APPENDIX D: ENVIROSYSTEMS, INC. REPORTS AND ANALYTICAL DATA

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ESI

EnviroSystems, Inc.
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603-926-3345

July 10, 2009

Mr. Dave Walsh
Woods Hole Group, Inc.
81 Technology Park
Falmouth, MA 02536

Dear Mr. Walsh;

Enclosed please find two (2) copies of our report evaluating the toxicity of samples received as part of the New Bedford Harbor surface water quality monitoring program for the 2009 sampling period. This report evaluates results of four (4) acute and chronic exposure toxicity tests conducted with the mysid shrimp, *Americamysis bahia*, plus chronic exposure assays conducted with the sea urchin, *Arbacia punctulata*, and red macro algae, *Champia parvula*. A fifth sample collected as part of the field effort was not analyzed as per specification.

Please do not hesitate to call me, Reneé McIsaac or Petra Karbe should you have any questions regarding the report.

Sincerely,

EnviroSystems, Incorporated

Kenneth A. Simon
President

Enclosure

Report; Two (2) Copies
Study Number 18661-09-07

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

June 24, 2009 Sampling Event

NED ACOE Job Number: TO-0010

Task Order No.: ESI0002

Prepared for

Woods Hole Group, Inc.
81 Technology Park
Falmouth, MA 02536

Prepared by

EnviroSystems, Incorporated
1 Lafayette Road
Hampton, New Hampshire 03843

June 2009
Reference Number: Woods Hole Group, Inc. 18661-09-07

Page 1 of 9

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

June 24, 2009 Sampling Event
NED ACOE Job Number: TO-0010

1.0 INTRODUCTION

This report provides a summarization of data generated from acute and chronic exposure screening assays evaluating surface water samples collected from New Bedford Harbor in New Bedford, Massachusetts. 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 under the supervision of Woods Hole Group, Inc. personnel from the Falmouth, 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 the acute survival portion of the algal assays were conducted by ESI at its Hampton, New Hampshire facility. Additionally, the algal assays were also conducted by Aquatox Testing & Consulting, Inc. (Aquatox), Guelph, Ontario, Canada in order to provide data in the event that the assay conducted by ESI failed to meet the target endpoints.

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 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±2°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 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 were from cultures maintained by Aquatox Testing & Consulting Inc. 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 Woods Hole Group, Inc. staff on one occasion in New Bedford Harbor, as shown in Table 1. Samples were placed in polyethylene cubitainers for shipment to the laboratory. One,5.0 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 0.02 mg/L). Prior to use in the assays, the salinity of the samples was adjusted, as 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. When necessary, 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. A summary of compositing and "As Received" data are summarized in Tables 2 and 3, respectively.

Laboratory control water used for the 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 (48 hour acute portion), collected from Hampton Harbor, 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. Control water used in the algal assays conducted by AquaTox (acute and chronic portions) was natural seawater collected from the West Coast of Canada. Salinity of the surface water samples was adjusted, as required, using commercial sea salts.

2.4 Bioassays

2.4.1 *Americamysis bahia* Modified Acute and Chronic Exposure Bioassays

Endpoints for the *A. bahia* bioassay were survival (acute and chronic) and growth. 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.

2.4.2 *Arbacia punctulata* Chronic Exposure Fertilization Assays

The endpoint for the *A. punctulata* bioassay was fertilization. Gametes were obtained by potassium chloride injection to induce spawning. Sperm were collected dry, diluted to achieve a concentration of approximately 5.0×10^7 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 target endpoints for the acute *C. parvula* bioassay were coloration and necrosis. Endpoints for the chronic *C. parvula* bioassay were survival and cystocarp development. 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. Data for the acute endpoints was generated by ESI while data for acute and chronic exposure endpoint was generated by AquaTox.

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 $\propto$ <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 5, provide relative health and response data while allowing for comparison with historic data sets.

2.7 Protocol Deviations and Unacceptable Assays

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

3.0 RESULTS SUMMARY

Table 2 provides a summary of test acceptability for the assays conducted during this monitoring period. Table 3 provides summaries of survival, growth, development and reproduction endpoints and associated statistical analyses. Table 4 provides a summary of water quality data associated with the assays. Support data, including copies of laboratory bench sheets, are provided in Appendix A.

For this round of sample analysis two (2) reference site samples, Composite 001 (WQTOX-001 / WQTOX-002) and Composite 002 (WQTOX-003 / WQTOX004), were provided. Composites 001 and 002 served as Flood and Ebb tide reference sites, respectively. Composite 005, WQTOX-009 and WQTOX-010, was not evaluated based on client specification.

3.1 *Americamysis bahia* Acute and Chronic Exposure Bioassay

Minimum test acceptability criteria for the acute exposure bioassay require ≥90% survival in the control concentrations. Minimum test acceptability criteria for the chronic exposure bioassay require ≥80% survival and a minimum weight of 0.2 mg per individual in the control concentrations. Achievement of these results indicate that healthy test organisms were used. See Table 4 for test acceptability and data summary.

3.2 *Arbacia punctulata* Chronic Fertilization Bioassay

Protocol specifies a 70% to 90% fertilization rate for *Arbacia punculata* (EPA 2002). Achievement of these results indicate that healthy test organisms were used. See Table 4 for test acceptability and data summary.

3.3 *Champia parvula* Modified Acute and Chronic Exposure Bioassay

The modified acute exposure bioassay was considered to be acceptable if no notable branch necrosis was observed and appropriate coloration of test species was achieved in the laboratory control treatment. Minimum test acceptability criteria for the chronic exposure bioassay require ≥80% survival and an average of 10 cystocarps per plant in the control concentrations. Achievement of these results indicate that healthy test organisms were used. See Table 4 for test acceptability and data summary.

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. Sample Receipt Summary. New Bedford Harbor Surface Water Quality Monitoring June 24, 2009 Sampling Event. New Bedford Harbor Dredge Plume Monitoring Program.

Field ID	ESI Reference	Matrix	Collection		Receipt	
			Date	Time	Date	Time
WQTOX-001-062409	18661-001	Water	06/24/09	0910	06/24/09	1730
WQTOX-002-062409	18661-002	Water	06/24/09	0910	06/24/09	1730
WQTOX-003-062409	18661-003	Water	06/24/09	1020	06/24/09	1730
WQTOX-004-062409	18661-004	Water	06/24/09	1020	06/24/09	1730
WQTOX-005-062409	18661-005	Water	06/24/09	1110	06/24/09	1730
WQTOX-006-062409	18661-006	Water	06/24/09	1110	06/24/09	1730
WQTOX-007-062409	18661-007	Water	06/24/09	1140	06/24/09	1730
WQTOX-008-062409	18661-008	Water	06/24/09	1140	06/24/09	1730
WQTOX-009-062409	18661-009	Water	06/24/09	1200	06/24/09	1730
WQTOX-010-062409	18661-010	Water	06/24/09	1200	06/24/09	1730

Table 2 Sample Compositing Summary. New Bedford Harbor Surface Water Quality Monitoring June 24, 2009 Sampling Event. New Bedford Harbor Dredge Plume Monitoring Program.

Composite Name	Components	ESI Code	Final Volume	Composite Date / Time	
Composite 001	WQTOX-001, WQTOX-002	18661-016	5 gallons	06/24/09	1745
Composite 002	WQTOX-003, WQTOX-004	18661-017	5 gallons	06/24/09	1750
Composite 003	WQTOX-005, WQTOX-006	18661-018	5 gallons	06/24/09	1755
Composite 004	WQTOX-007, WQTOX-008	18661-019	5 gallons	06/24/09	1800
Composite 005*	WQTOX-009, WQTOX-010	18661-020	5 gallons	06/24/09	1805

Table 3 Summary of "As Received" Sample Physical and Chemical Characteristics. New Bedford Harbor Surface Water Quality Monitoring June 24, 2009 Sampling Event. New Bedford Harbor Dredge Plume Monitoring Program.

Field ID	ESI Code	Ammonia (mg/L)	pH (SU)	Salinity (‰)	Total Residual Chlorine (mg/L)
WQTOX-001, WQTOX-002	18661-016	<0.1	7.65	27.5	<0.02
WQTOX-003, WQTOX-004	18661-017	<0.1	7.53	26.2	<0.02
WQTOX-005, WQTOX-006	18661-018	0.12	7.56	26.7	<0.02
WQTOX-007, WQTOX-008	18661-019	<0.1	7.54	25.0	<0.02
WQTOX-009, WQTOX-010	18661-020	0.14	7.56	26.3	<0.02

NOTE:
* Composite 005, WQTOX-009, WQTOX-010, was not tested as per client specification.

Table 4. Endpoint Summary Table - New Bedford Harbor Surface Water Quality Monitoring June 24, 2009 Sampling Event. New Bedford Harbor Dredge Plume Monitoring Program.

Sample ID	Reps	Mean	Min	Max	CV	Significant Difference vs					
						p Value	Lab	p Value	-001	p Value	-002
Arbacia punctulata											
		Portion Fertilized									
Lab Control		96.4%	95.2%	98.1%	1.25%	-	-	-	-	-	-
Flood Ref -001		93.4%	92.5%	94.3%	1.15%	0.0070	YES	-	-	-	-
Ebb Ref - 002	4	86.3%	81.0%	90.5%	4.76%	0.0008	YES	0.0099	YES	-	-
WQ-TOX-003		94.1%	91.9%	98.0%	2.94%	0.1174	NO	0.7012	NO	0.9887	NO
WQ-TOX-004		85.2%	85.5%	89.2%	3.34%	0.0001	YES	0.0006	YES	0.3322	NO
Americamysis bahia											
		Day 2 Survival									
Lab Control		100.0%	100.0%	100.0%	0.00%	-	-	-	-	-	-
Flood Ref -001		95.0%	60.0%	100.0%	14.89%	0.3372	NO	-	-	-	-
Ebb Ref - 002	8	97.5%	80.0%	100.0%	7.25%	0.3372	NO	0.9591	NO	-	-
WQ-TOX-003		100.0%	100.0%	100.0%	0.00%	0.5000	NO	0.6395	NO	0.6395	NO
WQ-TOX-004		100.0%	100.0%	100.0%	0.00%	0.5000	NO	0.6395	NO	0.6395	NO
		Day 7 Survival									
Lab Control		100.0%	100.0%	100.0%	0.00%	-	-	-	-	-	-
Flood Ref -001		92.5%	60.0%	100.0%	16.09%	0.2209	NO	-	-	-	-
Ebb Ref - 002	8	97.5%	80.0%	100.0%	7.25%	0.3605	NO	0.6454	NO	-	-
WQ-TOX-003		100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.7791	NO	0.6395	NO
WQ-TOX-004		97.5%	80.0%	100.0%	7.25%	0.3605	NO	0.6395	NO	0.4796	NO
		Day 7 Dry Weight Biomass - mg									
Lab Control		0.298	0.266	0.396	14.10%	-	-	-	-	-	-
Flood Ref -001		0.314	0.274	0.358	10.11%	0.7981	NO	-	-	-	-
Ebb Ref - 002	8	0.287	0.208	0.352	18.97%	0.3399	NO	0.2586	NO	-	-
WQ-TOX-003		0.436	0.268	0.790	42.74%	0.9700	NO	0.9555	NO	0.9758	NO
WQ-TOX-004		0.297	0.230	0.362	13.76%	0.4858	NO	0.1875	NO	0.6504	NO
Champia parvula											
		Day 2 Survival									
Lab Control		100.0%	100.0%	100.0%	0.00%	-	-	-	-	-	-
Flood Ref -001		100.0%	100.0%	100.0%	0.00%	0.5000	NO	-	-	-	-
Ebb Ref - 002	4	100.0%	100.0%	100.0%	0.00%	0.5000	NO	0.5000	NO	-	-
WQ-TOX-003		100.0%	100.0%	100.0%	0.00%	0.5000	NO	0.5000	NO	0.5000	NO
WQ-TOX-004		100.0%	100.0%	100.0%	0.00%	0.5000	NO	0.5000	NO	0.5000	NO
		Day 7 Mean # Cystocarps									
Lab Control		45.9	42.8	51.6	7.27%	-	-	-	-	-	-
Flood Ref -001		44.9	43.2	48.0	5.93%	0.3443	NO	-	-	-	-
Ebb Ref - 002	4	38.3	38.0	38.6	0.80%	0.0035	YES	0.0065	YES	-	-
WQ-TOX-003		0.5	0.4	0.6	24.74%	0.0000	YES	0.0000	YES	0.0000	YES
WQ-TOX-004		24.9	23.6	25.8	4.57%	0.0000	YES	0.0003	YES	0.0000	YES

Table 5 Reference Toxicant Summary. New Bedford Harbor Surface Water Quality Monitoring June 24, 2009 Sampling Event. New Bedford Harbor Dredge Plume Monitoring Program.

Date	Endpoint		Value	Historic Mean/ Central Tendency	Acceptable Range	Reference Toxicant
A. bahia						
06/17/09	Survival	LC-50	23.8	20.8	16.2 - 25.4	SDS (mg/L)
05/27/09	Survival	C-NOEC	15.0	10.0	5.0 - 15.0	SDS (mg/L)
05/27/09	Growth	C-NOEC	5.0	5.0	2.5 - 10.0	SDS (mg/L)
A. punctulata						
06/18/09	Fertilization	C-NOEC	<1	10.0	1.0 - 5.0	Copper (µg/L)
06/18/09	Fertilization	IC-25	1.0	19.9	0 - 66.1	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 18661: Sample Date 06/24/09	
A. bahia Bench Sheets & Statistical Analysis Report	33
A. punctulata Bench Sheets and Statistical Analysis Report	12
C. parvula Bench Sheets and Statistical Analysis Report	14
Water Quality Bench Sheets and Dilution Prep Sheets	4
Analytical Chemistry Report	1
Sample Receipt Records	1
Chain of Custody and Organism Shipping Information	3
Total Appendix Pages	69

METHODS USED IN NPDES PERMIT BIOMONITORING TESTING

Parameter	Method
Acute Exposure Bioassays:	
Ceriodaphnia dubia, Daphnia pulex	EPA-821-R-02-012
Pimephales promelas	EPA-821-R-02-012
Americamysis bahia	EPA-821-R-02-012
Menidia beryllina, Cyprinodon variegatus	EPA-821-R-02-012
Chronic Exposure Bioassays:	
Ceriodaphnia dubia	EPA-821-R-02-013 1002.0
Pimephales promelas	EPA-821-R-02-013 1000.0
Cyprinodon variegatus	EPA-821-R-02-014 1004.0
Menidia beryllina	EPA-821-R-02-014 1006.0
Arbacia punctulata	EPA-821-R-02-014 1008.0
Champia parvula	EPA-821-R-02-014 1009.0
Trace Metals:	
Trace Metals	EPA 200.7/SW 6010 and EPA 200.8/SW 6020
Hardness	Standard Methods 20th Edition - Method 2340 B
Wet Chemistries:	
Alkalinity	EPA 310.2
Chlorine, Residual	Standard Methods 20th Edition - Method 4500CLD
Total Organic Carbon	Standard Methods 20th Edition - Method 5310C
Specific Conductance	Standard Methods 20th Edition - Method 2510B
Nitrogen - Ammonia	Standard Methods 20th Edition - Method 4500NH3G
pH	Standard Methods 20th Edition - Method 4500H+B
Solids, Total (TS)	Standard Methods 20th Edition - Method 2540 B
Solids, Total Suspended (TSS)	Standard Methods 20th Edition - Method 2540 D
Solids, Total Dissolved (TDS)	Standard Methods 20th Edition - Method 2540 C
Dissolved Oxygen	Standard Methods 20th Edition - Method 4500-O G

Americamysis bahia 7 DAY CHRONIC ASSAY
SURVIVAL & OLD WATER QUALITIES

STUDY: 18661	CLIENT: Woods Hole Group	LOCATION: NEW BEDFORD	LAB CONTROL: HAMPTON ESTUARY	ORGANISM BATCH/LOT#

		NUMBER OF SURVIVORS								OLD DISSOLVED OXYGEN (mg/L)						
SAMPLE	Rep	0	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Lab Control	A	5	5	5	5	5	5	5	5	5.8	7.6	7.2	6.3	6.2	7.5	7.3
	B	5	5	5	5	5	5	5	5	5.6	7.7	7.2	6.5	6.3	7.6	7.4
	C	5	5	5	5	5	5	5	5	5.5	7.7	7.3	6.4	6.6	7.7	7.2
	D	5	5	5	5	5	5	5	5	5.5	7.7	7.3	6.2	6.2	7.8	7.4
	E	5	5	5	5	5	5	5	5	5.7	7.8	7.3	6.3	6.3	7.8	7.0
	F	5	5	5	5	5	5	5	5	5.7	7.9	7.3	6.3	6.2	7.9	7.2
	G	5	5	5	5	5	5	5	5	5.5	7.9	7.3	6.2	6.3	7.9	7.0
	H	5	5	5	5	5	5	5	5	5.2	7.9	7.4	6.4	6.2	7.9	7.4
-001	A	5	5	5	5	5	5	5	5	5.7	7.9	7.4	6.0	6.0	7.9	7.2
	B	5	5	5	5	5	5	5	5	5.6	8.0	7.8	6.0	5.9	7.9	7.3
	C	5	5	5	5	5	5	5	5	5.7	8.0	7.7	6.1	6.2	7.9	7.2
	D	5	5	5	5	4	4	4	4	5.9	8.0	7.6	6.1	6.2	8.0	7.2
	E	5	5	5	5	5	5	5	5	5.7	7.9	7.6	6.3	6.1	8.0	7.2
	F	5	5	5	5	5	5	5	5	6.0	8.0	7.6	6.0	6.1	8.0	7.3
	G	5	4	3	3	3	3	3	3	5.9	8.0	7.8	6.2	6.2	8.0	7.3
	H	5	5	5	5	5	5	5	5	5.9	8.0	7.8	6.1	6.3	8.0	7.0
-002	A	5	5	5	5	5	5	5	5	6.1	8.0	7.7	6.3	6.5	8.0	7.5
	B	5	5	5	5	5	5	5	5	6.0	8.0	7.7	6.2	6.6	8.0	7.2
	C	5	5	5	5	5	5	5	5	6.0	8.0	7.7	6.2	6.6	8.0	7.3
	D	5	5	5	5	5	5	5	5	6.1	8.0	7.7	6.2	6.4	8.0	7.2
	E	5	5	4	4	4	4	4	4	6.1	8.0	7.7	6.1	6.1	8.0	7.5
	F	5	5	5	5	5	5	5	5	6.1	8.0	7.7	5.9	5.8	8.0	7.1
	G	5	5	5	5	5	5	5	5	6.1	8.0	7.6	6.1	6.2	8.0	7.2
	H	5	5	5	5	5	5	5	5	6.1	8.0	7.6	5.9	6.3	8.1	7.2
INC TEMP:		25	25	24	24	24	24	24	26							
DATE:		6/25/09	6/26	6/27	6/28	6/29	6/30	7/1/09	7/2/09							
TIME:		1350	0850	1045	1240	1325	1330	0945	1000							
INITIALS:		JD	SJ	WM	SJ	JD	WM	WM	RC							

Americamysis bahia 7 DAY CHRONIC ASSAY
SURVIVAL & OLD WATER QUALITIES

STUDY: 18661	CLIENT: Woods Hole Group	LOCATION: NEW BEDFORD	LAB CONTROL: HAMPTON ESTUARY	ORGANISM BATCH/LOT#

		NUMBER OF SURVIVORS								OLD DISSOLVED OXYGEN (mg/L)						
SAMPLE	Rep	0	1	2	3	4	5	6	7	1	2	3	4	5	6	7
-003	A	5	5	5	5	5	5	5	5	6.2	8.0	7.6	6.3	6.4	8.0	7.2
	B	5	5	5	5	5	5	5	5	6.1	8.1	7.6	6.3	6.5	8.0	7.3
	C	5	5	5	5	5	5	5	5	6.1	8.1	7.6	6.5	6.6	8.0	7.4
	D	5	5	5	5	5	5	5	5	6.1	8.1	7.6	6.4	6.4	8.3	7.5
	E	5	5	5	5	5	5	5	5	6.2	8.0	7.7	6.4	6.1	8.2	7.2
	F	5	5	5	5	5	5	5	5	6.2	8.0	7.6	6.3	6.3	8.2	7.4
	G	5	5	5	5	5	5	5	5	6.1	8.1	7.6	6.2	6.5	8.1	7.3
	H	5	5	5	5	5	5	5	5	6.1	8.1	7.4	6.3	6.3	8.2	7.3
-004	A	5	5	5	5	5	5	5	5	6.1	8.0	7.4	5.9	6.5	8.1	7.1
	B	5	5	5	5	5	5	5	5	6.1	8.0	7.6	6.0	6.6	8.1	7.3
	C	5	5	5	5	5	5	5	5	6.0	8.1	7.5	6.2	6.5	8.1	7.6
	D	5	5	5	4	4	4	4	4	5.9	8.1	7.5	6.4	6.4	8.1	7.7
	E	5	5	5	5	5	5	5	5	5.9	8.0	7.5	6.0	6.5	8.2	7.5
	F	5	5	5	5	5	5	5	5	5.9	8.0	7.5	8.1	6.4	8.1	7.5
	G	5	5	5	5	5	5	5	5	5.7	8.0	7.4	6.0	6.4	8.1	7.6
	H	5	5	5	5	5	5	5	5	5.6	8.1	7.6	6.0	6.2	8.1	7.7
INC TEMP:		25	25	~~26~~ 24	24	24	24	24	26							
DATE:		6/25/09	6/26	6/27	6/28	6/29	6/30	7/1/09	7/2/09							
TIME:		1350	0850	1045	1240	1325	1330	0940	1000							
INITIALS:		JQ	SJ	WM	JQ	JQ	WM	WM	KL							

Larval Fish Dry Weight Summary Sheet

Study	18661	
Client:	Woods Hole Group-NBH	
Date/Time/Init:	07/05/09 1245 JQ	07/01/09 0814 LRO
Conc	Fish and Foil (mg)	Tare Wt (mg)
Lab A	210.26	208.74
Lab B	209.98	208.63
Lab C	209.7	208.33
Lab D	209.66	208.33
Lab E	210.13	208.66
Lab F	209.65	208.24
Lab G	211.8	209.82
Lab H	211.01	209.54
001A	209.94	208.15
001B	211.29	209.68
001C	209.56	208.19
001D	209.61	207.93
001E	209.62	208.14
001F	210.26	208.81
001G	209.45	208.03
001H	209.71	207.97
002A	209.1	207.34
002B	209.98	208.36
002C	209.27	208.23
002D	209.93	208.21
002E	209.83	208.58
002F	208.59	207.26
002G	210.44	209.27
002H	210.38	208.78
003A	208.99	207.5
003B	209.09	207.75
003C	210.09	208.64
003D	212.11	208.16
003E	210.72	208.14
003F	210.54	209.16
003G	211.57	208.82
003H	216.07	213.59
004A	210.39	208.58
004B	208.66	206.98
004C	207.44	205.99
004D	207.86	206.56
004E	210.3	209.15
004F	209.4	207.89
004G	210.87	209.39
004H	211.06	209.57

Americamysis bahia 7 DAY CHRONIC ASSAY
SAMPLE USE RECORD

STUDY: 18661	CLIENT: Woods Hole Group - New Bedford
SPECIES: *A. bahia*	TEST: chronic renewal

Sample	Day: 0 Volume Used (mL)	Day: 0 ESI Cube ID	Day: 1 Volume Used (mL)	Day: 1 ESI Cube ID	Day: 2 Volume Used (mL)	Day: 2 ESI Cube ID
Lab Control	1600	n/a	1600	n/a	1600	n/a
-001	1600	-001		-001		-001
-002	1600	-002		-002		-002
-003	1600	-003		-003		-003
-004	1600	-004		-004		-004

Day	Date	Time	Init
0	6/25/09	1130	WM
1	6/26	0905	SJ
2	6/27	1050	WM
3	6/28	1355	JQ
4	6/29	1400	JQ
5	6/30	1345	WM
6	7/1/09	1000	WM

Sample	Day: 3 Volume Used (mL)	Day: 3 ESI Cube ID	Day: 4 Volume Used (mL)	Day: 4 ESI Cube ID	Day: 5 Volume Used (mL)	Day: 5 ESI Cube ID
Lab Control	1600	n/a	1600	n/a	1600	n/a
-001		-001		-001		-001
-002		-002		-002		-002
-003		-003		-003		-003
-004		-004		-004		-004

Sample	Day: 6 Volume Used (mL)	Day: 6 ESI Cube ID
Lab Control	1600	n/a
-001		-001
-002		-002
-003		-003
-004		-004

SALTWATER ASSAYS

A. bahia, A. punctulata, C. parvula

STUDY: 18661	LOCATION: New Bedford Harbor					
CHEMISTRY	Lab Salt Control	-001	-002	-003	-004	-005
AMMONIA	18596-008	18661-016	18661-017	18661-018	18661-019	18661-020
AS RECEIVED WATER QUALITIES	Lab Salt Control	-001	-002	-003	-004	
SALINITY (ppt)	30	27.5	26.2	26.7	25.0	26.3
pH (SU)	8.08	7.65	7.53	7.56	7.54	7.56
TRC (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02	
DO (mg/L)	7.6	7.6	7.7	7.8	8.0	8.1
S/C (µmhos/cm)		42750	40900	41600	39270	41010
WQ STATION USED		2	2	2	2	2
INITIALS		WM	WM	WM	WM	WM
A. bahia SALINITY ADJUSTMENT RECORD	Lab Salt Control	-001	-002	-003	-004	
SAMPLE (mLs)						
SEA SALT (g)						
DATE:						
TIME:		1020	1020	1020	1020	
INITIALS:		WM	WM	WM	WM	

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

Americamysis bahia 7 DAY CHRONIC ASSAY
NEW WATER QUALITIES

STUDY:	CLIENT:	LOCATION:	LAB CONTROL:
18661	Woods Hole Group	NEW BEDFORD	HAMPTON ESTUARY

		NEW DISSOLVED OXYGEN (mg/L)							NEW SALINITY (ppt)						
CONC	REP	0	1	2	3	4	5	6	0	1	2	3	4	5	6
LAB	A	7.6	7.4	7.1	7.3	7.5	7.9	7.5	30	29	26	25	25	26	25
-001	A	7.4	7.4	7.7	6.8	7.3	7.2	6.9	28	28	28	28	28	28	28
-002	A	7.4	6.8	7.7	7.1	7.1	7.6	7.9	26	26	26	26	26	26	26
-003	A	7.5	6.9	8.0	7.4	7.6	7.7	7.8	27	27	27	27	27	27	27
-004	A	7.5	7.8	7.7	7.3	7.6	7.9	8.1	25	26	25	25	25	25	25

		NEW pH (SU)							NEW TEMPERATURE (°C)						
CONC	REP	0	1	2	3	4	5	6	0	1	2	3	4	5	6
LAB	A	8.08	7.91	7.98	7.96	8.02	8.02	8.01	25	25	25	25	25	25	25
-001	A	7.69	7.60	7.68	7.69	7.78	7.68	7.72	25	25	25	25	25	25	25
-002	A	7.53	7.55	7.57	7.59	7.60	7.55	7.55	25	25	25	25	25	25	25
-003	A	7.55	7.56	7.57	7.57	7.59	7.58	7.59	25	25	25	25	25	25	25
-004	A	7.53	7.58	7.54	7.52	7.53	7.60	7.54	24	25	25	25	25	25	25
INC TEMP:		25	25	24	24	24	24	24							
DATE:		6/25/09	6/26	6/27	6/28	6/29	6/30	7/1/09							
TIME:		1150	0915	1105	1315	1405	1400	1030							
INIT:		WM	SJ	WM	JQ	JQ	WM	WM							

WATER QUALITY METERS USED NEW WATER QUALITIES								
	0	1	2	3	4	5	6	7
Water Quality Station #		2	1	2	2	2	2	
Initials		WM SJ	WM	JQ	JQ	WM	WM	
Date	6/25/09	6/25/09 6/26/09	6/27/09	6/28	6/29	6/30/09	7/1/09	

Americamysis bahia 7 DAY CHRONIC ASSAY
OLD WATER QUALITIES

STUDY:	CLIENT:	LOCATION:	LAB CONTROL:
18661	Woods Hole Group	NEW BEDFORD	HAMPTON ESTUARY

OLD SALINITY (ppt)									OLD pH (SU)						
Conc	Rep	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Control	A	30	29	26	26	26	26	26	7.73	7.87	7.84	7.88	7.88	7.92	7.94
-001	A	29	28	28	28	28	28	29	7.75	7.79	7.78	7.81	7.78	7.81	7.88
-002	A	27	26	27	27	27	27	27	7.75	7.79	7.75	7.81	7.83	7.79	~~7.85~~ 7.86
-003	A	26	27	27	28	27	28	28	7.78	7.83	7.80	7.82	7.81	7.77	7.83
-004	A	26	26	26	26	25	26	26	7.79	7.78	7.79	7.76	7.80	7.82	7.82
OLD TEMPERATURE (°C)															
Conc	Rep	1	2	3	4	5	6	7							
Control	A	25	~~25~~	25	25	25	25	25							
-001	A	25	25	25	25	25	25	25							
-002	A	25	25	25	25	25	25	25							
-003	A	25	25	25	25	25	25	25							
-004	A	25	25	25	25	25	25	25							
INC TEMP:		25	24	24	~~25~~	~~25~~ 24	24	26							
DATE:		6/26/09	6/27	6/28	6/29	6/30	7/1/09	7/2/09							
TIME:		0830	1030	1220	1305	1255	0920	0935							
INITIALS:		JT	WM	JQ	JQ	WM	WM	KC							

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.

WATER QUALITY METERS USED OLD WATER QUALITIES								
	0	1	2	3	4	5	6	7
Water Quality Station #		1	2	1	1	1	2	1
Initials		JT	WM	JQ	JQ	WM	WM	KC
Date	6/25/09	6/26/09	6/27/09	6/28	6/29/09	6/30/09	7/1/09	7/2/09

CETIS Summary Report

Report Date: 07 Jul-09 10:18 (p 1 of 1)
Link/Link Code: 06-4898-2488

Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Test Run No:	05-4521-6965	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	27 Jun-09 10:45	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	45h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	7

Sample Code	Sample No	Sample Date	Receive Date	Sample Age	Client Name	Project
18661-000	07-7150-1310	25 Jun-09 11:00	25 Jun-09 11:10	3h (2 °C)	Woods Hole Group	Special Studies
18661-001	05-8419-9740	24 Jun-09 09:10	24 Jun-09 17:30	29h (2 °C)		
18661-002	20-7401-5578	24 Jun-09 10:20	24 Jun-09 17:30	28h (2 °C)		
18661-003	07-6176-0887	24 Jun-09 11:10	24 Jun-09 17:30	27h (2 °C)		
18661-004	04-5664-4176	24 Jun-09 11:40	24 Jun-09 17:30	26h (2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
18661-000	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-Lab Control		
18661-001	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-001		
18661-002	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-002		
18661-003	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-003		
18661-004	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-001		

48h Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	1	1	1	1	1	0	0	0.0%	0.0%
18661-001	8	0.95	0.8972	1	0.6	1	0.02582	0.1414	14.89%	5.0%
18661-002	8	0.975	0.9486	1	0.8	1	0.01291	0.07071	7.25%	2.5%
18661-003	8	1	1	1	1	1	0	0	0.0%	0.0%
18661-004	8	1	1	1	1	1	0	0	0.0%	0.0%

48h Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
18661-000	1	1	1	1	1	1	1	1
18661-001	1	1	1	1	1	1	0.6	1
18661-002	1	1	1	1	0.8	1	1	1
18661-003	1	1	1	1	1	1	1	1
18661-004	1	1	1	1	1	1	1	1

000-148-164-2 CETIS™ v1.6.4F Analyst:_____ QA:_____

Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	12-5042-8900	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:17	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-4521-6965	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	27 Jun-09 10:45	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	45h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	7

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C <> T	Not Run					12.36%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18661-001		18661-002	67.5		1	0.9591	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0030545	0.0030545	1	0.1826	0.6756	Non-Significant Effect
Error	0.2341306	0.0167236	14			
Total	0.2371852	0.0197782	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.719	8.885	0.1044	Equal Variances
Distribution	Shapiro-Wilk Normality	0.4951		0.0000	Non-normal Distribution

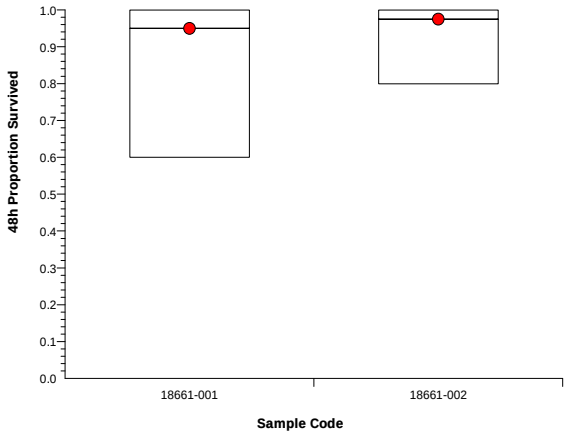
48h Proportion Survived Summary

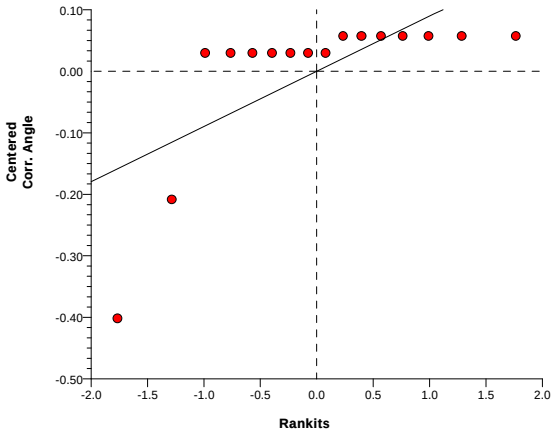
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	8	0.95	0.8962	1	0.6	1	0.02626	0.1414	14.89%	0.0%
18661-002	8	0.975	0.9481	1	0.8	1	0.01313	0.07071	7.25%	-2.63%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	8	1.288	1.226	1.35	0.8861	1.345	0.03015	0.1624	12.61%	0.0%
18661-002	8	1.316	1.283	1.348	1.107	1.345	0.01563	0.08419	6.4%	-2.15%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	17-3622-0221	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:17	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-4521-6965	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	27 Jun-09 10:45	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	45h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	7

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					6.84%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18661-002		18661-004	72		1	0.6395	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0035442	0.0035442	1	1	0.3343	Non-Significant Effect
Error	0.0496194	0.0035442	14			
Total	0.0531637	0.0070885	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	8.862	0.3343	Equal Variances
Distribution	Shapiro-Wilk Normality	0.4689		0.0000	Non-normal Distribution

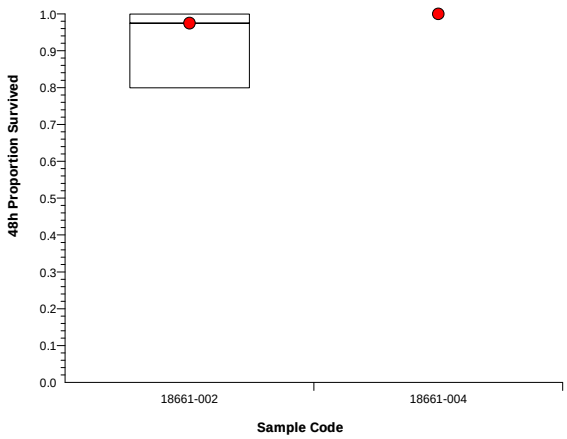
48h Proportion Survived Summary

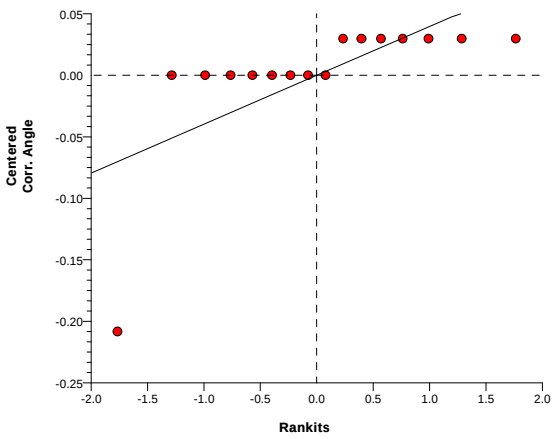
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-002	8	0.975	0.9481	1	0.8	1	0.01313	0.07071	7.25%	0.0%
18661-004	8	1	1	1	1	1	0	0	0.0%	-2.56%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-002	8	1.316	1.283	1.348	1.107	1.345	0.01563	0.08419	6.4%	0.0%
18661-004	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	-2.26%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	10-8763-0587	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:17	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-4521-6965	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	27 Jun-09 10:45	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	45h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	7

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					6.84%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18661-002		18661-003	72		1	0.6395	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0035442	0.0035442	1	1	0.3343	Non-Significant Effect
Error	0.0496194	0.0035442	14			
Total	0.0531637	0.0070885	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	8.862	0.3343	Equal Variances
Distribution	Shapiro-Wilk Normality	0.4689		0.0000	Non-normal Distribution

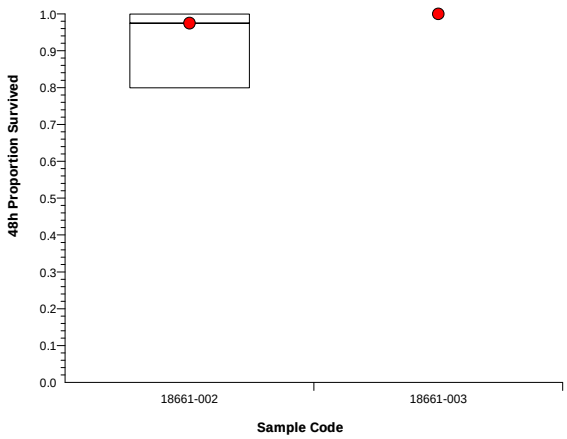
48h Proportion Survived Summary

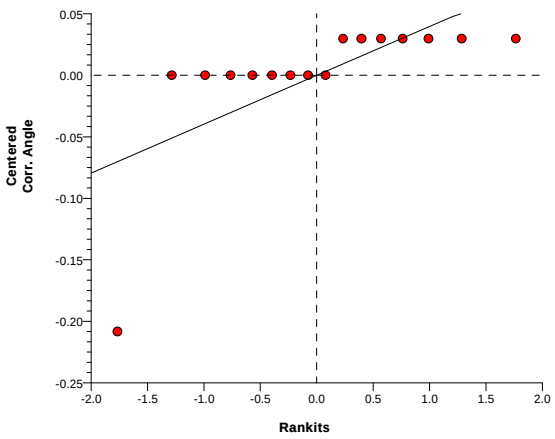
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-002	8	0.975	0.9481	1	0.8	1	0.01313	0.07071	7.25%	0.0%
18661-003	8	1	1	1	1	1	0	0	0.0%	-2.56%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-002	8	1.316	1.283	1.348	1.107	1.345	0.01563	0.08419	6.4%	0.0%
18661-003	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	-2.26%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	04-6491-9278	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:16	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-4521-6965	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	27 Jun-09 10:45	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	45h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	7

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					9.51%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18661-001		18661-004	72		1	0.6395	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0131794	0.0131794	1	1	0.3343	Non-Significant Effect
Error	0.1845112	0.0131794	14			
Total	0.1976906	0.0263588	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	8.862	0.3343	Equal Variances
Distribution	Shapiro-Wilk Normality	0.4689		0.0000	Non-normal Distribution

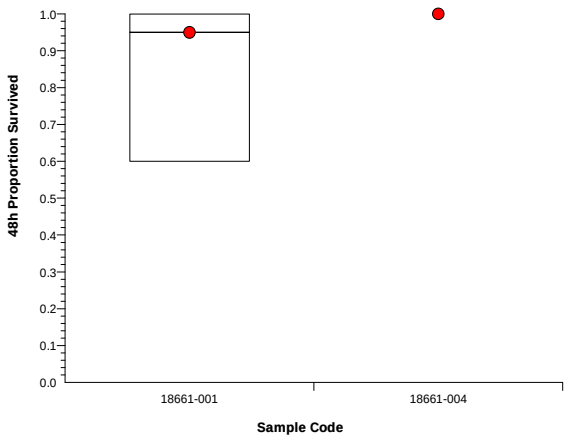
48h Proportion Survived Summary

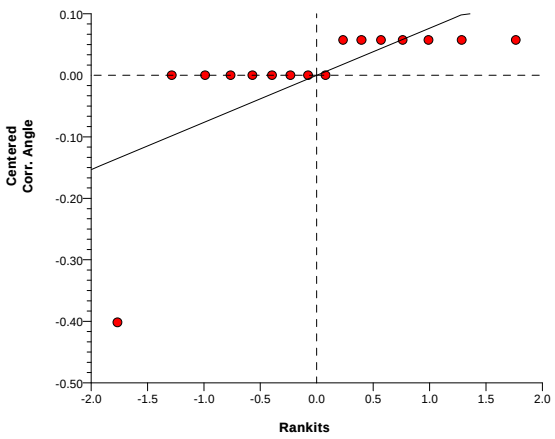
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	8	0.95	0.8962	1	0.6	1	0.02626	0.1414	14.89%	0.0%
18661-004	8	1	1	1	1	1	0	0	0.0%	-5.26%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	8	1.288	1.226	1.35	0.8861	1.345	0.03015	0.1624	12.61%	0.0%
18661-004	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	-4.46%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	05-0152-1063	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:16	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-4521-6965	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	27 Jun-09 10:45	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	45h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	7

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					9.51%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18661-001		18661-003	72		1	0.6395	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0131794	0.0131794	1	1	0.3343	Non-Significant Effect
Error	0.1845112	0.0131794	14			
Total	0.1976906	0.0263588	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	8.862	0.3343	Equal Variances
Distribution	Shapiro-Wilk Normality	0.4689		0.0000	Non-normal Distribution

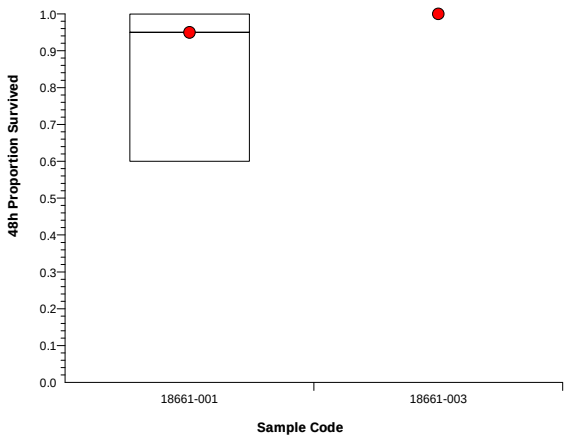
48h Proportion Survived Summary

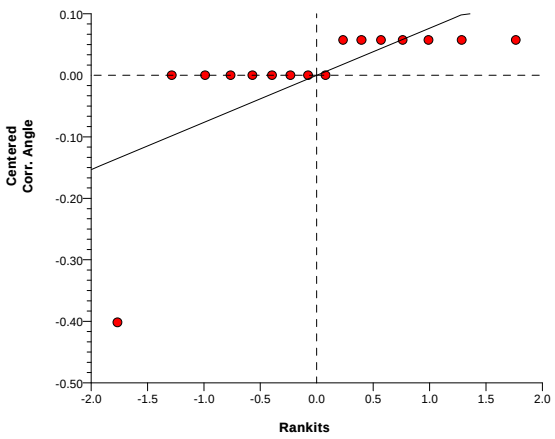
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	8	0.95	0.8962	1	0.6	1	0.02626	0.1414	14.89%	0.0%
18661-003	8	1	1	1	1	1	0	0	0.0%	-5.26%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	8	1.288	1.226	1.35	0.8861	1.345	0.03015	0.1624	12.61%	0.0%
18661-003	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	-4.46%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	10-3133-9090	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	30 Jun-09 13:47	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Test Run No:	05-4521-6965	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	27 Jun-09 10:45	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	45h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	7

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.0%

Steel Many-One Rank Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18661-000		18661-004	68	52	1	0.5000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0	0	1	65540	0.0000	Significant Effect
Error	0	0	14			
Total	0	0	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	65540	8.862	0.0000	Unequal Variances

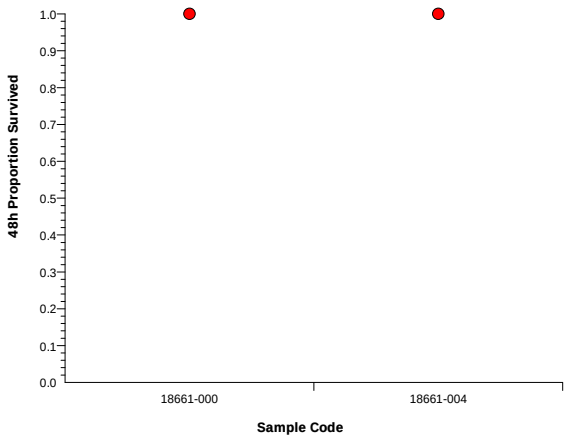
48h Proportion Survived Summary

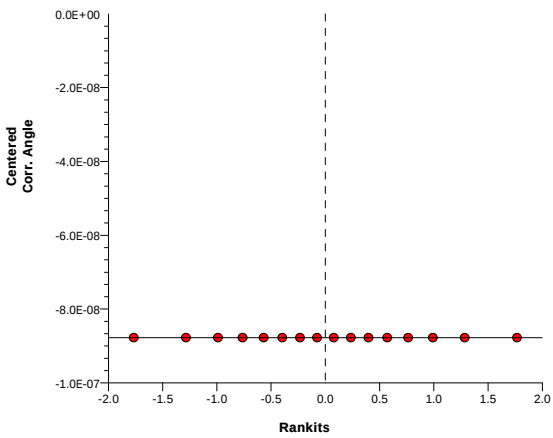
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	1	1	1	1	1	0	0	0.0%	0.0%
18661-004	8	1	1	1	1	1	0	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	0.0%
18661-004	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	0.0%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	15-8934-8000	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	30 Jun-09 13:47	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Test Run No:	05-4521-6965	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	27 Jun-09 10:45	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	45h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	7

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.0%

Steel Many-One Rank Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18661-000		18661-003	68	52	1	0.5000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0	0	1	65540	0.0000	Significant Effect
Error	0	0	14			
Total	0	0	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	65540	8.862	0.0000	Unequal Variances

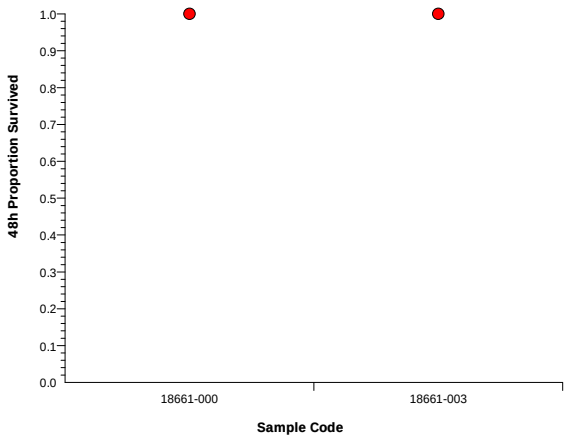
48h Proportion Survived Summary

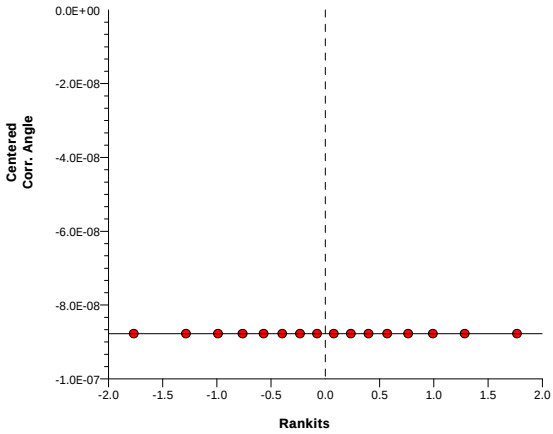
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	1	1	1	1	1	0	0	0.0%	0.0%
18661-003	8	1	1	1	1	1	0	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	0.0%
18661-003	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	0.0%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	07-4810-0815	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	30 Jun-09 13:47	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Test Run No:	05-4521-6965	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	27 Jun-09 10:45	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	45h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	7

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					7.53%

Steel Many-One Rank Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18661-000		18661-002	64	52	1	0.3372	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0035442	0.0035442	1	1	0.3343	Non-Significant Effect
Error	0.0496194	0.0035442	14			
Total	0.0531637	0.0070885	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	8.862	0.3343	Equal Variances
Distribution	Shapiro-Wilk Normality	0.4689		0.0000	Non-normal Distribution

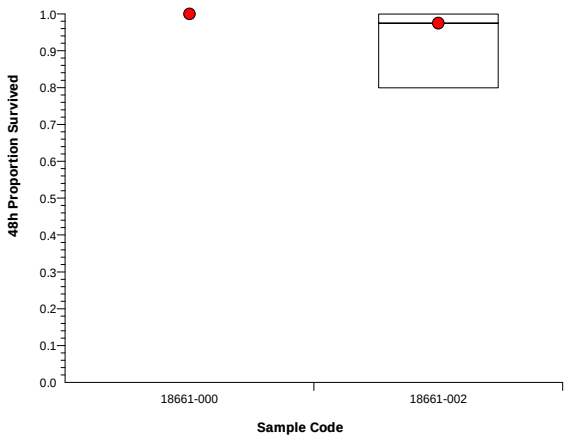
48h Proportion Survived Summary

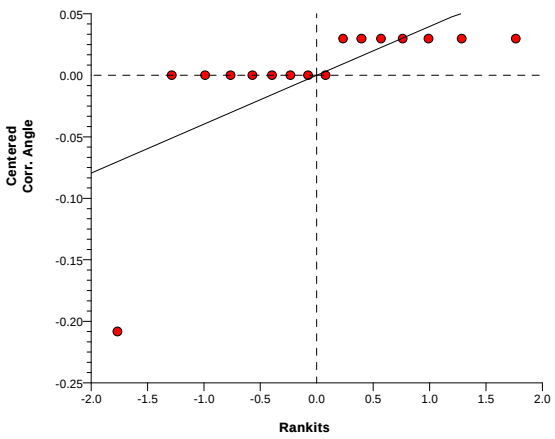
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	1	1	1	1	1	0	0	0.0%	0.0%
18661-002	8	0.975	0.9481	1	0.8	1	0.01313	0.07071	7.25%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	0.0%
18661-002	8	1.316	1.283	1.348	1.107	1.345	0.01563	0.08419	6.4%	2.21%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	19-7468-6667	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	30 Jun-09 13:47	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Test Run No:	05-4521-6965	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	27 Jun-09 10:45	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	45h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	7

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					10.29%

Steel Many-One Rank Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18661-000		18661-001	64	52	1	0.3372	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0131794	0.0131794	1	1	0.3343	Non-Significant Effect
Error	0.1845112	0.0131794	14			
Total	0.1976906	0.0263588	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	8.862	0.3343	Equal Variances
Distribution	Shapiro-Wilk Normality	0.4689		0.0000	Non-normal Distribution

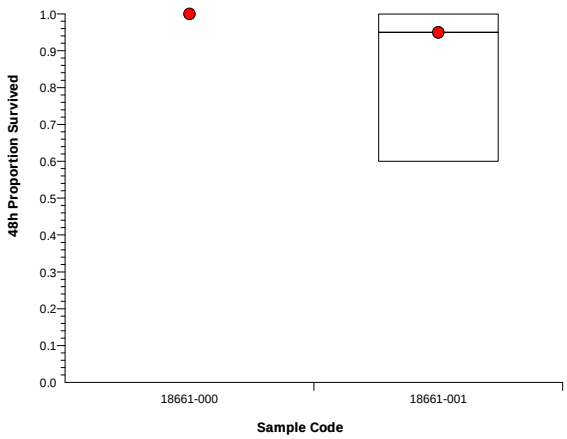
48h Proportion Survived Summary

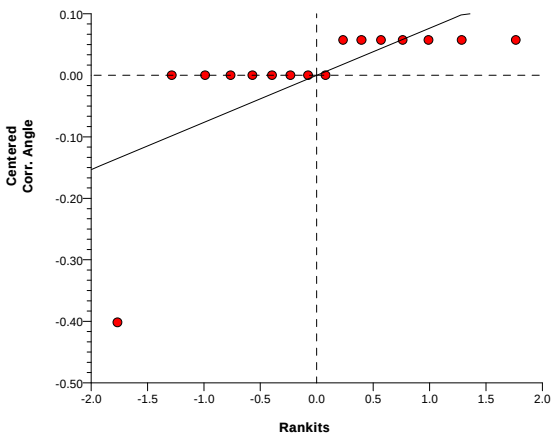
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	1	1	1	1	1	0	0	0.0%	0.0%
18661-001	8	0.95	0.8962	1	0.6	1	0.02626	0.1414	14.89%	5.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	0.0%
18661-001	8	1.288	1.226	1.35	0.8861	1.345	0.03015	0.1624	12.61%	4.27%

Graphics





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

Test Run No:	02-9104-8057	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Jul-09 11:00	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample No	Sample Date	Receive Date	Sample Age	Client Name	Project
18661-000	17-4269-3412	25 Jun-09 12:00	25 Jun-09 12:05	110m (2 °C)	Woods Hole Group	Special Studies
18661-001	17-4058-3203	24 Jun-09 09:10	24 Jun-09 17:30	29h (2 °C)		
18661-002	20-7401-5578	24 Jun-09 10:20	24 Jun-09 17:30	28h (2 °C)		
18661-003	18-0884-1223	24 Jun-09 11:10	24 Jun-09 17:30	27h (2 °C)		
18661-004	18-5578-7927	24 Jun-09 11:40	24 Jun-09 17:30	26h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
18661-000	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-Lab Control		
18661-001	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-001		
18661-002	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-002		
18661-003	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-003		
18661-004	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-004		

Test Acceptability

Analysis No	Endpoint	Attribute	Test Stat	Acceptabilty Limits	Overlap	Decision
09-3978-3033	7d Proportion Survived	Control Resp	1	0.8 - NL	Yes	Passes acceptability criteria
13-3525-2725	7d Proportion Survived	Control Resp	1	0.8 - NL	Yes	Passes acceptability criteria
15-6117-8021	7d Proportion Survived	Control Resp	1	0.8 - NL	Yes	Passes acceptability criteria
21-4451-1995	7d Proportion Survived	Control Resp	1	0.8 - NL	Yes	Passes acceptability criteria
00-2127-7063	Mean Dry Biomass-mg	Control Resp	0.2975	0.2 - NL	Yes	Passes acceptability criteria
00-9511-9198	Mean Dry Biomass-mg	Control Resp	0.2975	0.2 - NL	Yes	Passes acceptability criteria
04-1038-9084	Mean Dry Biomass-mg	Control Resp	0.2975	0.2 - NL	Yes	Passes acceptability criteria
06-3536-1163	Mean Dry Biomass-mg	Control Resp	0.2975	0.2 - NL	Yes	Passes acceptability criteria
00-2127-7063	Mean Dry Biomass-mg	PMSD	0.1439	0.11 - 0.37	Yes	Passes acceptability criteria
00-9511-9198	Mean Dry Biomass-mg	PMSD	0.11	0.11 - 0.37	Yes	Passes acceptability criteria
04-1038-9084	Mean Dry Biomass-mg	PMSD	0.1225	0.11 - 0.37	Yes	Passes acceptability criteria
05-4189-6011	Mean Dry Biomass-mg	PMSD	0.375	0.11 - 0.37	Yes	Fails acceptability criteria
06-3536-1163	Mean Dry Biomass-mg	PMSD	0.3994	0.11 - 0.37	Yes	Fails acceptability criteria
08-8485-6364	Mean Dry Biomass-mg	PMSD	0.1476	0.11 - 0.37	Yes	Passes acceptability criteria
13-0143-1956	Mean Dry Biomass-mg	PMSD	0.1525	0.11 - 0.37	Yes	Passes acceptability criteria
14-9836-6325	Mean Dry Biomass-mg	PMSD	0.1027	0.11 - 0.37	Yes	Fails acceptability criteria
17-8667-9162	Mean Dry Biomass-mg	PMSD	0.4204	0.11 - 0.37	Yes	Fails acceptability criteria

7d Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	1	1	1	1	1	0	0	0.0%	0.0%
18661-001	8	0.925	0.8694	0.9806	0.6	1	0.02717	0.1488	16.09%	7.5%
18661-002	8	0.975	0.9486	1	0.8	1	0.01291	0.07071	7.25%	2.5%
18661-003	8	1	1	1	1	1	0	0	0.0%	0.0%
18661-004	8	0.975	0.9486	1	0.8	1	0.01291	0.07071	7.25%	2.5%

Mean Dry Biomass-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	0.2975	0.2818	0.3132	0.266	0.396	0.007656	0.04194	14.1%	0.0%
18661-001	8	0.3135	0.3017	0.3253	0.274	0.358	0.005789	0.03171	10.11%	-5.38%
18661-002	8	0.2873	0.2669	0.3076	0.208	0.352	0.00995	0.0545	18.97%	3.44%
18661-003	8	0.4355	0.366	0.505	0.268	0.79	0.03398	0.1861	42.74%	-46.39%
18661-004	8	0.2967	0.2815	0.312	0.23	0.362	0.007458	0.04085	13.76%	0.25%

000-148-164-3 CETIS™ v1.6.4F Analyst:_____ QA:_____

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

Mean Dry Weight-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	0.2975	0.2818	0.3132	0.266	0.396	0.007656	0.04194	14.1%	0.0%
18661-001	8	0.3477	0.3219	0.3734	0.274	0.4733	0.01258	0.06888	19.81%	-16.86%
18661-002	8	0.2951	0.2753	0.3148	0.208	0.352	0.009649	0.05285	17.91%	0.82%
18661-003	8	0.4355	0.366	0.505	0.268	0.79	0.03398	0.1861	42.74%	-46.39%
18661-004	8	0.3049	0.2903	0.3194	0.23	0.362	0.007104	0.03891	12.76%	-2.48%

7d Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
18661-000	1	1	1	1	1	1	1	1
18661-001	1	1	1	0.8	1	1	0.6	1
18661-002	1	1	1	1	0.8	1	1	1
18661-003	1	1	1	1	1	1	1	1
18661-004	1	1	1	0.8	1	1	1	1

Mean Dry Biomass-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
18661-000	0.304	0.27	0.274	0.266	0.294	0.282	0.396	0.294
18661-001	0.358	0.322	0.274	0.336	0.296	0.29	0.284	0.348
18661-002	0.352	0.324	0.208	0.344	0.25	0.266	0.234	0.32
18661-003	0.298	0.268	0.29	0.79	0.516	0.276	0.55	0.496
18661-004	0.362	0.336	0.29	0.26	0.23	0.302	0.296	0.298

Mean Dry Weight-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
18661-000	0.304	0.27	0.274	0.266	0.294	0.282	0.396	0.294
18661-001	0.358	0.322	0.274	0.42	0.296	0.29	0.4733	0.348
18661-002	0.352	0.324	0.208	0.344	0.3125	0.266	0.234	0.32
18661-003	0.298	0.268	0.29	0.79	0.516	0.276	0.55	0.496
18661-004	0.362	0.336	0.29	0.325	0.23	0.302	0.296	0.298

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

Analysis No:	12-2280-9487	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:30	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	02-9104-8057	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Jul-09 11:00	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C <> T	Not Run					13.01%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18661-001		18661-002	63.5		2	0.6454	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0131794	0.0131794	1	0.7196	0.4105	Non-Significant Effect
Error	0.2564119	0.0183151	14			
Total	0.2695912	0.0314945	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	4.168	8.885	0.0792	Equal Variances
Distribution	Shapiro-Wilk Normality	0.6705		0.0001	Non-normal Distribution

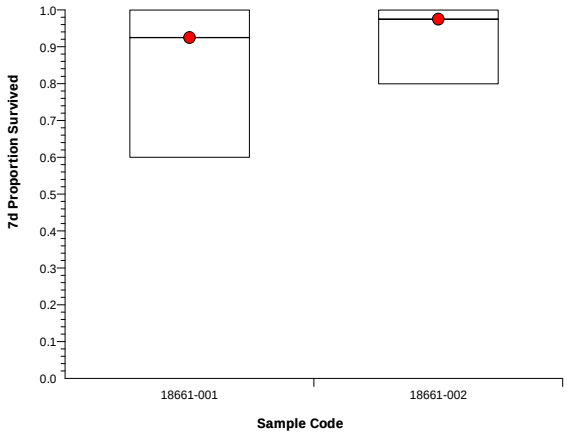
7d Proportion Survived Summary

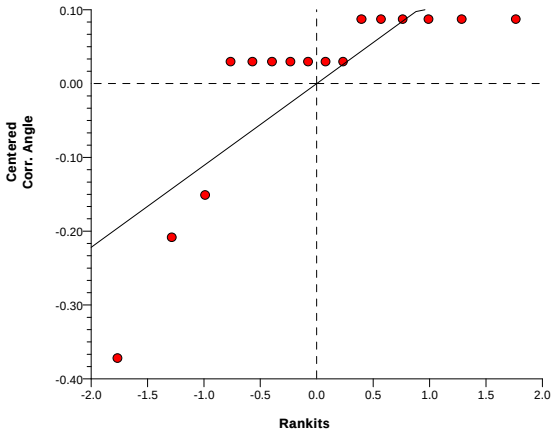
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	8	0.925	0.8684	0.9816	0.6	1	0.02763	0.1488	16.09%	0.0%
18661-002	8	0.975	0.9481	1	0.8	1	0.01313	0.07071	7.25%	-5.4%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	8	1.258	1.193	1.323	0.8861	1.345	0.03192	0.1719	13.66%	0.0%
18661-002	8	1.316	1.283	1.348	1.107	1.345	0.01563	0.08419	6.4%	-4.56%

Graphics





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

Analysis No:	16-9017-3126	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:30	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	02-9104-8057	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Jul-09 11:00	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					8.17%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18661-002		18661-004	68		2	0.4796	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0	0	1	0	1.0000	Non-Significant Effect
Error	0.0992388	0.0070885	14			
Total	0.0992388	0.0070885	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1	8.885	1.0000	Equal Variances
Distribution	Shapiro-Wilk Normality	0.3985		0.0000	Non-normal Distribution

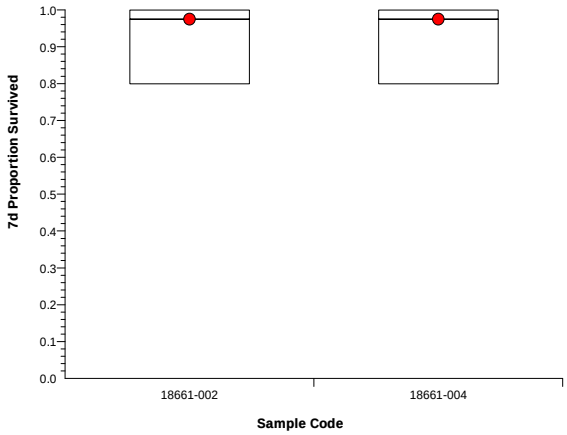
7d Proportion Survived Summary

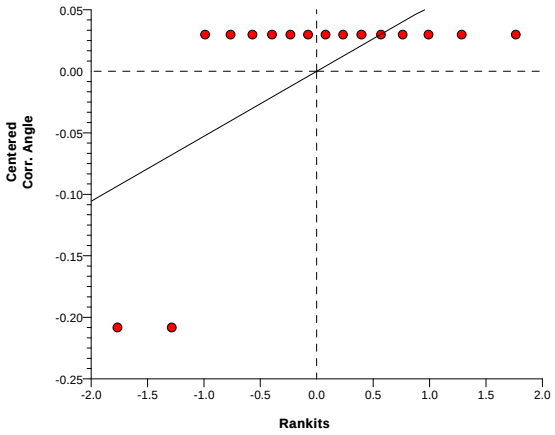
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-002	8	0.975	0.9481	1	0.8	1	0.01313	0.07071	7.25%	0.0%
18661-004	8	0.975	0.9481	1	0.8	1	0.01313	0.07071	7.25%	0.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-002	8	1.316	1.283	1.348	1.107	1.345	0.01563	0.08419	6.4%	0.0%
18661-004	8	1.316	1.283	1.348	1.107	1.345	0.01563	0.08419	6.4%	0.0%

Graphics





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

Analysis No:	07-9558-0410	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:30	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	02-9104-8057	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Jul-09 11:00	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					6.84%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18661-002		18661-003	72		1	0.6395	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0035442	0.0035442	1	1	0.3343	Non-Significant Effect
Error	0.0496194	0.0035442	14			
Total	0.0531637	0.0070885	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	8.862	0.3343	Equal Variances
Distribution	Shapiro-Wilk Normality	0.4689		0.0000	Non-normal Distribution

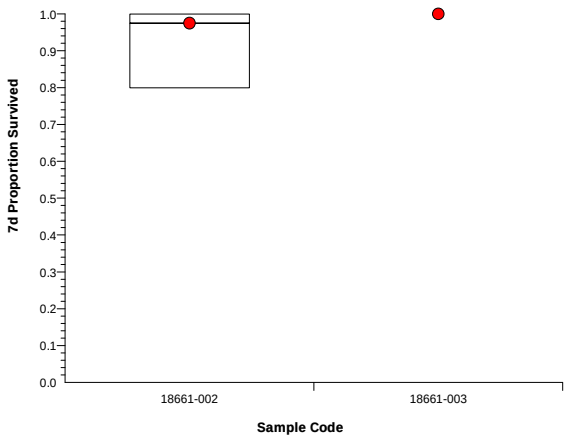
7d Proportion Survived Summary

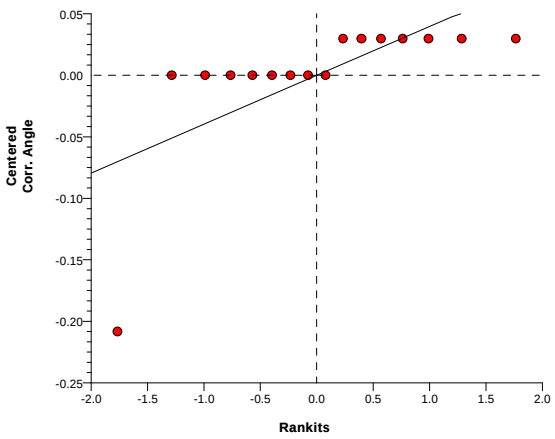
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-002	8	0.975	0.9481	1	0.8	1	0.01313	0.07071	7.25%	0.0%
18661-003	8	1	1	1	1	1	0	0	0.0%	-2.56%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-002	8	1.316	1.283	1.348	1.107	1.345	0.01563	0.08419	6.4%	0.0%
18661-003	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	-2.26%

Graphics





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

Analysis No:	06-2588-7644	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:30	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	02-9104-8057	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Jul-09 11:00	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					10.83%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18661-001		18661-004	72.5		2	0.6395	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0131794	0.0131794	1	0.7196	0.4105	Non-Significant Effect
Error	0.2564119	0.0183151	14			
Total	0.2695912	0.0314945	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	4.168	8.885	0.0792	Equal Variances
Distribution	Shapiro-Wilk Normality	0.6705		0.0001	Non-normal Distribution

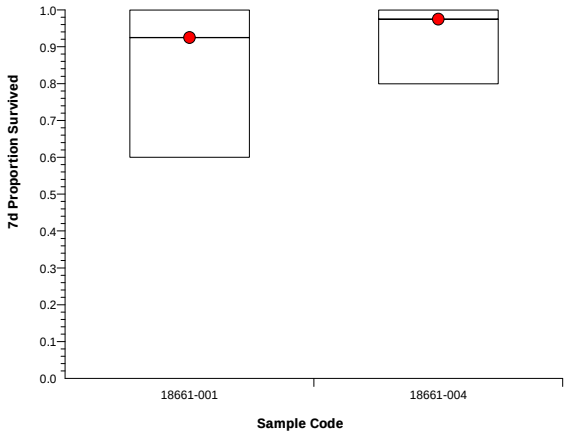
7d Proportion Survived Summary

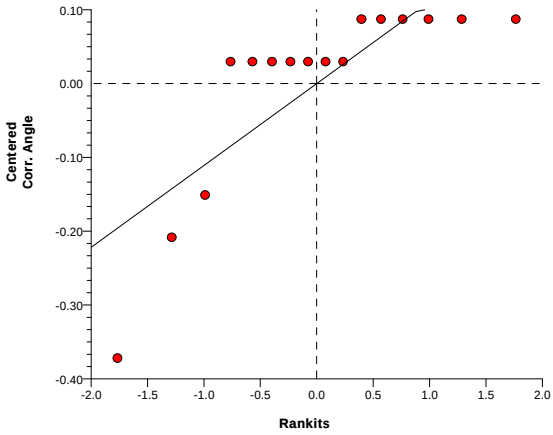
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	8	0.925	0.8684	0.9816	0.6	1	0.02763	0.1488	16.09%	0.0%
18661-004	8	0.975	0.9481	1	0.8	1	0.01313	0.07071	7.25%	-5.4%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	8	1.258	1.193	1.323	0.8861	1.345	0.03192	0.1719	13.66%	0.0%
18661-004	8	1.316	1.283	1.348	1.107	1.345	0.01563	0.08419	6.4%	-4.56%

Graphics





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

Analysis No:	17-2415-5691	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:30	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	02-9104-8057	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Jul-09 11:00	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					9.84%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18661-001		18661-003	76		1	0.7791	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0303927	0.0303927	1	2.058	0.1734	Non-Significant Effect
Error	0.2067925	0.0147709	14			
Total	0.2371852	0.0451636	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	2.058	8.862	0.1734	Equal Variances
Distribution	Shapiro-Wilk Normality	0.665		0.0001	Non-normal Distribution

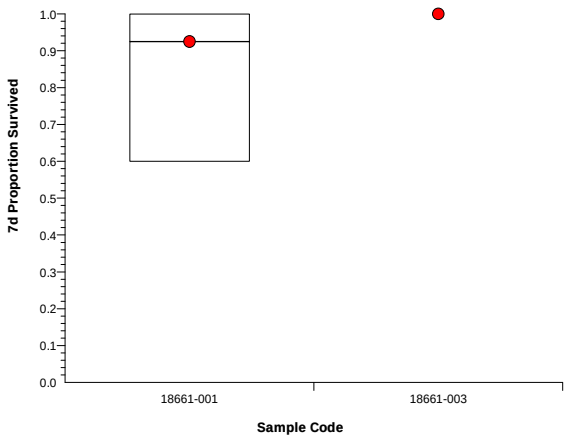
7d Proportion Survived Summary

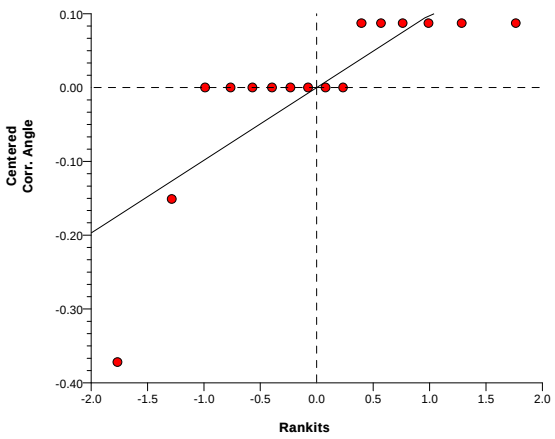
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	8	0.925	0.8684	0.9816	0.6	1	0.02763	0.1488	16.09%	0.0%
18661-003	8	1	1	1	1	1	0	0	0.0%	-8.11%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	8	1.258	1.193	1.323	0.8861	1.345	0.03192	0.1719	13.66%	0.0%
18661-003	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	-6.93%

Graphics





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

Analysis No:	21-4451-1995	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:29	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	02-9104-8057	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Jul-09 11:00	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					7.53%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18661-000		18661-004	64		1	0.3605	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0035442	0.0035442	1	1	0.3343	Non-Significant Effect
Error	0.0496194	0.0035442	14			
Total	0.0531637	0.0070885	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	8.862	0.3343	Equal Variances
Distribution	Shapiro-Wilk Normality	0.4689		0.0000	Non-normal Distribution

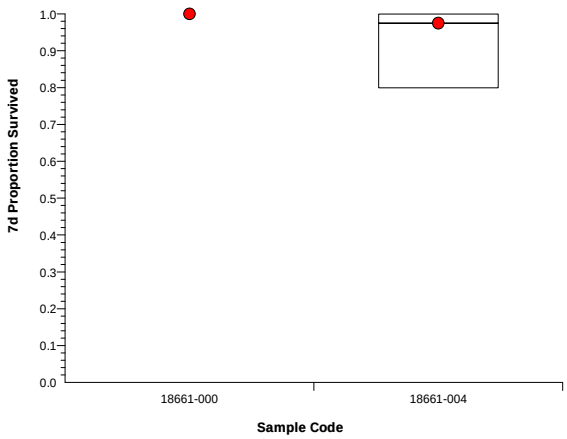
7d Proportion Survived Summary

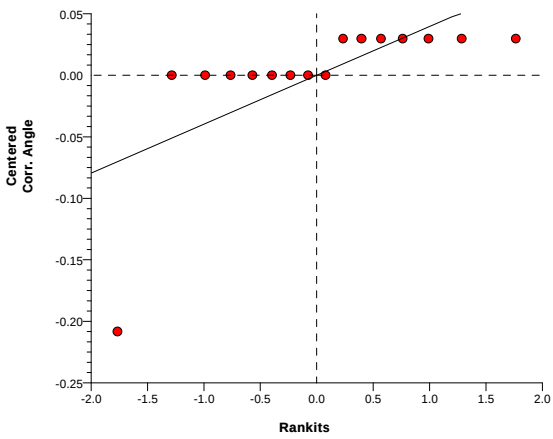
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	1	1	1	1	1	0	0	0.0%	0.0%
18661-004	8	0.975	0.9481	1	0.8	1	0.01313	0.07071	7.25%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	0.0%
18661-004	8	1.316	1.283	1.348	1.107	1.345	0.01563	0.08419	6.4%	2.21%

Graphics





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

Analysis No:	09-3978-3033	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:29	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	02-9104-8057	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Jul-09 11:00	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.0%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18661-000		18661-003	68		1	0.4796	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0	0	1	65540	0.0000	Significant Effect
Error	0	0	14			
Total	0	0	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	65540	8.862	0.0000	Unequal Variances

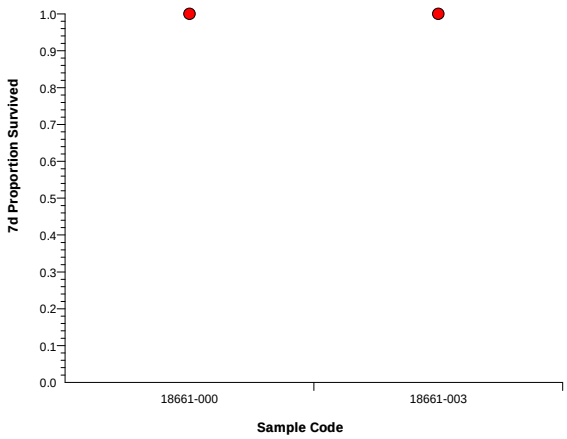
7d Proportion Survived Summary

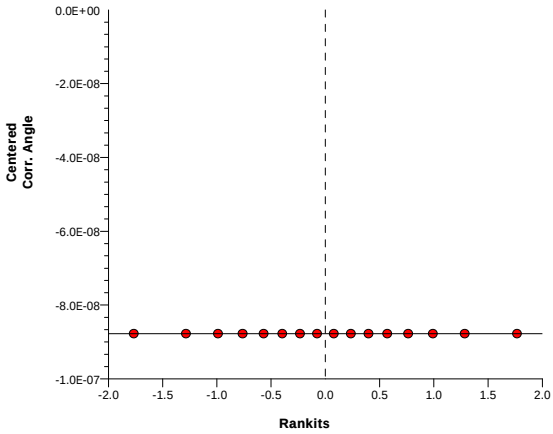
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	1	1	1	1	1	0	0	0.0%	0.0%
18661-003	8	1	1	1	1	1	0	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	0.0%
18661-003	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	0.0%

Graphics





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

Analysis No:	15-6117-8021	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:29	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	02-9104-8057	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Jul-09 11:00	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					7.53%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18661-000		18661-002	64		1	0.3605	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0035442	0.0035442	1	1	0.3343	Non-Significant Effect
Error	0.0496194	0.0035442	14			
Total	0.0531637	0.0070885	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	8.862	0.3343	Equal Variances
Distribution	Shapiro-Wilk Normality	0.4689		0.0000	Non-normal Distribution

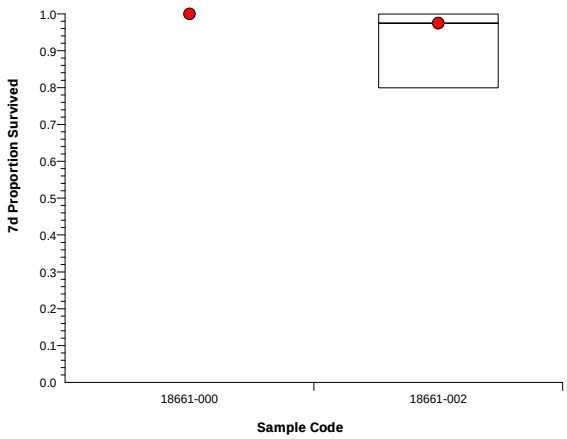
7d Proportion Survived Summary

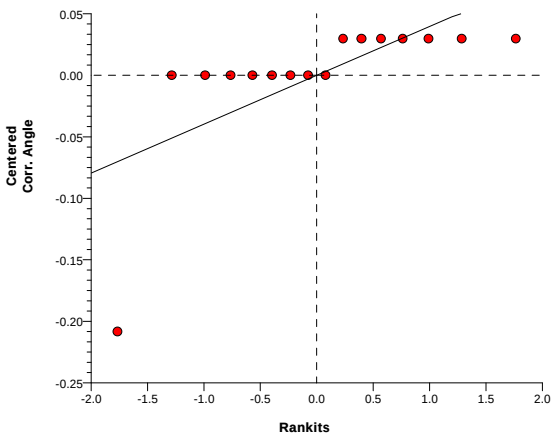
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	1	1	1	1	1	0	0	0.0%	0.0%
18661-002	8	0.975	0.9481	1	0.8	1	0.01313	0.07071	7.25%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	0.0%
18661-002	8	1.316	1.283	1.348	1.107	1.345	0.01563	0.08419	6.4%	2.21%

Graphics





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

Analysis No:	13-3525-2725	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:29	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	02-9104-8057	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Jul-09 11:00	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					10.66%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18661-000		18661-001	60		1	0.2209	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0303927	0.0303927	1	2.058	0.1734	Non-Significant Effect
Error	0.2067925	0.0147709	14			
Total	0.2371852	0.0451636	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	2.058	8.862	0.1734	Equal Variances
Distribution	Shapiro-Wilk Normality	0.665		0.0001	Non-normal Distribution

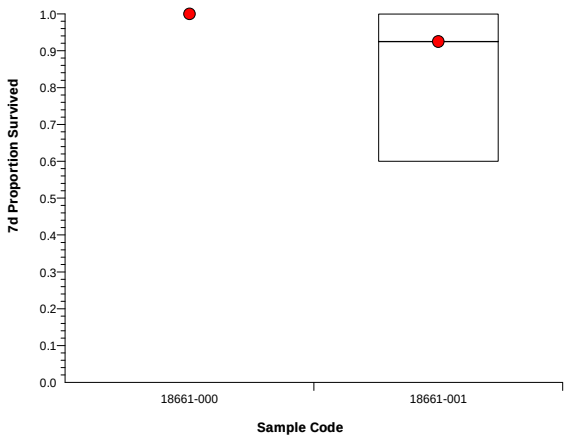
7d Proportion Survived Summary

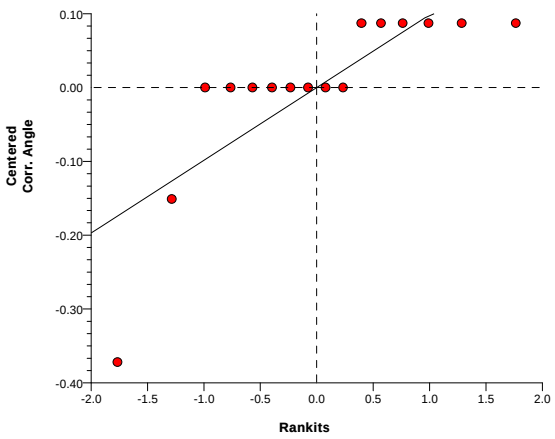
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	1	1	1	1	1	0	0	0.0%	0.0%
18661-001	8	0.925	0.8684	0.9816	0.6	1	0.02763	0.1488	16.09%	7.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	0.0%
18661-001	8	1.258	1.193	1.323	0.8861	1.345	0.03192	0.1719	13.66%	6.48%

Graphics





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

Analysis No:	13-0143-1956	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:32	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	02-9104-8057	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Jul-09 11:00	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C <> T	Not Run					15.25%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-001		18661-002	1.178	2.145	0.04781	0.2586	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0027563	0.0027563	1	1.387	0.2586	Non-Significant Effect
Error	0.0278297	0.0019878	14			
Total	0.0305859	0.0047441	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.954	8.885	0.1763	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9495		0.4819	Normal Distribution

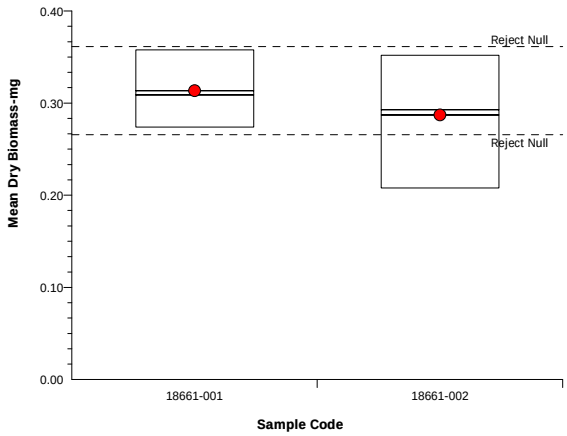
Mean Dry Biomass-mg Summary

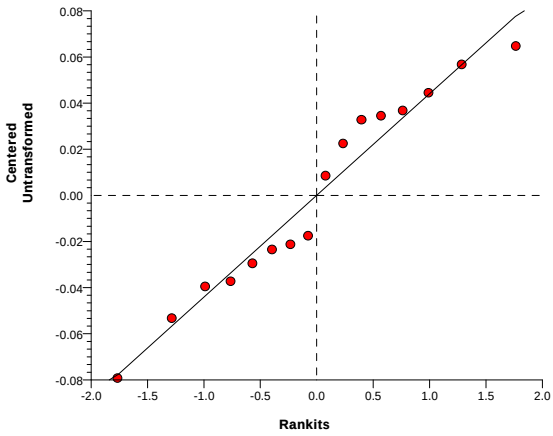
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	8	0.3135	0.3014	0.3256	0.274	0.358	0.005888	0.03171	10.11%	0.0%
18661-002	8	0.2873	0.2665	0.308	0.208	0.352	0.01012	0.0545	18.97%	8.37%

Mean Dry Biomass-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
18661-001	0.358	0.348	0.336	0.322	0.296	0.29	0.284	0.274
18661-002	0.352	0.344	0.324	0.32	0.266	0.25	0.234	0.208

Graphics





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

Analysis No:	08-8485-6364	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:32	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	02-9104-8057	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Jul-09 11:00	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					14.76%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-002		18661-004	-0.3945	1.761	0.04241	0.6504	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.000361	0.000361	1	0.1556	0.6991	Non-Significant Effect
Error	0.0324705	0.0023193	14			
Total	0.0328314	0.0026803	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.78	8.885	0.4645	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9508		0.5020	Normal Distribution

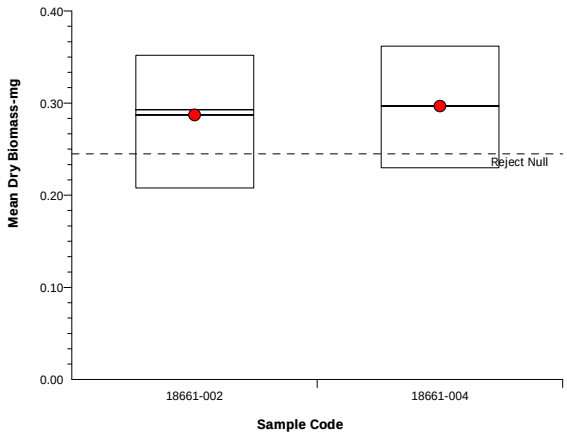
Mean Dry Biomass-mg Summary

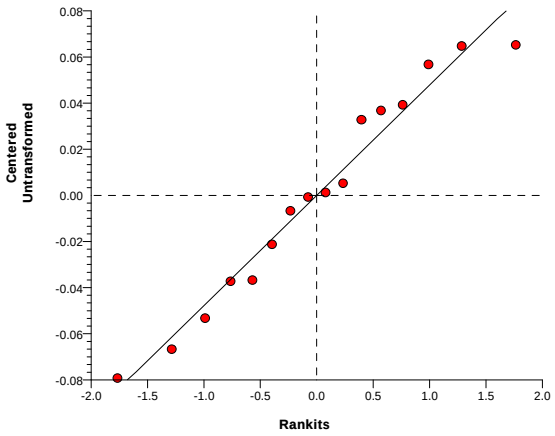
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-002	8	0.2873	0.2665	0.308	0.208	0.352	0.01012	0.0545	18.97%	0.0%
18661-004	8	0.2967	0.2812	0.3123	0.23	0.362	0.007585	0.04085	13.76%	-3.31%

Mean Dry Biomass-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
18661-002	0.352	0.344	0.324	0.32	0.266	0.25	0.234	0.208
18661-004	0.362	0.336	0.302	0.298	0.296	0.29	0.26	0.23

Graphics





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

Analysis No:	17-8667-9162	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:31	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	02-9104-8057	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Jul-09 11:00	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					42.04%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-002		18661-003	-2.162	1.761	0.1208	0.9758	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0879120	0.0879120	1	4.675	0.0484	Significant Effect
Error	0.2632858	0.0188061	14			
Total	0.3511979	0.1067182	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	11.66	8.885	0.0044	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.9008		0.0828	Normal Distribution

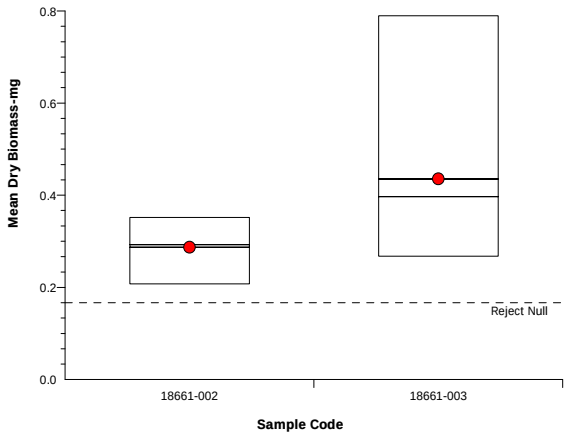
Mean Dry Biomass-mg Summary

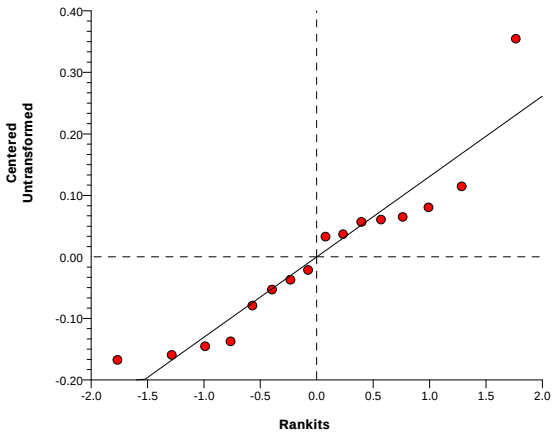
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-002	8	0.2873	0.2665	0.308	0.208	0.352	0.01012	0.0545	18.97%	0.0%
18661-003	8	0.4355	0.3647	0.5063	0.268	0.79	0.03456	0.1861	42.74%	-51.61%

Mean Dry Biomass-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
18661-002	0.352	0.344	0.324	0.32	0.266	0.25	0.234	0.208
18661-003	0.79	0.55	0.516	0.496	0.298	0.29	0.276	0.268

Graphics





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

Analysis No:	14-9836-6325	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:31	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	02-9104-8057	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Jul-09 11:00	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					10.27%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-001		18661-004	0.9162	1.761	0.0322	0.1875	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0011223	0.0011223	1	0.8394	0.3751	Non-Significant Effect
Error	0.0187177	0.001337	14			
Total	0.0198400	0.0024593	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.659	8.885	0.5201	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9876		0.9970	Normal Distribution

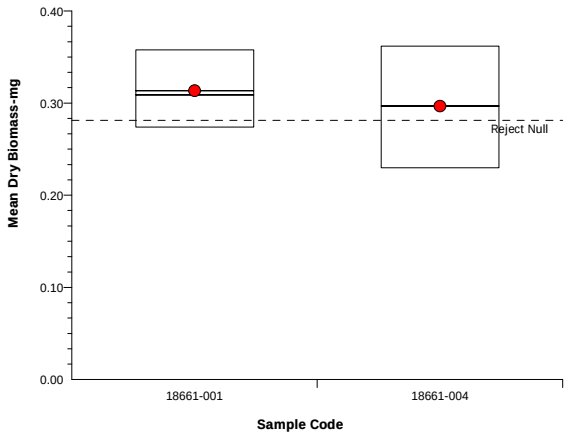
Mean Dry Biomass-mg Summary

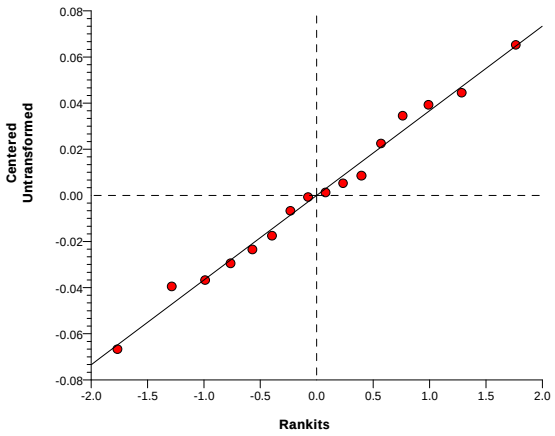
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	8	0.3135	0.3014	0.3256	0.274	0.358	0.005888	0.03171	10.11%	0.0%
18661-004	8	0.2967	0.2812	0.3123	0.23	0.362	0.007585	0.04085	13.76%	5.34%

Mean Dry Biomass-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
18661-001	0.358	0.348	0.336	0.322	0.296	0.29	0.284	0.274
18661-004	0.362	0.336	0.302	0.298	0.296	0.29	0.26	0.23

Graphics





000-148-164-3 CETIS™ v1.6.4F Analyst:_____ QA:_____

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

Analysis No:	05-4189-6011	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:31	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	02-9104-8057	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Jul-09 11:00	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					37.5%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-001		18661-003	-1.828	1.761	0.1176	0.9555	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0595358	0.0595358	1	3.34	0.0890	Non-Significant Effect
Error	0.2495331	0.0178238	14			
Total	0.3090689	0.0773596	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	34.45	8.885	0.0001	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.89		0.0557	Normal Distribution

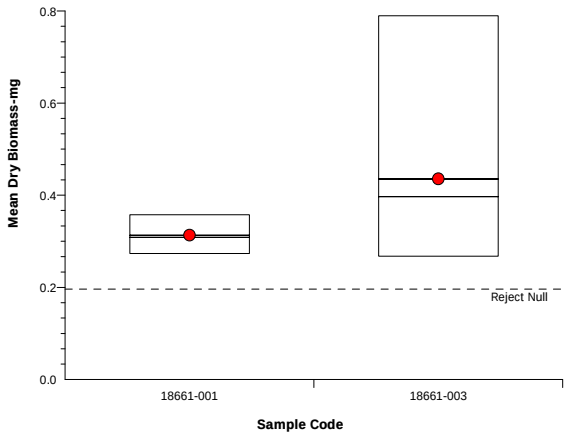
Mean Dry Biomass-mg Summary

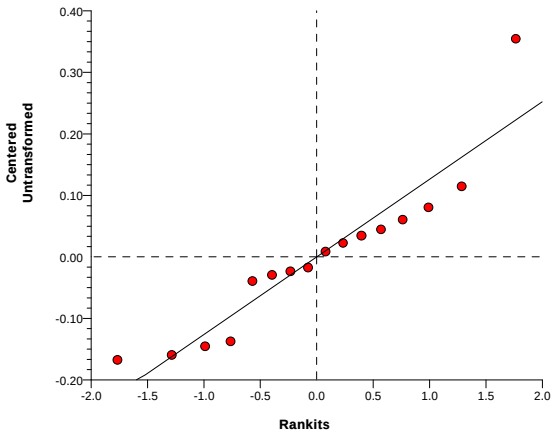
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	8	0.3135	0.3014	0.3256	0.274	0.358	0.005888	0.03171	10.11%	0.0%
18661-003	8	0.4355	0.3647	0.5063	0.268	0.79	0.03456	0.1861	42.74%	-38.92%

Mean Dry Biomass-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
18661-001	0.358	0.348	0.336	0.322	0.296	0.29	0.284	0.274
18661-003	0.79	0.55	0.516	0.496	0.298	0.29	0.276	0.268

Graphics





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

Analysis No:	04-1038-9084	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:31	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	02-9104-8057	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Jul-09 11:00	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					12.25%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-000		18661-004	0.0362	1.761	0.03645	0.4858	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2.245E-06	2.245E-06	1	0.00131	0.9716	Non-Significant Effect
Error	0.0239893	0.0017135	14			
Total	0.0239915	0.0017158	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.054	8.885	0.9465	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9099		0.1158	Normal Distribution

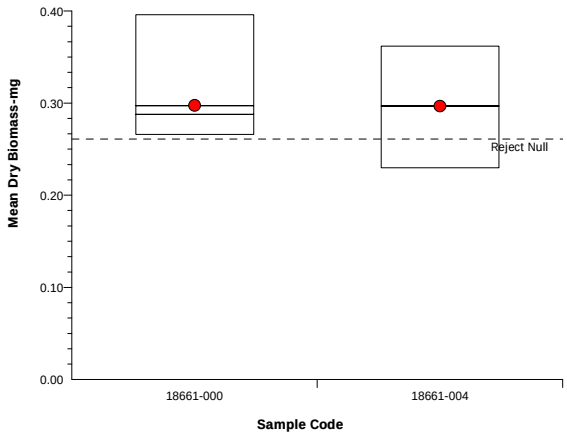
Mean Dry Biomass-mg Summary

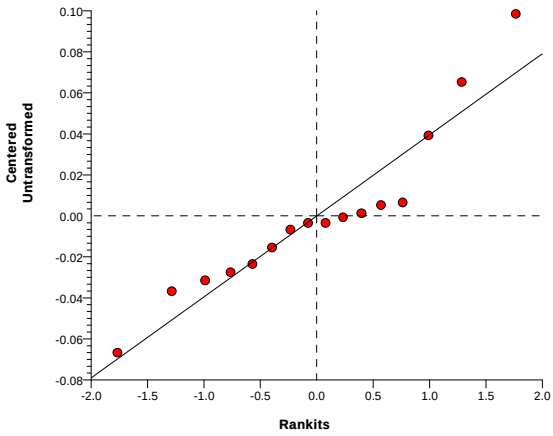
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	0.2975	0.2815	0.3135	0.266	0.396	0.007787	0.04194	14.1%	0.0%
18661-004	8	0.2967	0.2812	0.3123	0.23	0.362	0.007585	0.04085	13.76%	0.25%

Mean Dry Biomass-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
18661-000	0.396	0.304	0.294	0.294	0.282	0.274	0.27	0.266
18661-004	0.362	0.336	0.302	0.298	0.296	0.29	0.26	0.23

Graphics





000-148-164-3 CETIS™ v1.6.4F Analyst:_____ QA:_____

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

Analysis No:	06-3536-1163	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:31	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	02-9104-8057	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Jul-09 11:00	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					39.94%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-000		18661-003	-2.046	1.761	0.1188	0.9700	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.076177	0.076177	1	4.185	0.0600	Non-Significant Effect
Error	0.2548046	0.0182003	14			
Total	0.3309816	0.0943773	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	19.7	8.885	0.0008	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.8891		0.0540	Normal Distribution

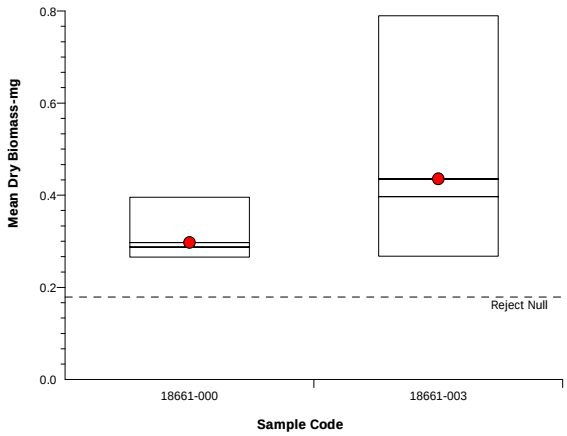
Mean Dry Biomass-mg Summary

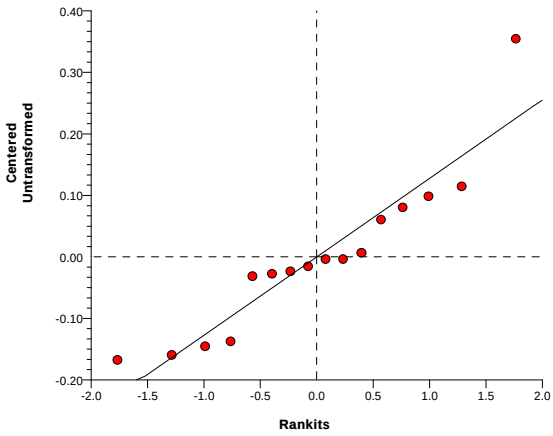
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	0.2975	0.2815	0.3135	0.266	0.396	0.007787	0.04194	14.1%	0.0%
18661-003	8	0.4355	0.3647	0.5063	0.268	0.79	0.03456	0.1861	42.74%	-46.39%

Mean Dry Biomass-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
18661-000	0.396	0.304	0.294	0.294	0.282	0.274	0.27	0.266
18661-003	0.79	0.55	0.516	0.496	0.298	0.29	0.276	0.268

Graphics





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

Analysis No:	00-2127-7063	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:30	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	02-9104-8057	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Jul-09 11:00	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					14.39%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-000		18661-002	0.4216	1.761	0.04282	0.3399	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0004202	0.0004202	1	0.1777	0.6798	Non-Significant Effect
Error	0.0331012	0.0023644	14			
Total	0.0335214	0.0027845	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.689	8.885	0.5058	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9642		0.7375	Normal Distribution

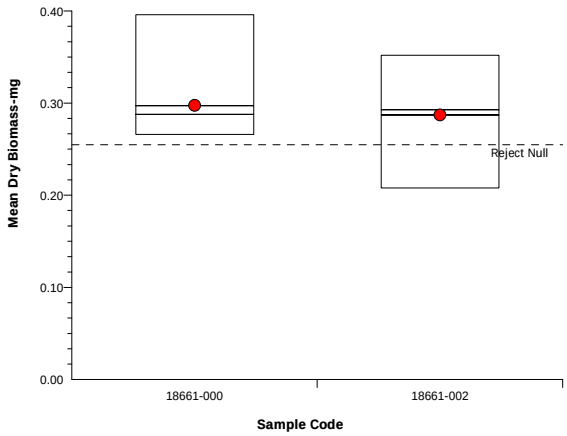
Mean Dry Biomass-mg Summary

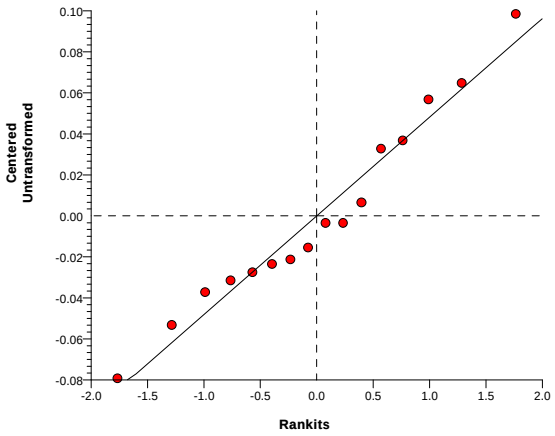
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	0.2975	0.2815	0.3135	0.266	0.396	0.007787	0.04194	14.1%	0.0%
18661-002	8	0.2873	0.2665	0.308	0.208	0.352	0.01012	0.0545	18.97%	3.44%

Mean Dry Biomass-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
18661-000	0.396	0.304	0.294	0.294	0.282	0.274	0.27	0.266
18661-002	0.352	0.344	0.324	0.32	0.266	0.25	0.234	0.208

Graphics





000-148-164-3 CETIS™ v1.6.4F Analyst:_____ QA:_____

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

Analysis No:	00-9511-9198	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:30	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	02-9104-8057	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Jul-09 11:00	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					11.0%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-000		18661-001	-0.8608	1.761	0.03274	0.7981	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0010241	0.0010241	1	0.741	0.4038	Non-Significant Effect
Error	0.0193485	0.0013820	14			
Total	0.0203726	0.0024062	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.749	8.885	0.4782	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8643		0.0223	Normal Distribution

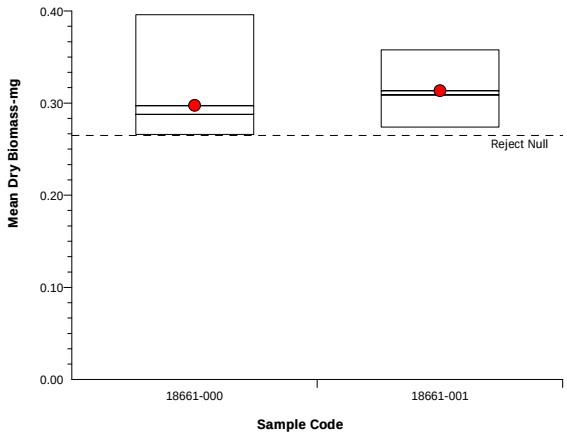
Mean Dry Biomass-mg Summary

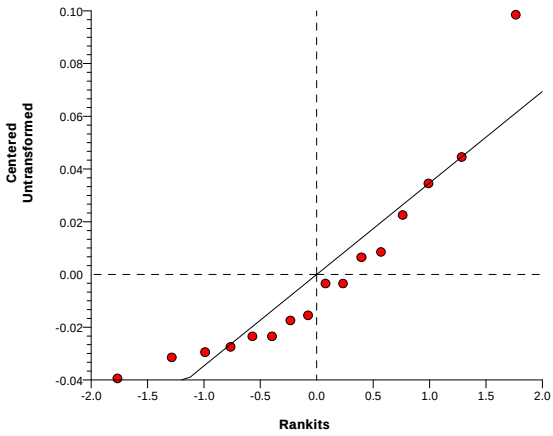
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	8	0.2975	0.2815	0.3135	0.266	0.396	0.007787	0.04194	14.1%	0.0%
18661-001	8	0.3135	0.3014	0.3256	0.274	0.358	0.005888	0.03171	10.11%	-5.38%

Mean Dry Biomass-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
18661-000	0.396	0.304	0.294	0.294	0.282	0.274	0.27	0.266
18661-001	0.358	0.348	0.336	0.322	0.296	0.29	0.284	0.274

Graphics





000-148-164-3 CETIS™ v1.6.4F Analyst:_____ QA:_____

Arbacia punctulata Chronic Fertilization Assay
Water Quality and Gamete Preparation Data

STUDY: 18661	CLIENT: Woods Hole Group	LOCATION: New Bedford	DATE: 6/25/09 INITIALS: LB

SALINITY ADJUSTMENT RECORD: 1000 mL -001 + 3 g SALT

SALINITY ADJUSTMENT RECORD: 1000 mL -002 + 4 g SALT

SALINITY ADJUSTMENT RECORD: 1000 mL -003 + 4 g SALT

SALINITY ADJUSTMENT RECORD: 1000 mL -004 + 6 g SALT

SALINITY ADJUSTED SAMPLE	D.O. (mg/L)	pH (SU)	SPEC COND (µmhos)	TEMP (°C)	SALINITY (ppt)
Lab Control	7.0	8.07	46700	21	30
-001	7.9	7.72	47100	21	31
-002	7.5	7.60	45380	21	29
-003	7.6	7.64	46680	21	30
-004	7.8	7.65	46360	20	30

METERS USED

DO meter # 3 DO probe # 82 pH meter # 1097 pH probe # 83 S/C meter # YSI300 S/C probe # YSI300

SALINITY meter # YSI300

DATE & INITIALS FOR GAMETE PREPARATION: 6/25/09 LB

SPERM DILUTIONS:

HEMACYTOMETER COUNT, E: 129 X 10^4 = SPM SOLUTION E = 1.29×10^6

SPERM CONCENTRATIONS:
SOLUTION E X 40 = SOLUTION A = 5.16×10^7 SPM
SOLUTION E X 20 = SOLUTION B = 2.58×10^7 SPM
SOLUTION E X 5 = SOLUTION C = 6.45×10^6 SPM

FINAL COUNTS:

FINAL SPERM COUNT: 5.16×10^7
FINAL EGG COUNT: 2000

TEST TIMES:

SPERM COLLECTED: 1330
EGGS COLLECTED: 1330
SPERM ADDED: 1350
EGGS ADDED: @ 1450
FIXATIVE ADDED: 1510

See ESI SOP #1412 for additional information

Arbacia punctulata Chronic Fertilization Assay

SAMPLE USE RECORD

STUDY: 18661	CLIENT: Woods Hole Group - New Bedford	
SPECIES: *A. punctulata*		
	Day: 0	
SAMPLE	Volume Used (mL)	ESI Cube ID
Lab Control	100	L
-001		001
-002		002
-003		003
-004		004
INITIALS:	LB	
TIME:	1245	
DATE:	6/25/09	

FERTILIZATION COUNTS

STUDY	CLIENT	LOCATION	DATE
	Woods Hole Group	New Bedford	INITIALS

	REPLICATE VIAL			
	1	2	3	4
SAMPLE	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL
Lab Control	101/103	99/104	100/104	98/102
-001	100/106	98/106	99/105	98/106
-002	95/105	90/102	88/103	85/105
-003	100/102	102/111	105/112	99/107
-004	91/102	90/106	91/108	85/103

CETIS Summary Report

Report Date: 07 Jul-09 10:15 (p 1 of 1)
Link/Link Code: 04-1568-8087/18661-Ap

Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Test Run No:	07-6280-7222	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jun-09 15:10	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample No	Sample Date	Receive Date	Sample Age	Client Name	Project
18661-000	17-4269-3412	25 Jun-09 12:00	25 Jun-09 12:05	110m (2 °C)	Woods Hole Group	Special Studies
18661-001	05-8419-9740	24 Jun-09 09:10	24 Jun-09 17:30	29h (2 °C)		
18661-002	04-8598-4764	24 Jun-09 10:20	24 Jun-09 17:30	28h (2 °C)		
18661-003	07-6176-0887	24 Jun-09 11:10	24 Jun-09 17:30	27h (2 °C)		
18661-004	18-5578-7927	24 Jun-09 11:40	24 Jun-09 17:30	26h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
18661-000	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-Lab Control		
18661-001	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-001		
18661-002	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-002		
18661-003	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-003		
18661-004	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-004		

Test Acceptability

Analysis No	Endpoint	Attribute	Test Stat	Acceptabilty Limits	Overlap	Decision
01-7251-8307	Proportion Fertilized	Control Resp	0.9637	0.7 - 1	Yes	Passes acceptability criteria
04-1974-7606	Proportion Fertilized	Control Resp	0.9637	0.7 - 1	Yes	Passes acceptability criteria
11-3921-8433	Proportion Fertilized	Control Resp	0.9637	0.7 - 1	Yes	Passes acceptability criteria
16-1682-6200	Proportion Fertilized	Control Resp	0.9637	0.7 - 1	Yes	Passes acceptability criteria
01-7251-8307	Proportion Fertilized	PMSD	0.03271	NL - 0.25	No	Passes acceptability criteria
03-9204-1513	Proportion Fertilized	PMSD	0.07326	NL - 0.25	No	Passes acceptability criteria
04-1974-7606	Proportion Fertilized	PMSD	0.02189	NL - 0.25	No	Passes acceptability criteria
05-6800-5588	Proportion Fertilized	PMSD	0.02566	NL - 0.25	No	Passes acceptability criteria
11-3921-8433	Proportion Fertilized	PMSD	0.02892	NL - 0.25	No	Passes acceptability criteria
13-2351-6541	Proportion Fertilized	PMSD	0.04599	NL - 0.25	No	Passes acceptability criteria
16-1682-6200	Proportion Fertilized	PMSD	0.0159	NL - 0.25	No	Passes acceptability criteria
17-1406-7684	Proportion Fertilized	PMSD	0.04075	NL - 0.25	No	Passes acceptability criteria
20-8976-5796	Proportion Fertilized	PMSD	0.05742	NL - 0.25	No	Passes acceptability criteria

Proportion Fertilized Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	4	0.9637	0.9592	0.9682	0.9519	0.9806	0.002203	0.01207	1.25%	0.0%
18661-001	4	0.9338	0.9298	0.9378	0.9245	0.9434	0.001961	0.01074	1.15%	3.1%
18661-002	4	0.8628	0.8474	0.8781	0.8095	0.9048	0.007493	0.04104	4.76%	10.48%
18661-003	4	0.9405	0.9302	0.9508	0.9189	0.9804	0.005054	0.02768	2.94%	2.41%
18661-004	4	0.8523	0.8416	0.8629	0.8252	0.8922	0.005191	0.02843	3.34%	11.56%

Proportion Fertilized Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
18661-000	0.9806	0.9519	0.9615	0.9608
18661-001	0.9434	0.9245	0.9429	0.9245
18661-002	0.9048	0.8824	0.8544	0.8095
18661-003	0.9804	0.9189	0.9375	0.9252
18661-004	0.8922	0.8491	0.8426	0.8252

000-148-164-2 CETIS™ v1.6.4F Analyst:_____ QA:_____

Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	13-2351-6541	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:11	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	07-6280-7222	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jun-09 15:10	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C <> T	Not Run					4.6%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-001		18661-002	3.719	2.447	0.0771	0.0099	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0274729	0.0274729	1	13.83	0.0099	Significant Effect
Error	0.0119149	0.0019858	6			
Total	0.0393878	0.0294587	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	7.469	47.47	0.1328	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9489		0.7002	Normal Distribution

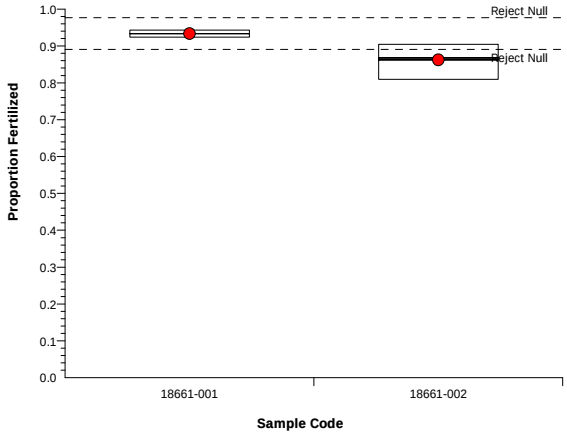
Proportion Fertilized Summary

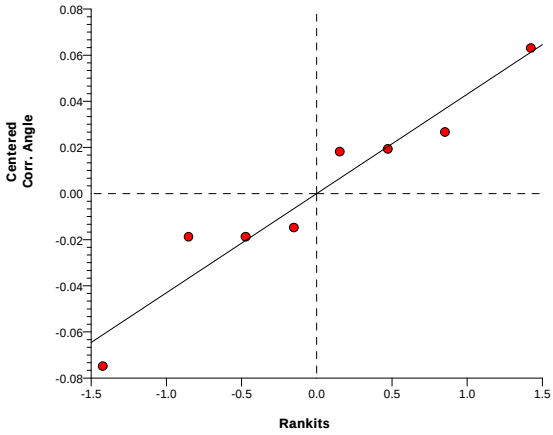
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	4	0.9338	0.9297	0.9379	0.9245	0.9434	0.001995	0.01074	1.15%	0.0%
18661-002	4	0.8628	0.8471	0.8784	0.8095	0.9048	0.007621	0.04104	4.76%	7.61%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	4	1.311	1.303	1.319	1.292	1.331	0.004022	0.02166	1.65%	0.0%
18661-002	4	1.194	1.172	1.217	1.119	1.257	0.01099	0.05918	4.96%	8.94%

Graphics





Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	20-8976-5796	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:08	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	07-6280-7222	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jun-09 15:10	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.74%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-002		18661-004	0.4561	1.943	0.07016	0.3322	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0005423	0.0005423	1	0.208	0.6644	Non-Significant Effect
Error	0.0156442	0.0026074	6			
Total	0.0161865	0.0031497	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.046	47.47	0.5715	Equal Variances
Distribution	Shapiro-Wilk Normality	0.948		0.6915	Normal Distribution

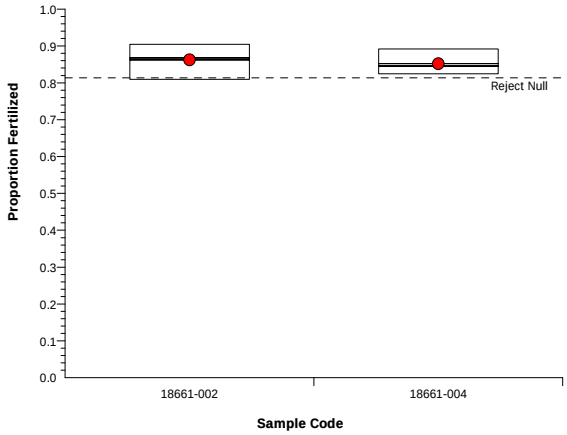
Proportion Fertilized Summary

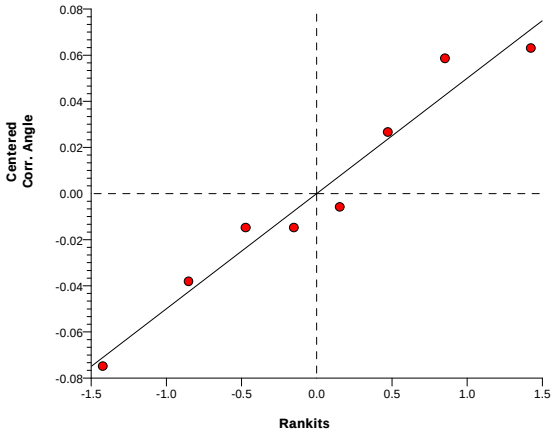
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-002	4	0.8628	0.8471	0.8784	0.8095	0.9048	0.007621	0.04104	4.76%	0.0%
18661-004	4	0.8523	0.8414	0.8631	0.8252	0.8922	0.00528	0.02843	3.34%	1.22%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-002	4	1.194	1.172	1.217	1.119	1.257	0.01099	0.05918	4.96%	0.0%
18661-004	4	1.178	1.162	1.193	1.14	1.236	0.007683	0.04138	3.51%	1.38%

Graphics





Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	03-9204-1513	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:08	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	07-6280-7222	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jun-09 15:10	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					7.33%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-002		18661-003	-3.044	1.943	0.08747	0.9887	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0375568	0.0375568	1	9.268	0.0227	Significant Effect
Error	0.0243129	0.0040522	6			
Total	0.0618697	0.0416089	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.314	47.47	0.8279	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9513		0.7240	Normal Distribution

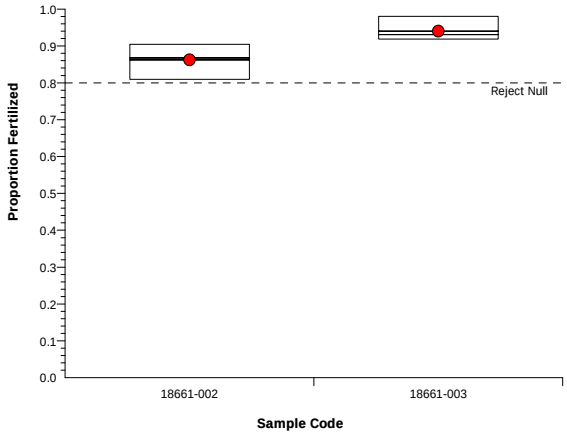
Proportion Fertilized Summary

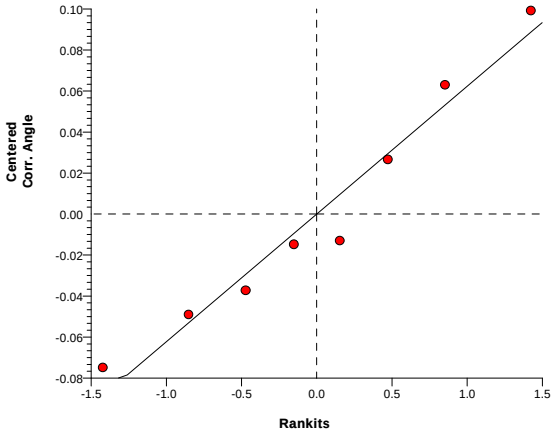
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-002	4	0.8628	0.8471	0.8784	0.8095	0.9048	0.007621	0.04104	4.76%	0.0%
18661-003	4	0.9405	0.93	0.951	0.9189	0.9804	0.005141	0.02768	2.94%	-9.01%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-002	4	1.194	1.172	1.217	1.119	1.257	0.01099	0.05918	4.96%	0.0%
18661-003	4	1.331	1.305	1.357	1.282	1.43	0.0126	0.06784	5.1%	-11.48%

Graphics





Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	05-6800-5588	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:07	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	07-6280-7222	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jun-09 15:10	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					2.57%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-001		18661-004	5.724	1.943	0.04537	0.0006	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0357349	0.0357349	1	32.77	0.0012	Significant Effect
Error	0.0065429	0.0010905	6			
Total	0.0422778	0.0368254	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.651	47.47	0.3158	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9183		0.4163	Normal Distribution

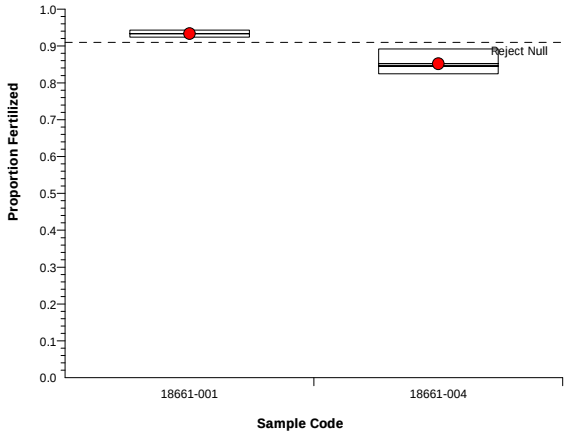
Proportion Fertilized Summary

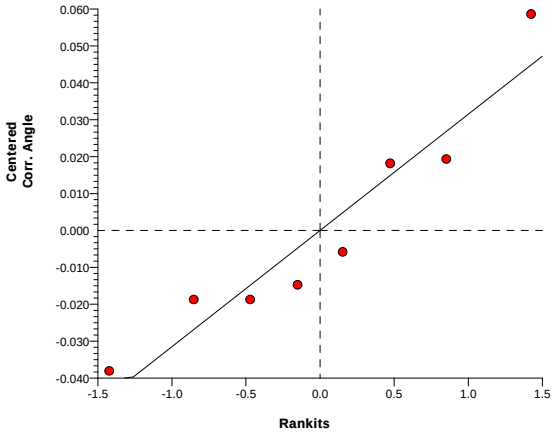
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	4	0.9338	0.9297	0.9379	0.9245	0.9434	0.001995	0.01074	1.15%	0.0%
18661-004	4	0.8523	0.8414	0.8631	0.8252	0.8922	0.00528	0.02843	3.34%	8.74%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	4	1.311	1.303	1.319	1.292	1.331	0.004022	0.02166	1.65%	0.0%
18661-004	4	1.178	1.162	1.193	1.14	1.236	0.007683	0.04138	3.51%	10.19%

Graphics





Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	17-1406-7684	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	07 Jul-09 10:07	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	07-6280-7222	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jun-09 15:10	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					4.08%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-001		18661-003	-0.557	1.943	0.06918	0.7012	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0007866	0.0007866	1	0.3103	0.5977	Non-Significant Effect
Error	0.0152116	0.0025353	6			
Total	0.0159982	0.0033219	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	9.813	47.47	0.0928	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8602		0.1206	Normal Distribution

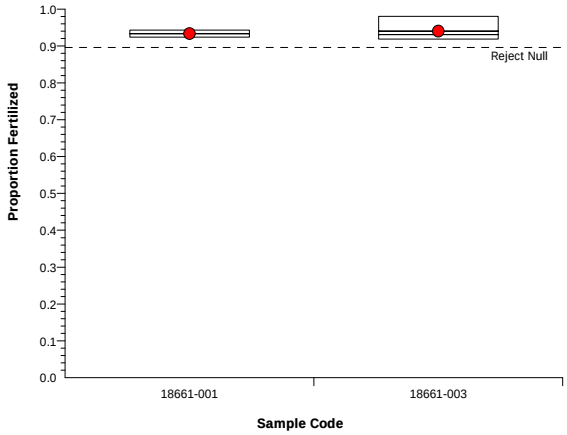
Proportion Fertilized Summary

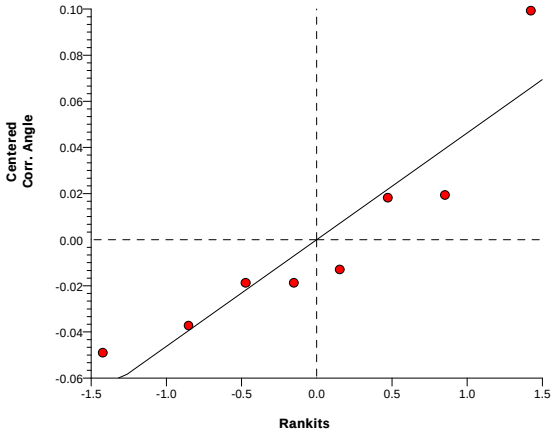
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	4	0.9338	0.9297	0.9379	0.9245	0.9434	0.001995	0.01074	1.15%	0.0%
18661-003	4	0.9405	0.93	0.951	0.9189	0.9804	0.005141	0.02768	2.94%	-0.72%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	4	1.311	1.303	1.319	1.292	1.331	0.004022	0.02166	1.65%	0.0%
18661-003	4	1.331	1.305	1.357	1.282	1.43	0.0126	0.06784	5.1%	-1.51%

Graphics





000-148-164-3 CETIS™ v1.6.4F Analyst:_____ QA:_____

Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	04-1974-7606	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	26 Jun-09 6:52	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	07-6280-7222	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jun-09 15:10	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					2.19%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-000		18661-004	7.543	1.943	0.05251	0.0001	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0830838	0.0830838	1	56.9	0.0003	Significant Effect
Error	0.0087614	0.0014602	6			
Total	0.0918452	0.0845440	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.417	47.47	0.7815	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8418		0.0786	Normal Distribution

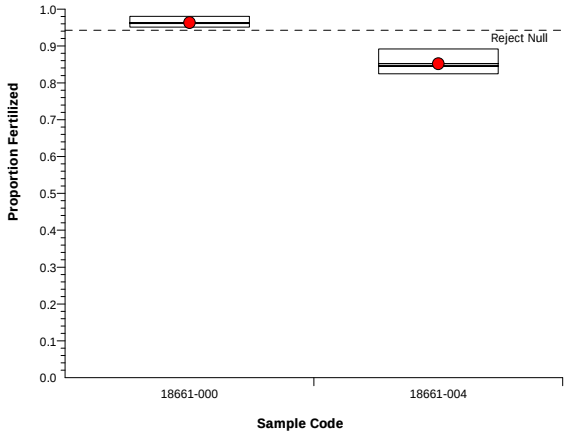
Proportion Fertilized Summary

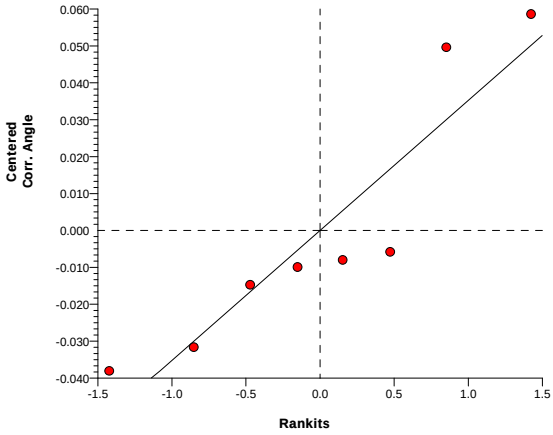
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	4	0.9637	0.9591	0.9683	0.9519	0.9806	0.002241	0.01207	1.25%	0.0%
18661-004	4	0.8523	0.8414	0.8631	0.8252	0.8922	0.00528	0.02843	3.34%	11.56%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	4	1.381	1.368	1.395	1.35	1.431	0.006455	0.03476	2.52%	0.0%
18661-004	4	1.178	1.162	1.193	1.14	1.236	0.007683	0.04138	3.51%	14.75%

Graphics





Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	01-7251-8307	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	26 Jun-09 6:52	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	07-6280-7222	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jun-09 15:10	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					3.27%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-000		18661-003	1.32	1.943	0.07406	0.1174	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0050637	0.0050637	1	1.743	0.2349	Non-Significant Effect
Error	0.0174301	0.0029050	6			
Total	0.0224938	0.0079687	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.808	47.47	0.3012	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8467		0.0883	Normal Distribution

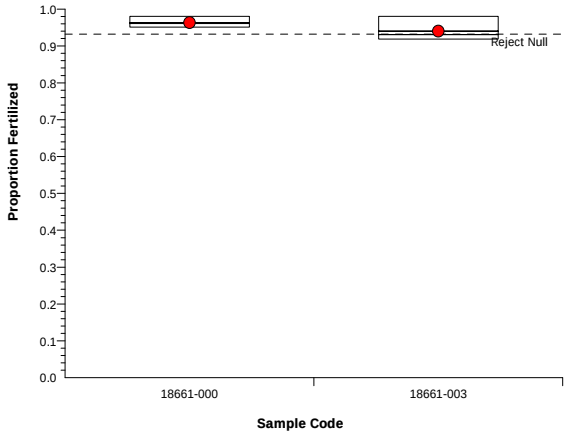
Proportion Fertilized Summary

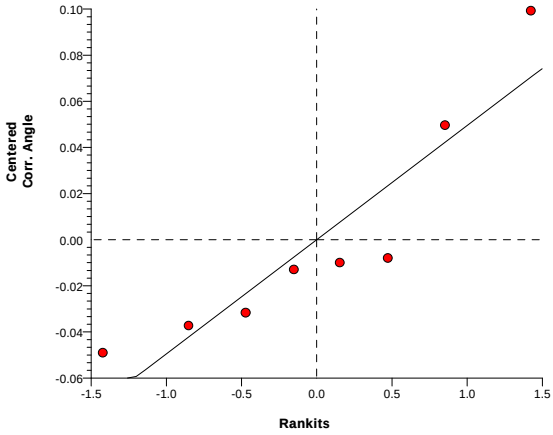
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	4	0.9637	0.9591	0.9683	0.9519	0.9806	0.002241	0.01207	1.25%	0.0%
18661-003	4	0.9405	0.93	0.951	0.9189	0.9804	0.005141	0.02768	2.94%	2.41%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	4	1.381	1.368	1.395	1.35	1.431	0.006455	0.03476	2.52%	0.0%
18661-003	4	1.331	1.305	1.357	1.282	1.43	0.0126	0.06784	5.1%	3.64%

Graphics





Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	11-3921-8433	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	26 Jun-09 6:52	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	07-6280-7222	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jun-09 15:10	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					2.89%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-000		18661-002	5.459	1.943	0.06669	0.0008	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0702013	0.0702013	1	29.8	0.0016	Significant Effect
Error	0.0141334	0.0023556	6			
Total	0.0843347	0.0725568	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.899	47.47	0.4054	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9605		0.8145	Normal Distribution

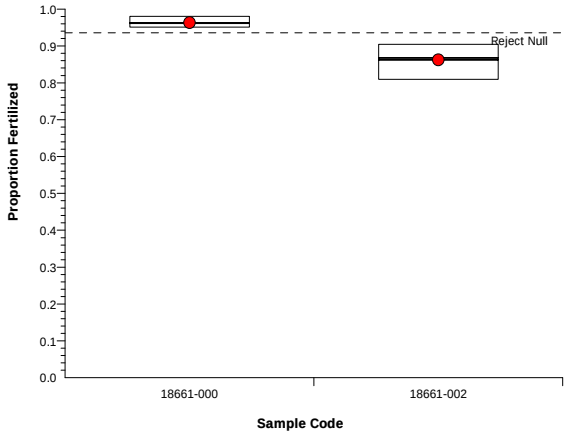
Proportion Fertilized Summary

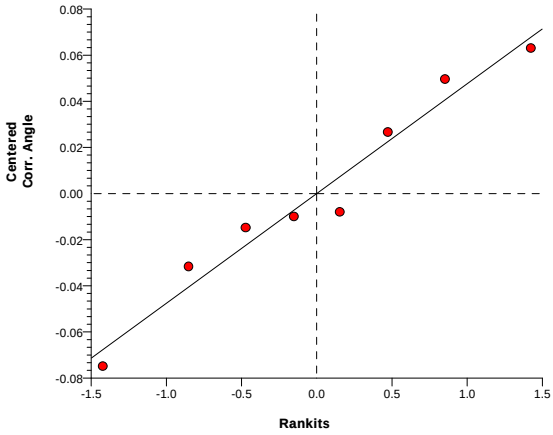
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	4	0.9637	0.9591	0.9683	0.9519	0.9806	0.002241	0.01207	1.25%	0.0%
18661-002	4	0.8628	0.8471	0.8784	0.8095	0.9048	0.007621	0.04104	4.76%	10.48%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	4	1.381	1.368	1.395	1.35	1.431	0.006455	0.03476	2.52%	0.0%
18661-002	4	1.194	1.172	1.217	1.119	1.257	0.01099	0.05918	4.96%	13.56%

Graphics





Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	16-1682-6200	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	26 Jun-09 6:52	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	07-6280-7222	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	25 Jun-09 13:50	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jun-09 15:10	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					1.59%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-000		18661-001	3.426	1.943	0.03979	0.0070	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0098418	0.0098418	1	11.73	0.0141	Significant Effect
Error	0.0050321	0.0008387	6			
Total	0.0148739	0.0106805	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.577	47.47	0.4574	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9131		0.3767	Normal Distribution

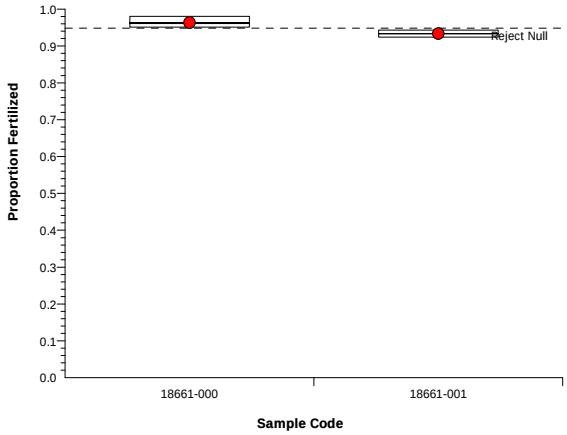
Proportion Fertilized Summary

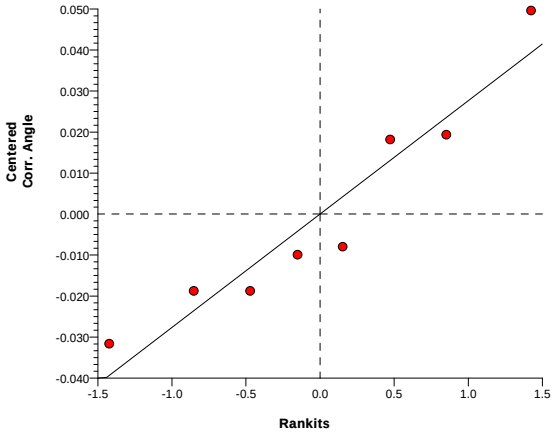
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	4	0.9637	0.9591	0.9683	0.9519	0.9806	0.002241	0.01207	1.25%	0.0%
18661-001	4	0.9338	0.9297	0.9379	0.9245	0.9434	0.001995	0.01074	1.15%	3.1%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	4	1.381	1.368	1.395	1.35	1.431	0.006455	0.03476	2.52%	0.0%
18661-001	4	1.311	1.303	1.319	1.292	1.331	0.004022	0.02166	1.65%	5.08%

Graphics





000-148-164-2 CETIS™ v1.6.4F Analyst:_____ QA:_____

Sample 001

Champia parvula
CYSTOCARP COUNTS
BENCHSHEET COPY

Work Order :	215383	Test Volume/Replicate (mL):	100
Sample Number :	**24846**	Recovery Volume/Replicate (mL):	200
Organism Batch # :	Cp09-06	Test Vessel :	240 mL polystyrene cup
Mortality Rate (prev. 7 days)(%) :	12.0	Test Solution Depth (cm) :	5.0
Start Date:	2009-06-26	Control/Dilution Water :	Natural seawater
Start Time:	17:40	Sample Filtered (60 µm) ? :	No
Placed in Recovery On:	2009-06-28	Recovery Water Filtered (60 µm) ?	Yes
Completion Date:	2009-07-05	Females per replicate:	5
Initiated by :	EJ	Trichogynes Present ?	Yes
Terminated by :	KEH	Males per replicate:	2
Minimum Light Intensity (lux) :	1110	Sori with Spermatia Present ?	Yes
Maximum Light Intensity (lux) :	1338	Test Aerated ?	No
		Recovery Aerated ?	Yes

Individual Plant Cystocarp Counts

Concentration (%)	Rep.	Plant 1	2	3	4	5	Replicate Mean	Treatment Mean	Standard Deviation	CV(%)
Control 1	A	39	58	47	41	35	44.0	47.1	4.01	8.512736
	B	63	45	51	46	53	51.6			
	C	47	30	48	54	49	45.6			
Control 2	A	45	71	38	44	41	47.8	44.7	2.73	6.112118
	B	53	34	39	40	51	43.4			
	C	32	46	52	36	48	42.8			
99	A	47	53	48	50	42	48.0	44.9	9.44	21.00337
	B	32	55	57	33	41	43.6			
	C	28	52	34	47	55	43.2			

NOTES :

Champia parvula
CYSTOCARP COUNTS
BENCHSHEET COPY

Sample 002

Work Order :	215383	Test Volume/Replicate (mL):	100
Sample Number :	**24847**	Recovery Volume/Replicate (mL):	200
Organism Batch # :	Cp09-06	Test Vessel :	240 mL polystyrene cup
Mortality Rate (prev. 7 days)(%) :	12.0	Test Solution Depth (cm) :	5.0
Start Date:	2009-06-26	Control/Dilution Water :	Natural seawater
Start Time:	17:50	Sample Filtered (60 µm) ? :	No
Placed in Recovery On:	2009-06-28	Recovery Water Filtered (60 µm) ?	Yes
Completion Date:	2009-07-06	Females per replicate:	5
Initiated by :	EJ	Trichogynes Present ?	Yes
Terminated by :	KEH	Males per replicate:	2
Minimum Light Intensity (lux) :	1110	Sori with Spermatia Present ?	Yes
Maximum Light Intensity (lux) :	1338	Test Aerated ?	No
		Recovery Aerated ?	Yes

Individual Plant Cystocarp Counts

Concentration (%)	Rep.	Plant 1	2	3	4	5	Replicate Mean	Treatment Mean	Standard Deviation	CV(%)
Control 1	A	39	58	47	41	35	44.0	47.1	4.01	8.512736
	B	63	45	51	46	53	51.6			
	C	47	30	48	54	49	45.6			
Control 2	A	45	71	38	44	41	47.8	44.7	2.73	6.112118
	B	53	34	39	40	51	43.4			
	C	32	46	52	36	48	42.8			
99	A	40	33	47	35	38	38.6	38.3	8.12	21.1855
	B	31	36	52	44	29	38.4			
	C	45	27	39	51	28	38.0			

NOTES :

Champia parvula
CYSTOCARP COUNTS
BENCHSHEET COPY

Sample 003

Work Order :	215383	Test Volume/Replicate (mL):	100
Sample Number :	**24848**	Recovery Volume/Replicate (mL):	200
Organism Batch # :	Cp09-06	Test Vessel :	240 mL polystyrene cup
Mortality Rate (prev. 7 days)(%) :	12.0	Test Solution Depth (cm) :	5.0
Start Date:	2009-06-26	Control/Dilution Water :	Natural seawater
Start Time:	17:45	Sample Filtered (60 µm) ? :	No
Placed in Recovery On:	2009-06-28	Recovery Water Filtered (60 µm) ?	Yes
Completion Date:	2009-07-05	Females per replicate:	5
Initiated by :	EJ	Trichogynes Present ?	Yes
Terminated by :	KEH	Males per replicate:	2
Minimum Light Intensity (lux) :	1110	Sori with Spermatia Present ?	Yes
Maximum Light Intensity (lux) :	1338	Test Aerated ?	No
		Recovery Aerated ?	Yes

Individual Plant Cystocarp Counts

Concentration (%)	Rep.	Plant 1	2	3	4	5	Replicate Mean	Treatment Mean	Standard Deviation	CV(%)
Control 1	A	39	58	47	41	35	44.0	47.1	4.01	8.512736
	B	63	45	51	46	53	51.6			
	C	47	30	48	54	49	45.6			
Control 2	A	45	71	38	44	41	47.8	44.7	2.73	6.112118
	B	53	34	39	40	51	43.4			
	C	32	46	52	36	48	42.8			
99	A	0	0	1	1	0	0.4	0.5	0.52	110.6567
	B	1	1	0	0	1	0.6			
	C	1	0	0	0	1	0.4			

NOTES :

Champia parvula
CYSTOCARP COUNTS
BENCHSHEET COPY

Sample 004

Work Order :	215383	Test Volume/Replicate (mL):	100
Sample Number :	**24849**	Recovery Volume/Replicate (mL):	200
Organism Batch # :	Cp09-06	Test Vessel :	240 mL polystyrene cup
Mortality Rate (prev. 7 days)(%) :	12.0	Test Solution Depth (cm) :	5.0
Start Date:	2009-06-26	Control/Dilution Water :	Natural seawater
Start Time:	17:30	Sample Filtered (60 µm) ? :	No
Placed in Recovery On:	2009-06-28	Recovery Water Filtered (60 µm) ?	Yes
Completion Date:	2009-07-05	Females per replicate:	5
Initiated by :	EJ	Trichogynes Present ?	Yes
Terminated by :	KEH	Males per replicate:	2
Minimum Light Intensity (lux) :	1110	Sori with Spermatia Present ?	Yes
Maximum Light Intensity (lux) :	1338	Test Aerated ?	No
		Recovery Aerated ?	Yes

Individual Plant Cystocarp Counts

Concentration (%)	Rep.	Plant 1	2	3	4	5	Replicate Mean	Treatment Mean	Standard Deviation	CV(%)
Control 1	A	39	58	47	41	35	44.0	47.1	4.01	8.512736
	B	63	45	51	46	53	51.6			
	C	47	30	48	54	49	45.6			
Control 2	A	45	71	38	44	41	47.8	44.7	2.73	6.112118
	B	53	34	39	40	51	43.4			
	C	32	46	52	36	48	42.8			
99	A	30	21	24	18	33	25.2	24.9	5.55	22.33193
	B	21	24	32	35	17	25.8			
	C	26	22	25	19	26	23.6			

NOTES :

Champia parvula
CYSTOCARP COUNTS
BENCHSHEET COPY

Sample 005

Work Order :	215383	Test Volume/Replicate (mL):	100
Sample Number :	**24850**	Recovery Volume/Replicate (mL):	200
Organism Batch # :	Cp09-06	Test Vessel :	240 mL polystyrene cup
Mortality Rate (prev. 7 days)(%) :	12.0	Test Solution Depth (cm) :	5.0
Start Date:	2009-06-26	Control/Dilution Water :	Natural seawater
Start Time:	17:35	Sample Filtered (60 µm) ? :	No
Placed in Recovery On:	2009-06-28	Recovery Water Filtered (60 µm) ?	Yes
Completion Date:	2009-07-05	Females per replicate:	5
Initiated by :	EJ	Trichogynes Present ?	Yes
Terminated by :	KEH	Males per replicate:	2
Minimum Light Intensity (lux) :	1110	Sori with Spermatia Present ?	Yes
Maximum Light Intensity (lux) :	1338	Test Aerated ?	No
		Recovery Aerated ?	Yes

Individual Plant Cystocarp Counts

Concentration (%)	Rep.	Plant 1	2	3	4	5	Replicate Mean	Treatment Mean	Standard Deviation	CV(%)
Control 1	A	39	58	47	41	35	44.0	47.1	4.01	8.512736
	B	63	45	51	46	53	51.6			
	C	47	30	48	54	49	45.6			
Control 2	A	45	71	38	44	41	47.8	44.7	2.73	6.112118
	B	53	34	39	40	51	43.4			
	C	32	46	52	36	48	42.8			
99	A	19	25	21	14	28	21.4	22.1	4.89	22.16555
	B	26	12	28	18	24	21.6			
	C	25	22	19	27	23	23.2			

NOTES :

CETIS Summary Report

Report Date: 17 Jul-09 13:14 (p 1 of 1)
Link/Link Code: 11-5878-6176

Champia parvula Red Macroalga Sexual Reproduction Test — **AquaTox**

Test Run No:	18-3381-7547	**Test Type:**	Champia	**Analyst:**	
Start Date:	26 Jun-09 12:00	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	05 Jul-09 12:00	**Species:**	Champia parvula	**Brine:**	Generic commercial salts
Duration:	9d 0h	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample No	Sample Date	Receive Date	Sample Age	Client Name	Project
18661-000	17-4269-3412	25 Jun-09 12:00	25 Jun-09 12:05	24h (2 °C)	Woods Hole Group	Special Studies
18661-001	04-5664-4176	24 Jun-09 11:40	24 Jun-09 17:30	48h (2 °C)		
18661-002	04-8598-4764	24 Jun-09 10:20	24 Jun-09 17:30	50h (2 °C)		
18661-003	18-0884-1223	24 Jun-09 11:10	24 Jun-09 17:30	49h (2 °C)		
18661-004	13-3350-5029	24 Jun-09 11:40	24 Jun-09 17:30	48h (2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
18661-000	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-Lab Control		
18661-001	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-001		
18661-002	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-002		
18661-003	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-003		
18661-004	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-004		

Mean Cystocarps Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	6	45.87	44.62	47.11	42.8	51.6	0.6091	3.336	7.27%	0.0%
18661-001	3	44.93	43.94	45.93	43.2	48	0.4863	2.663	5.93%	2.03%
18661-002	3	38.33	38.22	38.45	38	38.6	0.05578	0.3055	0.8%	16.42%
18661-003	3	0.4667	0.4235	0.5098	0.4	0.6	0.02108	0.1155	24.74%	98.98%
18661-004	3	24.87	24.44	25.29	23.6	25.8	0.2076	1.137	4.57%	45.78%

Mean Cystocarps Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
18661-000	44	51.6	45.6	47.8	43.4	42.8
18661-001	48	43.6	43.2			
18661-002	38.6	38.4	38			
18661-003	0.4	0.6	0.4			
18661-004	25.2	25.8	23.6			

000-148-164-3 CETIS™ v1.6.4F Analyst:_____ QA:_____

Champia parvula Red Macroalga Sexual Reproduction Test — **AquaTox**

Analysis No:	07-5029-6440	**Endpoint:**	Mean Cystocarps	**CETIS Version:**	CETISv1.6.4
Analyzed:	17 Jul-09 12:23	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	18-3381-7547	**Test Type:**	Champia	**Analyst:**	
Start Date:	26 Jun-09 12:00	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	05 Jul-09 12:00	**Species:**	Champia parvula	**Brine:**	Generic commercial salts
Duration:	9d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					3.78%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-002		18661-004	19.81	2.132	1.449	0.0000	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	272.0267	272.0267	1	392.3	0.0000	Significant Effect
Error	2.773333	0.6933333	4			
Total	274.8	272.72	5			

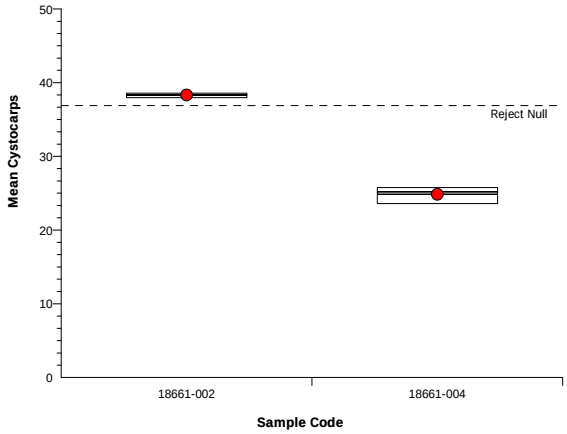
ANOVA Assumptions

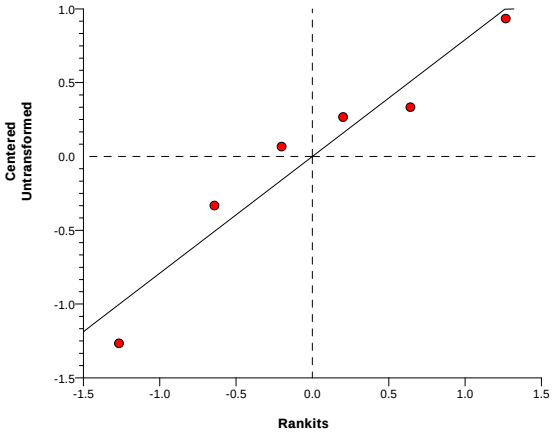
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	13.86	199	0.1346	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9455		0.7039	Normal Distribution

Mean Cystocarps Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-002	3	38.33	38.22	38.45	38	38.6	0.05672	0.3054	0.8%	0.0%
18661-004	3	24.87	24.43	25.3	23.6	25.8	0.2112	1.137	4.57%	35.13%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test — **AquaTox**

Analysis No:	14-2180-2323	**Endpoint:**	Mean Cystocarps	**CETIS Version:**	CETISv1.6.4
Analyzed:	17 Jul-09 12:23	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	18-3381-7547	**Test Type:**	Champia	**Analyst:**	
Start Date:	26 Jun-09 12:00	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	05 Jul-09 12:00	**Species:**	Champia parvula	**Brine:**	Generic commercial salts
Duration:	9d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					1.05%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-002		18661-003	200.8	2.132	0.402	0.0000	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2150.827	2150.827	1	40330	0.0000	Significant Effect
Error	0.2133333	0.0533333	4			
Total	2151.04	2150.88	5			

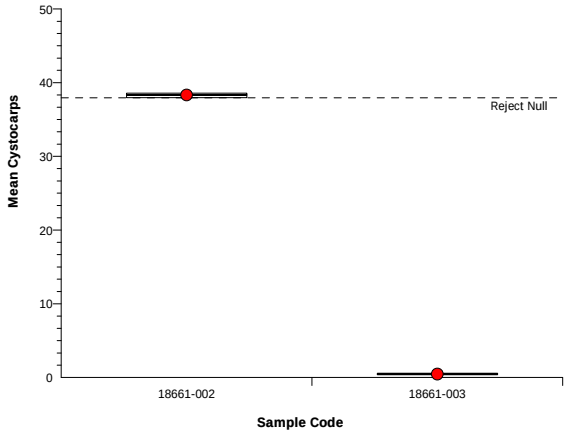
ANOVA Assumptions

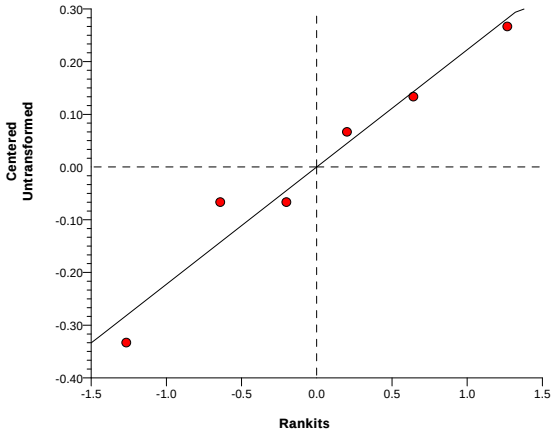
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	7	199	0.2500	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9649		0.8563	Normal Distribution

Mean Cystocarps Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-002	3	38.33	38.22	38.45	38	38.6	0.05672	0.3054	0.8%	0.0%
18661-003	3	0.4667	0.4227	0.5106	0.4	0.6	0.02144	0.1155	24.74%	98.78%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test — **AquaTox**

Analysis No:	21-2577-1477	**Endpoint:**	Mean Cystocarps	**CETIS Version:**	CETISv1.6.4
Analyzed:	17 Jul-09 12:23	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	18-3381-7547	**Test Type:**	Champia	**Analyst:**	
Start Date:	26 Jun-09 12:00	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	05 Jul-09 12:00	**Species:**	Champia parvula	**Brine:**	Generic commercial salts
Duration:	9d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					7.93%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-001		18661-004	12	2.132	3.564	0.0001	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	604.0067	604.0067	1	144	0.0003	Significant Effect
Error	16.77333	4.193333	4			
Total	620.78	608.2	5			

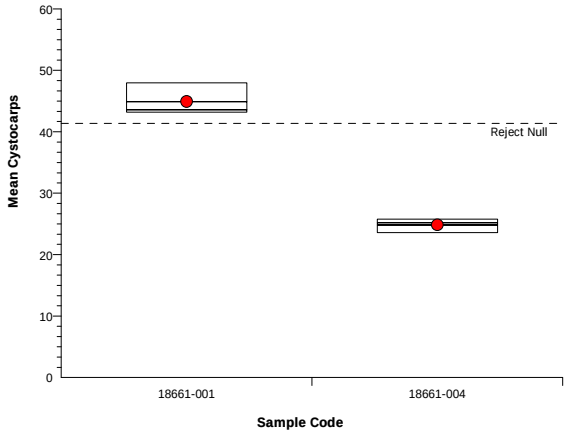
ANOVA Assumptions

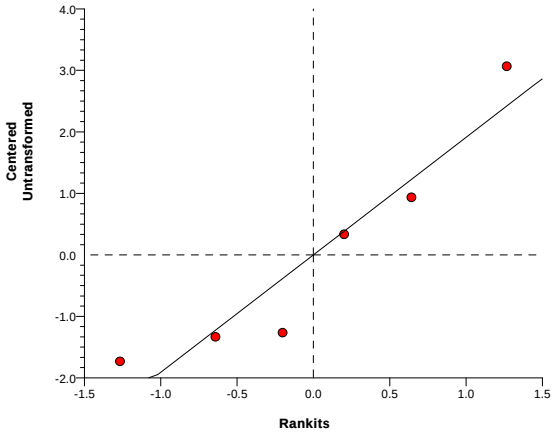
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	5.485	199	0.3084	Equal Variances
Distribution	Shapiro-Wilk Normality	0.89		0.3183	Normal Distribution

Mean Cystocarps Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	3	44.93	43.92	45.95	43.2	48	0.4946	2.663	5.93%	0.0%
18661-004	3	24.87	24.43	25.3	23.6	25.8	0.2112	1.137	4.57%	44.66%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test — **AquaTox**

Analysis No:	20-7291-2654	**Endpoint:**	Mean Cystocarps	**CETIS Version:**	CETISv1.6.4
Analyzed:	17 Jul-09 12:23	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	18-3381-7547	**Test Type:**	Champia	**Analyst:**	
Start Date:	26 Jun-09 12:00	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	05 Jul-09 12:00	**Species:**	Champia parvula	**Brine:**	Generic commercial salts
Duration:	9d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					7.3%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-001		18661-003	28.89	2.132	3.281	0.0000	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2965.927	2965.927	1	834.7	0.0000	Significant Effect
Error	14.21333	3.553333	4			
Total	2980.14	2969.48	5			

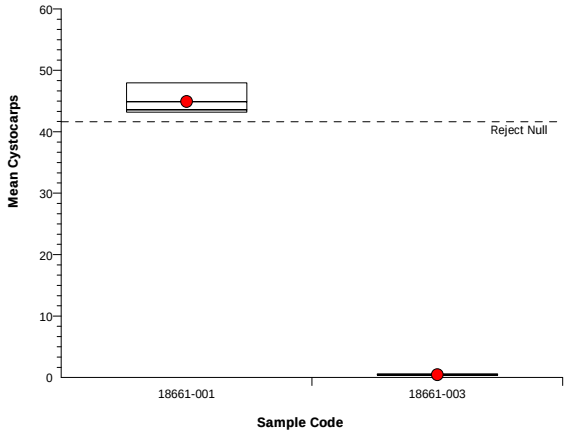
ANOVA Assumptions

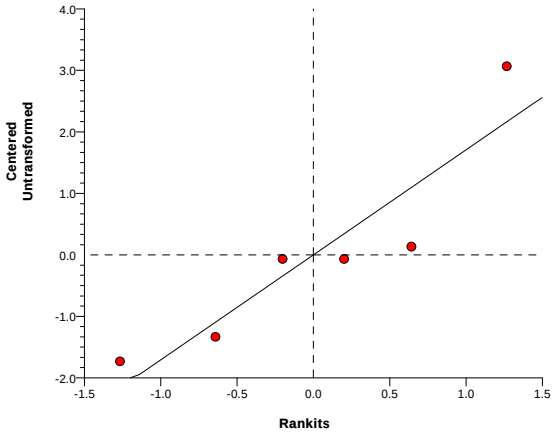
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	532	199	0.0038	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.8609		0.1922	Normal Distribution

Mean Cystocarps Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	3	44.93	43.92	45.95	43.2	48	0.4946	2.663	5.93%	0.0%
18661-003	3	0.4667	0.4227	0.5106	0.4	0.6	0.02144	0.1155	24.74%	98.96%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test — **AquaTox**

Analysis No:	07-3643-7563	**Endpoint:**	Mean Cystocarps	**CETIS Version:**	CETISv1.6.4
Analyzed:	17 Jul-09 12:23	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	18-3381-7547	**Test Type:**	Champia	**Analyst:**	
Start Date:	26 Jun-09 12:00	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	05 Jul-09 12:00	**Species:**	Champia parvula	**Brine:**	Generic commercial salts
Duration:	9d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					7.34%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-001		18661-002	4.264	2.132	3.3	0.0065	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	65.34	65.34	1	18.18	0.0130	Significant Effect
Error	14.37333	3.593333	4			
Total	79.71333	68.93333	5			

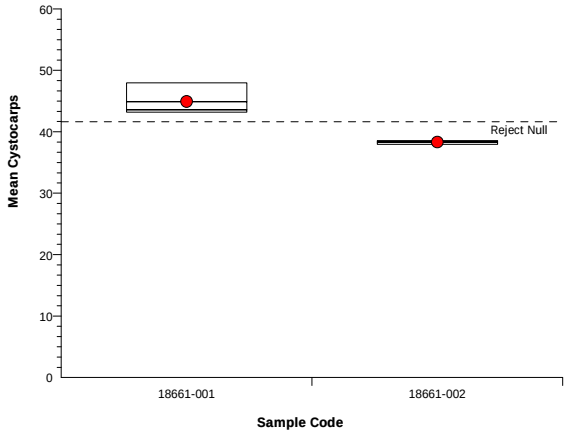
ANOVA Assumptions

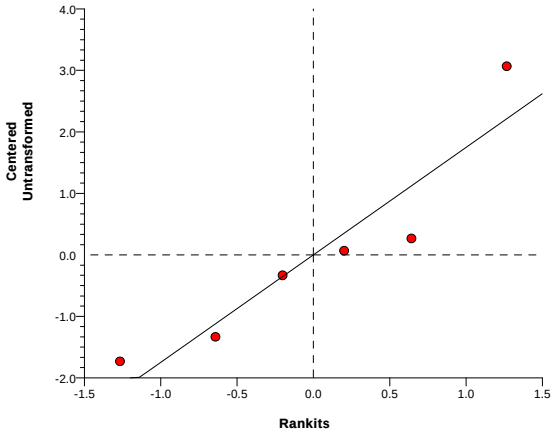
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	76	199	0.0260	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8871		0.3030	Normal Distribution

Mean Cystocarps Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-001	3	44.93	43.92	45.95	43.2	48	0.4946	2.663	5.93%	0.0%
18661-002	3	38.33	38.22	38.45	38	38.6	0.05672	0.3054	0.8%	14.69%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test — **AquaTox**

Analysis No:	05-7945-9409	**Endpoint:**	Mean Cystocarps	**CETIS Version:**	CETISv1.6.4
Analyzed:	17 Jul-09 12:23	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	18-3381-7547	**Test Type:**	Champia	**Analyst:**	
Start Date:	26 Jun-09 12:00	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	05 Jul-09 12:00	**Species:**	Champia parvula	**Brine:**	Generic commercial salts
Duration:	9d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					8.43%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-000		18661-004	10.3	1.895	3.864	0.0000	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	882	882	1	106	0.0000	Significant Effect
Error	58.24	8.32	7			
Total	940.24	890.32	8			

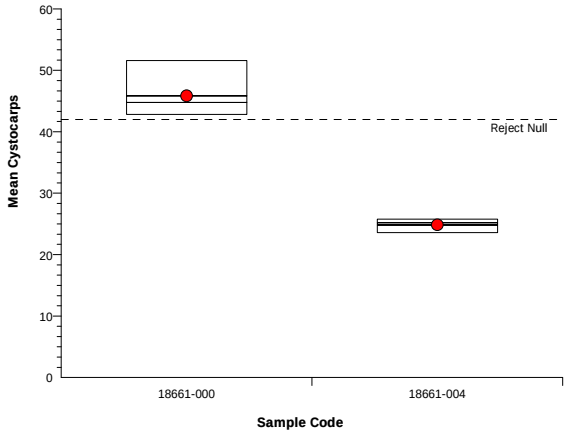
ANOVA Assumptions

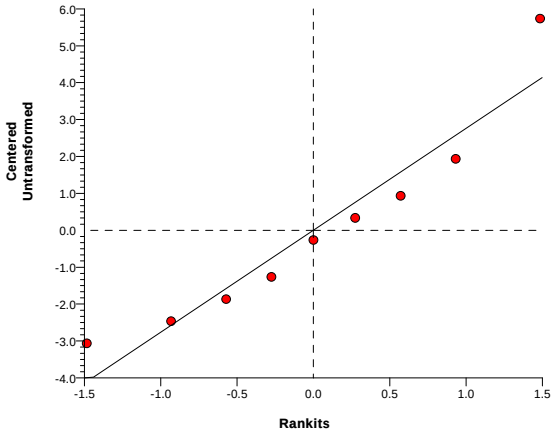
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	8.606	199.3	0.2147	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9186		0.3804	Normal Distribution

Mean Cystocarps Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	6	45.87	44.6	47.14	42.8	51.6	0.6195	3.336	7.27%	0.0%
18661-004	3	24.87	24.43	25.3	23.6	25.8	0.2112	1.137	4.57%	45.78%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test — **AquaTox**

Analysis No:	01-0710-4802	**Endpoint:**	Mean Cystocarps	**CETIS Version:**	CETISv1.6.4
Analyzed:	17 Jul-09 12:23	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	18-3381-7547	**Test Type:**	Champia	**Analyst:**	
Start Date:	26 Jun-09 12:00	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	05 Jul-09 12:00	**Species:**	Champia parvula	**Brine:**	Generic commercial salts
Duration:	9d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					5.99%

Unequal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-000		18661-003	33.29	2.015	2.748	0.0000	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	4122.32	4122.32	1	518.3	0.0000	Significant Effect
Error	55.68	7.954286	7			
Total	4178	4130.274	8			

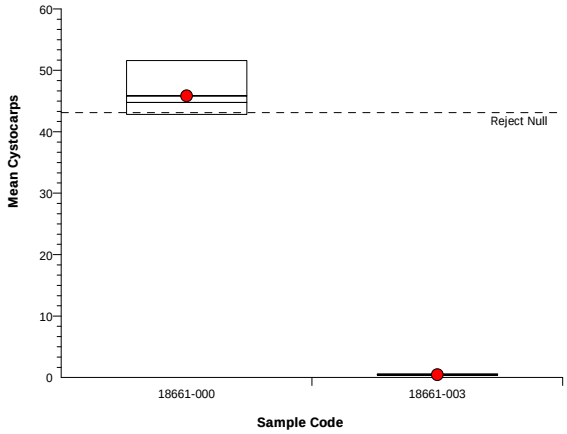
ANOVA Assumptions

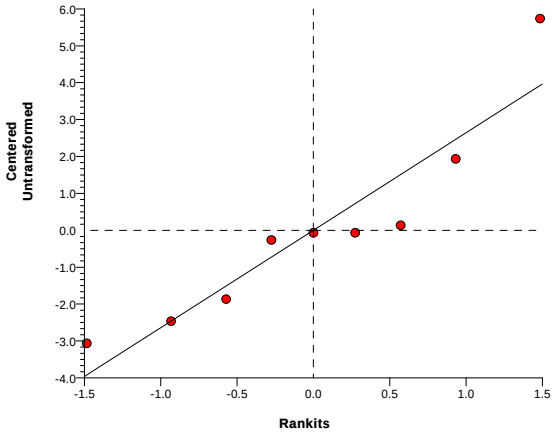
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	834.8	199.3	0.0024	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.8857		0.1800	Normal Distribution

Mean Cystocarps Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	6	45.87	44.6	47.14	42.8	51.6	0.6195	3.336	7.27%	0.0%
18661-003	3	0.4667	0.4227	0.5106	0.4	0.6	0.02144	0.1155	24.74%	98.98%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test — **AquaTox**

Analysis No:	16-1924-4370	**Endpoint:**	Mean Cystocarps	**CETIS Version:**	CETISv1.6.4
Analyzed:	17 Jul-09 12:23	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	18-3381-7547	**Test Type:**	Champia	**Analyst:**	
Start Date:	26 Jun-09 12:00	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	05 Jul-09 12:00	**Species:**	Champia parvula	**Brine:**	Generic commercial salts
Duration:	9d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					8.25%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-000		18661-002	3.772	1.895	3.784	0.0035	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	113.5022	113.5022	1	14.23	0.0070	Significant Effect
Error	55.84	7.977143	7			
Total	169.3422	121.4794	8			

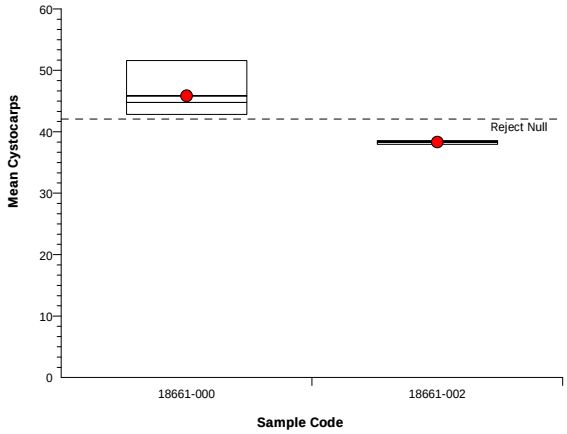
ANOVA Assumptions

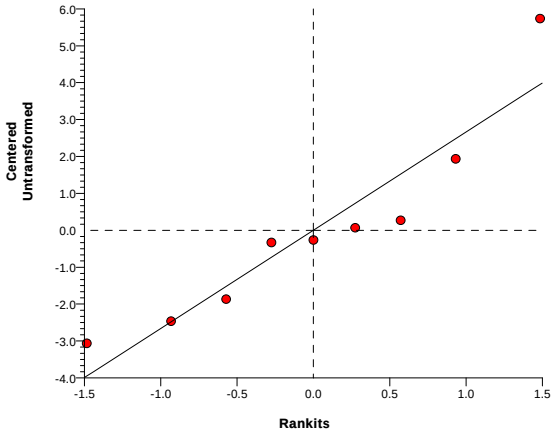
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	119.3	199.3	0.0167	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8946		0.2224	Normal Distribution

Mean Cystocarps Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	6	45.87	44.6	47.14	42.8	51.6	0.6195	3.336	7.27%	0.0%
18661-002	3	38.33	38.22	38.45	38	38.6	0.05672	0.3054	0.8%	16.42%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test — **AquaTox**

Analysis No:	06-1507-5390	**Endpoint:**	Mean Cystocarps	**CETIS Version:**	CETISv1.6.4
Analyzed:	17 Jul-09 12:23	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	18-3381-7547	**Test Type:**	Champia	**Analyst:**	
Start Date:	26 Jun-09 12:00	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	05 Jul-09 12:00	**Species:**	Champia parvula	**Brine:**	Generic commercial salts
Duration:	9d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					9.23%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18661-000		18661-001	0.4179	1.895	4.232	0.3443	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1.742222	1.742222	1	0.1746	0.6886	Non-Significant Effect
Error	69.84	9.977143	7			
Total	71.58222	11.71937	8			

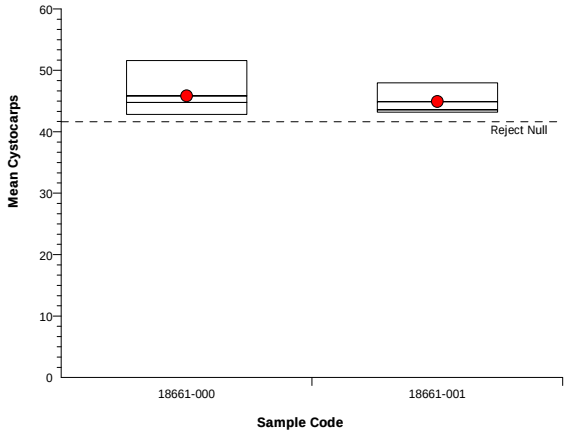
ANOVA Assumptions

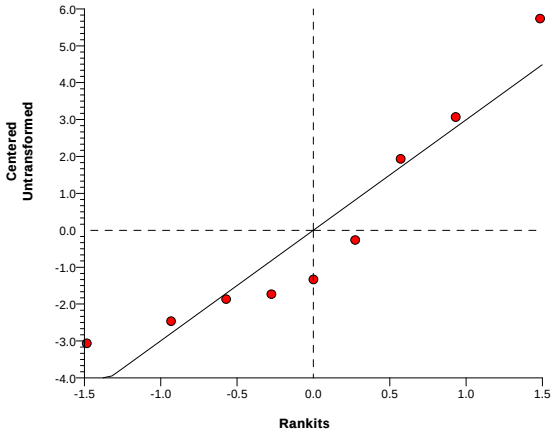
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.569	199.3	0.8663	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8862		0.1822	Normal Distribution

Mean Cystocarps Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18661-000	6	45.87	44.6	47.14	42.8	51.6	0.6195	3.336	7.27%	0.0%
18661-001	3	44.93	43.92	45.95	43.2	48	0.4946	2.663	5.93%	2.03%

Graphics





Report No: 18661 SDG:
Project: New Bedford Harbor Surface Water Monitoring

Matrix: Water
Sampled: 06/24/09

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	Method/Reference
Sample ID:	Composite 001						
Ammonia-N	18661-016	ND	0.1	mg/L as N	06/25/09	06/25/09	SM 4500-NH3 G
Sample ID:	Composite 002						
Ammonia-N	18661-017	ND	0.1	mg/L as N	06/25/09	06/25/09	SM 4500-NH3 G
Sample ID:	Composite 003						
Ammonia-N	18661-018	0.12	0.1	mg/L as N	06/25/09	06/25/09	SM 4500-NH3 G
Sample ID:	Composite 004						
Ammonia-N	18661-019	ND	0.1	mg/L as N	06/25/09	06/25/09	SM 4500-NH3 G
Sample ID:	Composite 005						
Ammonia-N	18661-020	0.14	0.1	mg/L as N	06/25/09	06/25/09	SM 4500-NH3 G

Notes:

ND = Not Detected

ESI

EnviroSystems, Inc. P.O. Box 778 Hampton, NH 03842-0778 603-926-3345 fax 603-926-3521 www.envirosystems.com

ESI

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO:	18661		
SDG No:			
Project:	New Bedford Harbor		
Delivered via:	Client		
Date and Time Received:	06/24/09 1730	Date and TIme Logged into Lab:	06/24/09 1800
Recieved By:	SJ	Logged into Lab by:	LCD LCD
Air bill / Way bill:	No	Air bill included in folder if received?	NA
Cooler on ice/packs:	Yes	Custody Seals present?	NA
Cooler Blank Temp (C) at arrival:	2	Custody Seals intact?	NA
Number of COC Pages:	1		
COC Serial Number(s):			
COC Complete:		Does the info on the COC match the samples?	Yes
Sampled Date:	Yes	Were samples received within holding time?	Yes
Field ID complete:	Yes	Were all samples properly labeled?	Yes
Sampled Time:	Yes	Were proper sample containers used?	Yes
Analysis request:	Yes	Were samples received intact? (none broken or leaking)	Yes
COC Signed and dated:	Yes	Were sample volumes sufficient for requested analysis?	Yes
Were all samples received?	Yes	Were VOC vials free of headspace?	NA
Client notification/authorization:	Not required		

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
WQ-TOX-001-062409	18661-001	W	Composite: Sample 001	2.5 G		
WQ-TOX-002-062409	18661-002	W	Composite: Sample 001	2.5 G		
WQ-TOX-003-062409	18661-003	W	Composite: Sample 002	2.5 G		
WQ-TOX-004-062409	18661-004	W	Composite: Sample 002	2.5 G		
WQ-TOX-005-062409	18661-005	W	Composite: Sample 003	2.5 G		
WQ-TOX-006-062409	18661-006	W	Composite: Sample 003	2.5 G		
WQ-TOX-007-062409	18661-007	W	Composite: Sample 004	2.5 G		
WQ-TOX-008-062409	18661-008	W	Composite: Sample 004	2.5 G		
WQ-TOX-009-062409	18661-009	W	Composite: Sample 005	2.5 G		
WQ-TOX-010-062409	18661-010	W	Composite: Sample 005	2.5 G		

Notes and qualifications:

Samples 001/002 were composited at 1745 to make sample 001.

Samples 003/004 were composited at 1750 to make sample 002.

Samples 005/006 were composited at 1755 to make sample 003.

Samples 007/008 were composited at 1800 to make sample 004.

Samples 009/010 were composited at 1805 to make sample 005.

EnviroSystems, Inc. One Lafayette Road P.O. Box 778 Hampton, NH 03842-0778 (603) 926-3345 fax (603) 926-3521 www.envirosystems.com

Aquatic Research Organisms

DATA SHEET

I. Organism History

Species Americamysis bahia

Source: Lab reared ✓ Hatchery reared ____ Field collected ____

Hatch date 6-18-09 Receipt date ____

Lot number 061809MS Strain ____

Brood origination FLORIDA

II. Water Quality

Temperature 25 °C Salinity ≈29 ppt D.O. — ppm

pH 7.8 su Hardness — ppm Alkalinity — ppm

III. Culture Conditions

Freshwater ____ Saltwater ✓ Other ____

Recirculating ✓ Flow through ____ Static ____

DIET: Flake food ✓ Phytoplankton ____ Trout chow ✓

Artemia ✓ Rotifers ____ YCT ____ Other Encap. Shrimp Diet

Prophylactic treatments: ____

Comments: ____

IV. Shipping Information

Client: ESI # of Organisms 300+

Carrier: ____ Date shipped 6-25-09

Biologist: Mark Dorenzo

PO BOX 1271 HAMPTON NH 03843-1271 (603) 926-1650 AROFISH@AOL.COM

ESI
EnviroSystems, Inc.
1 Lafayette Road
P.O. Box 778
Hampton, N.H. 03843
Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No: 18661

CHAIN OF CUSTODY DOCUMENTATION

Client: Woods Hole Group	Contact: 508-540-8080	Project Name: New Bedford Harbor WATER Quality	Page 1 of 1
Report to:	Address: 81 technology PARK	Project Number:	
Invoice to:	Address: FALMOUTH MA	Project Manager: DAVE WALSH	
Voice:	Fax:	email: KMCCARTNEY@whoi.com	P.O. No: Quote No:

Protocol: RCRA SDWA NPDES USCOE Other

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composit (G/C)	Container Size (ml.)	Container Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested\ Special Instructions:
-001	WQ-TOX-001-062409	6/24/09	0910	KGM	C	2.5GAL			W		toxicity analysis
-002	WQ-TOX-002-062409	"	0910	"		"			"		" "
(3) LCD -003	WQ-TOX-003-062409	"	1020	"		"			"		" "
-004	WQ-TOX-004-062409	"	1020	"		"			"		" "
(3) LCD -005	WQ-TOX-005-062409	"	1110	"		"			"		" "
-006	WQ-TOX-006-062409	"	1110	"		"			"		" "
(3) LCD -007	WQ-TOX-007-062409	"	1140	"		"			"		" "
-008	WQ-TOX-008-062409	"	1140	"		"			"		" "
(3) LCD -009	WQ-TOX-009-062409	"	1200	"		"			"		" "
-010	WQ-TOX-010-062409	"	1200	"		"			"		" "

Relinquished By: KAITLYN McCARTNEY	Date: 062409 Time: 1349	Received By: MARTIN Potter	Date: 6/24/09 Time: 1349
Relinquished By: MARTIN POTTER	Date: 062409 Time: 1730	Received at Lab By: AJ	Date: 6/24/09 Time: 1730

Comments:

COC Doc No: 3106

Sample Delivery Group No:	Page of

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

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

ESI Job No:

CHAIN OF CUSTODY DOCUMENTATION

Client: Envirosystems, Inc.	Contact: Kenneth Simon	Project Name: WHGR	Page 1 of 1
Report to: Ken Simon	Address:	Project Number: 18661	
Invoice to:	Address:	Project Manager: Shellie Jackman	
Voice: 1003-926-3345 x 209	Fax:	email: s.jackman@envirosystems.com	P.O. No: Quote No:

Protocol: RCRA SDWA NPDES USCOE Other

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composit (G/C)	Container Size (ml.)	Container Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested\ Special Instructions:
	Sample 001	06/24/09	1745		C	1L	P	N	W	N	C. parvula
	Sample 002	↓	1750		C	1L	P	↓	↓	N	"
	Sample 003	↓	1755		C	1L	P	↓	↓	N	"
	Sample 004	↓	1800		C	1L	P	↓	↓	N	"
	Sample 005	↓	1805		C	1L	P	↓	↓	N	"

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

Comments:

COC Doc No: 3088

Sample Delivery Group No: Page of

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

July 15, 2009 Sampling Event

NED ACOE Job Number: TO-0010

Task Order No.: ESI0002

Prepared for

Woods Hole Group, Inc.
81 Technology Park Drive
Falmouth, Massachusetts 02536

Prepared by

EnviroSystems, Incorporated
1 Lafayette Road
Hampton, New Hampshire 03843

July 2009
Reference Number: Woods Hole Group, Inc. 18726-09-07

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

July 15, 2009 Sampling Event
NED ACOE Job Number: TO-0010

1.0 INTRODUCTION

This report provides a summarization of data generated from acute and chronic exposure screening assays evaluating surface water samples collected from New Bedford Harbor in New Bedford, Massachusetts. 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 under the supervision of Woods Hole Group, Inc. personnel from the Falmouth, 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 the acute survival portion of the algal assays were conducted by ESI at its Hampton, New Hampshire facility. When necessary, the algal assays were also conducted by Aquatox Testing & Consulting, Inc. (Aquatox), Guelph, Ontario, Canada in order to provide data in the event that the assay conducted by ESI failed to meet the target endpoints.

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 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±2°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 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 were from cultures maintained by Aquatox Testing & Consulting Inc. 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 Woods Hole Group, Inc. staff on July 15, 2009 in New Bedford Harbor, as shown in Table 1. Samples were placed in polyethylene cubitainers for shipment to the laboratory. One 5.0 gallon cubitainer was 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 0.02 mg/L). Prior to use in the assays, the salinity of the samples was adjusted, as 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. When necessary, 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. A summary of compositing and "As Received" water quality data are summarized in Tables 2 and 3, respectively.

Laboratory control water used for the 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 (48 hour acute portion), collected from Hampton Harbor, 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. Control water used in the algal assays conducted by AquaTox (acute and chronic portions) was natural seawater collected from the West Coast of Canada. Salinity of the surface water samples was adjusted, as required, using commercial sea salts.

2.4 Bioassays

2.4.1 *Americamysis bahia* Modified Acute and Chronic Exposure Bioassays

Endpoints for the *A. bahia* bioassay were survival (acute and chronic) and growth. 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.

2.4.2 *Arbacia punctulata* Chronic Exposure Fertilization Assays

The endpoint for the *A. punctulata* bioassay was fertilization. Gametes were obtained by potassium chloride injection to induce spawning. Sperm were collected dry, diluted to achieve a concentration of approximately 5.0×10^7 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 target endpoints for the acute *C. parvula* bioassay were coloration and necrosis. Endpoints for the chronic *C. parvula* bioassay were survival and cystocarp development. 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. Data for the acute endpoints was generated by ESI while data for acute and chronic exposure endpoint was generated by AquaTox.

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 $\propto$ <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 5, provide relative health and response data while allowing for comparison with historic data sets.

2.7 Protocol Deviations and Unacceptable Assays

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

3.0 RESULTS SUMMARY

Table 4 provides summaries of survival, growth, development and reproduction endpoints and associated statistical analyses. Support data, including copies of laboratory bench sheets, are provided in Appendix A.

For this round of sample analysis there were no reference site samples. The laboratory control was used for statistical comparisons against composite sample -001, comprised of WQ-TOX-001-071509 and WQ-TOX-002-071509.

3.1 *Americamysis bahia* Acute and Chronic Exposure Bioassay

Minimum test acceptability criteria for the acute exposure bioassay require ≥90% survival in the control concentrations. Minimum test acceptability criteria for the chronic exposure bioassay require ≥80% survival and a minimum weight of 0.2 mg per individual in the control concentrations. Achievement of these results indicate that healthy test organisms were used. See Table 4 for test acceptability and data summary.

3.2 *Arbacia punctulata* Chronic Fertilization Bioassay

Protocol specifies a 70% to 90% fertilization rate for *Arbacia punculata* (EPA 2002). Achievement of these results indicate that healthy test organisms were used. See Table 4 for test acceptability and data summary.

3.3 *Champia parvula* Modified Acute and Chronic Exposure Bioassay

The modified acute exposure bioassay was considered to be acceptable if no notable branch necrosis was observed and appropriate coloration of test species was achieved in the laboratory control treatment. Minimum test acceptability criteria for the chronic exposure bioassay require ≥80% survival and an average of 10 cystocarps per plant in the control concentrations. Achievement of these results indicate that healthy test organisms were used. See Table 4 for test acceptability and data summary.

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. Sample Receipt Summary. New Bedford Harbor Surface Water Quality Monitoring July 15, 2009 Sampling Event. New Bedford Harbor Dredge Plume Monitoring Program.

Field ID	ESI Code	Matrix	Collection		Receipt	
			Date	Time	Date	Time
WQ-TOX-001-071509	18726-001	Water	07/15/09	1120	07/15/09	1318
WQ-TOX-002-071509	18726-002	Water	07/15/09	1120	07/15/09	1318

Table 2 Sample Compositing Summary. New Bedford Harbor Surface Water Quality Monitoring July 15, 2009 Sampling Event. New Bedford Harbor Dredge Plume Monitoring Program.

Composite Name	Components	ESI Code	Final Volume	Composite Date / Time
Composite 001	WQ-TOX-001, WQ-TOX-002	18726-003	5 gallons	

Table 3 Summary of "As Received" Sample Physical and Chemical Characteristics. New Bedford Harbor Surface Water Quality Monitoring July 15, 2009 Sampling Event. New Bedford Harbor Dredge Plume Monitoring Program.

Field ID	Composite Name	Ammonia (mg/L)	pH (SU)	Salinity (‰)	Total Residual Chlorine (mg/L)
WQTOX-001, WQTOX-002	Composite-001	<0.1	7.94	25	<0.02

Table 4. Endpoint Summary Table - New Bedford Harbor Surface Water Quality Monitoring July 15, 2009 Sampling Event. New Bedford Harbor Dredge Plume Monitoring Program.

Sample ID	Reps	Mean	Min	Max	CV	Significant Difference vs p Value	Lab		
Arbacia punctulata									
			Portion Fertilized						
Lab Control	4	98.8%	96.0%	100.0%	1.92%	-	-		
Composite-001		97.8%	97.1%	98.0%	0.47%	0.1127	NO		
Americamysis bahia									
			Day 2 Survival						
Lab Control		100.0%	100.0%	100.0%	0.00%	-	-		
Composite-001	8	95.0%	80.0%	100.0%	9.75%	0.2351	NO		
			Day 7 Survival						
Lab Control		90.0%	60.0%	100.0%	16.80%	-	-		
Composite-001	8	87.5%	80.0%	100.0%	11.83%	0.2869	NO		
			Day 7 Dry Weight Biomass - mg						
Lab Control	8	0.307	0.202	0.426	25.44%	-	-		
Composite-001		0.337	0.314	0.370	5.82%	0.8410	NO		
Champia parvula									
			Day 2 Survival						
Lab Control		100.0%	100.0%	100.0%	0.00%	-	-		
Composite-001	3	100.0%	100.0%	100.0%	0.00%	0.5000	NO		
			Day 7 Mean # Cystocarps						
Lab Control		29.33	29.0	29.6	1.04%		-		
Composite-001	3	9.53	8.8	10.0	6.74%	0.0000	YES		

Table 5 Reference Toxicant Summary. New Bedford Harbor Surface Water Quality Monitoring July 15, 2009 Sampling Event. New Bedford Harbor Dredge Plume Monitoring Program.

Date	Endpoint		Value	Historic Mean/ Central Tendency	Acceptable Range	Reference Toxicant
A. bahia						
06/17/09	Survival	LC-50	23.8	20.8	16.2 - 25.4	SDS (mg/L)
05/27/09	Survival	C-NOEC	15.0	10.0	5.0 - 15.0	SDS (mg/L)
05/27/09	Growth	C-NOEC	5.0	5.0	2.5 - 10.0	SDS (mg/L)
A. punctulata						
06/18/09	Fertilization	C-NOEC	<1	10.0	1.0 - 5.0	Copper (µg/L)
06/18/09	Fertilization	IC-25	1.0	19.9	0.0 - 66.1	Copper (µg/L)
C. parvula						
06/08/09	Reproduction	IC-25	0.1	0.11	0.065 - 0.178	SDS (mg/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 18726: Sample Date July 15, 2009	
A. bahia Bench Sheets & Statistical Analysis Report	13
A. punctulata Bench Sheets and Statistical Analysis Report	4
C. parvula Bench Sheets and Statistical Analysis Report	4
Analytical Chemistry Report	2
Chain of Custody Information and Sample Receipt Records	3
Total Appendix Pages	27

METHODS USED IN NPDES PERMIT BIOMONITORING TESTING

Parameter	Method
Acute Exposure Bioassays:	
Ceriodaphnia dubia, Daphnia pulex	EPA-821-R-02-012
Pimephales promelas	EPA-821-R-02-012
Americamysis bahia	EPA-821-R-02-012
Menidia beryllina, Cyprinodon variegatus	EPA-821-R-02-012
Chronic Exposure Bioassays:	
Ceriodaphnia dubia	EPA-821-R-02-013 1002.0
Pimephales promelas	EPA-821-R-02-013 1000.0
Cyprinodon variegatus	EPA-821-R-02-014 1004.0
Menidia beryllina	EPA-821-R-02-014 1006.0
Arbacia punctulata	EPA-821-R-02-014 1008.0
Champia parvula	EPA-821-R-02-014 1009.0
Trace Metals:	
Trace Metals	EPA 200.7/SW 6010 and EPA 200.8/SW 6020
Hardness	Standard Methods 20th Edition - Method 2340 B
Wet Chemistries:	
Alkalinity	EPA 310.2
Chlorine, Residual	Standard Methods 20th Edition - Method 4500CLD
Total Organic Carbon	Standard Methods 20th Edition - Method 5310C
Specific Conductance	Standard Methods 20th Edition - Method 2510B
Nitrogen - Ammonia	Standard Methods 20th Edition - Method 4500NH3G
pH	Standard Methods 20th Edition - Method 4500H+B
Solids, Total (TS)	Standard Methods 20th Edition - Method 2540 B
Solids, Total Suspended (TSS)	Standard Methods 20th Edition - Method 2540 D
Solids, Total Dissolved (TDS)	Standard Methods 20th Edition - Method 2540 C
Dissolved Oxygen	Standard Methods 20th Edition - Method 4500-O G

Americamysis bahia 7 DAY CHRONIC ASSAY
SURVIVAL & OLD WATER QUALITIES

STUDY: 18726	CLIENT: Woods Hole Group	LOCATION: NEW BEDFORD	LAB CONTROL: HAMPTON ESTUARY	ORGANISM BATCH/LOT#

		NUMBER OF SURVIVORS								OLD DISSOLVED OXYGEN (mg/L)						
SAMPLE	Rep	0	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Lab Control	A	5	5	5	5	5	5	5	5	6.4	6.7	7.0	6.3	6.8	5.8	6.2
	B	5	5	5	5	5	5	4	4	6.4	6.7	6.9	6.1	6.8	5.2	5.9
	C	5	5	5	5	5	5	5	5	6.4	6.7	6.9	6.0	6.9	5.3	5.9
	D	5	5	5	5	4	4	4	3	6.4	6.8	6.9	5.9	6.9	5.4	5.9
	E	5	5	5	5	5	5	5	5	6.4	6.9	7.0	5.9	6.8	5.5	6.0
	F	5	5	5	5	5	5	5	5	6.4	6.9	7.0	6.0	6.9	5.4	6.0
	G	5	5	5	5	5	5	5	5	6.4	6.9	7.1	6.0	6.9	5.5	5.9
	H	5	5	5	5	4	4	4	4	6.3	7.0	7.1	6.0	6.9	5.4	5.9
-001	A	5	5	5	5	5	5	5	4 5	6.1	7.0	7.2	5.9	6.9	5.4	6.1
	B	5	5	5	5	5	5	5	4 5	6.1	7.0	7.2	5.6	7.1	5.4	6.0
	C	5	5	5	5	5	4	4	4	6.2	7.0	7.2	5.5	7.1	5.2	5.9
	D	5	5	5	4	4	4	4	4	6.2	7.0	7.2	5.3	6.9	5.2	5.9
	E	5	5	5	5	5	5	5	4	6.2	7.0	7.3	5.2	7.0	5.3	5.8
	F	5	4	4	4	4	4	4	4	6.2	7.0	7.3	5.6	7.0	5.1	5.7
	G	5	5	4	4	4	4	4	4	6.2	7.0	7.2	5.0	7.0	5.3	5.6
	H	5	5	5	5	5	5	5	5	6.2	7.0	7.3	5.3	6.9	5.2	5.6
INC TEMP:		25	25	25	25	25	25	25	25							
DATE:		7/16/09	7/17	7/18	7/19	7/20	7/21	7/22	7/23							
TIME:		1615	1310	1205	1035	1510	1350	1045	1215							
INITIALS:		SJ	SJ	LB	SJ	JQ	JQ	DM	SJ							

Mysid Dry Weight Summary Sheet

Study	18726	
Client:	Woods Hole Group	
Date/Time/Init:	07/23/09 1050 NR	
Conc	Mysid and Foil (mg)	Tare Wt (mg)
Lab A	210.19	208.64
Lab B	208.64	207.44
Lab C	209.03	207.72
Lab D	211.62	210.61
Lab E	209.88	208.37
Lab F	209.4	207.34
Lab G	209.54	207.41
Lab H	210.96	209.44
001 A	209.49	207.82
001 B	210.4	208.73
001 C	208.47	206.62
001 D	210.04	208.43
001 E	209.69	208.09
001 F	209.78	208.08
001 G	212.03	210.46
001 H	210.16	208.36

CETIS Summary Report

Report Date: 06 Aug-09 15:21 (p 1 of 1)
Test Code: 13-4785-1739/18726 Ab

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

Batch ID:	01-9383-2500	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	16 Jul-09 16:15	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	23 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	7d	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project
18726-000	02-8543-4564	16 Jul-09 13:00	16 Jul-09 13:00	3h	Woods Hole Group	Ecological Risk Assessme
18726-001	10-9454-3457	15 Jul-09 11:20	15 Jul-09 13:18	29h (4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
18726-000	Surface Water	New Bedford Harbor Dredge Moni	Laboratory Water Control		
18726-001	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-001-071509		

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
17-8526-3359	7d Proportion Survived	Control Resp	0.9	0.8 - NL	Yes	Result Within Limits
12-3645-9490	Mean Dry Biomass-mg	Control Resp	0.3072	0.2 - NL	Yes	Result Within Limits
12-3645-9490	Mean Dry Biomass-mg	PMSD	0.1633	0.11 - 0.37	Yes	Result Within Limits

2d Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18726-000	8	1	1	1	1	1	0	0	0.0%	0.0%
18726-001	8	0.95	0.9154	0.9846	0.8	1	0.0169	0.09258	9.75%	5.0%

7d Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18726-000	8	0.9	0.8435	0.9565	0.6	1	0.0276	0.1512	16.8%	0.0%
18726-001	8	0.875	0.8363	0.9137	0.8	1	0.0189	0.1035	11.83%	2.78%

Mean Dry Biomass-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18726-000	8	0.3072	0.2781	0.3364	0.202	0.426	0.01427	0.07816	25.44%	0.0%
18726-001	8	0.3368	0.3294	0.3441	0.314	0.37	0.003577	0.01959	5.82%	-9.6%

Mean Dry Weight-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18726-000	8	0.3411	0.3191	0.363	0.262	0.426	0.01074	0.05881	17.24%	0.0%
18726-001	8	0.3888	0.3722	0.4055	0.334	0.4625	0.008137	0.04457	11.46%	-13.99%

2d Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
18726-000	1	1	1	1	1	1	1	1
18726-001	1	1	1	1	1	0.8	0.8	1

7d Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
18726-000	1	0.8	1	0.6	1	1	1	0.8
18726-001	1	1	0.8	0.8	0.8	0.8	0.8	1

Mean Dry Biomass-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
18726-000	0.31	0.24	0.262	0.202	0.302	0.412	0.426	0.304
18726-001	0.334	0.334	0.37	0.322	0.32	0.34	0.314	0.36

Mean Dry Weight-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
18726-000	0.31	0.3	0.262	0.3367	0.302	0.412	0.426	0.38
18726-001	0.334	0.334	0.4625	0.4025	0.4	0.425	0.3925	0.36

000-148-164-3 CETIS™ v1.7.0revW Analyst:_____ QA:_____

Aquatic Research Organisms

DATA SHEET

I. Organism History

Species AMERICAMYSIS bahia

Source: Lab reared ✓ Hatchery reared ____ Field collected ____

Hatch date 7-9-09 Receipt date ____

Lot number 070909MS Strain ____

Brood origination FLORIDA

II. Water Quality

Temperature 25 °C Salinity ≈30 ppt D.O. — ppm

pH 7.8 su Hardness — ppm Alkalinity — ppm

III. Culture Conditions

Freshwater ____ Saltwater ✓ Other ____

Recirculating ✓ Flow through ____ Static ____

DIET: Flake food ✓ Phytoplankton ____ Trout chow ✓

Artemia ✓ Rotifers ____ YCT ____ Other Encap. Shrimp Diet

Prophylactic treatments: ____

Comments: ____

IV. Shipping Information

Client: ESI # of Organisms 150+

Carrier: ____ Date shipped 7-16-09

Biologist: Mark Rosengard

PO BOX 1271 HAMPTON NH 03843-1271 (603) 926-1650 AROFISH@AOL.COM

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

Analysis ID:	10-7283-5093	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Jul-09 13:48	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project
18726-000	02-8543-4564	16 Jul-09 13:00	16 Jul-09 13:00	3h	Woods Hole Group	Ecological Risk Assessme
18726-001	10-9454-3457	15 Jul-09 11:20	15 Jul-09 13:18	29h (4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
18726-000	Surface Water	New Bedford Harbor Dredge Moni	Laboratory Water Control		
18726-001	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-001-071509		

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					13.47%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18726-000		18726-001	-1.83	1.761	0.04595	0.9557	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.009112407	0.009112407	1	3.347	0.0887	Non-Significant Effect
Error	0.03811406	0.002722433	14			
Total	0.04722646	0.01183484	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.741	8.885	0.4817	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9504		0.4953	Normal Distribution

Mean Dry Weight-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18726-000	8	0.3411	0.3187	0.3635	0.262	0.426	0.01092	0.05881	17.24%	0.0%
18726-001	8	0.3888	0.3719	0.4058	0.334	0.4625	0.008276	0.04457	11.46%	-13.99%

Mean Dry Weight-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
18726-000	0.426	0.412	0.38	0.3367	0.31	0.302	0.3	0.262
18726-001	0.4625	0.425	0.4025	0.4	0.3925	0.36	0.334	0.334

000-148-164-3 CETIS™ v1.7.0revW Analyst:_____ QA:_____

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

Analysis ID:	12-3645-9490	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Jul-09 13:48	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project
18726-000	02-8543-4564	16 Jul-09 13:00	16 Jul-09 13:00	3h	Woods Hole Group	Ecological Risk Assessme
18726-001	10-9454-3457	15 Jul-09 11:20	15 Jul-09 13:18	29h (4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
18726-000	Surface Water	New Bedford Harbor Dredge Moni	Laboratory Water Control		
18726-001	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-001-071509		

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					16.33%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18726-000		18726-001	-1.035	1.761	0.05018	0.8410	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.003481046	0.003481046	1	1.072	0.3180	Non-Significant Effect
Error	0.04545488	0.003246777	14			
Total	0.04893592	0.006727823	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	15.91	8.885	0.0017	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.9101		0.1168	Normal Distribution

Mean Dry Biomass-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18726-000	8	0.3072	0.2775	0.337	0.202	0.426	0.01451	0.07816	25.44%	0.0%
18726-001	8	0.3368	0.3293	0.3442	0.314	0.37	0.003639	0.01959	5.82%	-9.6%

Mean Dry Biomass-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
18726-000	0.426	0.412	0.31	0.304	0.302	0.262	0.24	0.202
18726-001	0.37	0.36	0.34	0.334	0.334	0.322	0.32	0.314

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

Analysis ID:	17-8526-3359	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Jul-09 13:47	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project
18726-000	02-8543-4564	16 Jul-09 13:00	16 Jul-09 13:00	3h	Woods Hole Group	Ecological Risk Assessme
18726-001	10-9454-3457	15 Jul-09 11:20	15 Jul-09 13:18	29h (4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
18726-000	Surface Water	New Bedford Harbor Dredge Moni	Laboratory Water Control		
18726-001	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-001-071509		

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run					12.21%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18726-000		18726-001	62.5		2	0.2869	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.004070338	0.004070338	1	0.1774	0.6800	Non-Significant Effect
Error	0.3212241	0.02294458	14			
Total	0.3252944	0.02701491	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.021	8.885	0.3737	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8163		0.0045	Non-normal Distribution

7d Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18726-000	8	0.9	0.8425	0.9575	0.6	1	0.02807	0.1512	16.8%	0.0%
18726-001	8	0.875	0.8356	0.9144	0.8	1	0.01922	0.1035	11.83%	2.78%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18726-000	8	1.228	1.162	1.295	0.8861	1.345	0.03254	0.1752	14.26%	0.0%
18726-001	8	1.196	1.15	1.243	1.107	1.345	0.02289	0.1232	10.3%	2.6%

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

Analysis ID:	17-8526-3359	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Jul-09 13:47	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

7d Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
18726-000	1	1	1	1	1	0.8	0.8	0.6
18726-001	1	1	1	0.8	0.8	0.8	0.8	0.8

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

Analysis ID:	11-8353-5506	**Endpoint:**	2d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	21 Jul-09 16:30	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project
18726-000	02-8543-4564	16 Jul-09 13:00	16 Jul-09 13:00	3h	Woods Hole Group	Ecological Risk Assessme
18726-001	10-9454-3457	15 Jul-09 11:20	15 Jul-09 13:18	29h (4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
18726-000	Surface Water	New Bedford Harbor Dredge Moni	Laboratory Water Control		
18726-001	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-001-071509		

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	10000 Trial					8.41%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18726-000		18726-001	60		1	0.2351	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.01417698	0.01417698	1	2.333	0.1489	Non-Significant Effect
Error	0.08506185	0.006075846	14			
Total	0.09923882	0.02025282	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Variance	2.333	8.862	0.1489	Equal Variances
Distribution	Shapiro-Wilk Normality	0.677		<0.0001	Non-normal Distribution

2d Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18726-000	8	1	1	1	1	1	0	0	0.0%	0.0%
18726-001	8	0.95	0.9148	0.9852	0.8	1	0.01719	0.09258	9.75%	5.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18726-000	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	0.0%
18726-001	8	1.286	1.244	1.328	1.107	1.345	0.02047	0.1102	8.57%	4.43%

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

Analysis ID:	11-8353-5506	**Endpoint:**	2d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	21 Jul-09 16:30	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

2d Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
18726-000	1	1	1	1	1	1	1	1
18726-001	1	1	1	1	1	1	0.8	0.8

Americamysis bahia 7 DAY CHRONIC ASSAY
NEW WATER QUALITIES

STUDY:	CLIENT:	LOCATION:	LAB CONTROL:
18726	Woods Hole Group	NEW BEDFORD	HAMPTON ESTUARY

		NEW DISSOLVED OXYGEN (mg/L)							NEW SALINITY (ppt)						
CONC	REP	0	1	2	3	4	5	6	0	1	2	3	4	5	6
LAB	A	7.1	6.9	7.1	7.3	7.1	7.0	7.0	25	25	24	24	24	25	25
-001	A	8.0	6.6	6.5	6.1	6.6	7.0	7.3	25	25	25	25	25	25	24
		NEW pH (SU)							NEW TEMPERATURE (°C)						
CONC	REP	0	1	2	3	4	5	6	0	1	2	3	4	5	6
LAB	A	7.94	7.89	7.92	7.92	7.87	7.90	7.87	25	25	24	25	24	24	24
-001	A	7.59	7.68	7.58	7.61	7.53	7.60	7.50	25	25	24	25	24	24	24
INC TEMP:		25	25	25	25	25	25	25							
DATE:		7/16/09	7/17	7/18	7/19	7/20	7/21	7/22							
TIME:		1320	1330	1220	1045	1535	1410	1110							
INIT:		SJ	SJ	LB	SJ	JQ	JQ	DM							

WATER QUALITY METERS USED NEW WATER QUALITIES								
	0	1	2	3	4	5	6	7
Water Quality Station #		1	2	2	1	1	1	
Initials		SJ	LB	SJ	JQ	JQ	DM	
Date	7/16/09	7/17	7/18	7/19	7/20	7/21	7/22	

Americamysis bahia 7 DAY CHRONIC ASSAY
OLD WATER QUALITIES

STUDY: 18724	CLIENT: Woods Hole Group	LOCATION: NEW BEDFORD	LAB CONTROL: HAMPTON ESTUARY

OLD SALINITY (ppt)									OLD pH (SU)						
Conc	Rep	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Control	A	25	25	24	24	25	25	26	7.85	7.94	7.85	7.83	7.72	7.77	7.65
-001	A	26	26	25	25	25	25	25	7.82	7.80	7.78	7.74	7.61	7.63	7.68

OLD TEMPERATURE (°C)								
Conc	Rep	1	2	3	4	5	6	7
Control	A	25	24	24	24	24	24	25
-001	A	25	24	24	24	24	24	25
INC TEMP:		25	25	25	25	25	25	25
DATE:		7/17/09	7/18	7/19	7/20	7/21	7/22	7/23
TIME:		1300	1140	1030	1500	1340	1045	1205
INITIALS:		SJ	LB	SJ	JQ	JQ	DM	SJ

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.

WATER QUALITY METERS USED OLD WATER QUALITIES								
	0	1	2	3	4	5	6	7
Water Quality Station #		1	2	2	1	2	1	1
Initials		SJ	LB	SJ	JQ	JQ	DM	SJ
Date	7/16/09	7/17	7/18	7/19	7/20	7/21	7/22	7/23/09

Americamysis bahia 7 DAY CHRONIC ASSAY
SAMPLE USE RECORD

STUDY: 18726	CLIENT: Woods Hole Group - New Bedford
SPECIES: *A. bahia*	TEST: chronic renewal

Sample	Day: 0		Day: 1		Day: 2	
	Volume Used (mL)	ESI Cube ID	Volume Used (mL)	ESI Cube ID	Volume Used (mL)	ESI Cube ID
Lab Control	1600	n/a	1200	n/a	1200	n/a
-001	↓	002	↓	003	↓	003

Day	Date	Time	Init
0	7/16/09	1300	SJ
1	7/17	1320	SJ
2	7/18	1210	LG
3	7/19	1040	SJ
4	7/20	1535	JQ
5	7/21	1405	JQ
6	7·22	1100	DM

Sample	Day: 3		Day: 4		Day: 5	
	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	1200	n/a
-001	↓	003	↓	003	↓	003

Sample	Day: 6	
	Volume Used (mL)	ESI Cube ID
Lab Control	1200	n/a
-001	↓	003

Arbacia punctulata Chronic Fertilization Assay
Water Quality and Gamete Preparation Data

STUDY: 18726	CLIENT: Woods Hole Group	LOCATION: New Bedford	DATE: 7/16/09 INITIALS: LB

SALINITY ADJUSTMENT RECORD: 500 mL -001 + 6 g SALT

SALINITY ADJUSTMENT RECORD: _____ mL -002 + _____ g SALT (EB)

SALINITY ADJUSTED SAMPLE	D.O. (mg/L)	pH (SU)	SPEC COND (µmhos)	TEMP (°C)	SALINITY (ppt)
Lab Control	6.8	8.10	46200	21	(EB) ~~29~~ 30
-001	6.6	7.82	47350	21	31
(3) ~~-002~~					

METERS USED

DO meter # 23 DO probe # 20 pH meter # 470 pH probe # 85 S/C meter # YSI 30D S/C probe # YSI 30D

SALINITY meter # YSI 30D

DATE & INITIALS FOR GAMETE PREPARATION: 7/16/09 LB

SPERM DILUTIONS:

HEMACYTOMETER COUNT, E: 127 X 10^4 = SPM SOLUTION E = 1.27×10^6

SPERM CONCENTRATIONS:
SOLUTION E X 40 = SOLUTION A = 5.08×10^7 SPM
SOLUTION E X 20 = SOLUTION B = 2.54×10^7 SPM
SOLUTION E X 5 = SOLUTION C = 6.35×10^6 SPM

FINAL COUNTS:

FINAL SPERM COUNT: 5.08×10^7
FINAL EGG COUNT: 2200

TEST TIMES:

(EB)

SPERM COLLECTED:	~~1445~~	1345
EGGS COLLECTED:	~~1445~~	1345
SPERM ADDED:	~~1510~~	1410
EGGS ADDED:	~~1630~~	1510
FIXATIVE ADDED:	~~1630~~	1530

See ESI SOP #1412 for additional information

CETIS Summary Report

Report Date: 17 Jul-09 11:32 (p 1 of 1)
Link/Link Code: 06-8335-2907

Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Test Run No:	10-4921-6632	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	16 Jul-09 14:10	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-09 15:30	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample No	Sample Date	Receive Date	Sample Age	Client Name	Project
18726-000	02-8543-4564	16 Jul-09 13:00	16 Jul-09 13:00	70m	Woods Hole Group	Ecological Risk Assessme
18726-003	13-5938-2267	15 Jul-09 11:20	15 Jul-09 16:00	27h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
18726-000	Surface Water	New Bedford Harbor Dredge Moni	Laboratory Water Control		
18726-003	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-001-071509		

Test Acceptability

Analysis No	Endpoint	Attribute	Test Stat	Acceptabilty Limits	Overlap	Decision
19-7755-8074	Proportion Fertilized	Control Resp	0.9876	0.7 - 1	Yes	Passes acceptability criteria
19-7755-8074	Proportion Fertilized	PMSD	0.01665	NL - 0.25	No	Passes acceptability criteria

Proportion Fertilized Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18726-000	4	0.9876	0.9806	0.9947	0.96	1	0.003461	0.01896	1.92%	0.0%
18726-003	4	0.9778	0.9761	0.9795	0.9709	0.9804	0.0008458	0.004633	0.47%	0.99%

Proportion Fertilized Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
18726-000	0.9906	1	1	0.96
18726-003	0.98	0.9804	0.9709	0.98

000-148-164-3 CETIS™ v1.6.4F Analyst:_____ QA:_____

CETIS Analytical Report

Report Date:	17 Jul-09 11:33 (p 1 of 1)
Link/Link Code:	06-8335-2907

Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	19-7755-8074	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	17 Jul-09 11:31	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	10-4921-6632	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	16 Jul-09 14:10	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-09 15:30	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					1.67%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18726-000		18726-003	1.351	1.943	0.07086	0.1127	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0048563	0.0048563	1	1.826	0.2253	Non-Significant Effect
Error	0.015956	0.0026593	6			
Total	0.0208123	0.0075156	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	22.47	47.47	0.0295	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8356		0.0679	Normal Distribution

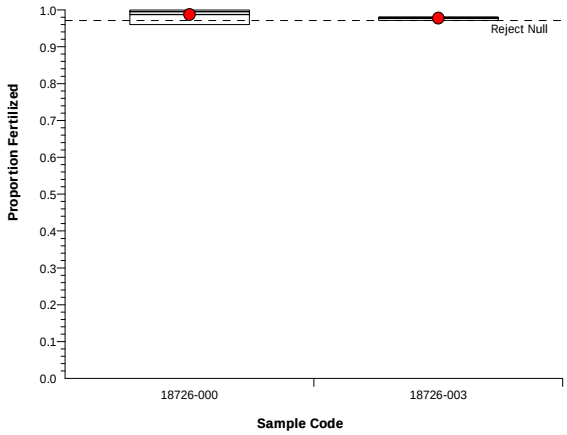
Proportion Fertilized Summary

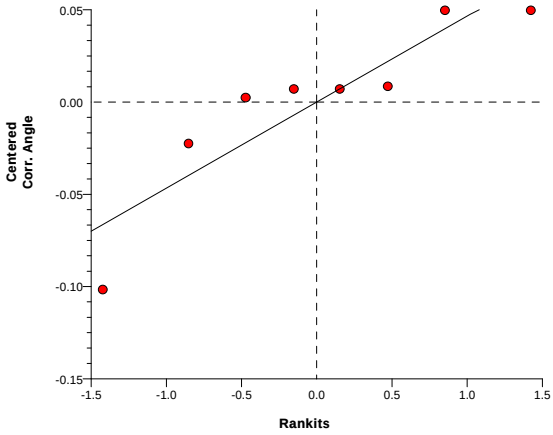
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18726-000	4	0.9876	0.9804	0.9949	0.96	1	0.00352	0.01896	1.92%	0.0%
18726-003	4	0.9778	0.9761	0.9796	0.9709	0.9804	0.0008603	0.004633	0.47%	0.99%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18726-000	4	1.471	1.444	1.498	1.369	1.521	0.01325	0.07136	4.85%	0.0%
18726-003	4	1.422	1.416	1.428	1.399	1.43	0.002795	0.01505	1.06%	3.35%

Graphics





000-148-164-3 CETIS™ v1.6.4F Analyst:_____ QA:_____

Arbacia punctulata Chronic Fertilization Assay

SAMPLE USE RECORD

STUDY: 18726	CLIENT: Woods Hole Group - New Bedford	
SPECIES: *A. punctulata*		
	Day: 0	
SAMPLE	Volume Used (mL)	ESI Cube ID
Lab Control	100	Lab Sea H
-001	100	001
~~-002~~		
INITIALS:	UB	
TIME:	1135	
DATE:	7/16/09	

FERTILIZATION COUNTS

STUDY	CLIENT	LOCATION	DATE 7/16/09
	Woods Hole Group	New Bedford	INITIALS UB

	REPLICATE VIAL			
	1	2	3	4
SAMPLE	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL
Lab Control	105/106	100/100	100/100	96/100
-001	98/100	100/102	100/103	98/100
~~-002~~				

Work Order : 215510
Sample Number : 25051

Cystocarp Counts at Test Termination

Initiated By : EJ
Initiation Date : 2009-07-17
Terminated By : VC
Termination Date : 2009-07-26

Concentration (%)	Replicate	Plant 1	Plant 2	Plant 3	Plant 4	Plant 5	Replicate Mean	Treatment Mean	Standard Deviation	CV (%)
Control	A	29	27	39	27	23	29.0			
	B	34	31	28	25	30	29.6	29.3	0.3	1.0
	C	24	23	43	29	28	29.4			
Salt Control*	A	29	28	38	21	31	29.4			
	B	44	19	30	24	30	29.4	29.0	0.7	2.4
	C	34	22	25	33	27	28.2[1]			
99	A	9	14	11	7	9	10.0			
	B	11	13	7	9	9	9.8	9.5	2.3	24.1
	C	6	8	10	12	8	8.8			

"–" = not counted/not required

[1] Outlier according to Grubbs Test (CETIS)[a]. Test data were analyzed with outlier(s) both included and excluded. The outlier(s) was included in calculation of the final result since exclusion had little effect on the final test outcome.

*'Salt Control' is a control prepared by Direct Salt Addition with Instant Ocean™ according to: Salinity Adjustment Guidance Document (2001). Environment Canada, revised December 2001.

Cumulative Plant Mortality

	Observation Period									
	♂ 0 Hours		♀ 0 Hours		♂ 48 Hours		♀ 48 Hours		♀ Test Completion	
Concentration (%)	Number Dead	Mortality (%)	Number Dead	Mortality (%)	Number Dead	Mortality (%)	Number Dead	Mortality (%)	Number Dead	Mortality (%)
Control	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Salt Control*	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Salt Control*	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

Test Data Reviewed By: SM
Date: 2009-08-05

CETIS Summary Report

Report Date:	06 Aug-09 15:19 (p 1 of 1)
Test Code:	08-5901-8127/18726 Cp

Champia parvula Red Macroalga Sexual Reproduction Test — **AquaTox**

Batch ID:	18-7379-7207	**Test Type:**	Champia	**Analyst:**	
Start Date:	17 Jul-09 09:00	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	24 Jul-09 09:00	**Species:**	Champia parvula	**Brine:**	Generic commercial salts
Duration:	7d 0h	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project
18726-000	12-2126-8702	17 Jul-09 08:00	17 Jul-09 08:00	60m	Woods Hole Group	Ecological Risk Assessme
18726-001	03-0374-5934	15 Jul-09 11:20	15 Jul-09 13:18	46h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
18726-000	Surface Water	New Bedford Harbor Dredge Moni	Laboratory Water Control		
18726-001	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-001-071509		

Mean Cystocarps Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18726-000	3	29.33	29.22	29.45	29	29.6	0.05578	0.3055	1.04%	0.0%
18726-001	3	9.533	9.293	9.773	8.8	10	0.1174	0.6429	6.74%	67.5%

Mean Cystocarps Detail

Sample Code	Rep 1	Rep 2	Rep 3
18726-000	29	29.6	29.4
18726-001	10	9.8	8.8

000-148-170-1 CETIS™ v1.7.0revW Analyst:_____ QA:_____

CETIS Analytical Report

Report Date:	06 Aug-09 15:20 (p 1 of 1)
Test Code:	08-5901-8127/18726 Cp

Champia parvula Red Macroalga Sexual Reproduction Test — **AquaTox**

Analysis ID:	18-8885-0704	**Endpoint:**	Mean Cystocarps	**CETIS Version:**	CETISv1.7.0
Analyzed:	06 Aug-09 15:18	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project
18726-000	12-2126-8702	17 Jul-09 08:00	17 Jul-09 08:00	60m	Woods Hole Group	Ecological Risk Assessme
18726-001	03-0374-5934	15 Jul-09 11:20	15 Jul-09 13:18	46h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
18726-000	Surface Water	New Bedford Harbor Dredge Moni	Laboratory Water Control		
18726-001	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-001-071509		

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					2.99%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18726-000		18726-001	48.18	2.132	0.8761	<0.0001	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	588.06	588.06	1	2321	<0.0001	Significant Effect
Error	1.013333	0.2533333	4			
Total	589.0733	588.3134	5			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	4.429	199	0.3684	Equal Variances
Distribution	Shapiro-Wilk Normality	0.905		0.4044	Normal Distribution

Mean Cystocarps Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18726-000	3	29.33	29.22	29.45	29	29.6	0.05673	0.3055	1.04%	0.0%
18726-001	3	9.533	9.289	9.778	8.8	10	0.1194	0.6429	6.74%	67.5%

Mean Cystocarps Detail

Sample Code	Rep 1	Rep 2	Rep 3
18726-000	29	29.6	29.4
18726-001	10	9.8	8.8

000-148-170-1 CETIS™ v1.7.0revW Analyst:_____ QA:_____

SALTWATER ASSAYS

A. bahia, A. punctulata, C. parvula

STUDY: 18726	LOCATION: New Bedford Harbor				
CHEMISTRY	Lab Salt Control	-001			
AMMONIA	18708 - 021	004			
AS RECEIVED WATER QUALITIES	Lab Salt Control	-001			
SALINITY (ppt)	25	20			
pH (SU)	7.94	7.32			
TRC (mg/L)	<0.02	<0.02			
DO (mg/L)	7.1	6.9			
S/C (µmhos/cm)	39580	31760			
WQ STATION USED	1	1			
INITIALS	SJ	SJ			
A. bahia SALINITY ADJUSTMENT RECORD	Lab Salt Control	-001			
SAMPLE (mLs)		16000 mL			
SEA SALT (g)		92			
DATE:	7/16/09	7/15/09			
TIME:	1320	1600			
INITIALS:	SJ	SJ			

Sample ID	ESI Cube ID
-001	-001

Report No:	18726	SDG:	
Project:	New Bedford Harbor		

Sample ID:	Sample 001
Matrix:	Water
Sampled:	07/15/09 1550

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Ammonia-N	18726-004	ND	0.1	mg/L as N	07/20/09	07/20/09	MES/SM 4500-NH3 G

Notes:

ND = Not Detected

ESI

EnviroSystems, Inc. P.O. Box 778 Hampton, NH 03842-0778 603-926-3345 fax 603-926-3521 www.envirosystems.com

Report No:	18708	SDG:	
Project:	Laboratory Seawater		
Sample ID:	Lab Salt 07/16/09		
Matrix:	Water		
Sampled:	07/16/09		

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Ammonia-N	18708-021	ND	0.1	mg/L as N	07/20/09	07/20/09	MES/SM 4500-NH3 G

Notes:

ND = Not Detected

ESI

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ESI

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO:	18726		
SDG No:			
Project:	WHGR-New Bedford Harbor		
Delivered via:	ESI		
Date and Time Received:	07/15/09 1318	Date and TIme Logged into Lab:	07/15/09 1600
Recieved By:	DG	Logged into Lab by:	SJ
Air bill / Way bill:	No	Air bill included in folder if received?	NA
Cooler on ice/packs:	YES	Custody Seals present?	NA
Cooler Blank Temp (C) at arrival:	4	Custody Seals intact?	NA
Number of COC Pages:	1		
COC Serial Number(s):			
COC Complete:		Does the info on the COC match the samples?	Yes
Sampled Date:	Yes	Were samples received within holding time?	Yes
Field ID complete:	Yes	Were all samples properly labeled?	Yes
Sampled Time:	Yes	Were proper sample containers used?	Yes
Analysis request:	Yes	Were samples received intact? (none broken or leaking)	Yes
COC Signed and dated:	Yes	Were sample volumes sufficient for requested analysis?	Yes
Were all samples received?	Yes	Were VOC vials free of headspace?	NA
Client notification/authorization:	Not required		

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
WQ-TOX-001 071509	18726-001	W	Composite: Sample 001			
WQ-TOX-002 071509	18726-002	W	Composite: Sample 001			
Sample 001	18726-003	W	AB7DCR,AP01CR,CP01CR			
Sample 001	18726-004	W	NH3;			

Notes and qualifications:

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ESI
EnviroSystems, Inc.
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Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No: 18726

CHAIN OF CUSTODY DOCUMENTATION

Client: Woods Hole Group	Contact: D. Walsh	Project Name: NBH-WQ sampling	Page 1 of 1
Report to: ~~K. McCartney~~ D. Walsh	Address: 81 Technology Park Dr	Project Number:	
Invoice to: D. Walsh	Address: Falmouth, MA	Project Manager: D. Walsh	
Voice: 508-540-8080	Fax: —	email: dwalsh@whgrp.com	P.O. No: Quote No:

Protocol: RCRA SDWA NPDES USCOE Other

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composit (G/C)	Container Size (ml.)	Container Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested\ Special Instructions:
001	WQ-TOX-001-071509	7/15	11:20	KGM	G	2.5G	P	ice 4°C	W	N	toxicity
~~002~~	WQ-TOX-002-071509	7/15	11:20	KGM	G	2.5G	P	ice 4°C	W	N	toxicity
~~003~~ 004	WQ-TOX-001 071509	↓	1540	SJ	G	60mL	P	H_2SO_4	W	N	NH_3
~~004~~ 003 SJ 7/15/09	↓ -002 ↓	↓	↓	SJ	G	↓	↓	↓	↓	↓	↓

Relinquished By: Kathyn McCartney	Date: 7/15/09	Time: 13:18	Received By: Rom	Date: 7/15/09	Time: 1318
Relinquished By:	Date:	Time:	Received at Lab By:	Date:	Time:

Comments:

Sample Delivery Group No: Page of

COC Doc No: 3644

ESI
EnviroSystems, Inc.
1 Lafayette Road
P.O. Box 778
Hampton, N.H. 03843
Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No:

CHAIN OF CUSTODY DOCUMENTATION

Client: EnviroSystems, Inc.	Contact: Shellie Jackman	Project Name:	Page 1 of 1
Report to: EnviroSystems, Inc.	Address: P.O. Box 778	Project Number: 18726	
Invoice to: EnviroSystems, Inc.	Address: Hampton, NH 03843	Project Manager: T. Simon	
Voice: 603-926-3345	Fax: 603-926-3521	email: TSimon@enviro systems.com	P.O. No: 18726 Quote No:

Protocol: RCRA SDWA NPDES USCOE Other

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composit (G/C)	Container Size (ml.)	Container Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested\ Special Instructions:
	18726-001 > 003	7/5/09	1120	C	G	1000	P	4°C	W	-	C. parvula Screen
	18726-002 > (3)	7/5/09	1120	C	G	1000	P	4°C	W	-	" "
	ATY										

Relinquished By: T. Simon	Date: 7/5/09 Time: 1530	Received By:	Date: Time:
Relinquished By:	Date: Time:	Received at Lab By:	Date: Time:

Comments: Salinity Adjust.

Sample Delivery Group No: Page of

COC Doc No: 3786

ESI

EnviroSystems, Inc.
P.O. Box 778
Hampton, NH 03843-0778
603-926-3345

August 6, 2009

Mr. Dave Walsh
Woods Hole Group, Inc.
81 Technology Park Drive
Falmouth, Massachusetts 02536

Dear Mr. Walsh;

Enclosed please find an electronic copy of our report evaluating the toxicity of samples received as part of the New Bedford Harbor surface water quality monitoring program for the 2009 sampling period. This report evaluates results of one (1) sample collected on July 22, 2009 and diluted to four (4) target concentrations (50, 100, 150, and 200 NTUs). Acute and chronic toxicity was evaluated using the mysid shrimp, *Americamysis bahia*, the sea urchin, *Arbacia punctulata*, and red macro algae, *Champia parvula*.

Please do not hesitate to call me, Reneé McIsaac or Petra Karbe should you have any questions regarding the report.

Sincerely,

EnviroSystems, Incorporated

Kenneth A. Simon
President

Enclosure

Report; Two (2) Copies
Study Number 18770-09-07

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

July 22, 2009 Sampling Event

NED ACOE Job Number: TO-0010

Task Order No.: ESI0002

Prepared for

Woods Hole Group, Inc.
81 Technology Park Drive
Falmouth, Massachusetts 02536

Prepared by

EnviroSystems, Incorporated
1 Lafayette Road
Hampton, New Hampshire 03843

July 2009
Reference Number: Woods Hole Group, Inc. 18770-09-07

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

July 22, 2009 Sampling Event
NED ACOE Job Number: TO-0010

1.0 INTRODUCTION

This report provides a summarization of data generated from acute and chronic exposure screening assays evaluating surface water samples collected from New Bedford Harbor in New Bedford, Massachusetts. 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 additional dilutions. Assays were conducted based on water quality levels in the vicinity of dredging operations. Samples were collected under the supervision of Woods Hole Group, Inc. personnel from the Falmouth, Massachusetts office. Testing was based on programs and protocols developed by the US EPA (2002) and included the following assays; 48 hour acute 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 the acute survival portion of the algal assays were conducted by ESI at its Hampton, New Hampshire facility.

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 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±2°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 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 were from cultures maintained by Saskatchewan Research Council. 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

A grab surface water sample was collected in New Bedford Harbor and diluted, in the field, to nominal 50, 100, 150, and 200 NTUs by Woods Hole Group, Inc. staff on July 22, 2009. Actual turbidity levels were documented by Alpha Analytical Labs after the start of the assays. Sample receipt information is shown in Table 1. Samples were placed in polyethylene cubitainers for shipment to the laboratory. One 5.0 gallon cubitainer was 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 0.02 mg/L). Prior to use in the assays, the salinity of the samples was adjusted, as 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. When necessary, 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. A summary of "As Received" water quality data are summarized in Table 2.

Laboratory control water used for the 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 (48 hour acute portion), collected from Hampton Harbor, 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. Control water used in the algal assays conducted by AquaTox (acute and chronic portions) was natural seawater collected from the West Coast of Canada. Salinity of the surface water samples was adjusted, as required, using commercial sea salts.

2.4 Bioassays

2.4.1 *Americamysis bahia* Acute Exposure Assays

The endpoint for the *A. bahia* bioassay was survival (acute). The 48 hour static acute toxicity tests were conducted at 25±1°C with a photoperiod of 16:8 hours light:dark. Test chambers for the acute assays were 250 mL glass beakers containing 200 mL test solution in each of 4 replicates with 10 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. Specific conductivity was measured in one replicate of each sample at the start of the assay. Mysids were not fed during the assay.

2.4.2 *Arbacia punctulata* Chronic Exposure Fertilization Assays

The endpoint for the *A. punctulata* bioassay was fertilization. Gametes were obtained by potassium chloride injection to induce spawning. Sperm were collected dry, diluted to achieve a concentration of approximately 5.0×10^7 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* Acute Exposure Assays

The target endpoints for the acute *C. parvula* bioassay were coloration and necrosis. The 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. Upon test termination, plants were examined to determine the physical condition and coloration of the individual branches. Branches showing signs of degeneration were noted and used to establish an acute endpoint. Data for the acute endpoints was generated by ESI.

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 $\propto$ <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 4, provide relative health and response data while allowing for comparison with historic data sets.

2.7 Protocol Deviations and Unacceptable Assays

Review of data collected from the assays conducted during the monitoring period documented one protocol deviations. Typically, the 48 hour acute exposure assay with the mysid shrimp is completed using <5 day old test organisms, however 7 day old organisms were acquired in anticipation of running the modified 7-day chronic assay which includes a 48-hour acute exposure endpoint. It is the opinion of ESI's study director that this deviation had no impact on the outcome of the assay.

3.0 RESULTS SUMMARY

Table 3 provides summaries of survival, growth, development and reproduction endpoints and associated statistical analyses. Support data, including copies of laboratory bench sheets, are provided in Appendix A.

For this round of sample analysis there were was one reference site sample (DS-TOX-005-072209). The laboratory control and reference site were both used for statistical comparisons against the four samples provided by Woods Hold Group (DS-TOX-001-072209 through DS-TOX-004-072209).

3.1*Americamysis bahia* Acute Exposure Bioassay

Minimum test acceptability criteria for the acute exposure bioassay require $\geq$90% survival in the control concentrations. Achievement of these results indicate that healthy test organisms were used. See Table 3 for test acceptability and data summary.

3.2 *Arbacia punctulata* Chronic Fertilization Bioassay

Protocol specifies a 70% to 90% fertilization rate for *Arbacia punculata* (EPA 2002). Achievement of these results indicate that healthy test organisms were used. See Table 3 for test acceptability and data summary.

3.3*Champia parvula* Acute Exposure Bioassay

The acute exposure bioassay was considered to be acceptable if no notable branch necrosis was observed and appropriate coloration of test species was achieved in the laboratory control treatment. Achievement of these results indicate that healthy test organisms were used. See Table 3 for test acceptability and data summary.

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. Sample Receipt Summary. New Bedford Harbor Surface Water Quality Monitoring July 22, 2009 Sampling Event. New Bedford Harbor Dredge Plume Monitoring Program.

Field ID	ESI Code	Matrix	Collection		Receipt	
			Date	Time	Date	Time
DS-TOX-001-072209	18770-001	Water	07/22/09	0826	07/22/09	1747
DS-TOX-002-072209	18770-002	Water	07/22/09	0952	07/22/09	1747
DS-TOX-003-072209	18770-003	Water	07/22/09	0951	07/22/09	1747
DS-TOX-004-072209	18770-004	Water	07/22/09	0951	07/22/09	1747
DS-TOX-005-072209	18770-005	Water	07/22/09	0949	07/22/09	1747

Table 2 Summary of "As Received" Sample Physical and Chemical Characteristics. New Bedford Harbor Surface Water Quality Monitoring July 22, 2009 Sampling Event. New Bedford Harbor Dredge Plume Monitoring Program.

Field ID	ESI Code	Target Dilution (NTUs) / Reference	Measured Turbidity*	Ammonia (mg/L)	pH (SU)	Salinity (‰)	Total Residual Chlorine (mg/L)
DS-TOX-001-072209	18770-001	200	190	0.15	7.27	23	<0.02
DS-TOX-002-072209	18770-002	150	140	<0.1	7.37	19	<0.02
DS-TOX-003-072209	18770-003	100	110	<0.1	7.40	17	<0.02
DS-TOX-004-072209	18770-004	50	92	<0.1	7.54	22	<0.02
DS-TOX-005-072209	18770-005	Reference	7.2	<0.1	7.71	27	<0.02

COMMENTS:
* Turbidity was measured by Woods Hole Group and provided via email communication.

Table 3. Endpoint Summary Table - New Bedford Harbor Surface Water Quality Monitoring July 22, 2009 Sampling Event. New Bedford Harbor Dredge Plume Monitoring Program.

Sample ID	Turbidity (NTUs)	Reps	Mean	Min	Max	CV	Significant Difference vs p Value	Lab	p Value	TOX-005
Arbacia punctulata										
			Portion Fertilized							
Lab Control			98.8%	97.2%	100.0%	1.20%	-	-	-	-
DS-TOX-005	7.2		99.1%	98.1%	100.0%	1.09%	0.6185	NO	-	-
DS-TOX-001	190	4	93.7%	92.6%	96.2%	1.80%	0.0015	YES	0.0012	YES
DS-TOX-002	140		90.3%	88.0%	92.5%	2.04%	0.0002	YES	0.0001	YES
DS-TOX-003	110		98.1%	94.3%	100.0%	2.60%	0.3650	NO	0.2888	NO
DS-TOX-004	92		98.0%	97.0%	99.0%	0.84%	0.1386	NO	0.0869	NO
Americamysis bahia										
			Day 1 Survival							
Lab Control	-		100.0%	100.0%	100.0%	0.00%	-	-	-	-
DS-TOX-005	7.2		100.0%	100.0%	100.0%	0.00%	0.4429	NO	-	-
DS-TOX-001	190		97.5%	90.0%	100.0%	5.13%	0.3429	NO	0.3429	NO
DS-TOX-002	140	4	100.0%	100.0%	100.0%	0.00%	0.4429	NO	0.4429	NO
DS-TOX-003	110		97.5%	90.0%	100.0%	5.13%	0.3429	NO	0.3429	NO
DS-TOX-004	92		97.5%	90.0%	100.0%	5.13%	0.3429	NO	0.3429	NO
			Day 2 Survival							
Lab Control	-		100.0%	100.0%	100.0%	0.00%	-	-	-	-
DS-TOX-005	7.2		100.0%	100.0%	100.0%	0.00%	0.4429	NO	-	-
DS-TOX-001	190		97.5%	90.0%	100.0%	5.13%	0.3429	NO	0.3429	NO
DS-TOX-002	140	4	100.0%	100.0%	100.0%	0.00%	0.4429	NO	0.4429	NO
DS-TOX-003	110		97.5%	90.0%	100.0%	5.13%	0.3429	NO	0.3429	NO
DS-TOX-004	92		97.5%	90.0%	100.0%	5.13%	0.3429	NO	0.3429	NO
Champia parvula										
			Day 2 Coloration/Necrosis							
Lab Control	-		4.0	4.0	4.0	0.00%	-	-	-	-
DS-TOX-005	7.2		3.2	3.0	3.4	5.10%	0.0143	YES	-	-
DS-TOX-001	190	4	0.0	0.0	0.0	0.00%	0.0143	YES	0.0143	YES
DS-TOX-002	140		0.8	0.6	1.0	20.41%	0.0143	YES	0.0000	YES
DS-TOX-003	110		2.0	1.8	2.0	5.13%	0.0143	YES	0.0000	YES
DS-TOX-004	92		2.9	2.8	3.0	3.98%	0.0000	YES	0.0120	YES

Table 4 Reference Toxicant Summary. New Bedford Harbor Surface Water Quality Monitoring July 22, 2009 Sampling Event. New Bedford Harbor Dredge Plume Monitoring Program.

Date	Endpoint		Value	Historic Mean/ Central Tendency	Acceptable Range	Reference Toxicant
A. bahia						
06/17/09	Survival	LC-50	23.8	20.8	16.2 - 25.4	SDS (mg/L)
05/27/09	Survival	C-NOEC	15.0	10.0	5.0 - 15.0	SDS (mg/L)
05/27/09	Growth	C-NOEC	5.0	5.0	2.5 - 10.0	SDS (mg/L)
A. punctulata						
06/18/09	Fertilization	C-NOEC	<1	10.0	1.0 - 5.0	Copper (µg/L)
06/18/09	Fertilization	IC-25	1.0	19.9	0 - 66.1	Copper (µg/L)
C. parvula						
06/08/09	Reproduction	IC-25	0.1	0.11	0.065 - 0.178	SDS (mg/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 18770: Sample Date July 22, 2009	
A. bahia Bench Sheets & Statistical Analysis Report	22
A. punctulata Bench Sheets and Statistical Analysis Report	12
C. parvula Bench Sheets and Statistical Analysis Report	12
Water Quality Bench Sheets and Dilution Prep Sheets	3
Analytical Chemistry Report	2
Sample Receipt Records	1
Chain of Custody and Organism Shipping Information	1
Total Appendix Pages	54

METHODS USED IN NPDES PERMIT BIOMONITORING TESTING

Parameter	Method
Acute Exposure Bioassays:	
Ceriodaphnia dubia, Daphnia pulex	EPA-821-R-02-012
Pimephales promelas	EPA-821-R-02-012
Americamysis bahia	EPA-821-R-02-012
Menidia beryllina, Cyprinodon variegatus	EPA-821-R-02-012
Chronic Exposure Bioassays:	
Ceriodaphnia dubia	EPA-821-R-02-013 1002.0
Pimephales promelas	EPA-821-R-02-013 1000.0
Cyprinodon variegatus	EPA-821-R-02-014 1004.0
Menidia beryllina	EPA-821-R-02-014 1006.0
Arbacia punctulata	EPA-821-R-02-014 1008.0
Champia parvula	EPA-821-R-02-014 1009.0
Trace Metals:	
Trace Metals	EPA 200.7/SW 6010 and EPA 200.8/SW 6020
Hardness	Standard Methods 20th Edition - Method 2340 B
Wet Chemistries:	
Alkalinity	EPA 310.2
Chlorine, Residual	Standard Methods 20th Edition - Method 4500CLD
Total Organic Carbon	Standard Methods 20th Edition - Method 5310C
Specific Conductance	Standard Methods 20th Edition - Method 2510B
Nitrogen - Ammonia	Standard Methods 20th Edition - Method 4500NH3G
pH	Standard Methods 20th Edition - Method 4500H+B
Solids, Total (TS)	Standard Methods 20th Edition - Method 2540 B
Solids, Total Suspended (TSS)	Standard Methods 20th Edition - Method 2540 D
Solids, Total Dissolved (TDS)	Standard Methods 20th Edition - Method 2540 C
Dissolved Oxygen	Standard Methods 20th Edition - Method 4500-O G

ACUTE BIOASSAY DATA SUMMARY

STUDY: 18770

CLIENT: Woods Hole Group

TEST ORGANISM: *A. bahia*

SAMPLE: New Bedford Harbor

ORGANISM SUPPLIER/BATCH/AGE: *See Organism Culture Sheet*

"AS RECEIVED" EFFLUENT AND DILUENT CHEMISTRIES

	TRC	TS/TSS	AMM	TOC	T.METAL	SAL	pH	S/C
EFF								
DIL								

CONC	REP	SURVIVAL 0	SURVIVAL 24	SURVIVAL 48	DO (mg/L) 0	DO (mg/L) 24	DO (mg/L) 48	pH (SU) 0	pH (SU) 24	pH (SU) 48	TEMP (°C) 0	TEMP (°C) 24	TEMP (°C) 48	SALINITY (ppt) 0	SALINITY (ppt) 24	SALINITY (ppt) 48	S/C (µmhos/cm) 0
LAB	A	10	10	10	7.2	6.7	6.2	7.97	7.94	7.83	25	25	24	24	25	25	38360
	B	10	10	10	7.2	6.7	5.9										
	C	10	10	10	7.2	6.7	6.0										
	D	10	10	10	7.2	6.8	5.5		7.92								
Reference Site	A	10	10	10	~~6.6~~ 7.4	6.8	~~5.6~~	7.47	~~7.82~~	7.78	25	25	24	~~24~~ 27	~~24~~ 27	28	42010
	B	10	10	10	~~6.5~~ 7.4	6.9	5.2										
005	C	10	10	10	~~6~~ 7.3	7.0	5.6										
	D	10	10	10	7.2	6.9	5.7										
50 NTU	A	10	10	10	7.0	6.9	5.9	7.26	7.87	7.80	25	25	24	25	~~24~~ 26	26	39170
	B	10	10	10	7.1	7.0	5.8										
004	C	10	10	10	7.1	7.0	5.9										
	D	10	9	9	7.2	7.0	5.8										
100 NTU	A	10	10	10	6.6	7.0	5.9	7.31	7.89	7.80	25	25	24	24	~~25~~ 25	25	38350
	B	10	9	9	6.7	7.0	5.5										
003	C	10	10	10	6.6	7.0	5.7										
	D	10	10	10	6.7	7.0	6.0										
DATE		7/23	7/24	7/25/09	7/23/09	7/24	7/25										
TIME		1555	1420	1420	1545	1405	1645										
INITIALS		SJ	SJ	WM	SJ	SJ	KE										

ACUTE BIOASSAY DATA SUMMARY

STUDY: 18770 | SAMPLE: New Bedford Harbor

CLIENT: Woods Hole Group | TEST ORGANISM: *A. bahia*

CONC	REP	SURVIVAL 0	SURVIVAL 24	SURVIVAL 48	DO (mg/L) 0	DO (mg/L) 24	DO (mg/L) 48	pH (SU) 0	pH (SU) 24	pH (SU) 48	TEMP (°C) 0	TEMP (°C) 24	TEMP (°C) 48	SALINITY (ppt) 0	SALINITY (ppt) 24	SALINITY (ppt) 48	S/C (µmhos/cm) 0
150 NTU	A	10	10	10	6.6	7.0	5.9	7.29	7.87	7.90	25	25	24	~~25~~ 25	26	26	39620
	B	10	10	10	6.7	7.0	6.0										
002	C	10	10	10	6.7	7.0	6.2										
	D	10	10	10	6.7	7.0	6.0										
200 NTU	A	10	10	10	6.6	7.0	6.0	7.28	7.82	7.84	25	25	24	~~24~~ 24	24	25	36850
	B	10	10	10	6.5	7.0	5.9										
001	C	10	10	10	6.5	7.0	5.8										
	D	10	9	9	6.5	7.0	6.2										
	A																
	B																
	C																
	D																
	A																
	B																
	C																
	D																
DATE		7/23	7/24	7/25	7/23/09	7/24	7/25										
TIME		1555	1440	1420	1545	1405	1645										
INITIALS		SJ	SJ	WM	SJ	SJ	WC										

CETIS Summary Report

Report Date: 27 Jul-09 10:52 (p 1 of 1)
Link/Link Code: 14-7067-7011/18770-Ab

Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample No	Sample Date	Receive Date	Sample Age	Client Name	Project
18770-000	06-7167-7012	23 Jul-09 12:00	23 Jul-09 12:00	4h	Woods Hole Group	Ecological Risk Assessme
18770-005	03-9927-1818	22 Jul-09 09:49	22 Jul-09 17:47	30h		
18770-001	15-6024-8561	22 Jul-09 08:26	22 Jul-09 17:47	32h		
18770-002	05-1145-9131	22 Jul-09 09:52	22 Jul-09 17:47	30h		
18770-003	01-6638-4937	22 Jul-09 09:51	22 Jul-09 17:47	30h		
18770-004	06-1076-1745	22 Jul-09 09:51	22 Jul-09 17:47	30h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
18770-000	Surface Water	New Bedford Harbor Dredge Moni	Laboratory Water Control		
18770-005	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-005-072209 (Reference		
18770-001	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-001-072209 (190 NTU)		
18770-002	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-002-072209 (140 NTU)		
18770-003	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-003-072209 (110 NTU)		
18770-004	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-004-072209 (092 NTU)		

24h Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-001	4	0.975	0.9563	0.9937	0.9	1	0.009129	0.05	5.13%	2.5%
18770-002	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-003	4	0.975	0.9563	0.9937	0.9	1	0.009129	0.05	5.13%	2.5%
18770-004	4	0.975	0.9563	0.9937	0.9	1	0.009129	0.05	5.13%	2.5%

48h Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-001	4	0.975	0.9563	0.9937	0.9	1	0.009129	0.05	5.13%	2.5%
18770-002	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-003	4	0.975	0.9563	0.9937	0.9	1	0.009129	0.05	5.13%	2.5%
18770-004	4	0.975	0.9563	0.9937	0.9	1	0.009129	0.05	5.13%	2.5%

24h Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
18770-000	1	1	1	1
18770-005	1	1	1	1
18770-001	1	1	1	0.9
18770-002	1	1	1	1
18770-003	1	0.9	1	1
18770-004	1	1	1	0.9

48h Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
18770-000	1	1	1	1
18770-005	1	1	1	1
18770-001	1	1	1	0.9
18770-002	1	1	1	1
18770-003	1	0.9	1	1
18770-004	1	1	1	0.9

000-148-164-3 CETIS™ v1.6.4F Analyst:_____ QA:_____

Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	17-8622-6234	**Endpoint:**	24h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	24 Jul-09 14:37	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-005		18770-004	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

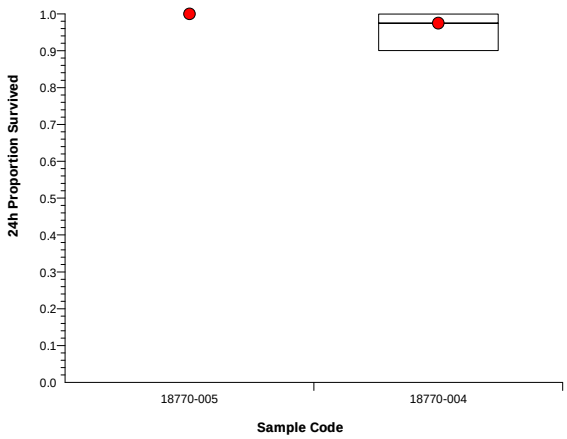
24h Proportion Survived Summary

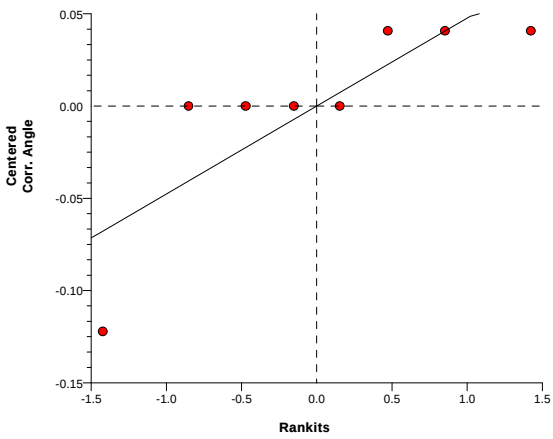
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-004	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-004	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	02-9572-0498	**Endpoint:**	24h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	24 Jul-09 14:37	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-005		18770-003	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

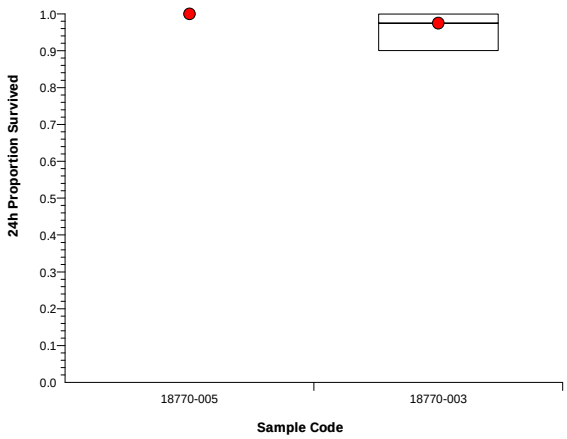
24h Proportion Survived Summary

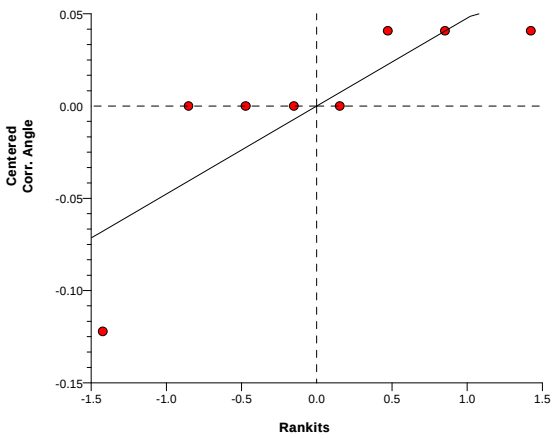
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-003	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-003	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	12-4998-4748	**Endpoint:**	24h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	24 Jul-09 14:36	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					2.5%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-005		18770-002	18		1	0.4429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0	0	1	65540	0.0000	Significant Effect
Error	0	0	6			
Total	0	0	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	65540	13.75	0.0000	Unequal Variances

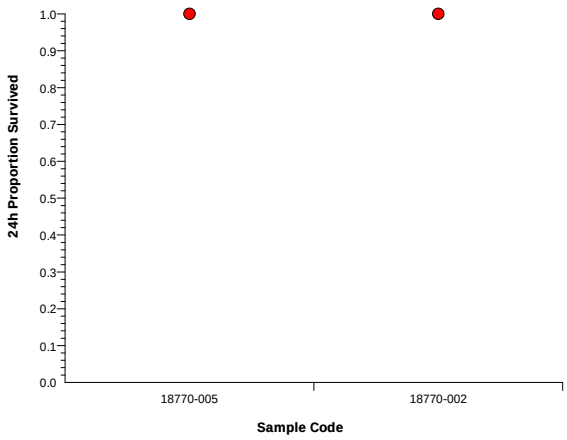
24h Proportion Survived Summary

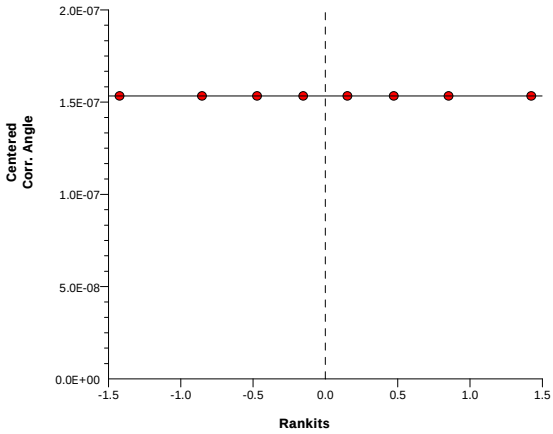
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-002	4	1	1	1	1	1	0	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-002	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	06-0548-8740	**Endpoint:**	24h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	24 Jul-09 14:36	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-005		18770-001	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

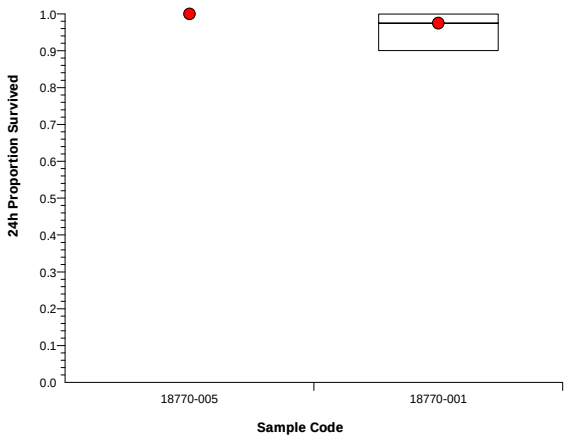
24h Proportion Survived Summary

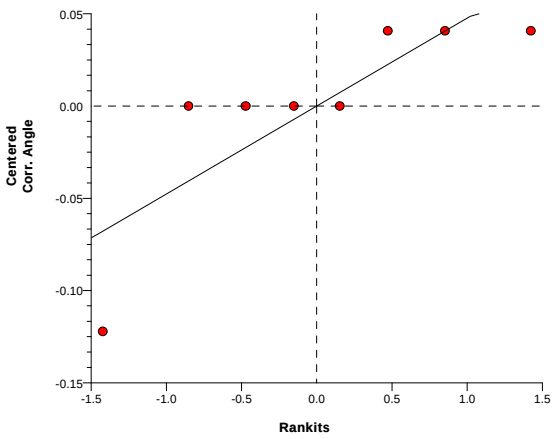
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-001	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-001	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	03-9607-9833	**Endpoint:**	24h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	24 Jul-09 14:36	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-004	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

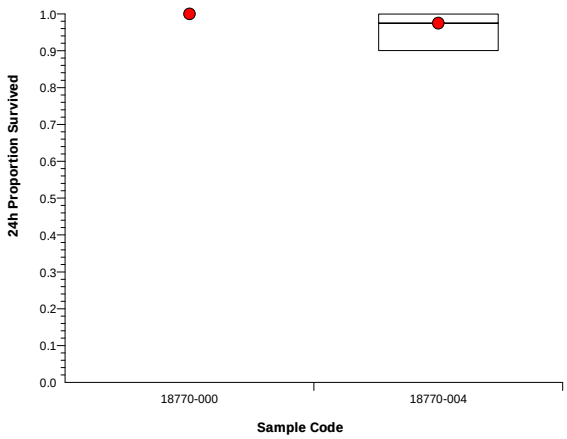
24h Proportion Survived Summary

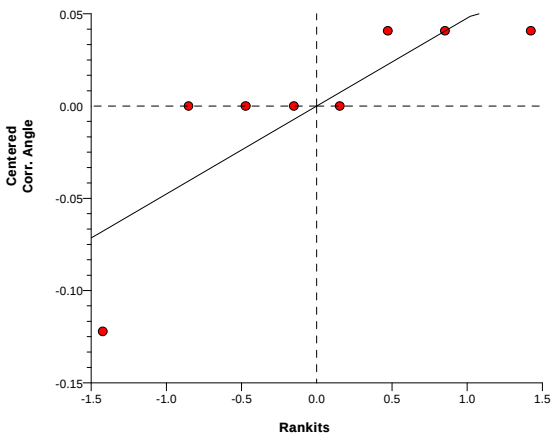
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-004	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-004	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	11-8632-2466	**Endpoint:**	24h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	24 Jul-09 14:36	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-003	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

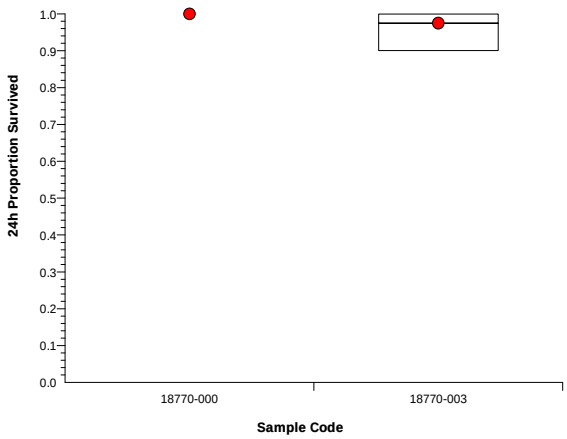
24h Proportion Survived Summary

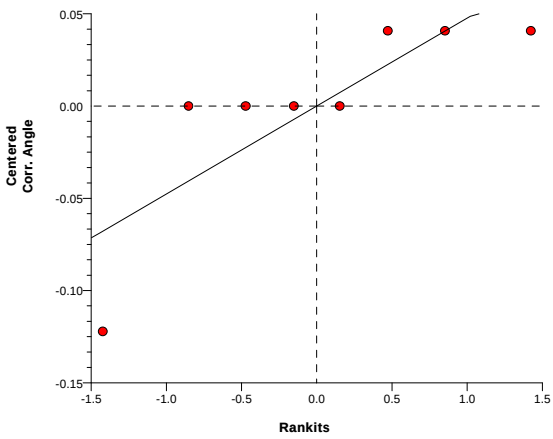
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-003	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-003	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	11-2256-6280	**Endpoint:**	24h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	24 Jul-09 14:36	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					2.5%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-002	18		1	0.4429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0	0	1	65540	0.0000	Significant Effect
Error	0	0	6			
Total	0	0	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	65540	13.75	0.0000	Unequal Variances

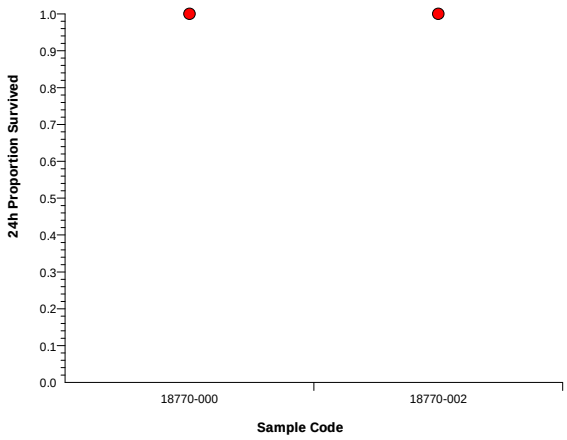
24h Proportion Survived Summary

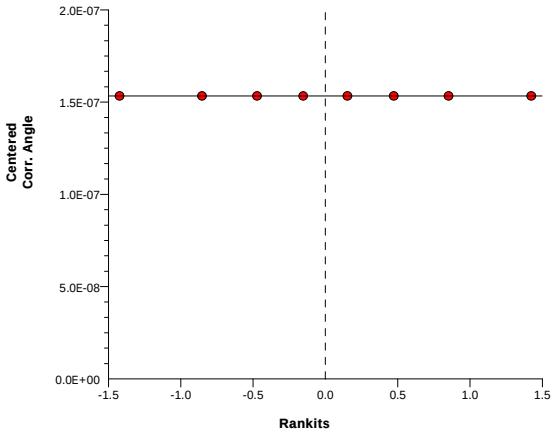
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-002	4	1	1	1	1	1	0	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-002	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	04-4072-4585	**Endpoint:**	24h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	24 Jul-09 14:36	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-001	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

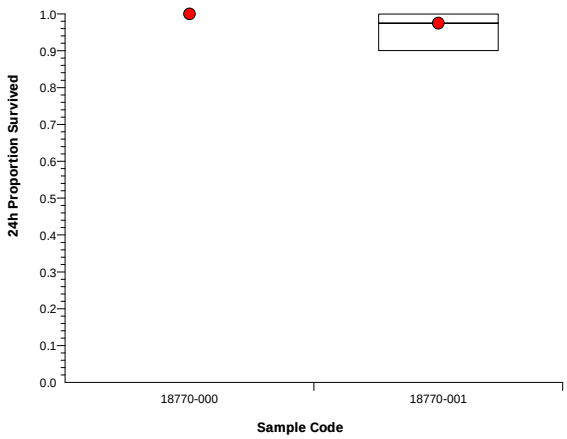
24h Proportion Survived Summary

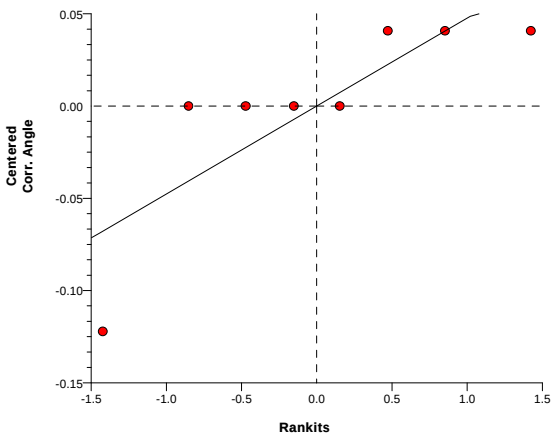
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-001	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-001	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	19-2609-4608	**Endpoint:**	24h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	24 Jul-09 14:36	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					2.5%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-005	18		1	0.4429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0	0	1	65540	0.0000	Significant Effect
Error	0	0	6			
Total	0	0	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	65540	13.75	0.0000	Unequal Variances

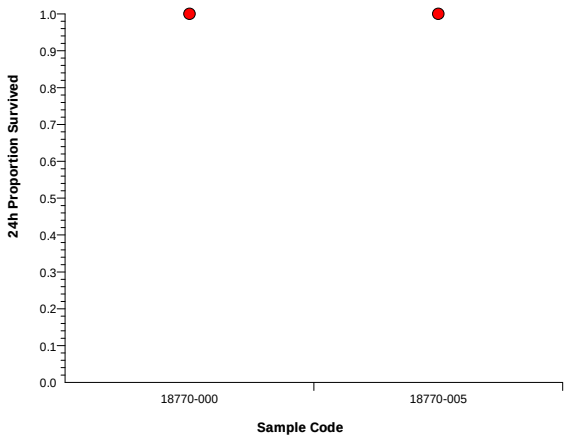
24h Proportion Survived Summary

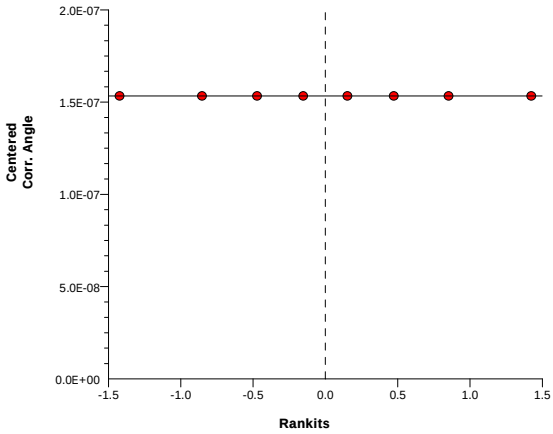
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-005	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	09-2386-3109	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 10:48	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-005		18770-004	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

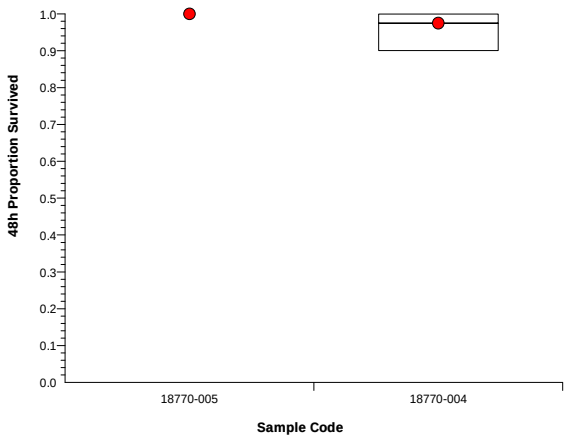
48h Proportion Survived Summary

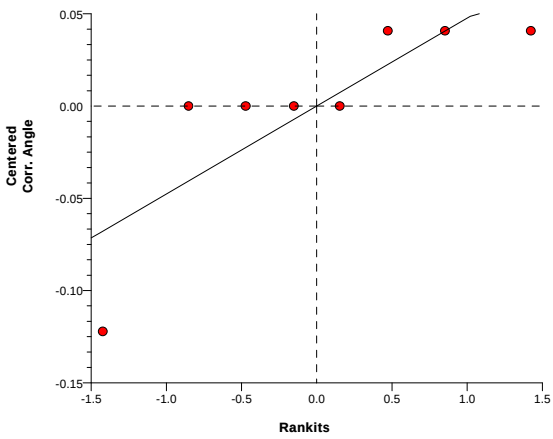
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-004	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-004	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	20-9989-5516	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 10:48	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-005		18770-003	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

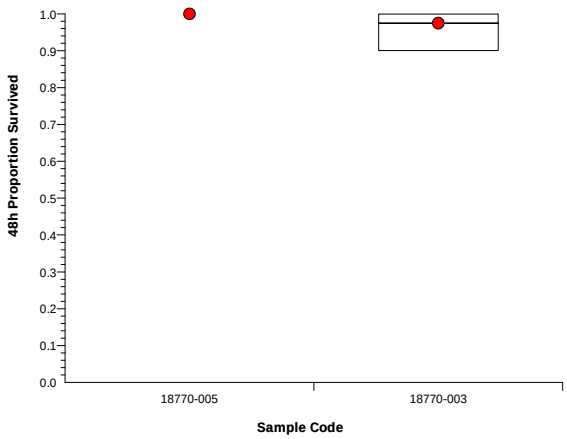
48h Proportion Survived Summary

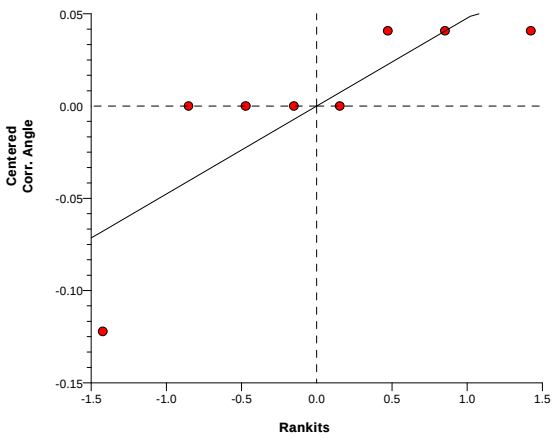
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-003	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-003	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	11-3419-3984	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 10:48	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					2.5%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-005		18770-002	18		1	0.4429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0	0	1	65540	0.0000	Significant Effect
Error	0	0	6			
Total	0	0	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	65540	13.75	0.0000	Unequal Variances

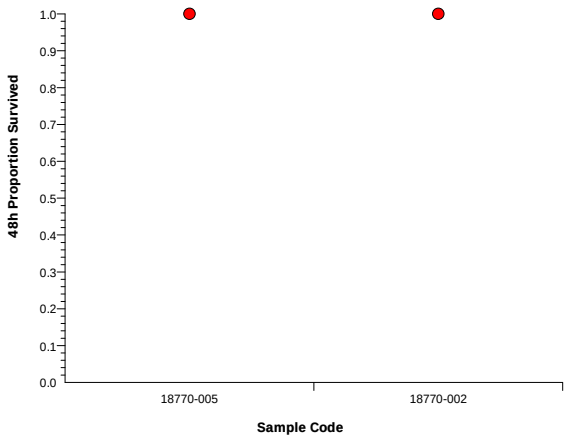
48h Proportion Survived Summary

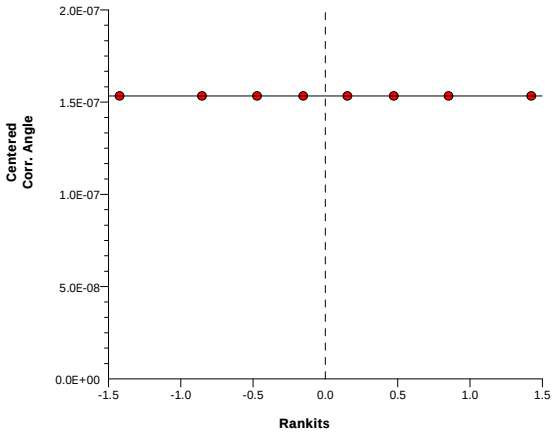
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-002	4	1	1	1	1	1	0	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-002	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	04-5963-4047	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 10:48	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-005		18770-001	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

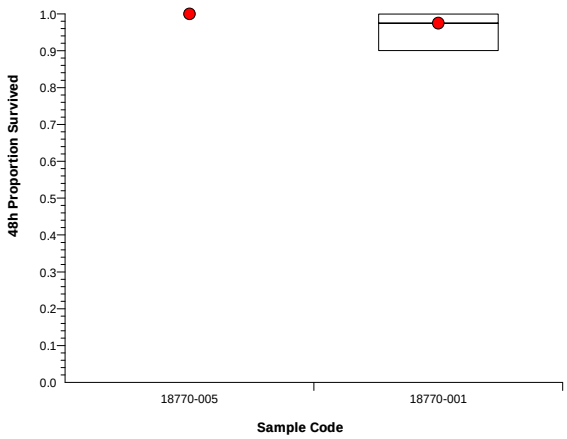
48h Proportion Survived Summary

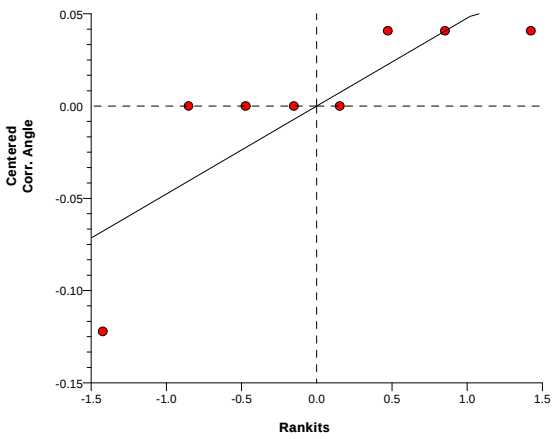
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-001	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-001	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	17-1499-2035	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 10:48	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-004	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

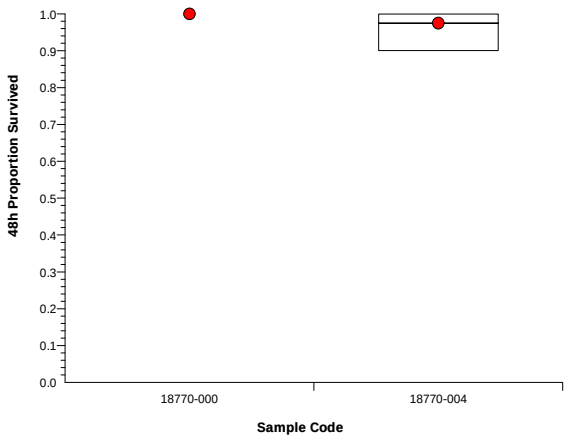
48h Proportion Survived Summary

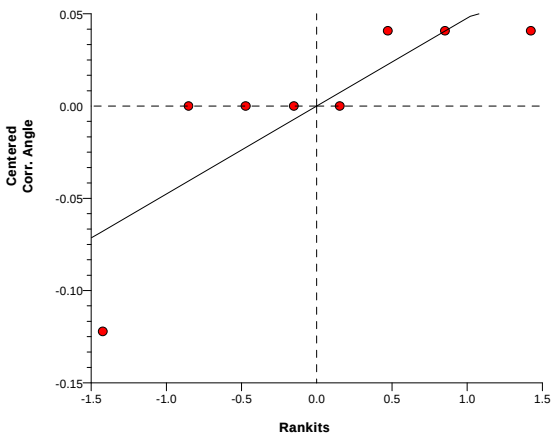
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-004	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-004	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	08-0227-6085	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 10:48	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-003	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

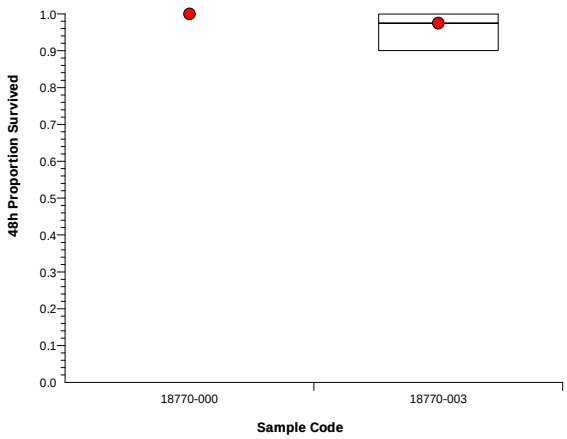
48h Proportion Survived Summary

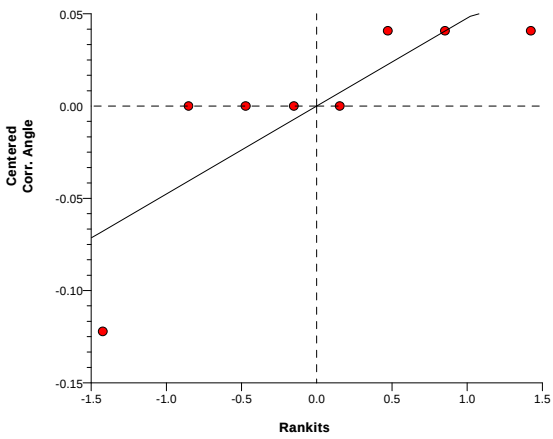
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-003	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-003	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	14-6729-0743	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 10:48	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					2.5%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-002	18		1	0.4429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0	0	1	65540	0.0000	Significant Effect
Error	0	0	6			
Total	0	0	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	65540	13.75	0.0000	Unequal Variances

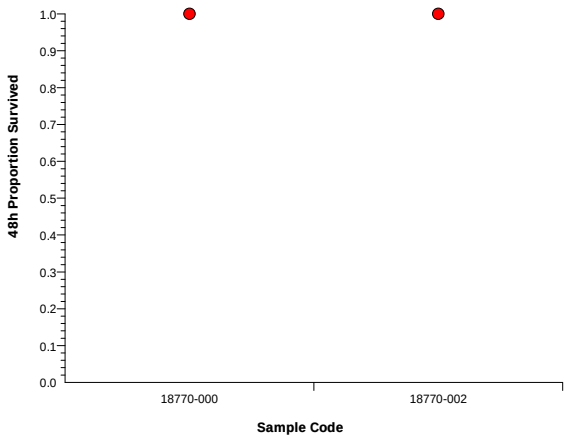
48h Proportion Survived Summary

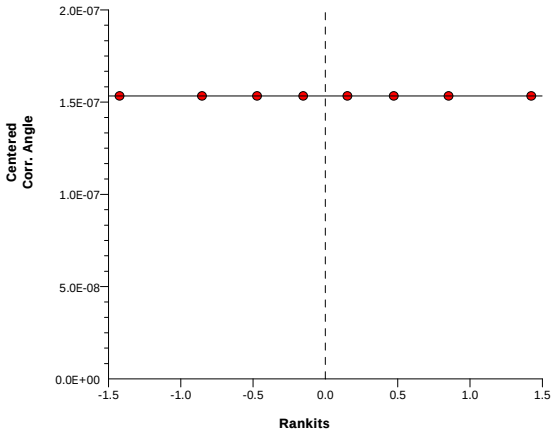
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-002	4	1	1	1	1	1	0	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-002	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	17-8143-7019	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 10:48	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-001	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

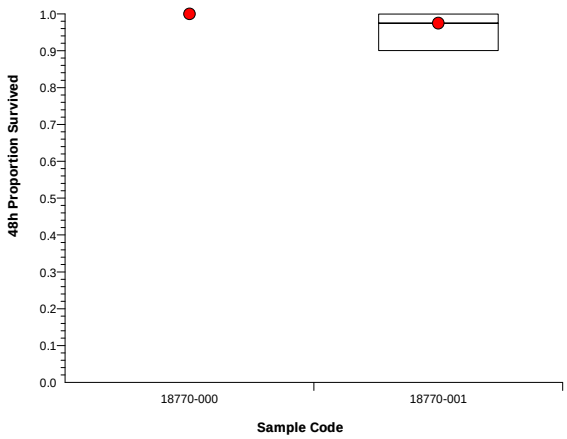
48h Proportion Survived Summary

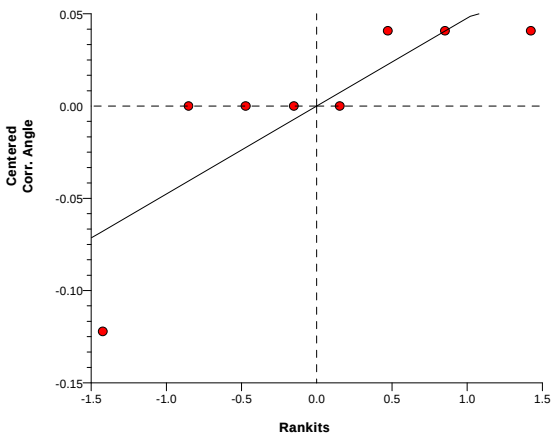
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-001	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-001	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	00-2870-5123	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 10:48	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					2.5%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-005	18		1	0.4429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0	0	1	65540	0.0000	Significant Effect
Error	0	0	6			
Total	0	0	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	65540	13.75	0.0000	Unequal Variances

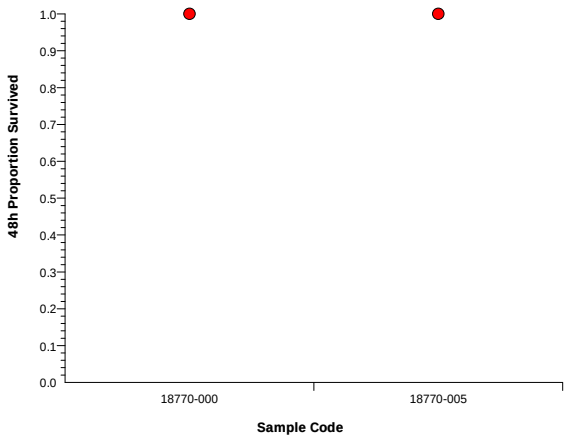
48h Proportion Survived Summary

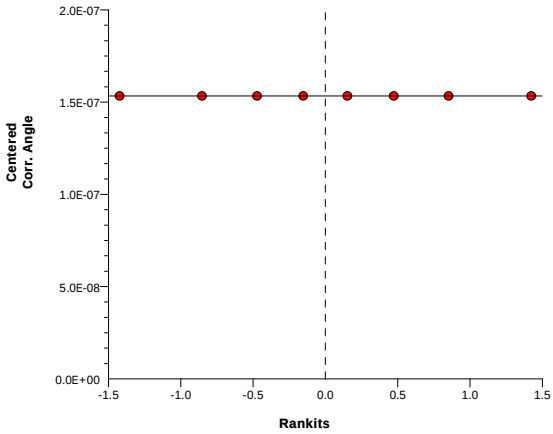
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-005	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%

Graphics





Aquatic Research Organisms

DATA SHEET

Rec 7/23

I. Organism History

Species Americamysis bahia

Source: Lab reared ✓ Hatchery reared ____ Field collected ____

Hatch date 7-16-09 Receipt date ____

Lot number 071609MS Strain ____

Brood origination Florida

II. Water Quality

Temperature 25 °C Salinity ~30 ppt D.O. – ppm

pH 7.8 su Hardness – ppm Alkalinity – ppm

III. Culture Conditions

Freshwater ____ Saltwater ✓ Other ____

Recirculating ✓ Flow through ____ Static ____

DIET: Flake food ✓ Phytoplankton ____ Trout chow ✓

Artemia ✓ Rotifers ____ YCT ____ Other Encap. Shrimp Diet

Prophylactic treatments: ____

Comments: ____

IV. Shipping Information

Client: EST # of Organisms 240+

Carrier: ____ Date shipped 7-23-09

Biologist: Mark Dominguez

PO BOX 1271 HAMPTON NH 03843-1271 (603) 926-1650 AROFISH@AOL.COM

Arbacia punctulata Chronic Fertilization Assay
Water Quality and Gamete Preparation Data

STUDY: 18770 (2) ~~18622~~	CLIENT: Woods Hole Group	LOCATION: New Bedford	DATE: 7/23/09 INITIALS: SO

SALINITY ADJUSTMENT RECORD: 200 mL Ref + _____g SALT

SALINITY ADJUSTMENT RECORD: 200 mL 200 NTU + _____g SALT

SALINITY ADJUSTMENT RECORD: 200 mL 150 NTU + _____g SALT

SALINITY ADJUSTMENT RECORD: 200 mL 100 NTU + _____g SALT

SALINITY ADJUSTMENT RECORD: 200 mL 50 NTU + _____g SALT

SALINITY ADJUSTED SAMPLE	D.O. (mg/L)	pH (SU)	SPEC COND (µmhos)	TEMP (°C)	SALINITY (ppt)
Lab Control	7.2	8.11	46.330	~~23~~ 20	30
Reference Site 005	8.1	7.66	45550	20	29
200 NTU 001	7.4	7.55	46~~3~~740	20	30
150 NTU 002	7.6	7.74	46340	20	30
100 NTU 003	8.4	7.87	47950	20	31
50 NTU 004	8.3	7.77	47660	20	31

METERS USED

DO meter # 23 DO probe # 20 pH meter # 470 pH probe # 85 S/C meter # YSI30D S/C probe # YSI30D

SALINITY meter # YSI30D

DATE & INITIALS FOR GAMETE PREPARATION: LB

SPERM DILUTIONS:

HEMACYTOMETER COUNT, E: 1.22 X 10^4 = SPM SOLUTION E = 1.22×10^6

SPERM CONCENTRATIONS:

SOLUTION E X 40 = SOLUTION A = 4.88×10^7 SPM

SOLUTION E X 20 = SOLUTION B = 2.44×10^7 SPM

SOLUTION E X 5 = SOLUTION C = 6.10×10^6 SPM

FINAL COUNTS:

FINAL SPERM COUNT: 4.88×10^7

FINAL EGG COUNT: 2400

TEST TIMES:

SPERM COLLECTED: 1345

EGGS COLLECTED: 1345

SPERM ADDED: 1425

EGGS ADDED: 1525

FIXATIVE ADDED: 1545

See ESI SOP #1412 for additional information

Arbacia punctulata Chronic Fertilization Assay

SAMPLE USE RECORD

STUDY: ~~18772~~ 18770	CLIENT: Woods Hole Group New Bedford	
SPECIES: *A. punctulata*		
	Day: 0	
SAMPLE	Volume Used (mL)	ESI Cube ID
Lab Control	200 mL	—
Reference Site 005		005
200 NTU 001		001
150 NTU 002		002
100 NTU 003		003
50 NTU 004		004
INITIALS:	SJ	
TIME:	1405	
DATE:	7/23/09	

FERTILIZATION COUNTS

STUDY 18770	CLIENT Woods Hole Group	LOCATION New Bedford	DATE 7/23/09 INITIALS UB

SAMPLE	REPLICATE VIAL 1 FERT/TOTAL	2 FERT/TOTAL	3 FERT/TOTAL	4 FERT/TOTAL
Lab Control	100/101	103/104	100/101	100/100
005 Reference	101/101	101/101	109/111	101/103
001 200 NTU	101/108	100/108	100/108	100/104
002 150 NTU	88/100	108/119	98/106	90/100
003 100 NTU	100/106	103/104	102/102	100/101
004 50 NTU	100/102	100/101	97/100	98/100

CETIS Summary Report

Report Date:	24 Jul-09 11:13 (p 1 of 1)
Link/Link Code:	16-5654-6835/18770-Ap

Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Test Run No:	08-3312-6536	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	23 Jul-09 14:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	23 Jul-09 15:45	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample No	Sample Date	Receive Date	Sample Age	Client Name	Project
18770-000	06-7167-7012	23 Jul-09 12:00	23 Jul-09 12:00	2h	Woods Hole Group	Ecological Risk Assessme
18770-005	03-9927-1818	22 Jul-09 09:49	22 Jul-09 17:47	29h		
18770-001	15-6024-8561	22 Jul-09 08:26	22 Jul-09 17:47	30h		
18770-002	05-1145-9131	22 Jul-09 09:52	22 Jul-09 17:47	29h		
18770-003	01-6638-4937	22 Jul-09 09:51	22 Jul-09 17:47	29h		
18770-004	06-1076-1745	22 Jul-09 09:51	22 Jul-09 17:47	29h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
18770-000	Surface Water	New Bedford Harbor Dredge Moni	Laboratory Water Control		
18770-005	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-005-072209 (Reference		
18770-001	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-001-072209 (190 NTU)		
18770-002	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-002-072209 (140 NTU)		
18770-003	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-003-072209 (110 NTU)		
18770-004	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-004-072209 (092 NTU)		

Test Acceptability

Analysis No	Endpoint	Attribute	Test Stat	Acceptabilty Limits	Overlap	Decision
06-7656-2976	Proportion Fertilized	Control Resp	0.988	0.7 - 1	Yes	Passes acceptability criteria
09-6737-1504	Proportion Fertilized	Control Resp	0.988	0.7 - 1	Yes	Passes acceptability criteria
10-6690-2820	Proportion Fertilized	Control Resp	0.988	0.7 - 1	Yes	Passes acceptability criteria
11-5470-6168	Proportion Fertilized	Control Resp	0.988	0.7 - 1	Yes	Passes acceptability criteria
17-7985-6300	Proportion Fertilized	Control Resp	0.988	0.7 - 1	Yes	Passes acceptability criteria
01-1516-8347	Proportion Fertilized	PMSD	0.01443	NL - 0.25	No	Passes acceptability criteria
06-7656-2976	Proportion Fertilized	PMSD	0.01384	NL - 0.25	No	Passes acceptability criteria
09-5020-8784	Proportion Fertilized	PMSD	0.01346	NL - 0.25	No	Passes acceptability criteria
09-6737-1504	Proportion Fertilized	PMSD	0.01371	NL - 0.25	No	Passes acceptability criteria
10-6690-2820	Proportion Fertilized	PMSD	0.01489	NL - 0.25	No	Passes acceptability criteria
11-5470-6168	Proportion Fertilized	PMSD	0.02683	NL - 0.25	No	Passes acceptability criteria
13-5798-4253	Proportion Fertilized	PMSD	0.01335	NL - 0.25	No	Passes acceptability criteria
16-0058-2404	Proportion Fertilized	PMSD	0.02555	NL - 0.25	No	Passes acceptability criteria
17-7985-6300	Proportion Fertilized	PMSD	0.0178	NL - 0.25	No	Passes acceptability criteria

Proportion Fertilized Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	0.988	0.9836	0.9924	0.9717	1	0.002157	0.01181	1.2%	0.0%
18770-005	4	0.9906	0.9866	0.9947	0.9806	1	0.001976	0.01082	1.09%	-0.27%
18770-001	4	0.9371	0.9309	0.9434	0.9259	0.9615	0.003074	0.01684	1.8%	5.14%
18770-002	4	0.903	0.8961	0.9099	0.88	0.9245	0.00337	0.01846	2.04%	8.6%
18770-003	4	0.981	0.9715	0.9905	0.9434	1	0.00465	0.02547	2.6%	0.71%
18770-004	4	0.9801	0.9771	0.9832	0.97	0.9901	0.001498	0.008207	0.84%	0.79%

Proportion Fertilized Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
18770-000	0.9901	0.9717	0.9901	1
18770-005	1	1	0.982	0.9806
18770-001	0.9352	0.9259	0.9259	0.9615
18770-002	0.88	0.9076	0.9245	0.9
18770-003	0.9434	0.9904	1	0.9901
18770-004	0.9804	0.9901	0.97	0.98

000-148-164-3 CETIS™ v1.6.4F Analyst:_____ QA:_____

Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	13-5798-4253	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	23 Jul-09 16:57	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	08-3312-6536	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	23 Jul-09 14:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	23 Jul-09 15:45	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					1.33%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-005		18770-004	1.543	1.943	0.05734	0.0869	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0041475	0.0041475	1	2.382	0.1737	Non-Significant Effect
Error	0.0104487	0.0017415	6			
Total	0.0145962	0.005889	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.747	47.47	0.4286	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8533		0.1030	Normal Distribution

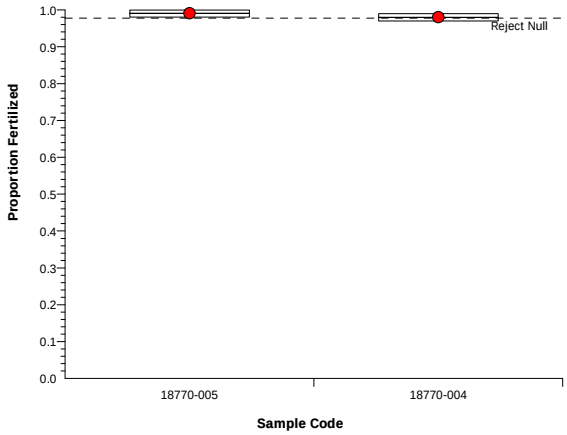
Proportion Fertilized Summary

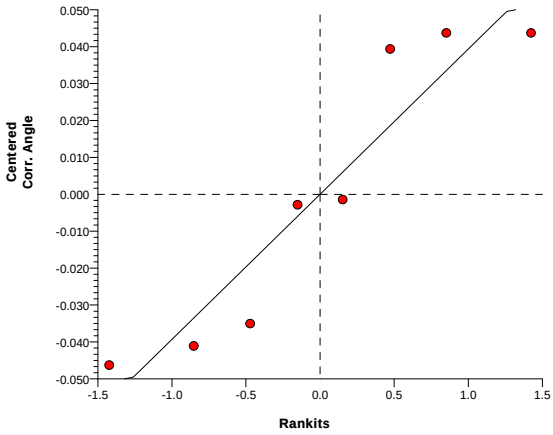
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	0.9906	0.9865	0.9948	0.9806	1	0.00201	0.01082	1.09%	0.0%
18770-004	4	0.9801	0.977	0.9832	0.97	0.9901	0.001524	0.008207	0.84%	1.06%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.477	1.458	1.497	1.431	1.521	0.009383	0.05053	3.42%	0.0%
18770-004	4	1.432	1.42	1.443	1.397	1.471	0.005661	0.03049	2.13%	3.08%

Graphics





Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	16-0058-2404	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	23 Jul-09 16:57	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	08-3312-6536	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	23 Jul-09 14:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	23 Jul-09 15:45	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					2.56%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-005		18770-003	0.5887	1.943	0.09379	0.2888	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0016145	0.0016145	1	0.3465	0.5776	Non-Significant Effect
Error	0.0279527	0.0046588	6			
Total	0.0295672	0.0062732	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.649	47.47	0.4448	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9021		0.3020	Normal Distribution

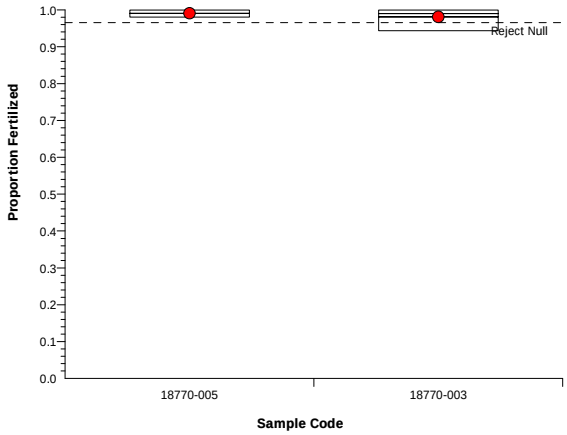
Proportion Fertilized Summary

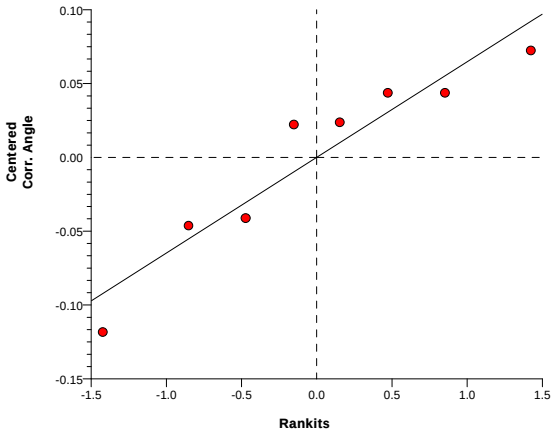
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	0.9906	0.9865	0.9948	0.9806	1	0.00201	0.01082	1.09%	0.0%
18770-003	4	0.981	0.9713	0.9907	0.9434	1	0.004729	0.02547	2.6%	0.98%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.477	1.458	1.497	1.431	1.521	0.009383	0.05053	3.42%	0.0%
18770-003	4	1.449	1.418	1.48	1.331	1.521	0.01527	0.08224	5.68%	1.92%

Graphics





Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	09-5020-8784	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	23 Jul-09 16:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	08-3312-6536	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	23 Jul-09 14:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	23 Jul-09 15:45	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					1.35%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-005		18770-002	7.48	1.943	0.05772	0.0001	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0987307	0.0987307	1	55.94	0.0003	Significant Effect
Error	0.0105888	0.0017648	6			
Total	0.1093195	0.1004955	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.616	47.47	0.4506	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8568		0.1116	Normal Distribution

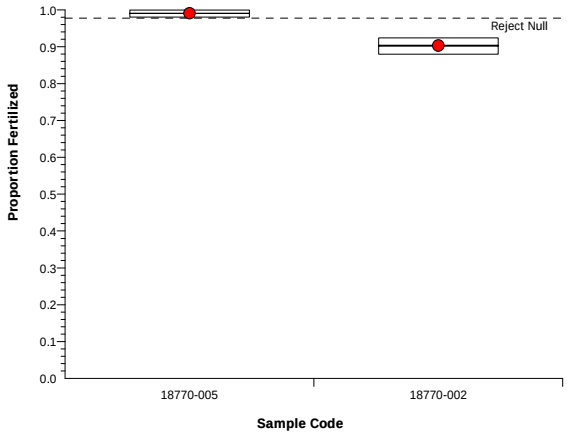
Proportion Fertilized Summary

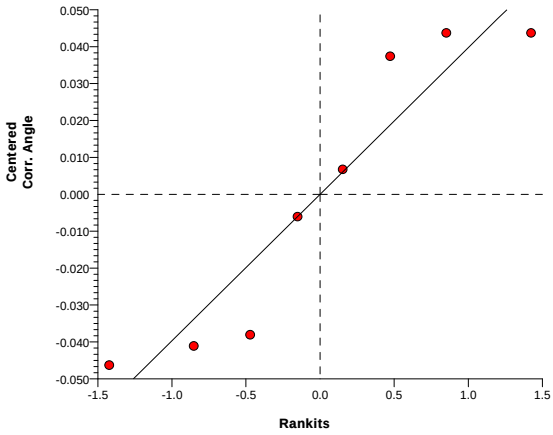
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	0.9906	0.9865	0.9948	0.9806	1	0.00201	0.01082	1.09%	0.0%
18770-002	4	0.903	0.896	0.91	0.88	0.9245	0.003428	0.01846	2.04%	8.84%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.477	1.458	1.497	1.431	1.521	0.009383	0.05053	3.42%	0.0%
18770-002	4	1.255	1.243	1.267	1.217	1.292	0.005802	0.03124	2.49%	15.04%

Graphics





Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	01-1516-8347	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	23 Jul-09 16:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	08-3312-6536	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	23 Jul-09 14:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	23 Jul-09 15:45	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					1.44%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-005		18770-001	5.042	1.943	0.0609	0.0012	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0499467	0.0499467	1	25.42	0.0024	Significant Effect
Error	0.0117884	0.0019647	6			
Total	0.0617352	0.0519115	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.856	47.47	0.6243	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8572		0.1125	Normal Distribution

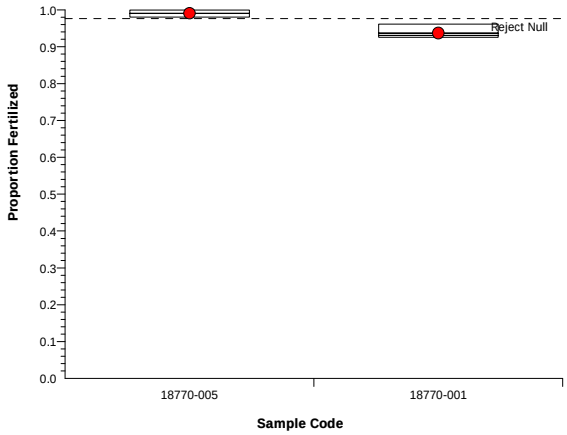
Proportion Fertilized Summary

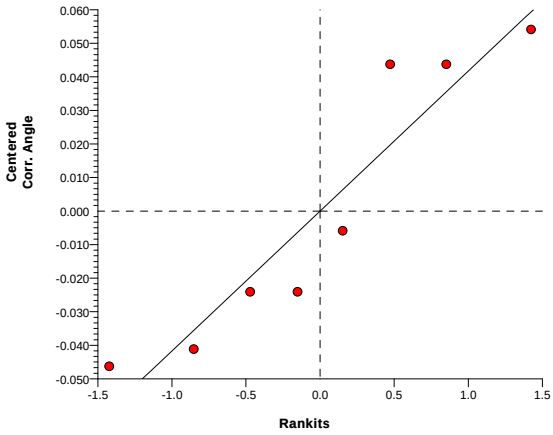
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	0.9906	0.9865	0.9948	0.9806	1	0.00201	0.01082	1.09%	0.0%
18770-001	4	0.9371	0.9307	0.9435	0.9259	0.9615	0.003127	0.01684	1.8%	5.4%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.477	1.458	1.497	1.431	1.521	0.009383	0.05053	3.42%	0.0%
18770-001	4	1.319	1.305	1.333	1.295	1.373	0.006888	0.0371	2.81%	10.7%

Graphics





Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	09-6737-1504	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	23 Jul-09 16:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	08-3312-6536	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	23 Jul-09 14:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	23 Jul-09 15:45	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					1.37%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-000		18770-004	1.195	1.943	0.056	0.1386	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0023717	0.0023717	1	1.428	0.2772	Non-Significant Effect
Error	0.0099678	0.0016613	6			
Total	0.0123395	0.0040330	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.575	47.47	0.4578	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9493		0.7039	Normal Distribution

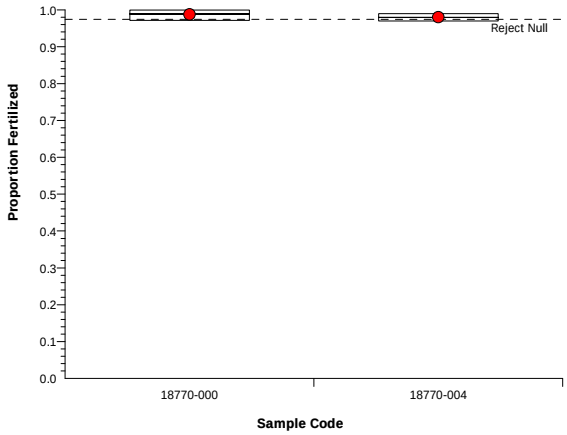
Proportion Fertilized Summary

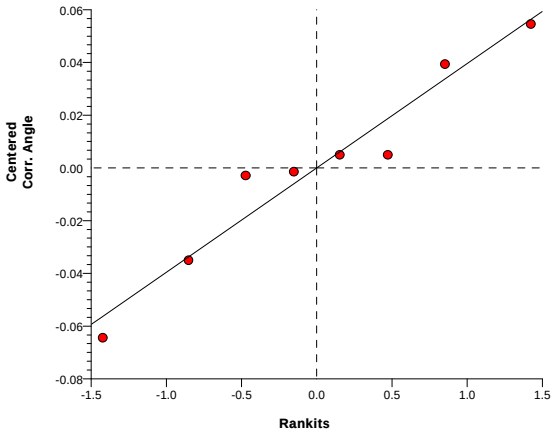
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	0.988	0.9835	0.9925	0.9717	1	0.002194	0.01181	1.2%	0.0%
18770-004	4	0.9801	0.977	0.9832	0.97	0.9901	0.001524	0.008207	0.84%	0.79%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.466	1.448	1.485	1.402	1.521	0.009084	0.04892	3.34%	0.0%
18770-004	4	1.432	1.42	1.443	1.397	1.471	0.005661	0.03049	2.13%	2.35%

Graphics





Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	11-5470-6168	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	23 Jul-09 16:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	08-3312-6536	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	23 Jul-09 14:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	23 Jul-09 15:45	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					2.68%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-000		18770-003	0.3618	1.943	0.09297	0.3650	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0005992	0.0005992	1	0.1309	0.7299	Non-Significant Effect
Error	0.0274718	0.0045786	6			
Total	0.0280710	0.0051779	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.826	47.47	0.4162	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9005		0.2922	Normal Distribution

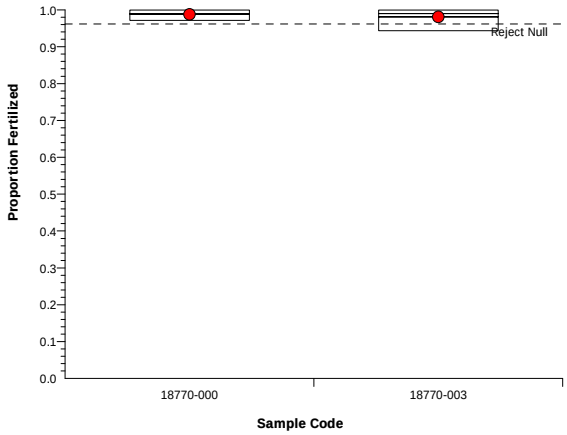
Proportion Fertilized Summary

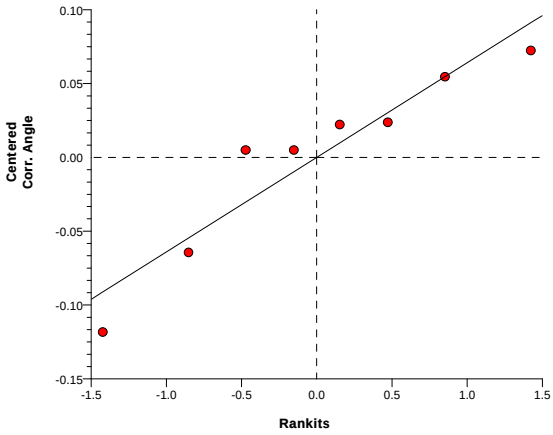
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	0.988	0.9835	0.9925	0.9717	1	0.002194	0.01181	1.2%	0.0%
18770-003	4	0.981	0.9713	0.9907	0.9434	1	0.004729	0.02547	2.6%	0.71%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.466	1.448	1.485	1.402	1.521	0.009084	0.04892	3.34%	0.0%
18770-003	4	1.449	1.418	1.48	1.331	1.521	0.01527	0.08224	5.68%	1.18%

Graphics





000-148-164-3 CETIS™ v1.6.4F Analyst:_____ QA:_____

Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	06-7656-2976	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	23 Jul-09 16:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	08-3312-6536	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	23 Jul-09 14:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	23 Jul-09 15:45	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					1.38%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-000		18770-002	7.273	1.943	0.0564	0.0002	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0891102	0.0891102	1	52.9	0.0003	Significant Effect
Error	0.0101079	0.0016847	6			
Total	0.0992181	0.0907948	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.452	47.47	0.4808	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9525		0.7360	Normal Distribution

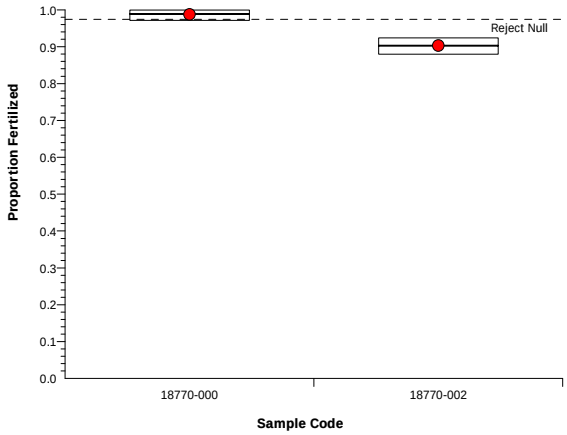
Proportion Fertilized Summary

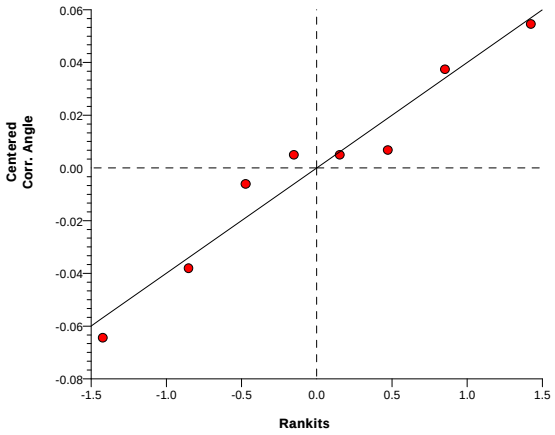
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	0.988	0.9835	0.9925	0.9717	1	0.002194	0.01181	1.2%	0.0%
18770-002	4	0.903	0.896	0.91	0.88	0.9245	0.003428	0.01846	2.04%	8.6%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.466	1.448	1.485	1.402	1.521	0.009084	0.04892	3.34%	0.0%
18770-002	4	1.255	1.243	1.267	1.217	1.292	0.005802	0.03124	2.49%	14.4%

Graphics





Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	10-6690-2820	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	23 Jul-09 16:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	08-3312-6536	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	23 Jul-09 14:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	23 Jul-09 15:45	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					1.49%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-000		18770-001	4.786	1.943	0.05965	0.0015	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0431752	0.0431752	1	22.91	0.0030	Significant Effect
Error	0.0113076	0.0018846	6			
Total	0.0544828	0.0450598	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.739	47.47	0.6606	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9284		0.5015	Normal Distribution

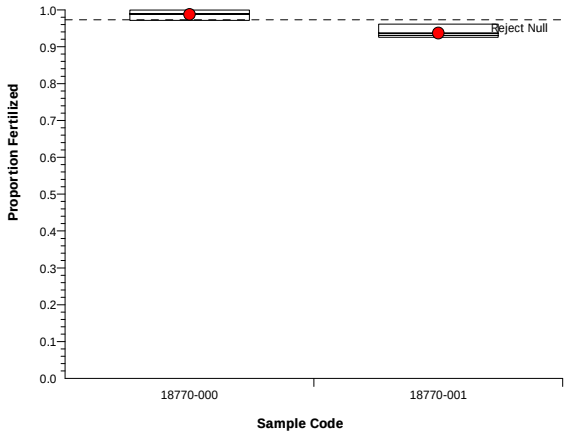
Proportion Fertilized Summary

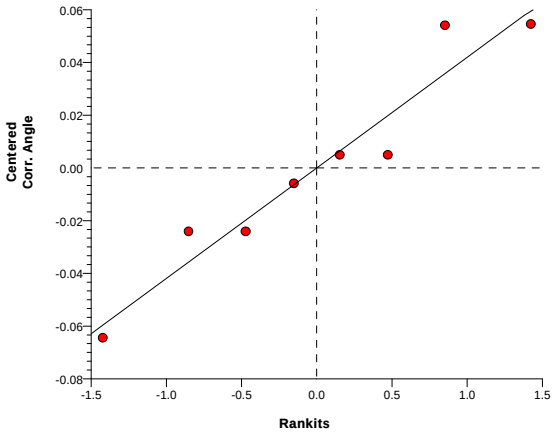
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	0.988	0.9835	0.9925	0.9717	1	0.002194	0.01181	1.2%	0.0%
18770-001	4	0.9371	0.9307	0.9435	0.9259	0.9615	0.003127	0.01684	1.8%	5.14%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.466	1.448	1.485	1.402	1.521	0.009084	0.04892	3.34%	0.0%
18770-001	4	1.319	1.305	1.333	1.295	1.373	0.006888	0.0371	2.81%	10.02%

Graphics





Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	17-7985-6300	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	23 Jul-09 16:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	08-3312-6536	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	23 Jul-09 14:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	23 Jul-09 15:45	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					1.78%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-000		18770-005	-0.3157	1.943	0.06833	0.6185	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0002465	0.0002465	1	0.09968	0.7629	Non-Significant Effect
Error	0.0148398	0.0024733	6			
Total	0.0150863	0.0027198	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.067	47.47	0.9587	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8966		0.2691	Normal Distribution

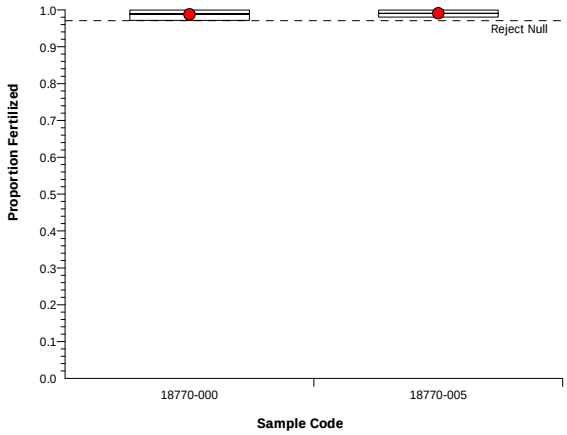
Proportion Fertilized Summary

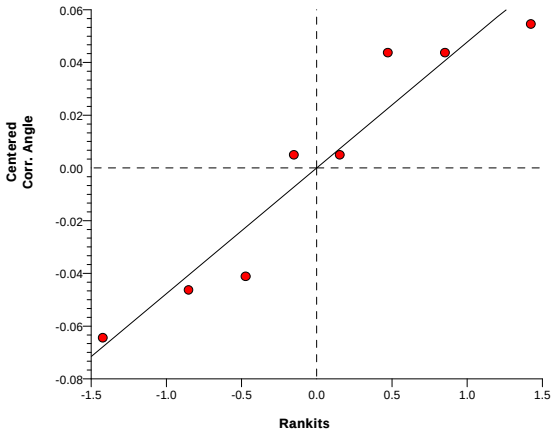
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	0.988	0.9835	0.9925	0.9717	1	0.002194	0.01181	1.2%	0.0%
18770-005	4	0.9906	0.9865	0.9948	0.9806	1	0.00201	0.01082	1.09%	-0.27%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.466	1.448	1.485	1.402	1.521	0.009084	0.04892	3.34%	0.0%
18770-005	4	1.477	1.458	1.497	1.431	1.521	0.009383	0.05053	3.42%	-0.76%

Graphics





STUDY NUMBER: 18770 CLIENT: Woods Hole NBH EFFLUENT: 001,002,003,004,005

DATE: 7/24/09 TECHNICIAN: UB

100% Effluent As Received Water Qualities:

Salinity 23.2 (001) 19.0 (002) 17.4 (003) 21.5 (004) 27.4 (005) pH 7.27 7.37 7.40 7.54 7.54 S/C _____ TRC _____

Salinity Adjustment Record:

1000 mL Effluent + ~~7.88~~ 65 13 14 10 3 g Sea Salts -or- mL Spring Water (Circle One)

Bottles Pulled:

Effluent: AMM ☐ TS/S ☐ TOC ☐ // Diluent: AMM ☐ TS/S ☐ TOC ☐

DILUTIONS

STUDY: 18770	CLIENT: ~~ENSR~~ WHG - New Bedford	
SPECIES: *C. parvula*		
Diluent: Lab Salt	Day: 0 Start Sample: 001, 002, 003, 004, 005	
Concentration %	Vol. Eff.(mls)	Final Vol.(mls)
65 Lab	800	800
~~6.25%~~ 001	↓	↓
~~12.5%~~ 002		
~~25%~~ 003		
~~50%~~ 004		
~~100%~~ 005		
INITIALS:	UB	
TIME:	1405	
DATE:	7/24/09	

Champia parvula Plant Viability Summary

STUDY NUMBER: 18770 ASSAY START: 07/24/09 ASSAY END: 07/26/09

REP/Branch	CONTROL	001	002	003	004	005
A 1	4	0	1	2	3	3
2		0	1	2	3	3
3		0	1	2	3	4
4		0	0	2	2	3
5		0	1	2	3	3
B 1	4	0	1	2	3	4
2		0	1	2	3	3
3		0	0	2	3	4
4		0	1	2	3	3
5		0	1	2	3	3
C 1	4	0	1	1	3	3
2	4	0	1	2	2	3
3	4	0	1	2	3	3
4	4	0	1	2	3	3
5	4	0	1	2	3	3
D 1	4	0	0	2	3	3
2	4	0	1	2	3	3
3	4	0	1	2	3	4
4	4	0	1	2	3	3
5	4	0	0	2	3	3
SALINITY	28	30	29	31	30	30
pH (SU)	8.08	7.50	7.65	7.73	7.70	7.65
S/C (µmhos)	45500	46000	45070	48670	46500	46320
TEMP (°C	24					
TRC	<0.02					—

pH meter# 1097 pH probe# 73 S/C meter# 3 S/C probe# 82 Salinity meter# YSI 30D

Scoring for Acute Assay Endpoint - Plant Health/Viability

SCORE	Description
4	Plants with good color and no signs of degeneration
3	Color faded - some sign of bleaching color light red to pink; no branch tip degeneration
2	Color faded - light pink; no green, yellow or white branch tips; no branch tip degeneration
1	Color yellow to white; no branch tip degeneration
0	Color limited to white; signs of branch tip degeneration

Technician Initials : CB/LB

CETIS Summary Report

Report Date: 27 Jul-09 11:02 (p 1 of 1)
Link/Link Code: 15-1550-6597

Champia parvula Red Macroalga Sexual Reproduction Test Branch Tip Viability **EnviroSystems, Inc.**

Test Run No:	15-5181-9457	**Test Type:**	Champia	**Analyst:**	
Start Date:	24 Jul-09 15:25	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	26 Jul-09 17:45	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	50h	**Source:**	Saskatchewan Research	**Age:**	

Sample Code	Sample No	Sample Date	Receive Date	Sample Age	Client Name	Project
18770-000	06-7167-7012	23 Jul-09 12:00	23 Jul-09 12:00	27h	Woods Hole Group	Ecological Risk Assessme
18770-005	03-9927-1818	22 Jul-09 09:49	22 Jul-09 17:47	54h		
18770-001	15-6024-8561	22 Jul-09 08:26	22 Jul-09 17:47	55h		
18770-002	05-1145-9131	22 Jul-09 09:52	22 Jul-09 17:47	54h		
18770-003	01-6638-4937	22 Jul-09 09:51	22 Jul-09 17:47	54h		
18770-004	06-1076-1745	22 Jul-09 09:51	22 Jul-09 17:47	54h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
18770-000	Surface Water	New Bedford Harbor Dredge Moni	Laboratory Water Control		
18770-005	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-005-072209 (Reference		
18770-001	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-001-072209 (190 NTU)		
18770-002	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-002-072209 (140 NTU)		
18770-003	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-003-072209 (110 NTU)		
18770-004	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-004-072209 (092 NTU)		

Mean ~~Cystocarps Summary~~ Branch Viability

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	4	4	4	4	4	0	0	0.0%	0.0%
18770-005	4	3.2	3.139	3.261	3	3.4	0.02981	0.1633	5.1%	20.0%
18770-001	4	0	0	0	0	0	0	0		100.0%
18770-002	4	0.8	0.739	0.861	0.6	1	0.02981	0.1633	20.41%	80.0%
18770-003	4	1.95	1.913	1.987	1.8	2	0.01826	0.1	5.13%	51.25%
18770-004	4	2.9	2.857	2.943	2.8	3	0.02108	0.1155	3.98%	27.5%

Mean ~~Cystocarps Detail~~ Branch Viability

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
18770-000	4	4	4	4
18770-005	3.2	3.4	3	3.2
18770-001	0	0	0	0
18770-002	0.8	0.8	1	0.6
18770-003	2	2	1.8	2
18770-004	2.8	3	2.8	3

000-148-164-3 CETIS™ v1.6.4F Analyst:_____ QA:_____

Champia parvula Red Macroalga Sexual Reproduction Test Branch Tip Viability **EnviroSystems, Inc.**

Analysis No:	07-2840-3294	**Endpoint:**	~~Mean Cystocarps~~ Plant	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 11:00	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	15-5181-9457	**Test Type:**	Champia	**Analyst:**	
Start Date:	24 Jul-09 15:25	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	26 Jul-09 17:45	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	50h	**Source:**		**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					6.07%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-005		18770-004	3	1.943	0.1943	0.0120	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.18	0.18	1	9	0.0240	Significant Effect
Error	0.12	0.02	6			
Total	0.3	0.2	7			

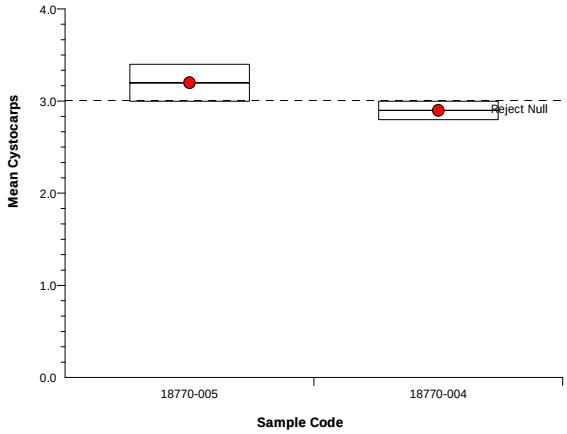
ANOVA Assumptions

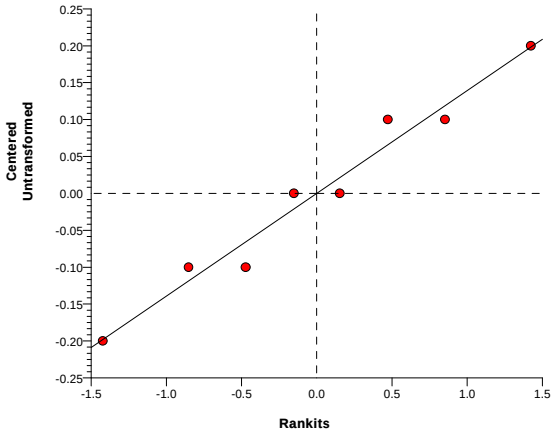
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2	47.47	0.5836	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9651		0.8568	Normal Distribution

Mean ~~Cystocarps Summary~~ Branch Viability

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	3.2	3.138	3.262	3	3.4	0.03032	0.1633	5.1%	0.0%
18770-004	4	2.9	2.856	2.944	2.8	3	0.02144	0.1155	3.98%	9.38%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test Branch Tip Viability **EnviroSystems, Inc.**

Analysis No:	08-4729-3241	**Endpoint:**	~~Mean Cystocarps~~ Plant	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 11:00	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	15-5181-9457	**Test Type:**	Champia	**Analyst:**	
Start Date:	24 Jul-09 15:25	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	26 Jul-09 17:45	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	50h	**Source:**		**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					5.81%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-005		18770-003	13.06	1.943	0.186	0.0000	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	3.125	3.125	1	170.5	0.0000	Significant Effect
Error	0.11	0.0183333	6			
Total	3.235	3.143333	7			

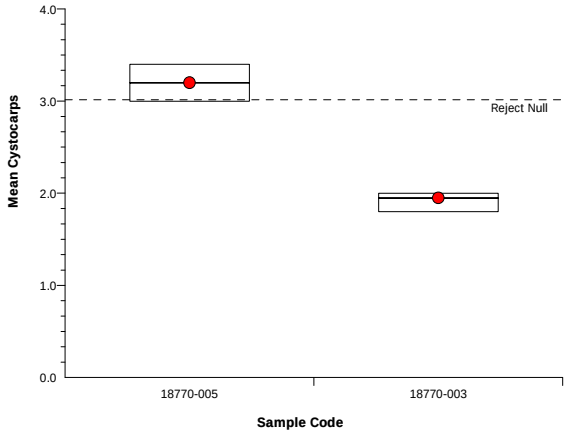
ANOVA Assumptions

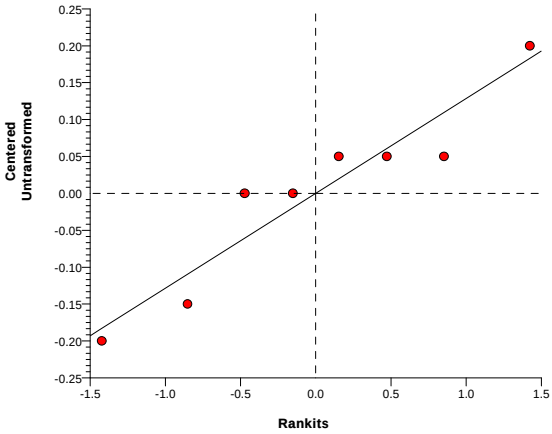
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.667	47.47	0.4419	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9128		0.3739	Normal Distribution

Mean ~~Cystocarps Summary~~ Branch Viability

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	3.2	3.138	3.262	3	3.4	0.03032	0.1633	5.1%	0.0%
18770-003	4	1.95	1.912	1.988	1.8	2	0.01857	0.1	5.13%	39.06%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test Branch Tip Viability **EnviroSystems, Inc.**

Analysis No:	17-5710-5878	**Endpoint:**	~~Mean Cystocarps~~ Plant	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 11:00	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	15-5181-9457	**Test Type:**	Champia	**Analyst:**	
Start Date:	24 Jul-09 15:25	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	26 Jul-09 17:45	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	50h	**Source:**		**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					7.01%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-005		18770-002	20.78	1.943	0.2244	0.0000	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	11.52	11.52	1	432	0.0000	Significant Effect
Error	0.16	0.0266667	6			
Total	11.68	11.54667	7			

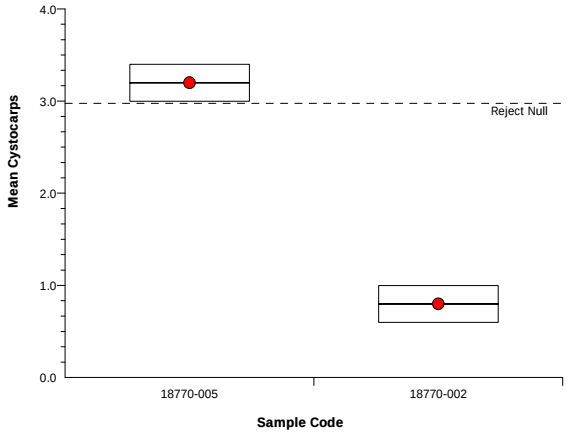
ANOVA Assumptions

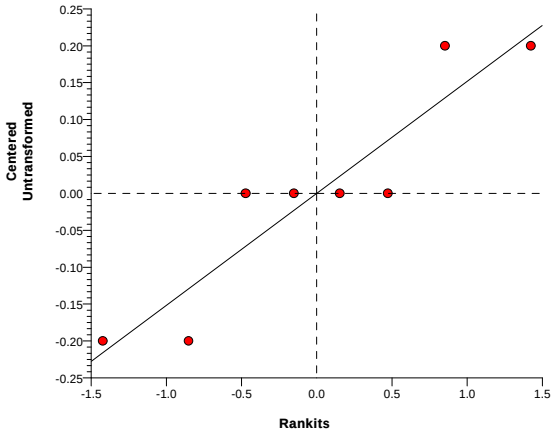
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1	47.47	1.0000	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8489		0.0929	Normal Distribution

Mean ~~Cystocarps Summary~~ Branch Viability

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	3.2	3.138	3.262	3	3.4	0.03032	0.1633	5.1%	0.0%
18770-002	4	0.8	0.7379	0.8621	0.6	1	0.03032	0.1633	20.41%	75.0%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test Branch Tip Viability **EnviroSystems, Inc.**

Analysis No:	02-0675-1624	**Endpoint:**	~~Mean Cystocarps~~ Plant	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 11:00	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	15-5181-9457	**Test Type:**	Champia	**Analyst:**	
Start Date:	24 Jul-09 15:25	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	26 Jul-09 17:45	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	50h	**Source:**		**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					4.96%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-005		18770-001	10		0	0.0143	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	20.48	20.48	1	1536	0.0000	Significant Effect
Error	0.08	0.0133333	6			
Total	20.56	20.49333	7			

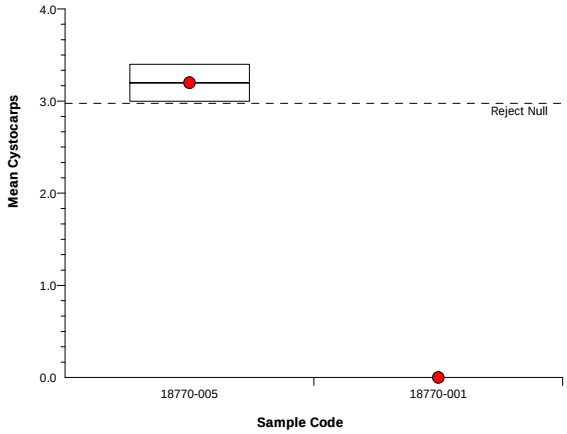
ANOVA Assumptions

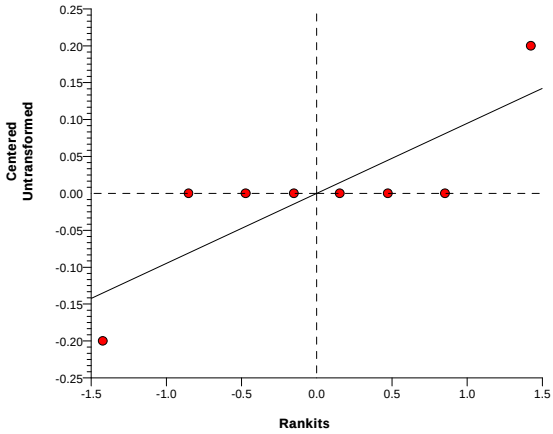
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	3	13.75	0.1340	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7322		0.0052	Non-normal Distribution

Mean ~~Cystocarps Summary~~ Branch Viability

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	3.2	3.138	3.262	3	3.4	0.03032	0.1633	5.1%	0.0%
18770-001	4	0	0	0	0	0	0	0		100.0%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test Branch Tip Viability **EnviroSystems, Inc.**

Analysis No:	16-1616-7438	**Endpoint:**	~~Mean Cystocarps~~ Plant	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 11:00	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	15-5181-9457	**Test Type:**	Champia	**Analyst:**	
Start Date:	24 Jul-09 15:25	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	26 Jul-09 17:45	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	50h	**Source:**		**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					2.8%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-000		18770-004	19.05	1.943	0.1122	0.0000	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2.42	2.42	1	363	0.0000	Significant Effect
Error	0.04	0.0066667	6			
Total	2.46	2.426667	7			

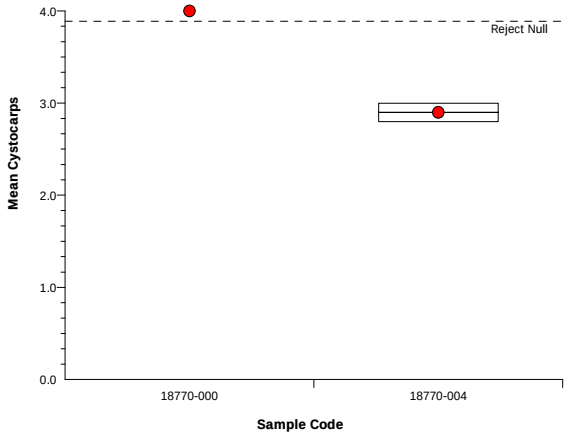
ANOVA Assumptions

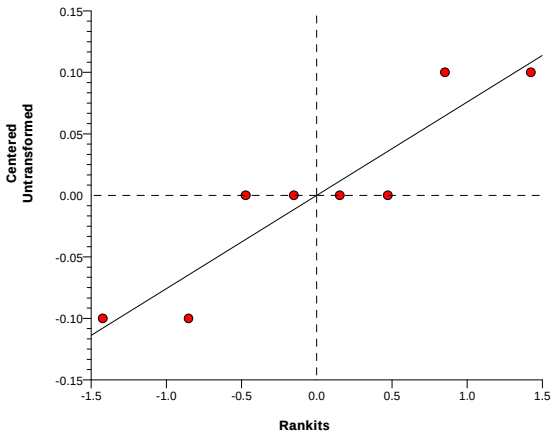
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	65540	13.75	0.0000	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.8489		0.0929	Normal Distribution

Mean ~~Cystocarps Summary~~ Branch Viability

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	4	4	4	4	4	0	0	0.0%	0.0%
18770-004	4	2.9	2.856	2.944	2.8	3	0.02144	0.1155	3.98%	27.5%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test Branch Tip Viability **EnviroSystems, Inc.**

Analysis No:	20-3632-1340	**Endpoint:**	~~Mean Cystocarps~~ Plant	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 11:00	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	15-5181-9457	**Test Type:**	Champia	**Analyst:**	
Start Date:	24 Jul-09 15:25	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	26 Jul-09 17:45	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	50h	**Source:**		**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					2.43%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-003	10		0	0.0143	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	8.405	8.405	1	1681	0.0000	Significant Effect
Error	0.03	0.005	6			
Total	8.434999	8.41	7			

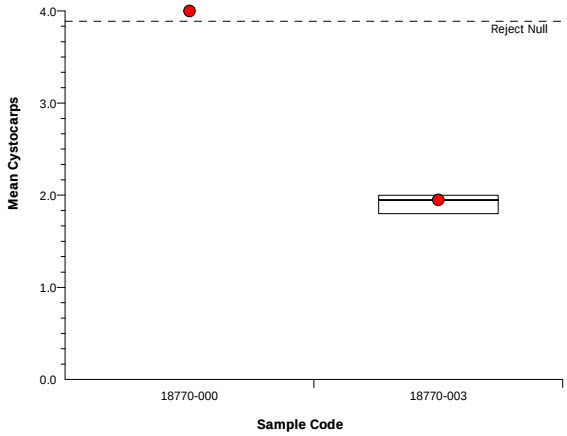
ANOVA Assumptions

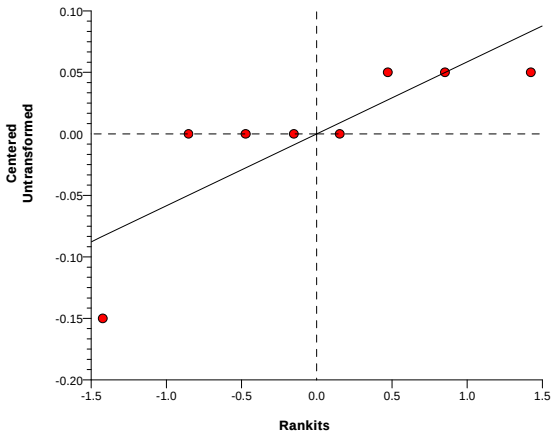
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

Mean ~~Cystocarps Summary~~ Branch Viability

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	4	4	4	4	4	0	0	0.0%	0.0%
18770-003	4	1.95	1.912	1.988	1.8	2	0.01857	0.1	5.13%	51.25%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test Branch Tip Viability **EnviroSystems, Inc.**

Analysis No:	21-0469-8663	**Endpoint:**	~~Mean Cystocarps~~ Plant	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 11:00	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	15-5181-9457	**Test Type:**	Champia	**Analyst:**	
Start Date:	24 Jul-09 15:25	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	26 Jul-09 17:45	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	50h	**Source:**		**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					3.97%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-002	10		0	0.0143	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	20.48	20.48	1	1536	0.0000	Significant Effect
Error	0.08	0.0133333	6			
Total	20.56	20.49333	7			

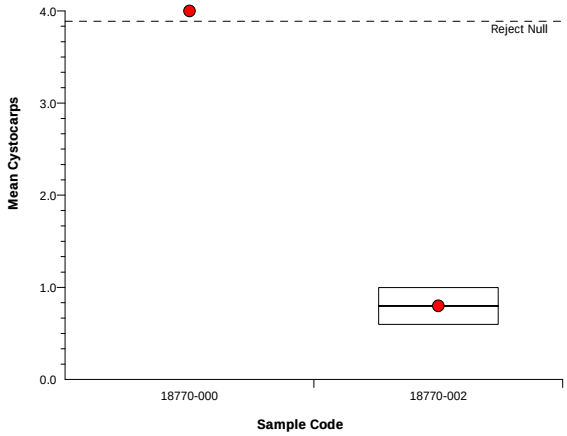
ANOVA Assumptions

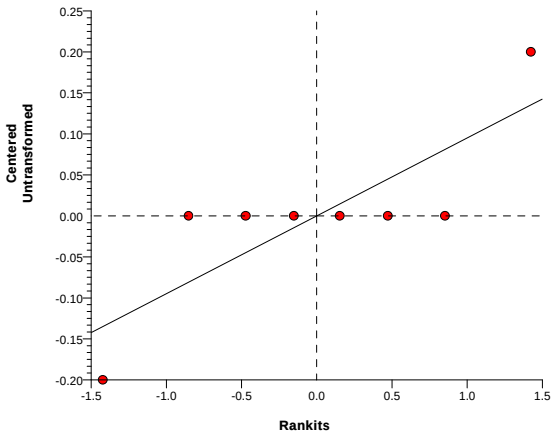
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	3	13.75	0.1340	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7322		0.0052	Non-normal Distribution

Mean ~~Cystocarps Summary~~ Branch Viability

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	4	4	4	4	4	0	0	0.0%	0.0%
18770-002	4	0.8	0.7379	0.8621	0.6	1	0.03032	0.1633	20.41%	80.0%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test Branch Tip Viability **EnviroSystems, Inc.**

Analysis No:	10-2051-9019	**Endpoint:**	~~Mean Cystocarps~~ Plant	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 11:00	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	15-5181-9457	**Test Type:**	Champia	**Analyst:**	
Start Date:	24 Jul-09 15:25	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	26 Jul-09 17:45	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	50h	**Source:**		**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					0.0%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-001	10		0	0.0143	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	32	32	1	65540	0.0000	Significant Effect
Error	0	0	6			
Total	32	32	7			

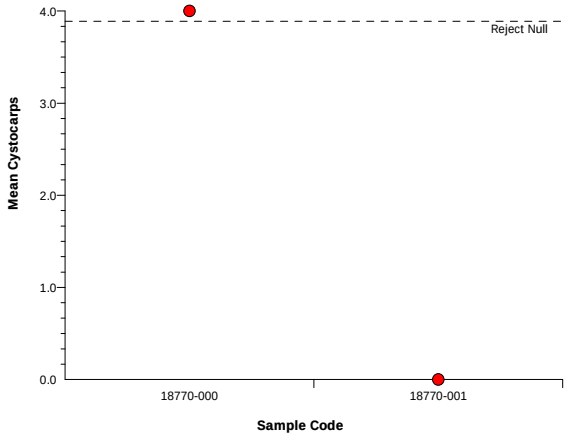
ANOVA Assumptions

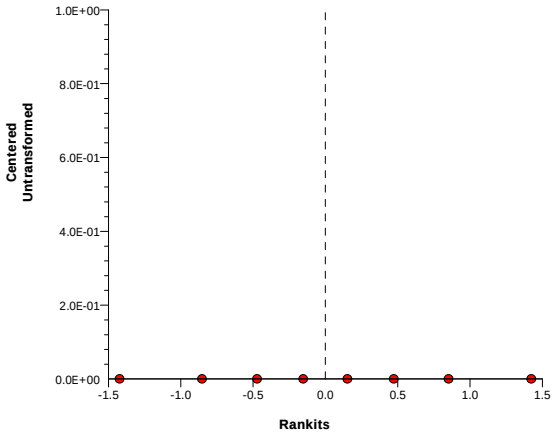
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	65540	13.75	0.0000	Unequal Variances

Mean ~~Cystocarps Summary~~ Branch Viability

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	4	4	4	4	4	0	0	0.0%	0.0%
18770-001	4	0	0	0	0	0	0	0		100.0%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test Branch Tip Viability **EnviroSystems, Inc.**

Analysis No:	21-2050-8151	**Endpoint:**	~~Mean Cystocarps~~ Plant	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 11:00	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	15-5181-9457	**Test Type:**	Champia	**Analyst:**	
Start Date:	24 Jul-09 15:25	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	26 Jul-09 17:45	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	50h	**Source:**		**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					3.97%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-005	10		0	0.0143	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1.28	1.28	1	96	0.0001	Significant Effect
Error	0.08	0.0133333	6			
Total	1.36	1.293333	7			

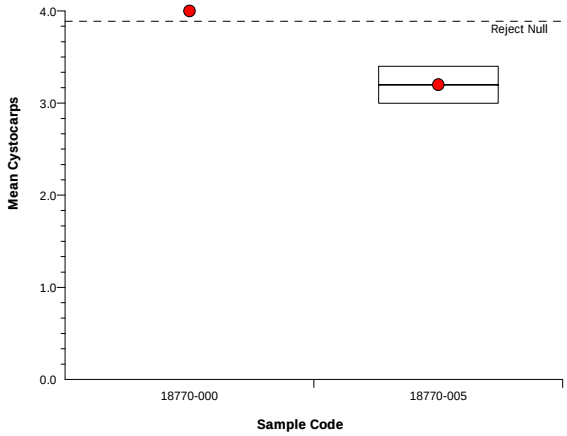
ANOVA Assumptions

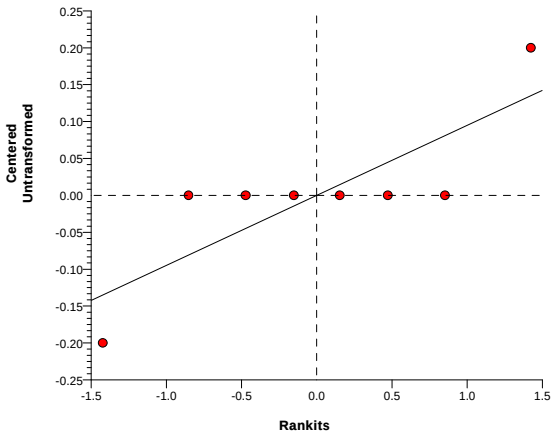
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	3	13.75	0.1340	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7322		0.0052	Non-normal Distribution

Mean ~~Cystocarps Summary~~ Branch Viability

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	4	4	4	4	4	0	0	0.0%	0.0%
18770-005	4	3.2	3.138	3.262	3	3.4	0.03032	0.1633	5.1%	20.0%

Graphics





SALTWATER ASSAYS

A. bahia, A. punctulata, C. parvula

STUDY: ~~18622~~ 18770	LOCATION: New Bedford Harbor					
CHEMISTRY	Lab Salt Control	-001 ~~Reference Site~~ 200 NTU	-002 ~~200 NTU~~ 150 NTU	-003 ~~150 NTU~~ 100 NTU	-004 ~~100 NTU~~ 50 NTU	-005 ~~50 NTU~~ Ref
AMMONIA	18708-007	~~18622~~ 18770-006	007	008	009	010
AS RECEIVED WATER QUALITIES	Lab Salt Control	-001	-002	-003	-004	-005
SALINITY (ppt)	25.0	23.2	19	17.4	21.5	27.4
pH (SU)	7.97	7.27	7.37	7.40	7.54	7.71
TRC (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
DO (mg/L)	7.2	7.0	6.9	6.9	6.8	6.2
S/C (µmhos/cm)	38360					
WQ STATION USED	1					
INITIALS	LRO					
A. bahia SALINITY ADJUSTMENT RECORD	Lab Salt Control	-001	-002	-003	-004	-005
SAMPLE (mLs)		4000	4000	4000	4000	4000
SEA SALT (g)		9	28	35	16	—
DATE:	7/23/09					
TIME:	1400					
INITIALS:	SJ					

Sample ID	ESI Cube ID
-001	-001
-002	-002
-003	-003
-004	-004
-005	-005

DILUTIONS

STUDY: 18770	CLIENT: Woods Hole Group	
SPECIES: *A. bahia*		
	Sample: New Bedford Harbor	
Concentration %	Vol. Eff.(mls)	Final Vol.(mls)
Lab	0	800
Reference Water 005	800	↓
50 NTU 004	↓	↓
100 NTU 003	↓	↓
150 NTU 002	↓	↓
200 NTU 001	↓	↓
INITIALS:	SJ	
TIME:	1500	
DATE:	7/24/09	

RECORD OF METERS USED

STUDY: 18770		CLIENT: Woods Hole Group	
A.bahia			
Exposure (Hours)			
	0	24	48
Water Quality Station #	2	2	
Initials / Date	SJ 7/23/09	SJ 7/24	

Water Quality Station #1		Water Quality Station #2		COMMENTS
DO meter #		DO meter #	23	
DO probe #		DO probe #	20	
pH meter #		pH meter #	470	
pH probe #		pH probe #	85	
S/C meter #		S/C meter #	YSI30D	
S/C probe #		S/C probe #	↓	
Salinity meter #		Salinity meter #		

Report No: 18770 SDG:
Project: NBH Monitoring

Sample ID: DS-TOX-001-072209
Matrix: Water
Sampled: 07/22/09 0826

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Ammonia-N	18770-006	0.15	0.1	mg/L as N	07/27/09	07/27/09	MES/SM 4500-NH3 G

Sample ID: DS-TOX-002-072209
Matrix: Water
Sampled: 07/22/09 0952

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Ammonia-N	18770-007	ND	0.1	mg/L as N	07/27/09	07/27/09	MES/SM 4500-NH3 G

Sample ID: DS-TOX-003-072209
Matrix: Water
Sampled: 07/22/09 0951

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Ammonia-N	18770-008	ND	0.1	mg/L as N	07/27/09	07/27/09	MES/SM 4500-NH3 G

Sample ID: DS-TOX-004-072209
Matrix: Water
Sampled: 07/22/09 0951

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Ammonia-N	18770-009	ND	0.1	mg/L as N	07/27/09	07/27/09	MES/SM 4500-NH3 G

Sample ID: DS-TOX-005-072209
Matrix: Water
Sampled: 07/23/09 0949

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Ammonia-N	18770-010	ND	0.1	mg/L as N	07/27/09	07/27/09	MES/SM 4500-NH3 G

Notes:

ND = Not Detected

ESI

EnviroSystems, Inc. P.O. Box 778 Hampton, NH 03842-0778 603-926-3345 fax 603-926-3521 www.envirosystems.com

Report No:	18708	SDG:	
Project:	Laboratory Seawater		
Sample ID:	Lab Salt 07/23/09		
Matrix:	Water		
Sampled:	07/23/09		

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Ammonia-N	18708-027	ND	0.1	mg/L as N	07/27/09	07/27/09	MES/SM 4500-NH3 G

Notes:

ND = Not Detected

ESI

EnviroSystems, Inc. P.O. Box 778 Hampton, NH 03842-0778 603-926-3345 fax 603-926-3521 www.envirosystems.com

ESI

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO:	~~18622~~ 18770 (E3) SJ 7/23/09		
SDG No:			
Project:	New Bedford Harbor Monitoring		
Delivered via:	Client		
Date and Time Received:	07/23/09 1747	Date and TIme Logged into Lab:	01/23/09 0820
Recieved By:	SJ	Logged into Lab by:	SJ
Air bill / Way bill:	No	Air bill included in folder if received?	NA
Cooler on ice/packs:	Yes	Custody Seals present?	NA
Cooler Blank Temp (C) at arrival:	2	Custody Seals intact?	NA
Number of COC Pages:	1		
COC Serial Number(s):			
COC Complete:		Does the info on the COC match the samples?	Yes
Sampled Date:	Yes	Were samples received within holding time?	Yes
Field ID complete:	Yes	Were all samples properly labeled?	Yes
Sampled Time:	Yes	Were proper sample containers used?	Yes
Analysis request:	Yes	Were samples received intact? (none broken or leaking)	Yes
COC Signed and dated:	Yes	Were sample volumes sufficient for requested analysis?	Yes
Were all samples received?	Yes	Were VOC vials free of headspace?	NA
Client notification/authorization:	Not required		

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
DS-TOX-001-072209	~~18622~~ 18770-001	W	AB48AD, AP01CR, CP48AD;	20 L	4C	
DS-TOX-002-072209	~~18622~~ 18770-002	W	AB48AD, AP01CR, CP48AD;	20 L	4C	
DS-TOX-003-072209	~~18622~~ 18770-003	W	AB48AD, AP01CR, CP48AD;	20 L	4C	
DS-TOX-004-072209	~~18622~~ 18770-004	W	AB48AD, AP01CR, CP48AD;	20 L	4C	
DS-TOX-005-072209	~~18622~~ 18770-005	W	AB48AD, AP01CR, CP48AD;	20 L	4C	

Notes and qualifications:

EnviroSystems, Inc. One Lafayette Road P.O. Box 778 Hampton, NH 03842-0778 (603) 926-3345 fax (603) 926-3521 www.envirosystems.com

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

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

ESI Job No: 18770

CHAIN OF CUSTODY DOCUMENTATION

Client: Woods Hole Group	Contact: Dave Walsh	Project Name: NBH monitoring	Page 1 of 1
Report to: Dave Walsh	Address: 81 Technology Park Dr.	Project Number: TO-0010	
Invoice to: Cathy Morey	Address: E. Falmouth, MA	Project Manager: Dave Walsh	
Voice: 508-540-8080	Fax: 508-540-1001	email: dwalsh@whgrp.com	P.O. No: Quote No:

Protocol: RCRA SDWA NPDES USCOE Other

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composit (G/C)	Container Size (ml.) (5 gal)	Container Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested\ Special Instructions:
001	DS-TOX-001-072209	7/22	0826	KGM	G	20L	P	N/A	W	N	toxicity (acute)
002	DS-TOX-002-072209	7/22	0952	KGM	C	20L	P	N/A	W	N	acute toxicity
003	DS-TOX-003-072209	7/22	0951	KGM	C	20L	P	N/A	W	N	acute toxicity
004	DS-TOX-004-072209	7/22	0951	KGM	C	20L	P	N/A	W	N	acute toxicity
005	DS-TOX-005-072209	7/22	0949	KGM	G	20L	P	N/A	W	N	acute toxicity

Relinquished By: Kaitlyn McCartney	Date: 7/22/09 Time: 1355	Received By: Martin Potter	Date: 07/22/09 Time: 1355
Relinquished By: Martin Potter	Date: 07/22/09 Time: 1747	Received at Lab By: [signature]	Date: 7/22/09 Time: 1747

Comments:

Sample Delivery Group No: Page of

COC Doc No: 3765

7°C