	Tie	es		Decision			
15007-000	15007-002	2	36		0.3605	1		1	Von-Sign	ificant Effe	ect	
Data Summary				Origi	nal Data					Transfo	rmed Data	
Sample Code		Count	Mean	Minimum	Maximum	SD		Mean	M	inimum	Maximum	SD
15007-000		8	1.00000	1.00000	1.00000	0.000	000	1.3452	28 1.	34528	1.34528	0.00019
15007-002		8	0.97500	0.80000	1.00000	0.070	071	1.3155	i 2 1.	10715	1.34528	0.08419
Data Detail												
Sample Code		Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep	o 6	Rep 7	Rep 8	Rep 9	Rep 10
15007-000		1.00000	1.00000	1.00000	1.00000	00000	1.00	0000	1.00000	1.0000	0	
15007-002		1.00000	1.00000	1.00000	1.00000 (0.80000	1.00	0000	1.00000	1.0000	10	
Graphics												
1.0 0.9 0.8 0.7 0.5 0.5 0.5 0.2 0.2	0		Q am			Corr. Angle	0.00 0.05 0.10-		0-6 0-0-0	005		o

Rankits

Sample Code

Comparisons: Report Date:

Page 2 of 4

27 Dec-06 2:07 PM Analysis: 05-5107-9127

Americamysis 7-d Survival, Growth and Fecundity Test EnviroSystems, Inc. 6d 23h Test No: 14-5718-9210 Test Type: Growth-Survival (7d) **Duration:** Start Date: 20 Sep-06 12:30 PM Protocol: EPA/821/R-02-014 (2002) Species: Americamysis bahla 27 Sep-06 12:25 PM Dil Water: Not Applicable ARO - Aquatic Research Organisms, N Ending Date: Source: Setup Date: 20 Sep-06 12:30 PM Brine: Generic commercial salts Control Link Analysis Type **Endpoint** Sample Link Date Analyzed Version 2d Proportion Survived Comparison 07-7578-8033 07-7578-8033 27 Dec-06 2:04 PM CETISv1.026 Method Ait H Data Transform Z NOEL LOEL **Toxic Units** ChV **MSDp** Mann-Whitney U C > T Angular (Corrected) N/A **ANOVA Assumptions** Attribute Test Statistic Critical P Level Decision(0.01) Variances Modified Levene 65535.00000 8.86159 0.00000 Unequal Variances **ANOVA Table** DF Source Sum of Squares Mean Square F Statistic P Level Decision(0.05) Between 0 0 1 65535.0 0.00000 Significant Effect 0 0 14 Error 0 15 Total 0 **Group Comparisons** Sample Statistic Critical Sample P Level Ties Decision(0.05) 15007-003 32 15007-000 0.4796 1 Non-Significant Effect **Original Data** Data Summary Transformed Data Sample Code Count Mean Minimum Maximum SD Mean Minimum Maximum SD 15007-000 1.00000 0.00000 8 1.00000 1.00000 1.34528 1.34528 1.34528 0.00019 15007-003 8 1.00000 1.00000 1.00000 0.00000 1.34528 0.00019 1.34528 1.34528 Data Detail Sample Code Rep 1 Rep 4 Rep 2 Rep 3 Rep 5 Rep 6 Rep 7 Rep 10 Rep 8 Rep 9 15007-000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 15007-003 1.00000 1,00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 Graphics o o 1,07 1.07 0.9 2d Proportion Survived 0.8 0.7 0.6 0.5 0.4 0.4-0.3 0.2 0.2 0.0 0.0 15007-000 1.5 15007-003 -0,5 1.0 -1,0 0,0 Sample Code Rankits

Comparisons:

Page 3 of 4 27 Dec-06 2:07 PM

Report Date:

CETIS An	aly	sis Detail							Anal	/sis:		07-5066-8500
Americamysis	7-d S	Survival, Growth and	d Fecundity	Test							EnviroS	ystems, Inc.
Test No: Start Date: Ending Date: Setup Date:	20 S	718-9210 sep-06 12:30 PM sep-06 12:25 PM sep-06 12:30 PM	Test Type: Protocol: Dil Water: Brine:	Not Applicat	02-014 (2002			Dura Spec Sou	cies: A	i 23h mericamy: RO - Aqua		Organisms, N
Endpoint		Anal	ysis Type		Sample L	ink	Cont	rol Link	Date A	nalyzed	Version	
2d Proportion S	Surviv	ed Com	parison		07-7578-8	033	017-715	78-8033	27 Dec	06 2:04 P	M CETISV	.026
Method		Ait i		ransform	Z	NO	EL_	LOEL	Toxic	Units	ChV	MSDp
Mann-Whitney	U	C > 7	Angula	ar (Corrected))				N/A			
ANOVA Assur Attribute Variances Distribution	nptio	Test Modified Levene Shapiro-Wilk W		Statistic 2.33333 0.67657	Critical 8.86159 0.84420		Р Leve D.1:489 D.00000	0	Decision Equal Va Non-norm		ution	
ANOVA Table												
Source		Sum of Squares	Mean Squa	are DF	F Statisti	ic	P Leve	<u></u>	Decision	* *		
Between		0.014177	0.014177	1	2.33	(0.1489	0	Non-Sign	ificant Effe	ect	
Error		0.0850619	0.0060758	14								
Total		0.09923882	0.0202528	15								
Group Compa	risor	ns										
	VS	Sample	Statistic	Critical	P Level		Ties		Decision			
15007-000		15007-004	40		0.2209	:	2		Non-Sign	ificant Eff	ect	
Data Summar	y	_		Origi	inal Data					Transfo	rmed Data	
Sample Code		Count	Mean	Minimum	Maximum	SE)	Mear	1 N	inimum	Maximum	SD
15007-000		8	1.00000	1.00000	1.00000	0.0	0000	1.345		34528	1.34528	0.00019
15007-004		8	0.95000	0.80000	1.00000	0.0	9258	1.285	575 1	10715	1.34528	0.11023
Data Detail												
Sample Code		Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	F	lep 6	Rep 7	Rep 8	Rep 9	Rep 10
15007-000		1.00000	1.00000	1.00000		.0000		.00000	1.00000	1.0000		
15007-004		0.80000	1.00000	1.00000	1.00000 (0.8000	00 1	.00000	1.00000	1.0000)0	
7.0 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0		O	Ş			Corr. Angle	0.10 0.35 -0.35		9-6 9-0-	000	0000	

0.0 Rankits 1.5 2,0

0.0

15007-000

Sample Code

15007-004

Comparisons:

Page 1 of 7 28 Sep-06 2:17 PM

Report Date: Analysis:

04-7997-9509

ved Com	Test Type: Protocol: Dil Water:	Growth-Sun EPA/821/R- Not Applical	02-014 (200			Dura Spec Sour	ies: Am	ericamys	is bahia	ystems, Inc.
Sep-06 12:30 PM Sep-06 12:25 PM Sep-06 12:30 PM Anal ved Com	Protocol: Dil Water: Brine: ysis Type	EPA/821/R- Not Applical	02-014 (200) ble			Spec	ies: Am	ericamys		
ved Com				5			ce. An) - Aqua	tic Research	Organisms, N
Alt I	parison		Sample	Link	Contro	l Link	Date Ana	lyzed	Version	
			07-7578-	8033	07-757	8-8033	28 Sep-06	3 2:10 PI	M CETISV1	.026
		ransform	Z	NO	EL	LOEL	Toxic U	nits (ChV	MSDp
C>.	Angulai	r (Corrected)		<u> </u>			N/A			
ons										
Test		Statistic	Critical		P Level		Decision(0	<u> </u>		
******									tion	
Shapilo-vviik vv		0.73737	0.04420		1,0000.0		TOTT-HOTTIA			
				4.		·				
									rt .	
0.1559467	0.0111391		1.2.1	,	U.Z.1 UZZ		rvorr-orgram	bant Lite	G.	
0.17012369	0.0253160	15								
ns				****	· · · · · · · · · · · · · · · · · · ·					
Sample	Statistic	Critical	P Level		Ties		Decision(0	.05)		
15007-001	24		0.7791	:	2		Non-Signifi	cant Effe	ct	
		Origi	inal Data				•	Transfor	med Data	
Count	Mean	Minimum	Maximun	ı SD)	Mean	Min	imum	Maximum	SD
8	0.92500	0.80000	1.00000						1.34528	0.12325
<u>8</u>	0.97500	0.80000	1.00000	0,0	J/U/1	1.315	52 1.10)/15 ————————————————————————————————————	1.34528	0.08419
Rep 1	Rep 2	Rep 3						Rep 8	Rep 9	Rep 10
1.00000	1.00000	1.00000	0.00	1.000	00 1.0	70000	1.00000	1.0000		
15007-000	15007-6			Centered Corr. Angle	0.10 0.05 0.00 -0.05 -0.10	/ 0		/	1.0 1.5	 2.0
	0.17012369 ns Sample 15007-001 Count 8 8	Shapiro-Wilk W Sum of Squares Mean Squa 0.014177 0.014177 0.1559467 0.0111391 0.17012369 0.0253160 ns Sample Statistic 15007-001 24 Count Mean 8 0.92500 8 0.97500 Rep 1 Rep 2 1.00000 0.80000 1.000000 1.000000	Shapiro-Wilk W 0.75737 Sum of Squares Mean Square DF 0.014177 0.014177 1 0.1559467 0.0111391 14 0.17012369 0.0253160 15 ns Sample Statistic Critical 15007-001 24 Origing Count Mean Minimum 8 0.92500 0.80000 8 0.97500 0.80000 8 0.97500 0.80000 1.00000 0.80000 0.80000 1.00000 1.00000 1.00000	Sum of Squares Mean Square DF F Statis 0.014177 0.014177 1 1.27 0.1559467 0.0111391 14 0.17012369 0.0253160 15 ns Sample Statistic Critical P Level 15007-001 24 0.7791 Original Data Count Mean Minimum Maximum 8 0.92500 0.80000 1.00000 8 0.97500 0.80000 1.00000 Rep 1 Rep 2 Rep 3 Rep 4 1.00000 1.00000 0.80000 0.80000 1.00000 1.00000 0.80000 0.80000	Shapiro-Wilk W 0.75737 0.84420	Shapiro-Wilk W 0.75737 0.84420 0.00037	Shapiro-Wilk W 0.75737 0.84420 0.00037	Shapiro-Wilk W 0.75737 0.84420 0.00037 Non-normal	Sum of Squares Mean Square DF F Statistic P Level Decision(0.05)	Sum of Squares

0.3 0.2

0.1

0.0

15007-000

Sample Code

15007-002

Comparisons:

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Report Date:

CETIS Anal	ysis Detail								Anal	ysis:	20	12-9090 - 594
Americamysis 7-	d Survival, Grow	th and Fec	undity Tes	st						,	Envi	roSystems, Inc.
Start Date: 20 Ending Date: 27	-5718-9210 Sep-06 12:30 PM Sep-06 12:25 PM Sep-06 12:30 PM	M Proto M Dil W	Vater: No	PA/821/R-0 ot Applicab	02-014 (2002			Spe	cies: A		ysis bahia ıatic Resear	rch Organisms, N
Endpoint 7d Proportion Surv	ived	Analysis T			Sample L 07-7578-1			ol Link 78-8033		nalyzed 06 2:11	Vers	ion Sv1.026
			Data Tran			NOE						
Method Mann-Whitney U			Angular (C		Z	NOE	· L	LOEL	Toxic N/A	Units	ChV	MSDp
ANOVA Assumpt	ions								****			
Attribute	Test		Sta	tistic	Critical	F	Level		Decision	(0.01)		
Variances	Variance Rati	ìo	1.2	5000	8.88539	0	.77596		Equal Va	riances		
Distribution	Shapiro-Wilk	W	0.69	9326	0.84420	0	.00003		Non-nom	nal Distril	oution	
ANOVA Table Source Between Error Total	Sum of Squa 0.0035442 0.1913892 0.19493340	0.00: 0.01:	n Square 35442 36707 72149	DF 1 14 15	F Statis 0.26		Level .61856		Decision Non-Sign	<u> </u>	fect	
Group Comparis Sample vs 15007-000	ons Sample 15007-002	Stati 28	ístic (Critical	P Level 0.6395		ies		Decision Non-Sign	<u>· </u>	fect	
Data Summary				Origi	nal Data					Transf	ormed Data	3
Sample Code	Со	unt Mea		linimum	Maximum			Mear		linimum	Maximu	
15007-000 15007-002	8	0.929 0.950		.80000 .80000	1.00000 1.00000		0351 9 25 8	1.258 1.288		.10715 .10715	1.34528 1.34528	
Data Detail												
Sample Code 15007-000 15007-002	1.0	8.0 0000	10000 0.	.80000 .00000	0.80000	Rep 5 1.0000 0.8000	0 1.	∍p 6 00000 00000	Rep 7 1.00000 1.00000	1.000 1.000	000	9 Rep 10
Graphics	1		å				0.107				o o ⁄o o	0
7d Proportion Survived 0.5-0.0	Î		Ĭ			Centered Corr. Angle	0.05			0000		

-0.15

-0.20-|/ -2.0

000

-0.5

0.0 Rankits 0.5

1.0

1.5 2.0

-1,0

О

-1.5

Sample Code

Comparisons: Report Date:

Page 2 of 7 28 Sep-06 2:17 PM

CETIS An	aiysis Detail						Anal	ysis:		06-0860-6800
Americamysis	7-d Survival, Growth	and Fecundity	y Test						EnviroS	Systems, Inc.
Ending Date:	14-5718-9210 20 Sep-06 12:30 PM 27 Sep-06 12:25 PM 20 Sep-06 12:30 PM	Test Type: Protocol: Dil Water: Brine:	Not Applica	-02-014 (2002			Species: A	d 23h mericamysi .RO - Aquat		Organisms, N
Endpoint	A	nalysis Type		Sample L	ink C	ontrol L	ink Date A	nalyzeď	Version	
7d Proportion S	urvived C	omparison		07-7578-8	3033 0	7-7578-8	033 28 Sep	-06 2:11 PN	/ CETISv	1.026
Method	A	lt H Data	Transform	Z	NOEL	LOI	L Toxic	Units C	ChV	MSDp
Mann-Whitney I	U C	> T Angul	ar (Corrected)			N/A			
ANOVA Assum	nptions						-			
Attribute	Test		Statistic	Critical	P 1	_evel	Decision	1(0.01)		
Variances	Modified Levens	}	4.20000	8.86159	0.0	5965	Equal Va	riances		
Distribution	Shapiro-Wilk W		0.78560	0.84420	0.0	0109	Non-norr	nal Distribu	tion	
ANOVA Table										
Source	Sum of Square	s Mean Squ	are DF	F Statist	ic PL	_evel	Decision	(0.05)		
Between	0.0318982	0.0318982	1	4.20	0.0	5965	Non-Sigr	ificant Effe	ct	
Епог	0.1063273	0.0075948	14							
Total	0.13822550	0.0394930	15							
Group Compai	risons									
<u> </u>	vs Sample	Statistic	Critical	P Level	Tie	es	Decision			
15007-000	15007-003	20		0.8828	2		Non-Sigr	ificant Effe	ct —————	
Data Summary	•		Orig	inal Data			_	Transfor	med Data	
Sample Code	Coun		Minimum	Maximum				linimum	Maximum	SD
15007-000	8	0.92500	0.80000	1.00000	0.103			.10715	1.34528	0.12325
15007-003	8	1.00000	1.00000	1.00000	0.000	100 1	.34528 1	.34528	1.34528	0.00019
Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6		Rep 8	Rep 9	Rep 10
15007-000	1.000		0.80000		1.00000	1.0000				
15007-003	1,000	00 1.00000	1.00000	1.00000	1.00000	1.0000	00 1.00000	1.00000	<u> </u>	
0.9- 1.0- 0.9- 0.8- 0.7- 0.6- 0.6- 0.7- 0.2- 0.1- 0.0- 0.1- 0.0- 0.1- 0.1- 0.0- 0.1- 0.1	ļ	0			Contered Corr. Angle	.05-		0		
	15007-000	15007	·-003		-0.	-2.0 -1	.5 -1.0 -0.5	0.0 0.5	1.0 1.5	2.0

Rankits

Comparisons: Report Date:

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Analysis:

Rankits

28 Sep-06 2:17 PM 06-1691-4229

Americamysis 7-d Survival, Growth and Fecundity Test EnviroSystems, Inc. Test No: 14-5718-9210 Test Type: Growth-Survival (7d) Duration: 6d 23h EPA/821/R-02-014 (2002) Species: Start Date: 20 Sep-06 12:30 PM Protocol: Americamysis bahia Ending Date: 27 Sep-06 12:25 PM Dil Water: Not Applicable Source: ARO - Aquatic Research Organisms, N Setup Date: 20 Sep-06 12:30 PM Brine: Generic commercial salts Sample Link Control Link Date Analyzed Version Endpoint Analysis Type 7d Proportion Survived Comparison 07-7578-8033 07-7578-8033 28 Sep-06 2:11 PM **CETISv1.026** Method Alt H **Data Transform** Z NOEL LOEL **Toxic Units** ChV MSDp Mann-Whitney U C > TAngular (Corrected) N/A ANOVA Assumptions Statistic Critical P Level Decision(0.01) Attribute Test Variance Ratio 1.45040 8.88539 0.63593 Equal Variances Variances Shapiro-Wilk W 0.69594 0.84420 0.00003 Non-normal Distribution Distribution **ANOVA Table** DF F Statistic P Level Decision(0.05) Sum of Squares Mean Square Source 0.1666301 0.1666301 1 12.99 0.00288 Significant Effect Between 0.1796363 0.0128312 Error 14 0.1794613 15 Total 0.34626642 Group Comparisons Sample Sample Statistic Critical P Level Ties Decision(0.05) 15007-000 15007-004 55 0.0074 3 Significant Effect **Original Data** Transformed Data **Data Summary** Sample Code Count Mean Minimum Maximum SD Mean Minimum SD Maximum 15007-000 8 0.80000 1.00000 0.10351 1.25598 1.10715 0.12325 0.92500 1.34528 15007-004 8 0.75000 0.60000 0.80000 0.09258 1.05188 0.88608 1.10715 0.10234 Data Detail Rep 10 Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Rep 6 Rep 7 Rep 8 Rep 9 15007-000 1.00000 0.80000 0.80000 0.80000 1.00000 1.00000 1.00000 1.00000 0.80000 15007-004 0.80000 0.80000 0.60000 0.80000 0.60000 0.80000 0.80000 Graphics 0.107 1.07 0.9 000000 7d Proportion Survived 0.05 0.8ð Centered Corr. Angle 0.7-0.00 0.6 -0.05-0.5 0.4 -0.10-0.3 0.2 -0.15-0 0 0 15007-000 15007-004 -1.5 -1.0 -0.5 0.0 0.5 1.0 1.5 -<u>2.0</u> 2.0

Sample Code

Americamysis 7-d Survival, Growth and Fecundity Test

Comparisons: Report Date:

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EnviroSystems, Inc.

Analysis:

14-1931-3953

Test No: 14-5718-9210 Test Type: Growth-Survival (7d) **Duration:** 6d 23h EPA/821/R-02-014 (2002) Start Date: 20 Sep-06 12:30 PM Protocol: Species: Americamysis bahia 27 Sep-06 12:25 PM Dil Water: Not Applicable Source: ARO - Aquatic Research Organisms, N Ending Date: Setup Date: 20 Sep-06 12:30 PM Brine: Generic commercial salts Sample Link Control Link Date Analyzed Endpoint Analysis Type Version 7d Proportion Survived Comparison 07-7578-8033 07-7578-8033 28 Sep-06 2:11 PM CETISv1.026 Method Alt H **Data Transform** Z NOEL LOEL **Toxic Units** ChV MSDp C > T Angular (Corrected) Mann-Whitney U N/A **ANOVA Assumptions** Decision(0.01) Attribute Test Statistic Critical P Level Variance Ratio 1.71429 8.88539 0.49388 Equal Variances Variances Distribution Shapiro-Wilk W 0.61116 0.84420 0.00000 Non-normal Distribution **ANOVA Table** Source Sum of Squares Mean Square DF F Statistic P Level Decision(0.05) Between 0.0035442 0.0035442 1 0.37 0.55358 Non-Significant Effect Error 0.1346813 0.0096201 14 Total 0.1382255 0.0131643 15 **Group Comparisons** Statistic Sample Sample Critical P Level Ties Decision(0.05) 15007-001 15007-002 36 0.3605 2 Non-Significant Effect **Original Data Transformed Data Data Summary** Sample Code Count Mean Minimum Maximum SD Mean Minimum Maximum SD 1.00000 0.07071 1.31552 15007-001 8 0.97500 0.80000 1.10715 1.34528 0.08419 15007-002 8 0.95000 0.80000 1.00000 0.09258 1.28575 1.10715 1.34528 0.11023 Data Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Rep 6 Rep 7 Rep 8 Rep 9 Rep 10 15007-001 1.00000 1.00000 1.00000 0.0000 1.00000 1.00000 1.00000 1.00000 15007-002 0.80000 1.00000 1,00000 1.00000 0.80000 1.00000 1.00000 1.00000 Graphics 0.10-1.07 Ō d 00000 0.9 0.05 7d Proportion Survived 0.B-0000000 0.7 0.00 0.6 -0.05-0.5 -0.10-0.4-0.3 -0.15 0.2--0.20-0.1-0.0 -0,5 2.0 15007-001 15007-002 -2.0 -1.5 -1.0 0.0 0,5 L.O 1.5 Sample Code Rankits

Comparisons: Report Date:

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Analysis:

07-0603-1931

Americamysis 7-d Survival, Growth and Fecundity Test

EnviroSystems, Inc.

Test No: Start Date:

Endpoint

14-5718-9210

Test Type: Growth-Survival (7d) EPA/821/R-02-014 (2002)

Duration: 6d 23h

Species: Americamysis bahia

Ending Date: 27 Sep-06 12:25 PM

20 Sep-06 12:30 PM

Protocol: Dil Water: Not Applicable

Source:

ARO - Aquatic Research Organisms, N

Setup Date: 20 Sep-06 12:30 PM

Brine:

Analysis Type

Comparison

Generic commercial salts

Sample Link	COILLOI LIIK	Date Allalyzeu	version
07-7578-8033	07-7578-8033	28 Sep-06 2:11 PM	CETISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Mann-Whitney U	C > T	Angular (Corrected)				N/A		

ANOVA Assumptions

7d Proportion Survived

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Modified Levene	1.00000	8.86159	0.33428	Equal Variances
Distribution	Shapiro-Wilk W	0.46890	0.84420	0.00000	Non-normal Distribution

ANOVA Table

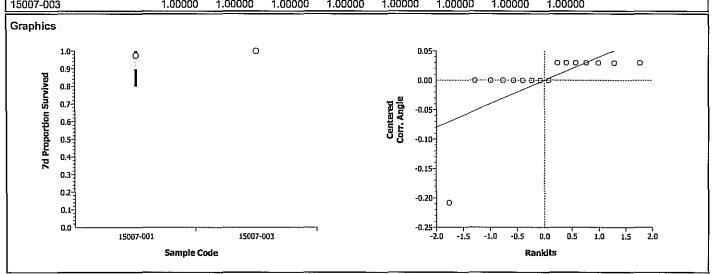
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.0035442	0.0035442	1	1.00	0.33428	Non-Significant Effect
Error	0.0496194	0.0035442	14			
Total	0.05316365	0.0070885	15	_		

Group Comparisons

Sample	vs	Sample	Statistic	Critical	P Level	Ties	Decision(0.05)
15007-001		15007-003	28		0.6395	1	Non-Significant Effect

Data Summary		Original Data					Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD		
15007-001	8	0.97500	0.80000	1.00000	0.07071	1,31552	1.10715	1.34528	0.08419		
15007-003	8	1.00000	1.00000	1.00000	0.00000	1.34528	1.34528	1.34528	0.00019		

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
15007-001	1.00000	1.00000	1.00000	0.80000	1.00000	1.00000	1.00000	1.00000		
15007-003	1 00000	1.00000	1 00000	1.00000	1 00000	1 00000	1 00000	1.00000		



Ending Date: 27 Sep-06 12:25 PM

Comparisons: Report Date: Analysis:

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Americamysis 7-d Survival, Growth and Fecundity Test EnviroSystems, Inc.

Test No: Start Date:

14-5718-9210

Test Type: Growth-Survival (7d)

20 Sep-06 12:30 PM

Protocol:

Not Applicable

EPA/821/R-02-014 (2002)

6d 23h Duration:

Species: Americamysis bahia

ARO - Aquatic Research Organisms, N Source:

Setup Date: 20 Sep-06 12:30 PM Brine: Generic commercial salts

Dit Water:

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
7d Proportion Survived	Comparison	07-7578-8033	07-7578-8033	28 Sep-06 2:11 PM	CETISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Mann-Whitney U	C > T	Angular (Corrected)				N/A		

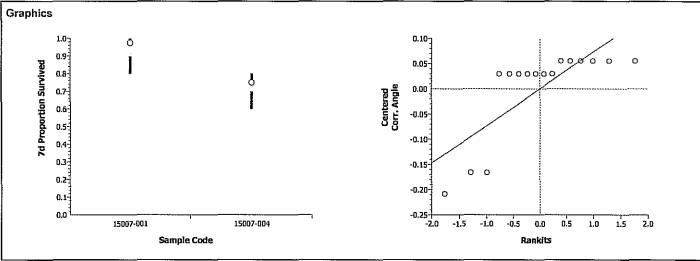
ANOVA Assum	ptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	1.47743	8.88539	0.61936	Equal Variances	
Distribution	Shapiro-Wilk W	0.60609	0.84420	0.00000	Non-normal Distribution	

ANOVA Table							
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.2780143	0.2780143	1	31.66	0.00006	Significant Effect	
Error	0.1229284	0.0087806	14				
Total	0.40094272	0.2867949	15	_			

Group Compa	ariso	ns					
Sample	V\$	Sample	Statistic	Critical	P Level	Ties	Decision(0.05)
15007-001		15007-004	61	х.	0.0005	3	Significant Effect

Data Summary		Original Data					Transfo	rmed Data	
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
15007-001	8	0.97500	0.80000	1.00000	0.07071	1.31552	1.10715	1.34528	0.08419
15007-004	8	0.75000	0.60000	0.80000	0.09258	1.05188	0.88608	1.10715	0.10234

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
15007-001	1.00000	1.00000	1.00000	0.80000	1.00000	1.00000	1.00000	1.00000		
15007-004	0.80000	0.80000	0.80000	0.60000	0.80000	0.60000	0.80000	0.80000		



Comparisons: Report Date:

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Analysis:

02-2373-9433

I	Americamysis 7-d Survival, Growth and Fecundity Test	EnviroSystems, Inc.
L		

Test No: Start Date:

14-5718-9210

20 Sep-06 12:30 PM

Test Type: Growth-Survival (7d) Protocol: EPA/821/R-02-014 (2002)

6d 23h Duration:

Species: Americamysis bahia

Source:

ARO - Aquatic Research Organisms, N

Ending Date: 27 Sep-06 12:25 PM 20 Sep-06 12:30 PM Setup Date:

Dil Water: Not Applicable Brine:

Generic commercial salts

Endpoint	Analysis	Туре	Sample L	ink	Control Link	Date Analyzed		Version		
Mean Dry Biomass-mg	Comparis	on	07-7578-8	033	07-7578-8033	28 Sep-06 2:11	PM	CETISv1.026		
Method	Alt H	Data Transform	Z	NOE	L LOEL	Toxic Units	Ch	/ MSDp		
Fougl Variance t	C>T	Untransformed				NI/A				

Equal Variance t Untransformed

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	2.86859	8.88539	0.18780	Equal Variances
Distribution	Shapiro-Wilk W	0.98388	0.84420	0.97510	Normal Distribution

ANOVA Table

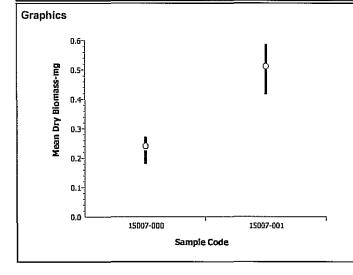
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.2921385	0.2921385	1	131.50	0.00000	Significant Effect	
Error	0.0311026	0.0022216	14				
Total	0.32324112	0.2943601	15				

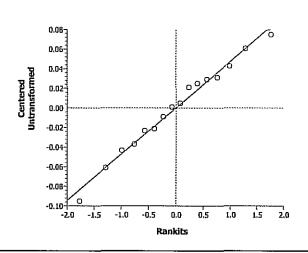
Group Comparisons

Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
15007-000		15007-001	-11.467	1.76131	1.0000	0.04151	Non-Significant Effect	

Data Summary		Original Data				Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
15007-000	8	0.24100	0.18000	0.27200	0.03389					
15007-001	8	0.51125	0.41600	0.58600	0.05740					

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep_4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
15007-000	0.26200	0.18000	0.23200	0.27200	0.24200	0.26600	0.20400	0.27000		1
15007-001	0.48800	0.55400	0.46800	0.41600	0.58600	0.49000	0.51600	0.57200		





Test No:

14-5718-9210

Comparisons: Report Date:

Page 5 of 7 28 Sep-06 2:19 PM 10-0955-7496

EnviroSystems, Inc.

Analysis:

Americamysis 7-d Survival, Growth and Fecundity Test

Test Type: Growth-Survival (7d) Duration: 6d 23h

Start Date: 20 Sep-06 12:30 PM Protocol: EPA/821/R-02-014 (2002) Species: Americamysis bahia

Ending Date: 27 Sep-06 12:25 PM Dil Water: Not Applicable ARO - Aquatic Research Organisms, N Source:

Setup Date: 20 Sep-06 12:30 PM Brine: Generic commercial salts

Endpoint	Analysi	s_Туре	Sample L	ink C	ontrol Link	Date Analyzed		Version
Mean Dry Biomass-mg	Compari	son	07-7578-8	033 0	7-7578-8033	28 Sep-06 2:11	PM	CETISv1.026
Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Mann-Whitney U	C > T	Untransformed][N/A		

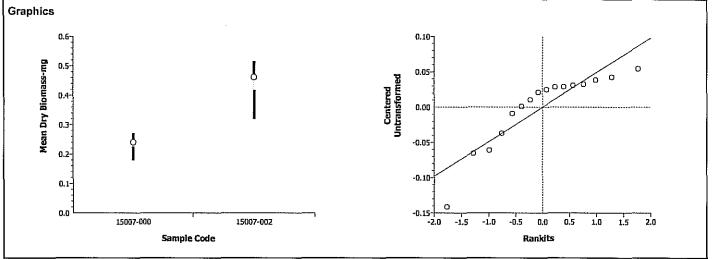
ANOVA Assum Attribute	ptions Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	4.04860	8.88539	0.08508	Equal Variances	
Distribution	Shapiro-Wilk W	0.82450	0.84420	0.00477	Non-normal Distribution	

Sum of Squares	Mean Square	DΕ	F Statistic	P Level	Decision(0.05)	
0.19448	0.19448	1	67.08	0.00000	Significant Effect	
0.0405897	0,0028993	14				
0.23506962	0.1973792	15	-			
	0.19448 0.0405897	0.19448	0.19448 0.19448 1 0.0405897 0.0028993 14	0.19448 0.19448 1 67.08 0.0405897 0.0028993 14	0.19448 0.19448 1 67.08 0.00000 0.0405897 0.0028993 14	0.19448 0.19448 1 67.08 0.00000 Significant Effect 0.0405897 0.0028993 14

١	Group Comba	roup Comparisons											
	Sample	vs	Sample	Statistic	Critical	P Level	Ties	Decision(0.05)	_				
	15007-000		15007-002	0		0.9999	0	Non-Significant Effect					

Data Summary		Original Data					Transfo	rmed Data		
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
15007-000	8	0.24100	0.18000	0.27200	0.03389					
15007-002	8	0.46150	0.32000	0.51600	0.06819					

Data Detail	•										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10	
15007-000	0.26200	0.18000	0.23200	0.27200	0.24200	0.26600	0.20400	0.27000		-	
15007-002	0.39600	0.47200	0.49000	0.50400	0.32000	0.51600	0.49400	0.50000			
										· · · · · · · · · · · · · · · · · · ·	=



Comparisons: Report Date: Analysis:

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05-4954-2665

Americamysis 7-d Survival, Growth and Fecundity Test EnviroSystems, Inc. Test Type: Growth-Survival (7d) Duration: 6d 23h Test No: 14-5718-9210 Start Date: 20 Sep-06 12:30 PM Protocol: EPA/821/R-02-014 (2002) Species: Americamysis bahia Dil Water: Not Applicable Source: ARO - Aquatic Research Organisms, N Ending Date: 27 Sep-06 12:25 PM Generic commercial salts Setup Date: 20 Sep-06 12:30 PM Brine: Sample Link Control Link Date Analyzed Version Endpoint Analysis Type Mean Dry Biomass-mg Comparison 07-7578-8033 07-7578-8033 28 Sep-06 2:11 PM CETISv1.026 Z Data Transform NOEL LOEL **Toxic Units** ChV MSDp Method Alt H C > T Unequal Variance t Untransformed N/A **ANOVA Assumptions** Decision(0.01) Statistic Critical P Level Attribute 0.00060 Unequal Variances Variances Variance Ratio 21.82139 8.88539 Shapiro-Wilk W Distribution 0.88092 0.84420 0.03958 Normal Distribution **ANOVA Table** DF F Statistic P Level Decision(0.05) Source Sum of Squares Mean Square 0.00001 Significant Effect 0.5829314 0.5829314 1 44.48 Between Error 0.183479 0.0131056 14 0.76641038 0.5960370 15 Total **Group Comparisons** Sample Statistic Critical P Level MSD Decision(0.05) Sample 15007-003 -6.6693 1.89458 0.9999 0.10845 Non-Significant Effect 15007-000 **Data Summary** Original Data **Transformed Data** Sample Code Count Mean Minimum Maximum SD Mean Minimum Maximum SD 0.03389 15007-000 8 0.24100 0.18000 0.27200 15007-003 8 0.62275 0.45200 0.944000.15831 Data Detail Rep 5 Rep 9 Rep 10 Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 6 Rep 7 Rep 8 15007-000 0.26200 0.18000 0.23200 0.27200 0.24200 0.26600 0.20400 0.27000 15007-003 0.60800 0.52200 0.54800 0.72600 0.50600 0.67600 0.94400 0.45200 Graphics Mean Dry Blomass-mg 0.3-0.6-Centered Untransformed 0.1-0000 0.4-0.0 0.2--D.1--0.2 0.0 -1.0 -0.5 0.5 1.0 1.5 2.0 15007-000 15007-003 0.0 Rankits Sample Code

Comparisons: Report Date: Analysis:

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17-2668-6025

EnviroSystems, Inc.

Test No: Start Date: 14-5718-9210

20 Sep-06 12:30 PM

Test Type: Growth-Survival (7d)

Protocol: EPA/821/R-02-014 (2002) Duration: 6d 23h

Ending Date: 27 Sep-06 12:25 PM

Dil Water: Not Applicable

Species: Americamysis bahia

20 Sep-06 12:30 PM Setup Date:

Brine: Generic commercial salts Source: ARO - Aquatic Research Organisms, N

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	07-7578-8033	07-7578-8033	28 Sep-06 2:12 PM	CETISv1.026

Method	Alt H	Data Transform	z	NOEL	LOEL	Toxic Units	ChV	MSDp
Mann-Whitney U	C > T	Untransformed				N/A		

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	426.25730	8.88539	0.00000	Unequal Variances
Distribution	Shapiro-Wilk W	0.77511	0.84420	0.00073	Non-normal Distribution

ANOVA Table

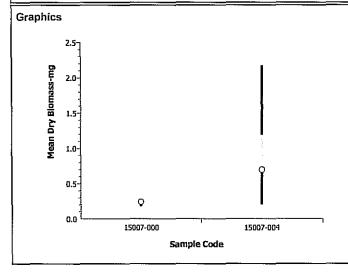
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.8290067	0.8290067	1	3.38	0.08735	Non-Significant Effect	
Error	3.435055	0.2453611	14	_			
Total	4.26406151	1.0743678	15	_			

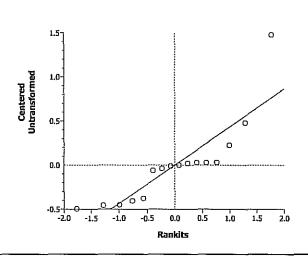
Group Comparisons

Sample	vs	Sample	Statistic	Critical	P Level	Ties	Decision(0.05)	
15007-000	_	15007-004	16		0.9476	0	Non-Significant Effect	

Data Summary	Original Data				Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
15007-000	8	0.24100	0.18000	0.27200	0.03389				
15007-004	8	0.69625	0.20000	2.17400	0.69970				

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
15007-000	0.26200	0.18000	0.23200	0.27200	0.24200	0.26600	0.20400	0.27000		
15007-004	1.17600	0.92200	0.24600	0.20000	2.17400	0.24000	0.29200	0.32000		





Comparisons: Report Date: Analysis:

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28 Sep-06 2:19 PM 03-6966-8356

EnviroSystems, Inc.

Americamysis 7-d Survival, Growth and Fecundity Test

14-5718-9210

20 Sep-06 12:30 PM

Test Type: Growth-Survival (7d)

EPA/821/R-02-014 (2002) Protocol:

Duration: 6d 23h

Species: Americamysis bahia

Source: ARO - Aquatic Research Organisms, N

Ending Date: 27 Sep-06 12:25 PM Setup Date: 20 Sep-06 12:30 PM

Test No:

Start Date:

Brine:

Dil Water: Not Applicable Generic commercial salts

Control Link Date Analyzed Endpoint Analysis Type Sample Link Version Mean Dry Biomass-mg Comparison 07-7578-8033 07-7578-8033 28 Sep-06 2:12 PM CETISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

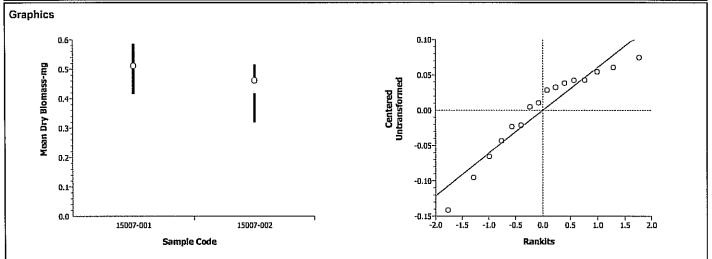
ANOVA Assumptions											
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)						
Variances	Variance Ratio	1.41136	8.88539	0.66079	Equal Variances						
Distribution	Shapiro-Wilk W	0.91115	0.84420	0.12156	Normal Distribution						

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.0099002	0.0099002	1	2.49	0.13673	Non-Significant Effect
Error	0.0556127	0.0039723	14			
Total	0.06551287	0.0138725	15			

Group Compa	arisoi	าร					1
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
15007-001		15007-002	1.57869	1.76131	0.0684	0.05550	Non-Significant Effect

Data Summary	,		Origi	nal Data			Transfo	rmed Data	
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
15007-001	8	0.51125	0.41600	0.58600	0.05740				
15007-002	8	0.46150	0.32000	0.51600	0.06819				

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
15007-001	0.48800	0.55400	0.46800	0.41600	0.58600	0.49000	0.51600	0.57200		
15007-002	0.39600	0.47200	0.49000	0.50400	0.32000	0.51600	0.49400	0.50000		



Comparisons: Report Date:

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Analysis:

12-5538-1032

Americamysis	3 7-d	Survival, G	Frowth an	d Fecundity	Test								EnviroS	systems, Inc.
Test No: Start Date: Ending Date: Setup Date:	20 S 27 S	6718-9210 Sep-06 12:3 Sep-06 12:2 Sep-06 12:3	25 PM	Test Type: Protocol: Dil Water: Brine:	Growth-Sur EPA/821/R- Not Applica Generic con	-02-014 (200 ble			Spe	ation: cies: rce:	6d 23h America ARO - A	ımysis I		Organisms, N
Endpoint			Anal	ysis Type		Sample	Link	Co	ntrol Link		Analyze		Version	
Mean Dry Bion	nass-	mg	Com	parison		07-7578	-803	3 07-	7578-8033	28 S	ep-06 2:1	12 PM	CETISV	1.026
Method			Ait I		ransform	Z		IOEL	LOEL		ic Units	Ch	ν	MSDp
Equal Variance	e t		C > 7	r Untran	sformed		<u> </u>			N/A				
ANOVA Assu	mptic	กร							_					
Attribute		Test			Statistic	Critical		P Le	vel	Decis	ion(0.01)			
Variances		Variance			7.60700	8.88539	<u> </u>	0.015	573	Equal	Variance	s		
Distribution		Shapiro-\	Nilk W		0.90814	0.84420		0.108	383	Norma	l Distribu	tion		
ANOVA Table	}													
Source		Sum of S	Squares	Mean Squa	re DF	F Statis	itic	P Le	vel	Decis	ion(0.05)			
Between		0.049729)5	0.0497295	1	3.51		0.082	213	Non-S	ignificant	Effect		
Error		0.198502	2	0.0141787	14	_								
Total		0.248231	153	0.0639082	15									
Group Compa	ariso	าร												
Sample	vs	Sample		Statistic	Critical	P Level		MSD		Decis	ion(0.05)			
15007-001		15007-00	3	-1.8728	1.76131	0.9589		0.104	186	Non-S	ignificant	Effect		
Data Summar	у				Orig	inal Data					Tran	sforme	ed Data	
Sample Code			Count	Mean	Minimum	Maximur	n_	SD	Mea	1	Minimu	m N	laximum	SD
15007-001			8	0.51125	0.41600	0.58600		0.05740)					
15007-003			8	0.62275	0.45200	0.94400		0.15831	1					
Data Detail														
Sample Code			Rep 1	Rep 2	Rep 3	Rep 4	Rep	5	Rep 6	Rep	7 Re	р8	Rep 9	Rep 10
15007-001			0.48800	0.55400	0.46800	0.41600	0.5	8600	0.49000	0.516	00 0.5	7200		
15007-003			0.60800	0.52200	0.54800	0.72600	0.50	0600	0.67600	0.944	00 0.4	5200		
Graphics 1.0 0.8 Semola 0.6 0.6 0.4		15007.001		15007	003		Centered	0.0 -0.1- -0.2-	0	900	000	250		
		15007-001	Sample C	15007-	uus			-2	2.0 -1.5	1.0 -0.	.5 0.0 Rankits	0.5	1.0 1.5	2.0
1			Sample C	ode							Rankits			

Comparisons:

Page 4 of 7 28 Sep-06 2:19 PM 09-6999-8575

Report Date: Analysis:

CL	110	\Box	iaiy	313	D	Jan

0211071114	nyono Doc	.GII							Апаіу	sis:			09-6999-8578
Americamysis 7	-d Survival, G	Frowth an	d Fecundity	Test								EnviroS	ystems, Inc.
Start Date: 2 Ending Date: 2	4-5718-9210 20 Sep-06 12:3 27 Sep-06 12:2 20 Sep-06 12:3	5 PM	Protocol:	Not Applica	02-014 (200			Spe	cies: Ar	l 23h nericamy RO - Aqui			Organisms, N
Endpoint		Anal	ysis Type		Sample I	 _ink	Cor	ntrol Link	Date Ar	alyzed		Version	
Mean Dry Bioma	ss-mg .	Com	parison		07-7578-	8033	07-7	7578-8033	28 Sep-	06 2:12 F	М	CETISv1	.026
Method		Alt I		ransform	z	NC	DEL	LOEL	Toxic l	Jnits	ChV		MSDp
Mann-Whitney U		C > 1	Γ Untran	sformed		<u> </u>			N/A				
ANOVA Assump	otions												
Attribute	Test			Statistic	Critical		P Lev		Decision				<u> </u>
Variances	Variance Shapire V			148.59460	8.88539		0.000		Unequal \ Non-norm				
Distribution	Shapiro-V	VALIK AA		0.78843	0.84420		0.001		NOH-HORE	ai Disuib	ullon		
ANOVA Table		_						_					
Source Between	Sum of S 0.136899		Mean Squa 0.1368998	ore DF	F Statis 0.56	_	P Lev 0.468		Decision Non-Signi		fect		
Error	3.450078		0.2464341	14	0.00		0.400	140	rvon-oigin	ngan un	CGL		
Total	3.586977	756	0.3833339	15	_								
Group Compari	sons						<u></u>						
Sample v	s Sample		Statistic	Critical	P Level		Ties		Decision	(0.05)			
15007-001	15007-004	4	40		0.2209		0		Non-Signi	ficant Eff	ect		
Data Summary				Orig	inal Data					Transfo	ormed	Data	
Sample Code		Count	Mean	Minimum	Maximum			Mear	1 M	inimum	Ma	ximum	SD
15007-001		8	0.51125	0.41600	0.58600		.05740						
15007-004		8	0.69625	0.20000	2.17400	====	69970	, 					
Data Detail				_	_		_	_	_			_	
Sample Code 15007-001		Rep 1 0.48800	Rep 2 0.55400	Rep 3 0.46800		Rep 5		Rep 6 0.49000	Rep 7 0.51600	Rep 8 0.5720		Rep 9	Rep 10
15007-004		1.17600	0.92200	0.24600		2.174		0.24000	0.29200	0.3200			
Graphics						_							
2.5 ₇							1.57					a	,
0.5- 0.0- 0.0-	15007-001		15007-			Centered Untransformed	1	0 -1.5 -	00	0.0 0.5			
	-200, 001	Sample C		== *						ankits		2.2	
			-						,-				



Aquatic Research Organisms

DATA SHEET

I.	Organism E	listory
	Species:	AMERICAMYSIS LALIA
	Source:	Lab reared
		Hatch date 9-/3-66 Receipt date
		Lot number 09/306 MS Strain
		Brood Origination Florida
II.	Water Qual	lity
		Temperature 25 °C Salinity = 30 ppt DO
		pH_7.8 Hardnessppm
III.	Culture Co	nditions
		System: RECIRC
		Diet: Flake Food Phytoplankton Trout Chow
		Brine Shrimp Rotifers Other Eucap. Streing Die 7
		Prophylactic Treatments:
		Comments:
IV.	Shipping In	formation
		Client: EST # of Organisms: 160+
		Carrier: Date Shipped: 9-20-06
Biol	ogist:	Mark Voxenger
		0 -

1 - 800 - 927 - 1650

Arbacia punctulata Chronic Fertilization Assay Water Quality and Gamete Preparation Data

STUDY: [5007	CLIENT: BATTELLE	LOCATION: New Bedford		DATE: 9/19	J06 J
SALINITY ADJUSTMENT	RECORD: /00	00 mL -001 + _	2 g SALT		
SALINITY ADJUSTMENT	RECORD: /O	00 mL -002+_	7 g SALT		
SALINITY ADJUSTMENT	RECORD: 100	00 mL -003+_	∑ g SALT		
SALINITY ADJUSTMENT	RECORD: 100	<u>りの</u> mL -004+_	₹ g SALT		
SALINITY ADJUSTED SAMPLE	D.O. (mg/L)	pH (SU)	SPEC COND (µmhos)	TEMP (°C)	SALINITY (ppt)
Lab Control	6.9	8.06	44840	20	29
-001	8.6	8.05	48860	20	31
-002	8.7	7.99	48810	20	31
-003	8.7	8.05	48740	20	31
-004	8.3	7.99	46620	20	30

METERS USED

DO meter # 19 DO probe #12 pH meter #470 pH probe #48 S/C meter #1300 S/C probe #45 I 300 S/C probe #45 I

DATE & INITIALS FOR GAMETE PREPARATION: 4 20 06 SPERM DILUTIONS:

HEMACYTOMETER COUNT, E: SPERM CONCENTRATIONS:

SOLUTION E X 40 = SPM SOLUTION E = 1.13×10^{8} SOLUTION E X 40 = SOLUTION A = 4.52×10^{7} SPM SOLUTION E X 20 = SOLUTION B = 2.20×10^{7} SPM SOLUTION E X 5 = SOLUTION C = 5.65×10^{7} SPM

FINAL COUNTS:

FINAL SPERM COUNT:

113

FINAL EGG COUNT:

TEST TIMES:

SPERM COLLECTED: 0905
EGGS COLLECTED: 0855
SPERM ADDED: 0945
EGGS ADDED: 1045
FIXATIVE ADDED: 1105

See ESI SOP #1412 for additional information

Arbacia punctulata Chronic Fertilization Assay

SAMPLE USE RECORD

STUDY: 1500	STUDY: CLIENT: Battelle - New Bedford								
SPECIES: A. punctulata									
	Day:	0							
SAMPLE	Volume Used (mL)	ESI Cube ID							
Lab Control	200 mL								
-001		-001							
-002		-00Z							
-003		- 003							
-004	7	-004							
INITIALS:	SJ								
TIME:	0835								
DATE:	917/06								
	(53)								

FERTILIZATION COUNTS

STUDY	CLIENT BATTELLE	LOCATION New Bedford		DATE 9/20/06 INITIALS SJ
		REPLICA	ATE VIAL	
	1	2	3	4
SAMPLE	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL
Lab Control	100 101	100/100	100/102	100 1 50
-001	801/001	100/102	101/111	100/106
-002	103/107	100/104	104/112	100/103
-003	101/109	102/108	100/107	100 1105
-004	100 108	102/110	100/107	101/110

Report Date:

20 Sep-06 1:24 PM

Link:

04-9116-7811

Arhacia Snerm	Cell Fertilization	Test						EnviroSystems, Inc
	Cen i e inization	Lest						Liiviiodystems, mc
Test No:	04-5064-7243		Test Type: Protocol:	Fertilization			Duration:	80m
Start Date: Ending Date:	20 Sep-06 09:45 A 20 Sep-06 11:05 A		Dil Water:	Not Applica	02-014 (2002 blo)	Species: Source:	Arbacia punctulata In-House Culture
Setup Date:	20 Sep-06 09:45 A		Brine:	Not Applica			Source:	III-mouse Calture
Setup Date.	20 dep-00 09:43 A	iiVi	DIME.	Not Applica	DIE .			
Sample No:	16-3216-2814		Material:	Marine Mor	itoring Sampli	3	Client:	Battelle Labs
Sample Date:	20 Sep-06 09:00 A		Code:	15007-000			Project:	Ecological Risk Assessment
	20 Sep-06 09:00 A	.M	Source:		d Harbor Dred	lge Monitorin		
Sample Age:	45m		Station:	WQ-TOX-L	ab Control			•
Sample No:	11-7565-0630		Material:	Marine Mor	itoring Sample	9	Client:	Battelle Labs
Sample Date:	19 Sep-06 09:00 A	М	Code:	15007-001			Project:	Ecological Risk Assessment
Receive Date:	19 Sep-06 02:15 P	M	Source:	New Bedfor	d Harbor Dred	lge Monitorin		
Sample Age:	25h		Station:	WQ-TOX-0	01			
Sample No:	06-1096-0183		Material:	Marine Mor	itoring Sample	9	Client:	Battelle Labs
Sample Date:	19 Sep-06 10:00 A	М	Code:	15007-002			Project:	Ecological Risk Assessment
Receive Date:	19 Sep-06 02:15 P	M	Source:	New Bedfor	d Harbor Dred	lge Monitorin		
Sample Age:	24h		Station:	WQ-TOX-0	02			
Sample No:	05-1252-8989		Material:	Marine Mor	itoring Sample	3	Client:	Battelle Labs
•	19 Sep-06 10:07 A	М	Code:	15007-003			Project:	Ecological Risk Assessment
	19 Sep-06 02:15 P		Source:	New Bedfor	d Harbor Dred	lge Monitorin		-
Sample Age:	24h		Station:	WQ-TOX-0	03			
Sample No:	11-4354-7682		Material:	Marine Mor	itoring Sample	3	Client:	Battelle Labs
Sample Date:	19 Sep-06 10:22 A	M	Code:	15007-004			Project:	Ecological Risk Assessment
Receive Date:	19 Sep-06 02:15 P	M	Source:	New Bedfor	d Harbor Dred	lge Monitorin		
Sample Age:	23h		Station:	WQ-TOX-0	04			
Proportion Fe	rtilized Summary							
Sample Code	Re	eps	Mean	Minimum	Maximum	SE	SD	cv
15007-000	4		0.99262	0.98039	1.00000	0.00470	0.00940	0.95%
15007-001	4		0.93991	0.90991	0.98039	0.01513	0.03026	3.22%
15007-002	4		0.95590	0.92857	0.97087	0.00934	0.01869	1.96%
15007-003	4		0.93950	0.92661	0.95238	0.00563	0.01127	1.20%
15007-004	4		0.92649	0.91818	0.93458	0.00336	0.00672	0.73%
Proportion Fe	rtilized Detail				\$			
Sample Code		p 1	Rep 2	Rep 3	Rep 4			
15007-000		99010	1.00000	0.98039	1.00000			
15007-001		92593	0.98039	0.90991	0.94340			
15007-002		96262	0.96154	0.92857	0.97087			
15007-003		92661	0.94444	0.93458	0.95238			
15007-004	0.0	92593	0.92727	0.93458	0.91818			

CETIS Test Summary

Analyst:____

Comparisons: Report Date: Analysis:

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16-2347-6851

EnviroSystems, Inc.

Arbacia	Sperm	Cell	Fertilization	Test
---------	-------	------	---------------	------

Test No: 04-5064-7243

20 Sep-06 09:45 AM

Test Type: Fertilization Protocol:

EPA/821/R-02-014 (2002)

Duration: 80m

Species: Arbacia punctulata

Ending Date: 20 Sep-06 11:05 AM Setup Date: 20 Sep-06 09:45 AM

Start Date:

Dil Water: Not Applicable Brine: Not Applicable Source: In-House Culture

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version	
Proportion Fertilized	Comparison	04-9116-7811	04-9116-7811	20 Sep-06 1:23 PM	CETISv1.026	
Method	Alt H Data Transform	Z NO	EL LOEL	Toxic Units Ch	V MSDp	

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C>T	Angular (Corrected)				N/A		

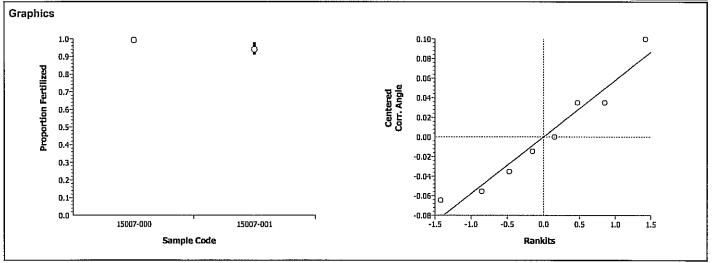
ANOVA Assumptions Critical Attribute Statistic P Level Decision(0.01) Variances Variance Ratio 2.67845 47,46723 0.43987 Equal Variances Distribution Shapiro-Wilk W 0.94385 0.74935 Normal Distribution 0.61192

ANOVA Table							
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0482054	0.0482054	1	13.70	0.01008	Significant Effect	
Error	0.0211193	0.0035199	6				
Total	0.06932466	0.0517253	7	_			

Group Comparisons											
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)				
15007-000		15007-001	3.70070	1.94318	0.0050	0.08152	Significant Effect				

Data Summary		Original Data				Transformed Data				
Sample Code Coun		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
15007-000	4	0.99262	0.98039	1.00000	0.00940	1.48575	1.43031	1.52078	0.04375	
15007-001	4	0.93991	0.90991	0.98039	0.03026	1.33050	1.26595	1.43031	0.07160	

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
15007-000	0.99010	1.00000	0.98039	1.00000		•				
15007-001	0.92593	0.98039	0.90991	0.94340						



Approval:_LUB

Analyst:

Comparisons: Report Date:

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Analysis:

07-5731-7102

Arbacia Sperm Cell Fertilization Test

EnviroSystems, Inc.

Test No: 04-5064-7243 Start Date:

20 Sep-06 09:45 AM

Test Type: Fertilization

Protocol: EPA/821/R-02-014 (2002)

Duration: 80m Species:

Arbacia punctulata

Ending Date: 20 Sep-06 11:05 AM Setup Date: 20 Sep-06 09:45 AM

Dil Water: Not Applicable Brine: Not Applicable

Source: In-House Culture

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Fertilized	Comparison	04-9116-7811	04-9116-7811	20 Sep-06 1:23 PM	CETISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL_	Toxic Units	ChV	MSDp
Equal Variance t	C>T	Angular (Corrected)				N/A		***

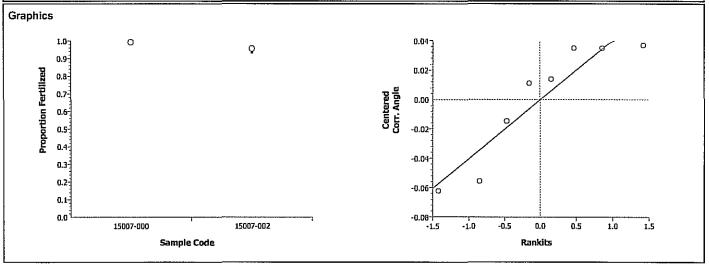
ANOVA Assumptions										
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)					
Variances	Variance Ratio	1.03706	47.46723	0.97684	Equal Variances					
Distribution	Shapiro-Wilk W	0.84085	0.74935	0.08145	Normal Distribution					

ANOVA Table							
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0304825	0.0304825	1	16.22	0.00690	Significant Effect	* ***
Error	0.0112775	0.0018796	6				
Total	0.04176002	0.0323621	7	_			

Group Comp	ariso	ns						
Sample	٧s	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
15007-000		15007-002	4.02711	1.94318	0.0035	0.05957	Significant Effect	

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
15007-000	4	0.99262	0.98039	1.00000	0.00940	1.48575	1.43031	1.52078	0.04375
15007-002	4	0.95590	0.92857	0.97087	0.01869	1.36229	1.30025	1.39929	0.04296

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
15007-000	0.99010	1.00000	0.98039	1.00000						
15007-002	0.96262	0.96154	0.92857	0.97087						



Comparisons: Report Date:

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Analysis:

05-1976-6400

Arbacia Sperm Cell Fertilization Test

EnviroSystems, Inc.

Test No:	04-5	064-7243	Test Type	: Fertilization	1			Dura	ation:	80m		
Start Date:	20 5	Sep-06 09:45 AM	Protocol:	EPA/821/R	-02-014 (2002	2)		Spe	cies:	Arbacia pun	ctulata	
Ending Date:	20 8	Sep-06 11:05 AM	Dil Water:	: Not Applica	ıble			Sou	rce:	In-House Cu	ılture	
Setup Date:	20 5	Sep-06 09:45 AM	Brine:	Not Applica	ıble							
Endpoint		Δn	alysis Type		Sample I	ink	Contro	llink	Date	Analyzed	Version	
Proportion Fer	tilized		mparison		04-9116-			6-7811		p-06 1:23 Pl		
1 Toporton 1 Ci	IIIEGO		Прилоч		010110	7	01011			P 00 1:2011	. 02,107	
Method				Transform	Z	NO	EL	LOEL		c Units (ChV	MSDp
Equal Variance	∍ t	C >	>T Angu	lar (Corrected	l) 	<u> </u>			N/A			
ANOVA Assur	mptic	ins										
Attribute		Test		Statistic	Critical		P Level		Decisio	on(0.01)		
Variances		Variance Ratio		3.39145	47.4672	3	0.34262		Equal \	/ariances		
Distribution		Shapiro-Wilk W		0.92221	0.74935		0.41827		Normal	Distribution		
ANOVA Table												
Source		Sum of Squares	Mean Squ	are DF	F Statis	tic	P Level		Decisio	on(0.05)		
Between		0.0529296	0.0529296	3 1	42.72		0.00061		Signific	ant Effect		
Error		0.0074342	0.0012390	6								
Total		0.06036386	0.0541687	7 7								
Group Compa	arisor	าร										
Sample	vs	Sample	Statistic	Critical	P Level		MSD		Decisio	n(0.05)		
15007-000		15007-003	6.53592	1.94318	0,0003		0.04837		Signific	ant Effect		
Data Summar	rv			Orig	inal Data					Transfo	med Data	
Sample Code	-	Count	Mean	Minimum	Maximum	: S		Mear	1	Minimum	Maximum	SD
15007-000		4	0,99262	0.98039	1.00000		00940	1.485		1.43031	1.52078	0.04375
15007-003		4	0.93950	0.92661	0.95238		01127	1.323		1.29645	1.35081	0.02376
Data Detail												
Sample Code	<u>.</u>	Rep 1	Rep 2	Rep 3	Rep 4	Rep :	5 Re	p 6	Rep 7	Rep 8	Rep 9	Rep 10
15007-000		0.9901	<u>-</u>		1.00000				•			
15007-003		0.9266		0.93458	0.95238							
Graphics											<u></u>	
1.07		0					0,047				_	
0.9		J	()			0.03				. %	0
. 4							0.02			C	·/	
						- a	0.01					
0.7						Ang	0.00			7		
0.5.						Centered Corr, Angle	- 1					
pod 0.53	ĺ					- 0	-0.01		9/	0		

1.0

0.5

-0.02 -0.03 -0.04 -0.05 -0.06 10--1.5

0.0

15007-000

Sample Code

15007-003

Rankits

-0.5

-1.0

Comparisons: Report Date:

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EnviroSystems, Inc.

Analysis:

17-2160-0763

Arbacia Sperm Cell Fertilization Test

04-5064-7243

20 Sep-06 09:45 AM

Test Type: Fertilization

EPA/821/R-02-014 (2002) Protocol:

Duration: 80m

Species: Arbacia punctulata

Ending Date: Setup Date:

Test No:

Start Date:

20 Sep-06 11:05 AM 20 Sep-06 09:45 AM

Dil Water: Not Applicable Brine: Not Applicable Source:

In-House Culture

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Fertilized	Comparison	04-9116-7811	04-9116-7811	20 Sep-06 1:24 PM	CETISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C>T	Angular (Corrected)				N/A		

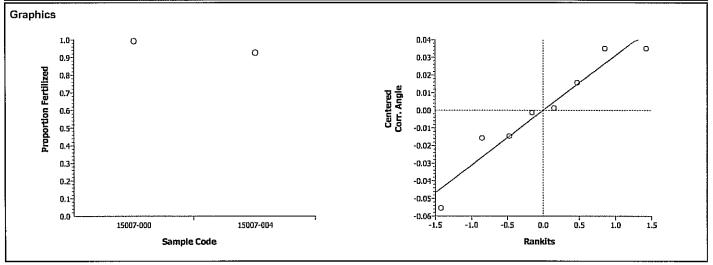
ANOVA Assumptions Decision(0.01) **Attribute** Statistic Critical P Level Variances Variance Ratio 11.53760 47.46723 0.07462 **Equal Variances** Distribution Shapiro-Wilk W 0.93173 0.74935 0.49712 Normal Distribution

ANOVA Table							
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0716770	0.0716770	1	68.93	0.00017	Significant Effect	
Error	0.006239	0.0010398	6				
Total	0.07791597	0.0727168	7	_			

Group Comparisons										
Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)			
15007-000		15007-004	8.30251	1.94318	0.0001	0.04431	Significant Effect			

Data Summary	Original Data				Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
15007-000	4	0.99262	0.98039	1.00000	0.00940	1.48575	1.43031	1.52078	0.04375
15007-004	4	0.92649	0.91818	0.93458	0.00672	1.29644	1.28071	1.31215	0.01288

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
15007-000	0.99010	1.00000	0.98039	1.00000						
15007-004	0,92593	0.92727	0.93458	0.91818						



Comparisons: Report Date:

Page 4 of 7 20 Sep-06 1:26 PM 13-1692-8962

EnviroSystems, Inc.

Analysis:

Arbacia Sperm Cell Fertilization Test

04-5064-7243

Duration: 80m

20 Sep-06 09:45 AM Start Date:

EPA/821/R-02-014 (2002) Protocol:

Ending Date: 20 Sep-06 11:05 AM

Test No:

Species: Arbacia punctulata Source: In-House Culture

Setup Date: 20 Sep-06 09:45 AM Dil Water: Not Applicable Brine: Not Applicable

Test Type: Fertilization

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Fertilized	Comparison	04-9116-7811	04-9116-7811	20 Sep-06 1:24 PM	CETISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Angular (Corrected)				N/A		

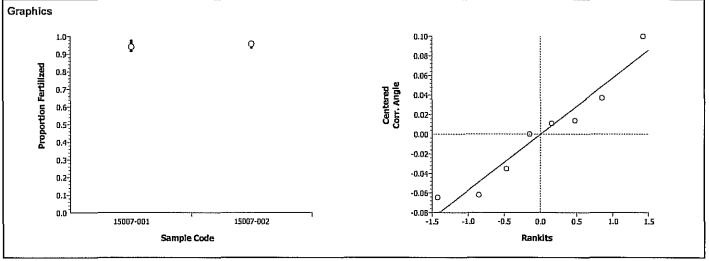
ANOVA Assum	ANOVA Assumptions									
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	_				
Variances	Variance Ratio	2.77771	47.46723	0.42375	Equal Variances					
Distribution	Shapiro-Wilk W	0.93739	0.74935	0.54880	Normal Distribution					

ANOVA Table							
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0020218	0.0020218	1	0.58	0.47516	Non-Significant Effect	
Error	0.0209141	0.0034857	6				
Total	0.02293596	0.0055075	7	-			

Group Com	pariso	ns					
Sample vs Sample		Statistic	Critical	P Level	MSD	Decision(0.05)	
15007-001		15007-002	-0.7616	1.94318	0.7624	0.08112	Non-Significant Effect

Data Summary		Original Data				Transformed Data			
Sample Code Co		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
15007-001	4	0.93991	0.90991	0.98039	0.03026	1,33050	1.26595	1.43031	0.07160
15007-002 4		0.95590	0.92857	0.97087	0.01869	1.36229	1.30025	1.39929	0.04296

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
15007-001	0.92593	0.98039	0.90991	0.94340						,
15007-002	0.96262	0.96154	0.92857	0.97087						



Approval: CUK Analyst:_

Comparisons: Report Date:

Analysis:

Page 3 of 7 20 Sep-06 1:26 PM

: 20 Sep-06 1:26 PM 10-3474-0118

EnviroSystems, Inc.

Arbacia Sperm Cell Fertilization Test

Test No: 04-5064-7243 Start Date: 20 Sep-06 09:

Ending Date:

000-148-126-1

20 Sep-06 09:45 AM 20 Sep-06 11:05 AM Test Type: Fertilization

Protocol: EPA/821/R-02-014 (2002)

Dil Water: Not Applicable

Duration: 80m

Species: Arbacia punctulata Source: In-House Culture

Setup Date: 20 Sep-06 09:45 AM Brine: Not Applicable

Endpoint	Analysis	Туре	Sample Li	ink	Control Link	Date Analyzed		Version
Proportion Fertilized	Comparis	on	04-9116-7	811	04-9116-7811	20 Sep-06 1:24	PM	CETISv1.026
Method	Alt H	Data Transform	Z	NOE	L LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Angular (Corrected)				N/A		

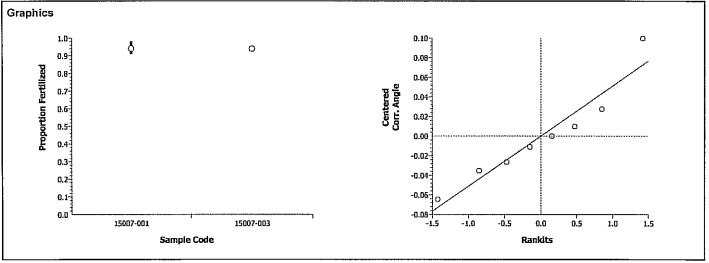
ANOVA Assum	ptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	9.08384	47.46723	0.10282	Equal Variances	-
Distribution	Shapiro-Wilk W	0.93581	0.74935	0.53408	Normal Distribution	
ANOVA Table						

ANOVA Table							
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0001104	0.0001104	1	0.04	0.85034	Non-Significant Effect	
Error	0.0170708	0.0028451	6				
Total	0.01718121	0.0029555	7				

Group Companisons									
	Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
	15007-001		15007-003	0.19699	1.94318	0.4252	0.07329	Non-Significant Effect	

Data Summary			Origi	nal Data		Transformed Data			
Sample Code Cou		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
15007-001	4	0.93991	0.90991	0.98039	0.03026	1.33050	1.26595	1.43031	0.07160
15007-003	4	0.93950	0.92661	0.95238	0.01127	1.32307	1.29645	1.35081	0.02376

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
15007-001	0.92593	0.98039	0.90991	0.94340					***************************************	
15007-003	0.92661	0.94444	0.93458	0.95238						



Approval: CUB

Test No:

Start Date:

Comparisons: Report Date: Analysis:

Page 6 of 7 20 Sep-06 1:26 PM

16-4784-5725 EnviroSystems, Inc.

Arbacia Sperm Cell Fertilization Test

04-5064-7243

20 Sep-06 09:45 AM

Test Type: Fertilization

EPA/821/R-02-014 (2002) Protocol:

Duration: 80m

Species: Arbacia punctulata S

Ending Date: 20 Sep-06 11:05 AM Setup Date: 20 Sep-06 09:45 AM

Brine:

Dil Water: Not Applicable Not Applicable

ource:	In-House	Culture
ource:	In-House	Culture

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Fertilized	Comparison	04-9116-7811	04-9116-7811	20 Sep-06 1:24 PM	CETISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Angular (Corrected)				N/A		

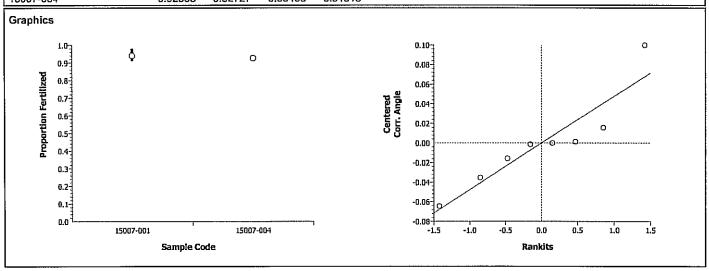
ANOVA Assumptions Statistic Critical P Level Decision(0.01) Attribute Test Variance Ratio 30.90291 47.46723 0.01866 **Equal Variances** Variances Distribution Shapiro-Wilk W 0.88705 0.74935 0.21190 Normal Distribution

ANOVA Table							
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0023202	0.0023202	1	0.88	0.38520	Non-Significant Effect	
Error	0.0158756	0.0026459	6				
Total	0.01819574	0.0049661	7	_			

Group Comp	Group Comparisons										
Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)				
15007-001		15007-004	0.93643	1.94318	0.1926	0.07068	Non-Significant Effect				

Data Summary		Origi	nal Data		Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
15007-001	4	0.93991	0.90991	0.98039	0.03026	1.33050	1.26595	1.43031	0.07160
15007-004	4	0.92649	0.91818	0.93458	0.00672	1.29644	1.28071	1.31215	0.01288

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
15007-001	0.92593	0.98039	0.90991	0.94340						
15007-004	0.92593	0.92727	0.93458	0.91818						



Analyst:

STUDY: 15007

CLIENT: Battelle Labs

PROJECT: New Bedford Harbor Dredge Monitoring

ASSAY: Champia parvula Chronic Exposure

SPECIES: Champia parvula

Champia Raw Data

Date of test:	Sept 21/06								_	
		Cysto	ocarps per	plant			Mean	SD	Group mean and SD	Comments
Control	NSW	15	18	11	15	14	14.6	2.5	23.9	
		40	15	18	22	21	23.2	9.8	11.3	
		22	50	38	31	29	34.0	10.6		
Control	Inst Ocean	32	26	38	39	21	31.2	7.7	27.3	
		24	25	22	31	30	26.4	3.9	7.1	
		18	15	27	25	36	24.2	8.2		
		, -		ooled contro			25.6	9.8		
Samples collecte	d Sept 19/06									
•	% V/V									
SRC #527	100	12	14	33	26	20	21.0	8.7	24.5	Healthy red colour
WP-TOX-001	100	23	20	6	18	21	17.6	6.7	9.6	Normal growth
	100	14	28	28	25	21	23.2	5.9		
	100	44	37	40	31	29	36.2	6.2		
SRC #528	100	2	2	3	1	1	1.8	8.0	8.0	Branches white with
WP-TOX-002	100	1	0	0	0	1	0.4	0.5	13.8	red tips
	100	1	0	0	1	0	0.4	0.5		
	100	3	0	0	0	0	0.6	1.3		
SRC #529	100	0	0	2	0	0	0.4	0.9	0.2	Branches white with
WP-TOX-003	100	0	0	0	0	0	0.0	0.0	0.5	red tips
	100	0	1	0	0	0	0.2	0.4		
	100	1	0	0	0	0	0.2	0.4		
SRC #530	100	0	0	0	0	0	0.0	0.0	0.2	Branches slighlty broken
WP-TOX-004	100	0	0	0	0	0	0.0	0.0	0.4	White with red tips
	100	0	1	0	1	1	0.6	0.5		•
	100	0	0	0	0	0	0.0	0.0		

Samples 002, 003 and 004 were at salinity of 27 ppt so were adjusted with the addition of 1.2 g Instant Ocean to 500 mL sample to raise salinity to 30 ppt.

CETIS Test Summary

Report Date:

29 Sep-06 12:51 PM

Link:

04-6908-2140

ula Red Macroa	lga Sex	ual Reproduc	tion Test				Saskatchewan Research Council
28 Sep-06 12:0	0 PM	Test Type: Protocol: Dil Water: Brine:	Champia EPA/600/4-91/003 (1994) Not Applicable Not Applicable			Duration: Species: Source:	7d 0h Champia parvula In-House Culture
·		Material: Code: Source: Station:	15007-000 New Bedfor	d Harbor Dred		Client: Project:	Battelle Labs Ecological Risk Assessment
*		Material: Code: Source: Station:	15007-001 New Bedfor	rd Harbor Dred		Client: Project:	Battelle Labs Ecological Risk Assessment
•		Material: Code: Source: Station:	15007-002 New Bedfor	d Harbor Dred		Client: Project:	Battelle Labs Ecological Risk Assessment
		Material: Code: Source: Station:	15007-003 New Bedfor	rd Harbor Dred		Client: Project:	Battelle Labs Ecological Risk Assessment
		Material: Code: Source: Station:	15007-004 New Bedfo	rd Harbor Dred		Client: Project:	Battelle Labs Ecological Risk Assessment
ırps Summary		**************************************		<u></u>			
	Reps 3 4 4 4 4	Mean 23,933 24.5 0.8 0.2 0.15	Minimum 14.6 17.6 0.4 0	Maximum 34 36.2 1.8 0.4 0.6	5E 5.6123 4.0665 0.3367 0.0816 0.15	9.7208 8.1331 0.6733 0.1633 0.3	CV 40.62% 33.20% 84.16% 81.65% 200.00
arps Detail		····					
	Rep 1 14.6 21 1.8 0.4 0	Rep 2 23.2 17.6 0.4 0	Rep 3 34 23.2 0.4 0.2 0.6	36.2 0.6 0.2			
	00-7249-1704 21 Sep-06 12:0 28 Sep-06 12:0 21 Sep-06 12:0 16-3216-2814 20 Sep-06 09:0 20 Sep-06 09:0 27h 11-7565-0630 19 Sep-06 02:1 51h 06-1096-0183 19 Sep-06 10:0 19 Sep-06 02:1 50h 05-1252-8989 19 Sep-06 02:1 50h 11-4354-7682 19 Sep-06 02:1 50h 11-9 Sep-06 02:1 50h 11-9 Sep-06 02:1 50h 11-9 Sep-06 10:0 19 Sep-06 10:0 19 Sep-06 10:0 19 Sep-06 10:0 19 Sep-06 10:0 19 Sep-06 10:0 19 Sep-06 10:0	00-7249-1704 21 Sep-06 12:00 PM 28 Sep-06 12:00 PM 21 Sep-06 12:00 PM 16-3216-2814 20 Sep-06 09:00 AM 20 Sep-06 09:00 AM 27h 11-7565-0630 19 Sep-06 09:00 AM 19 Sep-06 02:15 PM 51h 06-1096-0183 19 Sep-06 10:00 AM 19 Sep-06 02:15 PM 50h 05-1252-8989 19 Sep-06 02:15 PM 50h 11-4354-7682 19 Sep-06 02:15 PM 50h 11-95-06 02:15 PM 50h 11-4354-7682 19 Sep-06 02:15 PM 50h 11-4354-7682 19 Sep-06 10:22 AM 19 Sep-06 02:15 PM 50h 11-4354-7682 19 Sep-06 10:22 AM 19 Sep-06 02:15 PM 50h 11-4354-7682 19 Sep-06 10:22 AM 19 Sep-06 02:15 PM 50h 11-4354-7682 19 Sep-06 10:22 AM 19 Sep-06 02:15 PM 50h 11-4354-7682 19 Sep-06 10:22 AM 19 Sep-06 02:15 PM 50h 11-4354-7682 19 Sep-06 10:22 AM 19 Sep-06 02:15 PM 50h 11-4354-7682	00-7249-1704 Test Type: 21 Sep-06 12:00 PM Protocol: 28 Sep-06 12:00 PM Dil Water: 21 Sep-06 12:00 PM Brine: 16-3216-2814 Material: 20 Sep-06 09:00 AM Code: 20 Sep-06 09:00 AM Source: 27h Station: 11-7565-0630 Material: 19 Sep-06 09:00 AM Code: 19 Sep-06 02:15 PM Source: 51h Station: 06-1096-0183 Material: 19 Sep-06 10:00 AM Code: 19 Sep-06 02:15 PM Source: 50h Station: 05-1252-8989 Material: 19 Sep-06 10:07 AM Code: 19 Sep-06 02:15 PM Source: 50h Station: 11-4354-7682 Material: 19 Sep-06 02:15 PM Source: 50h Station: arps Summary Reps Mean 3 23.933 4 0.2 4 0.15 arps D	21 Sep-06 12:00 PM	100-7249-1704	Test Type: Champia 21 Sep-06 12:00 PM	Duration: 21 Sep-06 12:00 PM

Ending Date: 28 Sep-06 12:00 PM

Test No:

Start Date:

Setup Date:

Comparisons: Report Date: Analysis:

Page 1 of 7 29 Sep-06 12:52 PM

00-7215-1359

Champia parvula Red Macroalga Sexual Reproduction Test

00-7249-1704

21 Sep-06 12:00 PM

21 Sep-06 12:00 PM

Test Type: Champia

Protocol: EPA/600/4-91/003 (1994)

Dil Water: Not Applicable Brine: Not Applicable Saskatchewan Research Council

7d 0h Species: Champia parvula Source: In-House Culture

Duration:

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Cystocarps	Comparison	04-6908-2140	04-6908-2140	29 Sep-06 12:51 PM	CETISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed		ļ		N/A		

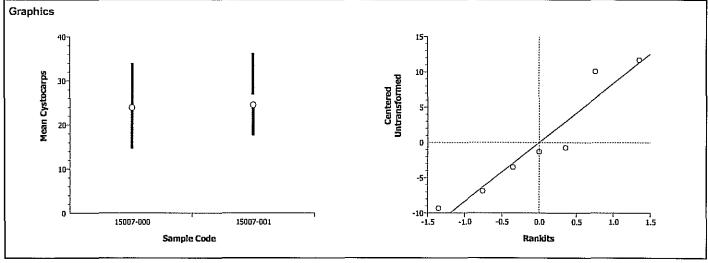
ANOVA Assumptions Attribute Test Statistic Critical P Level Decision(0.01) Variances Variance Ratio 1.42854 49.79928 0.73314 **Equal Variances** Distribution Shapiro-Wilk W 0.89684 0.72991 0.29455 Normal Distribution

ble						
Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
0.5504762	0.5504762	1	0.01	0.93610	Non-Significant Effect	
387.4267	77.48534	5				
387.977142	78.035812	6				
	Sum of Squares 0.5504762 387.4267	Sum of Squares Mean Square 0.5504762 0.5504762 387.4267 77.48534	Sum of Squares Mean Square DF 0.5504762 0.5504762 1 387.4267 77.48534 5	Sum of Squares Mean Square DF F Statistic 0.5504762 0.5504762 1 0.01 387.4267 77.48534 5	Sum of Squares Mean Square DF F Statistic P Level 0.5504762 0.5504762 1 0.01 0.93610 387.4267 77.48534 5	Sum of Squares Mean Square DF F Statistic P Level Decision(0.05) 0.5504762 0.5504762 1 0.01 0.93610 Non-Significant Effect 387.4267 77.48534 5

Group Compa	ariso	ns					
Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
15007-000		15007-001	-0.0843	2.01505	0.5320	13.5473	Non-Significant Effect

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
15007-000	3	23.933	14.6	34	9.7208				
15007-001	4	24.500	17.6	36.2	8.1331				

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
15007-000	14.6	23.2	34							
15007-001	21	17.6	23.2	36,2						



Comparisons:

Page 3 of 7

Report Date:

29 Sep-06 12:52 PM

Saskatchewan Research Council

Analysis:

07-5620-6625

Champia parvula Red Macroalga Sexual Reproduction Te	st
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00-7249-1704

21 Sep-06 12:00 PM Ending Date: 28 Sep-06 12:00 PM Test Type: Champia

Protocol: EPA/600/4-91/003 (1994)

7d Oh Duration: Champia parvula

Species: Source:

Setup Date:

Test No:

Start Date:

21 Sep-06 12:00 PM

Brine:

Dil Water: Not Applicable Not Applicable

In-House Culture

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Cystocarps	Comparison	04-6908-2140	04-6908-2140	29 Sep-06 12:51 PM	CETISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Unequal Variance t	C>T	Untransformed				N/A		

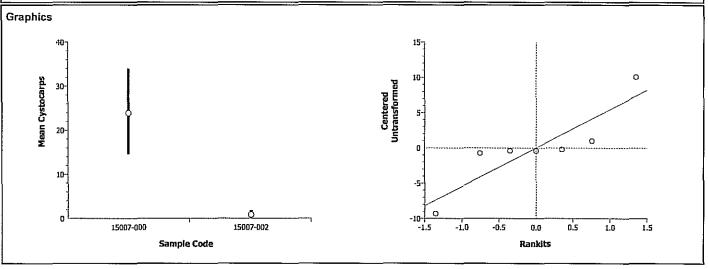
ANOVA Assum	ptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	208.44120	49.79928	0.00121	Unequal Variances	
Distribution	Shapiro-Wilk W	0.84008	0.72991	0.10448	Normal Distribution	-

ANOVA Table							
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	917.4019	917.4019	1	24.10	0.00444	Significant Effect	
Error	190.3467	38.06933	5				
Total	1107.74858	955.47125	6				

Group Com	hairac	1113						
Sample	٧s	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
15007-000		15007-002	4.11451	2.91999	0.0272	16.4173	Significant Effect	

Data Summary			Origi	nal Data			Transfo	rmed Data	
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
15007-000	3	23.933	14.6	34	9.7208				
15007-002	4	0.8	0.4	1.8	0.6733				

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
15007-000	14.6	23.2	34							
15007-002	1.8	0.4	0.4	0.6						



Comparisons: Report Date:

Page 7 of 7 29 Sep-06 12:52 PM

Saskatchewan Research Council

Analysis:

15-6759-2849

Champia parvula Red Macroalga Sexual Reproduction Test

00-7249-1704

Start Date: 21 Sep-06 12:00 PM Ending Date: 28 Sep-06 12:00 PM Test Type: Champia

Protocol: EPA/600/4-91/003 (1994) Dil Water: Not Applicable

Species:

7d Oh Duration: Champia parvula

Source: In-House Culture

Litting Dute.	20	CCP CG	12.00	
Setup Date:	21	Sep-06	12:00	PN

Test No:

Endpoint

Brine: Analysis Type Not Applicable

Control Link	Date Analyzed	Version
04-6908-2140	29 Sep-06 12:51 PM	CETISv1.026

Mean Cystocarps	Compari	son	04-6908-	2140 04	6908-2140	29 Sep-06 12:5	1 PM CE	TISv1.026
Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Unequal Variance t	C>T	Untransformed				N/A		

Sample Link

ANOVA Assumptions Attribute Statistic Critical P Level Decision(0.01) Variance Ratio 3543.50000 49.79928 0.00002 Unequal Variances Variances Distribution Shapiro-Wilk W 0.81364 0.72991 0.06238 Normal Distribution

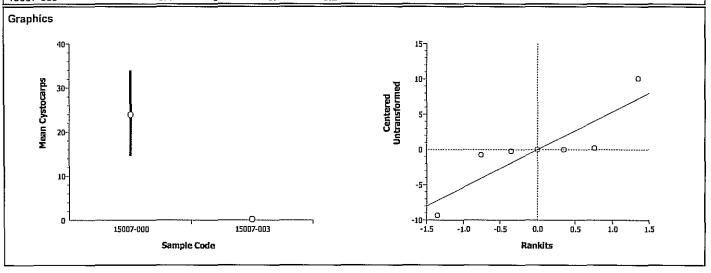
ANOVA Table							
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	965.6076	965.6076	1	25.54	0.00392	Significant Effect	
Error	189.0667	37.81333	5				
Total	1154.67427	1003.4209	6	-			

Group Comparisons

Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
15007-000		15007-003	4.22837	2.91999	0.0258	16.3895	Significant Effect	,

Data Summary			Origi	nal Data			Transfo	rmed Data	
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
15007-000	3	23.933	14.6	34	9.7208				
15007-003	4	0.2000	0	0.4	0.1633				

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
15007-000	14.6	23,2	34						-	
15007-003	0.4	0	0.2	0.2						



Comparisons: Report Date:

Page 2 of 7 29 Sep-06 12:52 PM

Analysis:

04-2543-5950

Champia parvula Red Macroalga Sexual Reproduction Test

Saskatchewan Research Council

Test No:

00-7249-1704

Test Type: Champia

EPA/600/4-91/003 (1994)

Duration: 7d Oh

Start Date: 21 Sep-06 12:00 PM Ending Date: 28 Sep-06 12:00 PM Protocol: Dil Water: Not Applicable Species: Champia parvula

Setup Date: 21 Sep-06 12:00 PM

Brine:

Not Applicable

Source: In-House Culture

Endpoint	Analysis	Туре	Sample L	ink	Control Link	Date Analyzed	d V	ersion
Mean Cystocarps	Compari	son	04-6908-2	140	04-6908-2140	29 Sep-06 12:5	51 PM C	ETISv1.026
Method	Alt H	Data Transform	Z	NO	L LOEL	Toxic Units	ChV	MSDp

Unequal Variance t C > T Untransformed N/A

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	1049.92600	49.79928	0.00011	Unequal Variances	
Distribution	Shapiro-Wilk W	0.81910	0.72991	0.06952	Normal Distribution	

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	969.6805	969.6805	1	25.62	0.00390	Significant Effect
Error	189.2567	37.85133	5			
Total	1158.93715	1007.5318	6			

Group Comparisons

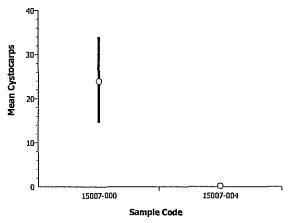
Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
15007-000		15007-004	4.23621	2.91999	0.0257	16.3937	Significant Effect	

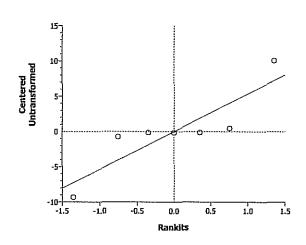
Data Summary		Original Data				Transformed Data					
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD		
15007-000	3	23.933	14.6	34	9.7208						
15007-004	4	0.1500	0	0.6	0.3000						

Data Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
15007-000	14.6	23.2	34				-	ä.		
15007-004	0	0	0.6	0						







Approval:

Comparisons:

Page 4 of 7

Report Date:

29 Sep-06 12:52 PM

Analysis:

09-0725-0942

Champia	parvula Red	Macroaiga	Sexual Re	ebroanction	lest

Saskatchewan Research Council

Test No: Start Date:

00-7249-1704

21 Sep-06 12:00 PM

Test Type: Champia Protocol:

EPA/600/4-91/003 (1994)

7d 0h Duration:

Ending Date: 28 Sep-06 12:00 PM Dil Water: Not Applicable Species: Champia parvula

Setup Date:

21 Sep-06 12:00 PM

Brine:

Not Applicable

Source:

In-House Culture

Endpoint	Analysis Type Comparison		Sample Li	Sample Link C		Date Analyzed	i	Version
Mean Cystocarps			04-6908-2140 04-6908-2140		04-6908-2140	29 Sep-06 12:51 PM		CETISv1.026
Method	Alt H	Data Transform	Z	NOE	L LOEL	Toxic Units	ChV	MSDp

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Unequal Variance t	C>T	Untransformed		N/A				

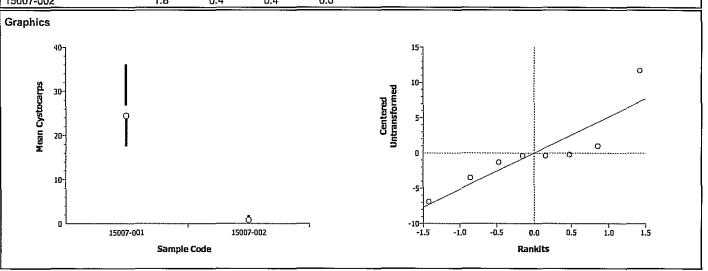
ANOVA Assumptions Attribute Test Statistic Critical P Level Decision(0.01) Variance Ratio 145.91180 47.46723 0.00190 Unequal Variances Variances Shapiro-Wilk W 0.82930 0.74935 0.06355 Normal Distribution Distribution

ANOVA Table							
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	1123.38	1123.38	1	33.74	0.00114	Significant Effect	
Error	199.8	33,3	6				
Total	1323.18001	1156.6800	7	_			

Group Companisons										
	Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)		
	15007-001		15007-002	5.8082	2.35336	0.0051	9.60276	Significant Effect		

Data Summary		Original Data					Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD		
15007-001	4	24.500	17.6	36.2	8.1331						
15007-002	4	8.0	0.4	1.8	0.6733						

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
15007-001	21	17.6	23.2	36.2						
15007-002	1.8	0.4	0.4	0.6						



Comparisons: Report Date:

Page 5 of 7 29 Sep-06 12:52 PM

Analysis:

09-9932-6505

Champia parvula Red Macroalga Sexual Reproduction Test

Saskatchewan Research Council

Test No: Start Date:

00-7249-1704

21 Sep-06 12:00 PM

Test Type: Champia

Protocol: EPA/600/4-91/003 (1994) Duration: 7d 0h

Species: Champia parvula

Dil Water: Not Applicable

Ending Date: 28 Sep-06 12:00 PM Setup Date: 21 Sep-06 12:00 PM

Brine:

Not Applicable

Source: In-House Culture

octub par	٠. ،	e i ocp-oo	12.001	, 5,11	 at tabbildable

Endpoint	Analysis Type		Sample Li	ink Control Link		Date Analyzed		Version	
Mean Cystocarps	Comparison		04-6908-2140 04-6908-2140		10 29 Sep-06 12:51 PM		CETISv1.026		
Method	Alt H	Data Transform	Z	NOE	L LOEL	Toxic Units	ChV	MSDp	

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Unequal Variance t	C > T	Untransformed		<u> </u>		N/A		

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	2480.50000	47.46723	0.00003	Unequal Variances
Distribution	Shapiro-Wilk W	0.80802	0.74935	0.03978	Normal Distribution

ANOVA Table

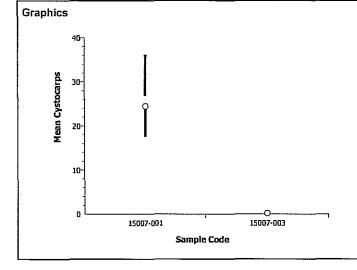
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	1180.98	1180.98	1	35.69	0.00099	Significant Effect	
Error	198.52	33.08667	6				
Total	1379.49998	1214.0666	7]

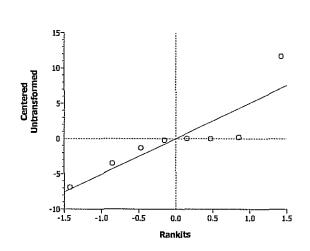
Group Comparisons

Sample	vs	Sample	Sta <u>tistic</u>	Critical	P Level	MSD	Decision(0.05)	
15007-001		15007-003	5.97441	2.35336	0.0047	9.57195	Significant Effect	

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
15007-001	4	24,500	17.6	36.2	8.1331	""			"
15007-003	4	0.2000	0	0.4	0.1633				

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
15007-001	21	17.6	23.2	36.2				<u>. </u>		,-
15007-003	0.4	0	0.2	0.2						





Comparisons: Report Date:

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Saskatchewan Research Council

Analysis:

15-0259-0732

Champia parvula Red Macroalga Sexual Reproduction Test

Test No: Start Date: 00-7249-1704

21 Sep-06 12:00 PM

Test Type: Champia

Protocol: EPA/600/4-91/003 (1994) Duration: 7d Oh

Species: Champia parvula

Ending Date: 28 Sep-06 12:00 PM

Dil Water: Not Applicable

Source:

In-House Culture

Setup Date:	21 Sep-06 12:00 PN	/ Brine:
Endpoint		Analysis Type

Brine: Not Applicable

•					_		=
	Control	Link	Date A	nalyzed	,	Version	

Mean Cystocarps	Comparison	04-6908-2140	04-6908-2140	29 Sep-06 12:51	IPM CE	TISv1.026
Method	Alt H Data Transform	Z NO	EL LOEL	Toxic Units	ChV	MSDp

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Unequal Variance t	C > T	Untransformed	<u> </u>			N/A		

Sample Link

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	734.96300	47.46723	0.00017	Unequal Variances
Distribution	Shapiro-Wilk W	0.81257	0.74935	0.04403	Normal Distribution

ANOVA Table

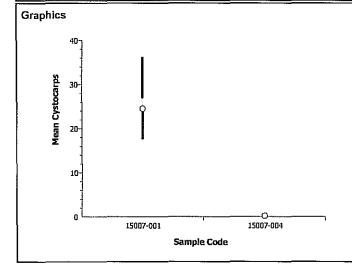
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	1185.845	1185.845	1	35.81	0.00098	Significant Effect	
Error	198.71	33.11833	6				
Total	1384.55498	1218.9633	7	_			

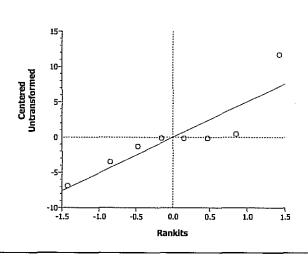
Group Comparisons

Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
15007-001		15007-004	5.98384	2.35336	0.0047	9.57653	Significant Effect

Data Summary			Origi	nal Data			Transfo	rmed Data	
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
15007-001	4	24.500	17.6	36.2	8.1331				
15007-004	4	0.1500	0	0.6	0.3000				

Data Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
15007-001	21	17.6	23.2	36.2						
15007-004	n	n	0.6	Λ						





SALTWATER ASSAYS

A. bahia, A. punctulata, C. parvula

STUDY: 15007	LOCATION: Nev	v Bedford Harbor			
CHEMISTRY	Lab Salt Control	-001	-002	-003	-004
AMMONIA	-009	-005	-006	-007	-008
AS RECEIVED WATER QUALITIES	Lab Salt Control	-001	-002	-003	-004
SALINITY (ppt)	75	28	24	23	23
pH (SU)	- 7,47	7.89	7.79	7.89	7.80
TRC (mg/L)	10.05	(0.05	<0.05	<0.05	20.05
DO (mg/L)	7.1	8-6	8.5	8.3	7.8
S/C (µmhos/cm)	395a0	42790	37390	36050	36 190
WQ STATION USED	а	(į	١	(
INITIALS	m	BB	BB	/ BB	BB
A. bahia SALINITY		<u>.</u>	2		
ADJUSTMENT RECORD	Lab Salt Control	-001	-002	-003	-004
SAMPLE (mLs)	NIA	NA	NIA	NA	NIA
SEA SALT (g)	NA	NA	N/A	NA	NIA
DATE:	9/20	9/19/06-			2
TIME:	1030	1515.			〉
INITIALS:	m	BB_			2

Sample ID	ESI Cube ID
-001	-001
-002	-002
-003	-003
-004	-004

Americamysis bahia 7 DAY CHRONIC ASSAY NEW WATER QUALITIES

STUDY:	57		CLIENT: BATTELLE NEW DISSOLVED O				TION: BEDFO	RD		LAB CONTROL: HAMPTON ESTUARY					
			NEW C	ISSOL'	VED O	YGEN	(mg/L)		NEW SALINITY (ppt)						
CONC	REP	0	1	2	3	4	5	6	0	1	2	3	4	5	6
LAB	Α	7,1	7.0	7.0	69	6.6	6.8	7.0	วร์	26	25	25	26	25	25
-001	Α	7,6	6.7	7.1	6.9	6.7	6.7	6.8	27	27	28	28	28	28	29
-002	Α	7.1	6.3	60	6.4	6.5	6.2	<i>6</i> 5	<u>ገ</u> ዛ	24	24	24	24	24	24
-003	Α	η,Ο	6.3	6.4	6.1	6.3	6.7	6.6		23	23	23	23	23	23
-004	Α	<i>ζ.</i> . <i>\</i>	4.8	54.	53	5.6	6,0	6.2	23	23	23	23	23	23	23
			NEV	V pH (S	U)				NEW TEMPERATURE (°C)						
CONC	REP	0	1	2	3	4	5	6	0	11	2	3	4	5	6
LAB	Α	7,47	7.99	7.92	7.94	8,00	8.05	7.78	ر بر	25	24	24	25	25	24
-001	Α	7.79	7.75	7.64	7.60	1	7.82	7.86	고서	25	2le	26	26	25	24
-002	Α	7,56	7.38	7,24	7.3	7.34	7.39	7.30	3 6	25	260	26	26	25	24
-003	Α	7.62	7.54	7.37	7.34	7.43	7.59	7.37	26	25	26	26	26	25	24
-004	Α	7.31	7.08	7.07	7.09	7.09	7.57	7.24	J.G	25	26	26	26	25	24
INC TEM	1P:	スラ	25	25	25	25	25	25							
DATE:		470	9/21	9/22	9123	9/24	9/25	9/26							The princip of Public Account of the Control of the
TIME:		1130	1135	1445	1110	1105	1210	1540						The state of the s	and a second sec
INIT:		in	55	ઇ	EG	<u>5</u> J	ST	96						The state of the s	

		WATE NI	R QUALITY W WATER	METERS L QUALITIE:	JSED.			
	0	1	2	3	4	5	6	7
Water Quality Station #	1/1/	2	2		2	2		
Initials	15/396	SJ	25	€G	ST	SJ	EG	
Date	9/20	9/21	9/22	9123	9/24	9/25	9/26	

Americamysis bahia 7 DAY CHRONIC ASSAY OLD WATER QUALITIES

						OLD									
STUDY:		CLIENT: BATTELLE				ATION:				CONT					
1500	7	BATT	ELLE		NEW 	BEDF	ORD		HAMPTON ESTUARY						
		OL	D SAL	INITY ((ppt)				OLD pH (SU)						
Conc	Rep	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Control	Α	26	25	26	26	26	26	25	7.79	7.92	7.98	7.95	8.04	7.99	7.85
-001	Α	28	28	28	28	28	ጋፄ	29	7.78	7.98	7.89	7.97	8.03	7.97	7.92
-002	Α	25	24	25	25	25	25	25	7.51	7,59	7.96	7.96	7.80	7.89	7.87
-003	Α	23	24	24	23	23	24	24	7.72	8.00	7.91	7.94	8.01	7.97	792
-004	Α	23	24	23	23	23	24	24	7.45	8.01	792	7.36	7.91	7.45	7.91
		OLD 1	EMPE	RATU	RE (°C)									
Conc	Rep	1	2	3	4	5	6	7	VAR		17/10/2005				
Control	А	25	24	24	25	25	24	25							
-001	Α	25	24	24	25	25	24	25				1 1 2 1 1 2 1 1 2 1 2 1 2 1 2 1 2 1 2 1			
-002	Α	25	24	24	25	25	24	25					A STATE OF THE STA		
-003	Α	25	24	24	25	25	24	25			THE PROPERTY OF THE PROPERTY O	**************************************	VANNA SAW LA REMANDA		
-004	Α	25	24	24	25	25	24	25							
									1044 7 1 10 10 10 10 10 10 10 10 10 10 10 10 1				(2) (2) (2) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3		**************************************
INC TEMP		25	25	25	25	25	25	25			10 10 11 10 10 10 10 10 10 10 10 10 10 1				
DATE:		9/21	9/22	9/23	9/24	91/25	906	927							
TIME:		1040	1350	1035	1030	1130		1210							
INITIALS:		57	EG	9C	51	22	m	CP							######################################

GENERAL NOTES - for additional information refer to SOP #1411 or EPA manual 600/4-91/003

- •Test vessels will be 250 mL glass beakers containing a minimum of 150 mL of solution
- •8 replicates per site with 5 organisms each

•Test Temperature: 26±1°C

-Salinity: 25 ±2ppt

•Dissolved Oxygen: >4.3 mg/L

•Photoperiod will be 16 hours light and 8 hours dark.

•Passing criteria require ≥80% survival and average dry weight of ≥0.20 mg/organism in the control vessels.

	Miller to the aller of the could be	WATI	ER QUALITY OLD WATER	METERS US QUALITIES	ED	包括 电电路		
	0	1	2	3	4	5	6	7
Water Quality Station #	////		2	1	2	2	व	2
Initials		SJ	2G	90	SI	SJ	hy	CP
Date	9/20/06	01/21/06	9/22/06	9/23/06	9/24/06	9/25/06	926	9 27

Americamysis bahia 7 DAY CHRONIC ASSAY SAMPLE USE RECORD

STUDY: (5	007	CLIENT: DA	TTELLE No.				1			
SPECIES: A. bal		CLIENT: BA	TEST: chroi				1			
	Day: 0		Day: 1	11	Day: 2					
Sample	Volume Used (mL)	ESI Cube ID	Volume Used (mL)	ESI Cube ID	Volume Used (mL)	ESI Cube ID	Day	Date	Time	lnit
Lab Control	1600	n/a	1600	n/a	1600	n/a	0	720	1160	m
-001		-∞/		-00 l		-001	1	9/21	(130	SJ
-002		-002		- 002		-002	2	9/22	1430	છ
-003		~0CT		- 003		-003	3	9/23	[]00	લુ
-004	\leftarrow	-004	G	-004	V	-004	4	9/24	1105	SJ
							5	9/25		
							6	926		ln
	Day: 3		Day: 4		Day: 5					
]] }		1			
Sample	Volume Used (mL)	ESI Cube ID	Volume Used (mL)	ESI Cube ID	Volume Used (mL)	ESI Cube ID				
Sample Lab Control										
	Used (mL)	ID	Used (mL)	ID	Used (mL)	ID				
Lab Control	Used (mL)	ID n/a	Used (mL)	n/a	Used (mL)	ID n/a				
Lab Control -001	Used (mL)	n/a	Used (mL)	n/a -00 [-00 2 -00 3	Used (mL)	n/a -00 -00 2				
Lab Control -001 -002	Used (mL)	n/a -001 -002	Used (mL)	n/a -50 [-00 Z	Used (mL)	n/a -00				
Lab Control -001 -002 -003	Used (mL)	n/a -001 -002 -003	Used (mL)	n/a -00 [-00 2 -00 3	Used (mL)	n/a -00 -00 2 -00 3				
Lab Control -001 -002 -003	Used (mL)	n/a -001 -002 -003	Used (mL)	n/a -00 [-00 2 -00 3	Used (mL)	n/a -00 -00 2 -00 3				
Lab Control -001 -002 -003 -004	Used (mL)	ID n/a -001 -002 -003 -004 ESI Cube ID n/a	Used (mL)	n/a -00 [-00 2 -00 3	Used (mL)	n/a -00 -00 2 -00 3				
Lab Control	Day: 6 Volume Used (mL)	n/a -001 -002 -003 -004 ESI Cube ID	Used (mL)	n/a -00 [-00 2 -00 3	Used (mL)	n/a -00 -00 2 -00 3				
Lab Control -001 -002 -003 -004 Sample Lab Control	Day: 6 Volume Used (mL)	ID n/a -00] -002 -003 -004 ESI Cube ID n/a NOT PNOU	Used (mL)	n/a -00 [-00 2 -00 3	Used (mL)	n/a -00 -00 2 -00 3				
Lab Control -001 -002 -003 -004 Sample Lab Control -001	Day: 6 Volume Used (mL)	ID n/a -001 -002 -003 -004 ESI Cube ID n/a NOT PNOU Sample	Used (mL)	n/a -00 [-00 2 -00 3	Used (mL)	n/a -00 -00 2 -00 3				

CLIENT: Battelle

PROJECT: New Bedford Harbor Dredge Monitoring

ASSAY: Various

TASK: As Received" Water Quality

PARAMETER: Ammonia

METHOD: SM 4500-NH3 G

FIELD ID LAB ID RESULT Q	UAL QLIMIT UNITS SAMPLED ANALYZED
Laboratory Control 14877-009 ND WQ-TOX-001-081406 14877-008 ND WQ-TOX-002-081406 14877-005 ND WQ-TOX-003-081406 14877-006 ND WQ-TOX-004-081406 14877-007 ND	0.1 mg/L as N 08/15/06 08/30/06 0.1 mg/L as N 08/15/06 08/30/06 0.1 mg/L as N 08/15/06 08/30/06 0.1 mg/L as N 08/15/06 08/16/06 0.1 mg/L as N 08/15/06 08/30/06
Laboratory Control 14886-008 ND WQ-TOX-001-081606 14886-004 ND WQ-TOX-002-081606 14886-005 ND WQ-TOX-003-081606 14886-006 ND	0.1 mg/L as N 08/16/06 08/25/06 0.1 mg/L as N 08/16/06 08/25/06 0.1 mg/L as N 08/16/06 08/21/06 0.1 mg/L as N 08/16/06 08/21/06
Laboratory Control 14925-004 ND WQ-TOX-001-082806 14925-005 ND WQ-TOX-002-082806 14925-006 0.14 WQ-TOX-003-082806 14925-007 ND	0.1 mg/L as N 08/28/06 08/30/06 0.1 mg/L as N 08/28/06 08/30/06 0.1 mg/L as N 08/28/06 08/30/06 0.1 mg/L as N 08/28/06 08/30/06
Laboratory Control 15007-009 0.13 WQ-TOX-001-091906 15007-005 ND WQ-TOX-002-091906 15007-006 ND WQ-TOX-003-091906 15007-007 0.2 WQ-TOX-004-091906 15007-008 0.17	0.1 mg/L as N 09/19/06 09/26/06 0.1 mg/L as N 09/19/06 09/26/06

EnviroSystems, Inc. One Lafayette Road P.O. Box 778 Hampton, NH 03843-0778 Telephone: 603-926-3345

SAMPLE RECEIPT RECORD

ESI STUDY NUMBER: <u>\ਖ਼</u> ੳ77 CLIENT:	Battelle	2
SAMPLE RECEIPT: DATE: 8/+5 14/06 TIME:	1510	BY: PK
DELIVERED VIA: □ FEDEX □ CLIENT 趣	ESI 🗆 UPS 🛭	□ OTHER
LOGGED INTO LAB: DATE:	0950	BY: M
SAMPLE CONDITION:		
CHAIN OF CUSTODY:	I ∳YES	□ NO
CHAIN OF CUSTODY SIGNED:	AD YES	□ NO
CHAIN OF CUSTODY COMPLETE:	∀ YES	□NO
SAMPLE DATE: SAMPLE TIME RECORDED: SAMPLE TYPE IDENTIFIED:	☐ YES D YES Æ YES	□ NO □ NO □ NO
CUSTODY SEAL IN PLACE:	東YES	□NO
SHIPPING CONTAINER INTACT:	Ď(YES	□ NO
SAMPLE TEMPERATURE (AT ARRIVA	AL):니	<u>°C</u>
DOES CLIENT NEED NOTIFICATION	OF TEMPERATU ☐ YES	JRE? ₽™O
SAMPLE ARRIVED ON ICE:	d YES	□NO
COMMENTS: 4x5 Sal 998's		

The Business of Innovation

Chain of Custody

397 Washington Street Duxbury, MA 02332 Phone: 781-952-5200

Fax: 781-934-2124

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Proj. No		Proj. Name												<i>\\\</i> _{\overline{U}}			
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DATE	TIME	BATTELLE ID	CLIENT ID		SAMP	LE DESCRIPTION			HIN				~		¥	PR	To ef
8/14/00	0849	WQ-TOX-O	01-081406	5 Gal	Cube	container								メ			
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8 14 06	1345	WO-TOX -C	104-0814B6											X			
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EnviroSystems, Inc.
One Lafayette Road
P.O. Box 778
Hampton, NH 03843-0778
Telephone: 603-926-3345

SAMPLE RECEIPT RECORD

ESI STUDY NUMBER: 14886 CLIEN	IT: <u>Batelle</u> - N	ew Bedford
SAMPLE RECEIPT: DATE: 8 17 06 TIME:	0825	BY: DG
DELIVERED VIA: FEDEX CLIENT	KÓ ESI□UPS □	OTHER
LOGGED INTO LAB: DATE: 8 17 06 TIME:	1120	BY: ST
SAMPLE CONDITION:		
CHAIN OF CUSTODY:	ÄYES	□ NO
CHAIN OF CUSTODY SIGNED:	X YES	□ NO
CHAIN OF CUSTODY COMPLETE:	資YES	□ NO
SAMPLE DATE: SAMPLE TIME RECORDED: SAMPLE TYPE IDENTIFIED		□ NO □ NO □ NO
CUSTODY SEAL IN PLACE:	∀(YES	□ NO
SHIPPING CONTAINER INTACT:	X YES	□ NO
SAMPLE TEMPERATURE (AT ARR	(IVAL):4_	<u>°C</u>
DOES CLIENT NEED NOTIFICATION	ON OF TEMPERATUR □ YES	E? Žίνο
SAMPLE ARRIVED ON ICE:	tX YES	□NO
COMMENTS:		

The Business of Innovation

Chain of Custody

603-702-1597 Bow Cell #2

397 Washington Street Duxbury, MA 02332 Phone: 781-952-5200 Fax: 781-934-2124

Proj. No SAMPLERS	432	Proj. Name New Be	edford Harbon										Soit/			
SAMPLERS	S: Signature	Lel			ANALYSIS REQUESTED → "NUMBER OF CONTAINERS"	F	8	H PRINT	н	Ą	I	ALS	OTHER TOXICITY	FIED.	EVED.	imber iiners
DATE	TIME	BATTELLE ID	«GIJENTEID»	SAM	IPLE DESCRIPTION	PEST	PCB	TPH FINGERPRINT	PAH	VOA	TBT	METALS	TOTH HITO	ACIDIFIED	PRESERVED	Total Number of Containers
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Battelle The Business of Innovation

Chain of Custody

603 -02. 6597 Book (Ell #2)

397 Washington Street Duxbury, MA 02332 Phone: 781-952-5200

Fax: 781-934-2124

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DATE	TIME	BATTELLE ID	-GLIENT ID		PLE DESCRIPTION	PEST	PCB	TPH FINGERPRINT	PAH	VOA	TBT	METALS	OTH	ACIDIFIED	PRESERVED	Total Number of Containers
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سرويو Relinquishe	d by:	<u>-le</u>		8-17-06 825	Recorded by/	<u> 111</u>	<u> 11</u>	\ <u>_D(</u>	<u> </u>			8	117		08,	25
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EnviroSystems, Inc.
One Lafayette Road
P.O. Box 778
Hampton, NH 03843-0778
Telephone: 603-926-3345

SAMPLE RECEIPT RECORD

ESI STUDY NUMBER: 14925 CLIE	NT: BaHe	(e
SAMPLE RECEIPT: DATE: 8 28 26 TIME	:(600	BY: By CP
DELIVERED VIA: FEDEX CLIENT	□ ESI □ UPS □	□ OTHER
LOGGED INTO LAB: DATE: 8 28 26 TIME	: 1610	вү: <i></i>
SAMPLE CONDITION:		
CHAIN OF CUSTODY:	Ø YES-	□ NO
CHAIN OF CUSTODY SIGNED:	Z YES	□ NO
CHAIN OF CUSTODY COMPLETE	: DYES	□ NO
SAMPLE DATE: SAMPLE TIME RECORDED SAMPLE TYPE IDENTIFIED		□ NO □ NO □ NO
CUSTODY SEAL IN PLACE:	1 YES	□ NO
SHIPPING CONTAINER INTACT:	Z YES	□ NO
SAMPLE TEMPERATURE (AT ARI	RIVAL):4	°C
DOES CLIENT NEED NOTIFICATI	ON OF TEMPERAT ☐ YES	URE? ☑NO
SAMPLE ARRIVED ON ICE:	₫ YES	□ NO
COMMENTS:		
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Chain of Custody

14925

Ship 10' LAVIOSYS / em-

397 Washington Street Duxbury, MA 02332 Phone: 781-952-5200 Fax: 781-934-2124

New Bedford Harban OTHER (B) ANALYSIS REQUESTED → ACIDIFÍED METALS "NUMBER OF CONTAINERS" PCB PAH DATE TIME BATTELLE ID CLIENTID SAMPLE DESCRIPTION 0930 Reterences: Te Óδ 00/2 WQ-TOX-003-082806 033 Relinquished by: Received by: Date/Time Date/Time 08-28-06 11:00 Date/Time Date/Time M-EMy 8/28/00 1600 BPO

The Business of Innovation

Chain of Custody

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397 Washington Street Duxbury, MA 02332 Phone: 781-952-5200 Fax: 781-934-2124

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