Final

Summary and Evaluation of Phase 1 (2005)Sediment Toxicity Tests Upper Columbia River Site

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Acronyms and Abbreviations

°C	degrees Celsius
A&R	approach and rationale
ABS	Aquatic Bio Systems
amsl	above mean sea level
ANOVA	analysis of variance
ASL	Applied Science Laboratories
ASTM	American Society for Testing and Materials
AVS	acid volatile sulfides
BERA	baseline ecological risk assessment
BLM	biotic ligand model
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEE	CH2M HILL and Ecology and Environment
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
cm	centimeter(s)
COI	contaminant of interest
COPC	contaminant of potential concern
CSM	conceptual site model
DDT	dichlorodiphenyltrichloroethane
dioxin	polychlorinated dibenzo-p-dioxin
DQO	data quality objective
Ecology	State of Washington Department of Ecology
ESB	equilibrium partitioning-based sediment benchmark
f_{OC}	fraction organic carbon
furan	polychlorinated dibenzofuran
g	gram(s)
g_{OC}	gram organic carbon
ICP	inductively coupled plasma
MDL	method detection limit
µg/L	microgram(s) per liter
µmol	micromole(s)
mg/kg	milligram(s) per kilogram

mg/L	milligram(s) per liter
NA	not applicable
NAS	Northwestern Aquatic Sciences
NRWQC	National Recommended Water Quality Criteria
PAHs	polycyclic aromatic hydrocarbons
PARCC	precision, accuracy, representativeness, comparability, and completeness
PCB	polychlorinated biphenyl
PEC	probable effects concentration
PEC-Q	PEC quotient
PW-TU	pore water toxic unit
QA	quality assurance
QAPP	quality assurance project plan
QC	quality control
REC	reference envelope criterion
RI/FS	remedial investigation/feasibility study
RL	reporting limit
RM	river mile
RPD	relative percent difference
SEM	simultaneously extracted metals
SLERA	screening level ecological risk assessment
TAL	target analyte list
TEC	threshold effect concentration
TAI	Teck American Incorporated
TOC	total organic carbon
TU	toxic unit
UCR	Upper Columbia River
U.S.	United States
USEPA	U.S. Environmental Protection Agency
USGS	United States Geologic Survey

SECTION 1

Introduction

This Sediment Toxicity Testing and Pore Water Data Evaluation Report provides an assessment of the potential impacts on the survival, growth, and reproduction of benthic macroinvertebrates from exposure to Upper Columbia River (UCR) sediments. The data evaluated in this report were collected during the 2005 Phase 1 sediment sampling program that was conducted under the direction of the United States Environmental Protection Agency (USEPA) in anticipation of a possible Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remedial investigation/feasibility study (RI/FS) for the site. Samples were collected in April and May 2005.

The Phase 1 sediment sampling program was developed following the process described in the *RI/FS Document and Data Gathering Task Summary* (CH2M HILL, 2004). The approach and rationale (A&R) used for program development are described in the *Phase 1 Sediment Approach and Rationale Document* (CH2M HILL and Ecology and Environment [CEE], 2004). Development of the Phase 1 sediment sampling program involved creation of a preliminary conceptual site model (CSM), definition of data quality objectives (DQOs), identification of data needs, assessment of existing data usability, and identification of data gaps. The Phase 1 sediment sampling program was developed in consideration of the specific data needs identified in the DQO process, the unique characteristics of the site, and comments received from participating stakeholders. The specific policies, organizations, objectives, and functional activities/ procedures for the program are described in the *Phase 1 Sediment Sampling Quality Assurance Project Plan* (Phase 1 Sediment QAPP) (CEE, 2005). The field activities associated with the program are described in the *Phase 1 Sediment Sampling Field Report* (Sediment Field Report) (CH2M HILL, 2006).

More than 387 sediment samples, from approximately 150 miles of the Columbia River between the United States (U.S.)-Canada border and Grand Coulee Dam, were collected for laboratory analysis. Whole sediment toxicity tests were conducted on a subset of these Phase 1 sediment samples. The resulting data were to be used, in conjunction with other data, to characterize the potential risk to benthic/epibenthic resources (that is, benthic infaunal communities) in the UCR.

A draft technical memorandum documenting the results of the 2005 sediment toxicity tests was released in October 2006 (*Upper Columbia River Site CERCLA RI/FS Summary and Evaluation of 2005 Sediment Toxicity Test Results)* but was not finalized. This report supersedes the earlier draft report and incorporates additional data analyses. The 2005 results will be considered and incorporated as appropriate into the UCR ecological risk assessment after additional site-specific toxicity data are collected by Teck American Incorporated (TAI).

2.1 Objectives

The overall objectives of the RI/FS for the UCR are to determine the nature and extent of site contamination, assess potential risks to human or ecological receptors, and develop

remedial approaches to mitigate unacceptable risks. The Phase 1 sediment sampling program was designed to gather data to support the human and ecological risk assessments per issuance of an updated fish advisory for Lake Roosevelt. The sediment toxicity testing and pore water components of Phase 1 used both sediment-associated macroinvertebrates (*Hyalella azteca* and *Chironomus dilutus*) and a water column macroinvertebrate (*Ceriodaphnia dubia*) in laboratory toxicity tests to assess the possible impact that exposure to UCR sediment could have on the growth, development, and mortality of macroinvertebrates at the UCR site.

The specific objective of this data evaluation report is to use statistical and other analytical approaches to interpret the toxicity test results and gain an understanding of the uncertainties regarding toxicity at the UCR site. This has been accomplished using the following approach:

- Establish and apply criteria for reference conditions to identify sediment samples from the 2005 dataset that would qualify as reference sediment samples.
- Develop a reference envelope for each toxicity test endpoint.
- Categorize sediment sample toxicity by the relative percent difference from the reference envelope.
- Assess potential relationships between sediment toxicity and sediment chemistry for key contaminants of interest (COIs), including arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc, COI mixtures (that is, sum of simultaneously extracted metals [SEM] minus acid volatile sulfides [AVS], (SEM-AVS) and (SEM-AVS)/fraction organic carbon [f_{OC}], mean probable effects concentration quotient (PEC-Q) for metals normalized to 1 percent organic carbon [PEC-$Q_{metals(1\%OC)}$], summed PEC-Qs, and pore water toxic units [PW-TUs]) and physical parameters.
- Designate site sediment samples as similar or significantly different from reference samples using common statistical testing approaches (for example, analysis of variance [ANOVA]).

2.2 Report Organization

The remainder of this report is organized as follows:

Section 2, Background—Presents a review of site conditions and existing historical bioassay data.

Section 3, Field and Analytical Program Overview—Presents an overview of the sediment toxicity study design, a review of the field methods used, and the analytical program.

Section 4, Data Evaluation Methods—Presents an overview of the approach and scope of the data evaluation used to identify sediment toxicity. Data handling procedures, calculation of sediment quality metrics, identification of reference stations, sediment effect levels, sediment chemistry metrics, statistical analyses, and approaches for defining concentration response models are described.

Section 5, Analytical and Bioassay Results—Details the results of sediment toxicity tests, bulk sediment chemistry, pore water chemical analysis, and sediment toxicity metrics and it

includes the results of reference station designations, concentration response analyses, and statistical comparisons.

Section 6, Discussion—Presents comparisons to the reference envelope, spatial patterns of effects, relationships between sediment toxicity and key sediment metrics and sediment chemistry, comparisons to other studies, and uncertainties.

Section 7, Summary and Recommendations—Summarizes the evaluation and provides recommendations for further investigation or analysis.

Section 8, References—Lists documents used in preparing this evaluation.

SECTION 2

Background

This section presents a brief description of the UCR site and background information concerning the site investigation. Additional information is available in the RI/FS work plan (USEPA, 2008) and the *Baseline Ecological Risk Assessment (BERA) Work Plan* (TAI, 2011).

3.1 Site Conditions

The Site is located wholly within Washington State and includes approximately 150 river miles of the Columbia River, extending from the U.S.- Canada border to the Grand Coulee Dam. Located immediately behind the dam is Lake Roosevelt, a large reservoir extending approximately 133 river miles, with possible backwater effects up to and perhaps north of the border at full pool (USEPA, 2008)[1]. The Columbia and Pend Oreille rivers represent the primary sources of water to Lake Roosevelt. The Spokane River and, to a lesser extent, the Colville, Kettle, and Sanpoil rivers also contribute (Lake Roosevelt Forum, 2006). Dam operations may result in seasonal reservoir level fluctuations in excess of 80 feet, ranging from full pool conditions at 1,290 feet above mean sea level (amsl) to low pool conditions as low as 1,208 feet amsl for flood control during years of high precipitation; however, fluctuations during more typical years are generally about 45 feet (USEPA, 2003 and 2007a). Bed and bank sediments are exposed along the length of the reservoir during spring drawdown periods (USEPA, 2003).

Previous investigations by federal and state agencies documented sediment contamination along the Upper Columbia River Site from the U.S.-Canada border to the Grand Coulee Dam. These investigations are summarized in the A&R document (CEE, 2004), the RI/FS work plan (USEPA, 2008), and in the BERA work plan (TAI, 2011). Contaminants included metals such as cadmium, copper, lead, mercury, and zinc, as well as organic contaminants such as polychlorinated dibenzo-p-dioxins (dioxins), polychlorinated dibenzofurans (furans), and polychlorinated biphenyls (PCBs). Based on initial data, the USEPA concluded that both the smelter in Trail, British Columbia, and the former Le Roi Smelter in Northport, Washington, were sources of contamination to the UCR site; however, the Trail smelter was

[1] In preparing the RI/FS work plan (USEPA, 2008), an error was found in the manner in which river miles (RMs) were designated for the upper portion of the UCR during the 2005 Phase I sediment study. This discrepancy occurred when transitioning between the United States Geologic Survey (USGS) topographic maps for the Inchelium and Rice quadrants. In making this transition, the USGS designated a 2-mile distance between USGS RM 680 and the next RM demarcation. However, during the Phase I study, the USEPA designated only a 1-mile distance between these two points. Therefore, all RM designations above USGS RM 680 in the Phase I study are l mile less than the designations used by the USGS. For the purposes of this section of the work plan, all RM designations made for the 2005 Phase I study are those used by the USEPA and are acknowledged as such. In this manner, the identification of specific locations within the UCR will be consistent with the sample and station locations used during that study (that is, they include the RM designations). However, the discrepancies with the RMs used by the USGS above USGS RM 680 should be noted when comparing with other documents.

identified as the "primary source of contamination" (USEPA, 2003 and 2008). With the exception of the Spokane River, Phase 1 sediment sampling by the USEPA near the mouth of selected major UCR tributaries did not identify the presence of notably elevated COI concentrations indicative of major watershed sources of contamination from historical mine and mill sites (CEE, 2006).

3.2 Review of Historical Sediment Toxicity Data

A review of historical sediment toxicity data was conducted as part of planning for the 2005 sediment sampling program. Historical bioassay studies were limited to a few localized areas of the UCR but were useful for indicating the potential for adverse biological effects from exposure to COIs and identifying data gaps. Information about these studies is summarized in *Evaluation of Historical Bioassay Test Results and Recommendations for Phase* 1 *Bioassay Toxicity Testing – Upper Columbia River Site CERCLA RI/FS* (CH2M HILL, 2005; included as Appendix A of this report), and the results of these studies are discussed relative to the 2005 results (see Section 6.3). Additional reviews of historical toxicity data are also provided in the BERA work plan (TAI, 2011).

3.3 Conceptual Site Model

The preliminary ecological CSM provides a framework for identifying potential sources of contaminants in the UCR and the subsequent complex suite of chemical, physical, and biological processes that may occur as a consequence of such inputs. The ecological CSM represents the understanding of potential sources and the UCR system based on the best available information and recognizes that some of the transport and fate mechanisms, ecological receptors, and exposure pathways will be refined as additional site-specific data are collected and further evaluations are conducted. A preliminary CSM for contaminated sediment in the UCR was presented in the A&R Document (CEE, 2004) and the Draft Phase 1 Sediment Sampling Data Evaluation (CEE, 2006) for use in developing the Phase 1 sampling and analysis plan. An update of this preliminary CSM is provided in the RI/FS work plan (USEPA, 2008) and includes potential sources of contamination, the nature and extent of contaminated sediment, the fate and transport of sediment contamination, and potential exposure pathways of concern.

3.3.1 Potential Sources

Potential sources of sediment contamination include chemical discharges via stacks, liquid effluent, or slag discharges from the Trail or Le Roi smelter operations. A current and historical source of metals to the UCR was the Teck Cominco Smelter complex (Trail, British Columbia, Canada) and adjacent impacted areas such as Stoney Creek. Lesser quantities of slag from the Le Roi smelter in Northport, Washington, also are known to have been discharged to the UCR. In addition, the Young American Mine was recently identified as another potential source of metal contamination (USEPA, 2012). The primary source of historical loading of dioxins and furans to the UCR was the Celgar pulp mill in Castlegar, British Columbia. The sources of PCBs to the UCR are unknown. Although PCBs have been detected in a number of fish tissue analyses, PCBs have been found in a limited number of sediment samples.

3.3.2 Nature and Extent of Contaminated Sediment

Within the UCR, sediment contamination may be associated with either sand-sized particulates or silt/clay-sized particulates. The coarser-grained bed sediment is more predominant in the upper reaches of the UCR. Slag from historical Cominco smelting operations is evident along the banks of the UCR in selected beach and point bar areas upstream of Northport and constitutes a large portion of the sand-sized sediment materials that are present in these areas. Metals such as arsenic, copper, and zinc are notably enriched in these coarser-grained sediments that display visual evidence of slag material. Slag is also present in Columbia River sediments north of the U.S.-Canada border.

Visual evidence and grain-size information from historical sediment sampling indicate that coarse-grained slag material is not present to a measurable degree in surficial bed sediments downstream from Kettle Falls/Marcus Flats. In the middle and lower reaches of the reservoir, finer-grained sediments (consisting of silt, clay, and/or organic particulates) are more dominant and typically contain a higher total organic carbon (TOC) concentration. Metals such as mercury and cadmium, and to a lesser degree lead, appear to be less correlated with the coarser-grained, slag-impacted sediment and more with the finer-grained sediments.

Organic contaminants (dioxins, furans, pesticides, and PCBs) have been detected in only a limited number of samples. Where found, these constituents seem to be associated with finer-grained sediments that have a TOC concentration greater than that found in the coarser-grained sediments.

3.3.3 Fate and Transport

Movement of contaminants from upriver to downriver within the UCR can be described by the following four general types of primary advective transport mechanisms in the water, which are also applicable to UCR tributaries:

- Dissolved in solution
- Suspended particulates
- Surface film or floating
- Bed load

Some contaminants, such as metals, can be transported by all four mechanisms. For example, metals can occur as dissolved ions; be sorbed to suspended organic or inorganic particulates or colloids; be present in small, floating mats of slag; or be present in coarse-grained slag that is transported via saltation and/or bed transport. Organic constituents such as dioxins, furans, and PCBs have a relatively low solubility in water and show a strong affinity for sorption to solid-phase particulates, especially those containing elevated concentrations of organic carbon. These constituents are more likely to be transported downstream beyond the higher velocity reaches, where they settle in the middle and lower reaches of the reservoir because of lower flow velocity. The less-chlorinated PCBs are moderately volatile and can undergo biodegradation processes. Like PCBs, the dioxins and furans also tend to be persistent in the aquatic environment. Bio-uptake and bio-accumulation of dioxins, furans, and PCBs can be an important process affecting the fate and distribution of these constituents in the food web.

3.3.4 Potential Exposure Pathways for Contaminated Sediments

The most prominent potential contaminant exposure pathways for ecological receptors include the following:

- Direct exposure of invertebrates, fish, and wildlife to sediment constituents from bulk sediment or pore water
- Bioconcentration and bioaccumulation of sediment constituents into fish, invertebrates, and plants, with subsequent consumption by wildlife such as birds, mammals, fish, amphibians, and reptiles

SECTION 3

Field and Analytical Program Overview

Detailed information about study design, sampling methods, and analytical procedures for the 2005 Phase 1 sediment sampling program is provided in the *Phase 1 Sediment QAPP* (CEE, 2005) and summarized in this section. The approach and rationale for sample locations and the sediment sampling program are also described herein and detailed in the A&R Document (CEE, 2004) and the *Draft Phase 1 Sediment Sampling Data Evaluation report* (CEE, 2006). DQOs related to toxicity testing are presented herein and detailed in the Sediment QAPP (CEE, 2005).

4.1 Sediment Toxicity Study Design

The toxicity testing program used sediment-associated macroinvertebrates (*H. azteca* and *C. dilutus*) and an aquatic macroinvertebrate (*C. dubia*) to assess the possible impact that exposure to UCR sediment could have on the growth, development, and mortality of these organisms. Bulk sediment was analyzed for metals, organic carbon, AVS, grain size, and a suite of organic contaminants.

Chemical analysis of the pore water associated with the bioassay sediment samples was intended to provide a preliminary look at metal concentrations in the pore water of this particular subset of Phase 1 sediment samples. The results of pore water analyses were not intended to represent *in situ* concentrations of metals that may be measured in UCR sediment pore water; rather, these analyses were intended to provide an indication of potential exposures requiring further investigation.

4.1.1 Data Quality Objectives

The USEPA's DQO process (USEPA, 2000a) was used to identify specific data needs for the project and establish decision rules for the collection of sediment data to support RI/FS tasks and activities (Table 3-1). DQOs are qualitative and quantitative statements specifying the required quality of the data for each specific use. DQOs are based on the concept that different data uses often require data of varying quality. The DQO process is a strategic planning approach that provides a systematic procedure for defining the criteria that a data collection design should satisfy, including when to collect samples, the tolerable level of decision errors for the study, and how many samples to collect (USEPA, 2000a). This process consists of the following seven steps:

1. **State the Problem**: Concisely describe the problem to be studied based on concerns and/or data gaps identified by previous investigations.
2. **Identify the Decision**: Identify what questions the study will attempt to resolve.
3. **Identify the Inputs to the Decision**: Identify the informational inputs that need to be obtained and the measurements that need to be taken to resolve the decision statement.
4. **Define the Study Boundaries**: Specify the time and spatial boundaries (or constraints) to which decisions will apply. Determine when and where the data should be collected.

5. **Develop a Decision Rule**: Integrate the previous DQO outputs into a single "if-then" statement that describes the logical basis for choosing from among alternative actions.
6. **Specify Tolerable Limits on Decision Errors**: Specify how the data will be treated statistically and what the tolerable limits on decisions are.
7. **Optimize the Design for Obtaining Data**: State the sampling strategy design, given the previous DQO outputs.

Preliminary DQOs for sediment were developed following an assessment of the chemical, temporal, spatial, and risk-based representativeness of the existing body of UCR historical sediment data and based on identification of decisions that will need to be made with the data under the RI/FS process. For the purpose of developing DQOs, sediment (as a separate media of interest) was subdivided into three groups during the sediment sampling planning stages (CEE, 2004):

- Surface sediment, 0 to 4 inches (10 centimeters [cm]) below the sediment-water interface; the bioassay sediment samples are a subset of this group
- Subsurface sediment, greater than 4 inches (10 cm) below the sediment-water interface
- Beach sediment

As an outcome of the DQO process for the UCR site, several data gaps pertaining to the nature, extent, fate, and transport of contaminants within UCR sediment were identified. Additional sediment characterization data were needed to address these critical data gaps and determine whether measures are needed to prevent exposure of benthic/epibenthic resources to contaminants in UCR sediments. The need for additional sediment sampling was also to be determined following evaluation of Phase 1 data. Specifically, if the weight-of-evidence in Phase 1 evaluations indicates that benthic/epibenthic communities are potentially at risk, with moderate to high uncertainty associated with the results, additional data collection may be necessary. The DQOs for benthic/epibenthic resources that governed the design of the bioassay sediment sampling program are outlined in Table 3-1.

4.1.2 Bioassay Sediment Samples

Sediment samples for toxicity testing were collected at 50 locations along the full length of the UCR (from RM 603 to RM 744). These locations were selected to provide a broad spatial coverage and representation as described in the DQOs. Findings from the review of historical sediment toxicity test information suggested that sediment conditions in the upper reaches of the UCR were most likely to produce adverse effects on toxicity test organisms. Therefore, a greater density of sediment samples for bioassays were collected in the upper reaches of the UCR to increase the likelihood that a concentration-response relationship (if evident) could be developed over a broad range of concentrations. Sediment samples for toxicity testing were collected from the top 10 to 15 cm (CEE, 2005) (defined here as the biologically active zone). Note that UCR surficial sediment was sampled according to the QAPP, defined as the top 10 to 15 cm, although this differed from the description of surface sediment in planning documents (CEE, 2004).

Sediment samples for toxicity testing were collected from the near-shore side bank area of the river and reservoir and were several feet below the water line at the time of sampling, thereby representing relevant exposure media for benthic organisms. However, it should be

noted that water levels vary in reaches of the UCR affected by operations at the Grand Coulee Dam, and the sampled sediments may not be submerged at all times. If the pre-selected locations were not suitable for the collection of a bioassay sample at the time of sampling (for example, inappropriate substrate type), the specific sample location was relocated upstream or downstream, as appropriate. Figure 3-1 is an overview of the UCR showing the general location where sediment samples were collected. The coordinates of each sample are provided in the *Phase 1 Sediment Field Data Report* (CEE, 2006).

Each Phase 1 sediment sample that was designated for toxicity testing included a collocated companion whole sediment sample (that is, solids and associated liquid) and sediment water samples (referred to as pore water samples) that were analyzed for selected COIs (dissolved). The intent of pore water sampling was to provide additional supporting data for interpretation of toxicity in surface sediment rather than to be indicative of *in situ* conditions (CEE, 2006). Pore water samples were collected from collocated but separate sediment samples at each of the bioassay sampling stations, typically on different dates after bioassay and whole sediment chemistry samples were collected.

Collection methods described in the QAPP (CEE, 2005) directed samples to be completely homogenized prior to collection and for multiple samples to be collected prior to homogenization if needed for adequate sample volumes. The field sampling report (CH2MHILL, 2006) described bioassay samples as "co-located with the corresponding transect sample to allow for a direct comparison of bioassay results with the corresponding sediment chemical quality information." This description should be interpreted to mean whole sediment for chemical analyses and bioassay samples were homogenized splits (Jeff Schut 2005 Phase 1 sediment sampling field team leader, pers. comm., July 26, 2011) for all sediment chemistry and bioassay samples except for one (sample RM734A1) where bioassay and sediment chemistry samples were collected on separate days (CH2MHILL, 2006).

SEM and AVS were also measured in site sediments collected synoptically with bioassays and whole sediment chemical analyses samples. However, the SEM and AVS samples were removed immediately from the sampler after overlying water was decanted and prior to homogenization to minimize disturbance (CEE, 2005). It is recognized that this adds uncertainty in interpretation of SEM and AVS results in comparison to other chemistry and bioassay results, but this approach was a necessary constraint imposed by standard sampling methodology.

4.1.3 Reference Area Sediment Samples

Reference area sediment samples typically address two distinct issues: 1) determination of naturally occurring concentrations of COIs, and 2) control sites for toxicity tests. These reference samples, collected during the Phase 1 sediment sampling program, were specifically intended to identify factors that could bias the toxicity test results and compromise their interpretation. The reference samples consisted of sediment obtained from shallow near-shore locations near the mouths of six UCR tributaries at elevations greater than the maximum water level in the reservoir. The general locations where reference sediment samples were collected are shown on Figure 3-1. The reference areas were as follows:

- Five Mile Creek (RM 732, elevation 1,410 feet)
- Crown Creek (RM 726, elevation 1,716 feet)

- Flat Creek (RM 721, elevation 1,310 feet)
- Nancy Creek (RM 705, elevation 1,360 feet)
- Barnaby Creek (RM 686, elevation 1,302 feet)
- Cheweka Creek (RM 685, elevation 1,297 feet)

Criteria for reference area selection included location, lack of contamination, and elevations greater than the maximum water level in the reservoir. The reference area sample locations were distributed over a fairly broad portion of the study area and provided a range of sediment characteristics, such as grain size and organic content, from the area.

4.2 Field and Analytical Methods

Sediment samples from 50 locations within the UCR and 6 reference locations near the mouth and/or lower reaches of UCR tributaries were collected for toxicity testing.

4.2.1 Sample Identification

Sample identification codes are described here because they are referenced in this report, and these are consistent with the QAPP (CEE, 2005) and associated sampling documents (CEE, 2006; CH2M HILL, 2006). The sample identification convention incorporates the RM where it was collected followed by a two-character code. The first character is a letter that indicates the sample type, where A = site sample and R = reference sample. The second character is a number that indicates the sample number at that RM. Either one or two bioassay samples were collected at a designated RM. Surface sediment samples were collected along transects oriented perpendicular to the flow at the designated RM, and the final sample identification indicates the sample collection location along the transect, with "1" representing the left bank (when looking downstream) and a higher number indicating the right bank for bioassay samples. For example, Sample RM603A1(A1) was a bioassay sample collected at RM 603 from the left bank.

4.2.2 Whole Sediment and Pore Water Chemistry

Samples collected in the field were homogenized, split, and sent to separate labs for sediment chemical analyses, pore water separation and subsequent analyses, and toxicity testing. The analytical suite for the whole sediment samples was as follows:

- Target Analyte List (TAL) metals plus uranium
- Polycyclic aromatic hydrocarbons (PAHs)
- PCBs
- Pesticides
- SEM and AVS (sampled prior to homogenization)
- TOC
- Grain size

In addition to the whole sediment samples, pore water samples were extracted from each of the 56 whole sediment samples (50 UCR samples plus 6 reference area samples) via centrifugation. Sample centrifugation was performed at the USEPA's Manchester Environmental Laboratory. The resulting pore water samples were analyzed exclusively for dissolved Contract Laboratory Program (CLP) TAL metals plus uranium. USEPA's laboratory followed Manchester Environmental Laboratory guidelines and the Sediment

Pore Water Isolation and Handling Procedures as presented in the *Phase 1 Sediment QAPP* (CEE, 2005). The pore water analytical results provide additional supporting data to assist with the overall interpretation of the toxicity results.

4.2.3 Whole Sediment Toxicity Tests

The amphipod, *H. azteca*, the aquatic midge, *C. dilutus,* and the planktonic crustacean, *C. dubia,* were selected as indicator species for the UCR sediment toxicity evaluation. These species were selected based on a scoping meeting with USEPA, the U.S. Department of the Interior, the State of Washington, the Colville Confederate Tribes, and the Spokane Tribe on February 17, 2005. The test species and endpoint selection process are described in Appendix A. Generally, the selection process considered 11 selection criteria (provided in Appendix A, Table A5-1), the relative species sensitivities, and the need to evaluate multiple endpoints. Test methods for conducting whole sediment toxicity testing using each test species are briefly described in the following section. The following whole sediment toxicity tests were conducted on each sample.

28-Day Amphipod (*H. azteca*) Toxicity Test

The toxicity of UCR sediments was assessed using a 28-day exposure with the amphipod, *H. azteca*, with growth and survival as measured endpoints. The protocol used was based on American Society for Testing and Materials (ASTM) Method E 1706-00 (ASTM, 2003) and USEPA Method 100.4 (USEPA, 2000b). *H. azteca* is an epibenthic detritivore that burrows into the sediment surface, selectively ingesting bacteria and algae. It is found in warm lakes (20 to 30 degrees Celsius [°C] for much of the summer) that support aquatic plants and also in ponds, sloughs, marshes, rivers, ditches, streams, and springs at lower abundances, and it has been used in at least six previous investigations in the UCR. Test conditions for conducting the 28-day sediment toxicity test with *H. azteca* are summarized in Exhibit A5-1 of Appendix A.

10-Day Midge (*C. dilutus*) Toxicity Test

The toxicity of UCR sediments was also assessed using a 10-day exposure with the midge, *C. dilutus*, with growth and survival as measured endpoints. The protocol used was based on ASTM Method E 1706-00 (ASTM, 2003) and USEPA Method 100.2 (USEPA, 2000b). Midge larvae are important in the diet of fish and waterfowl. Larvae of *C. dilutus* usually penetrate a few cm into sediment. In both lotic and lentic habitats with soft bottoms, about 95 percent of the chironomid larvae occur in the upper 10 cm of substrate. *C. dilutus* has been used in at least four previous investigations in the UCR (Appendix A, Table A2-1). The test conditions for conducting the 10-day sediment toxicity test with *C. dilutus* are summarized in Exhibit A5-2 of Appendix A.

7-Day Cladoceran (*C. dubia*) Toxicity Test

The toxicity of UCR sediments was also assessed using a 7-day exposure with the cladoceran, *C. dubia*, with reproduction and survival as measured endpoints. The protocol used was based on ASTM Method E 1706-00 (ASTM, 2003). One reason for using cladoceran as toxicity test organisms is their importance as a food source for invertebrates and fish. In addition, they provide a reproduction endpoint, which is not an endpoint for either of the other two selected species. In whole sediment toxicity tests, cladocerans behave as nonselective epifaunal zooplankton. The organisms are frequently observed on the sediment

surface during the toxicity tests and are likely exposed to both water-soluble and particulate-bound contaminants (through ingestion) in overlying water and surface sediments. The responsiveness of *C. dubia* to UCR sediments has been confirmed, and correspondence with *H. azteca* toxicity in the UCR has been reported (USGS, 1994; Table A2-4a in Appendix A). The test conditions for conducting the 7-day sediment toxicity test with *C. dubia* are summarized in Exhibit A5-3 of Appendix A.

Bioassay Laboratories

H. azteca testing was conducted by Northwestern Aquatic Sciences (NAS) in Newport, Oregon. *C. dilutus* and *C. dubia* testing was conducted by CH2M HILL's Applied Science Laboratories (ASL) in Corvallis, Washington. A quality assurance/quality control (QA/QC) review of the toxicity test methods and associated laboratory QA/QC is available in toxicity reports from the laboratories, which are provided in Appendix B. Organism responses to test sediment exposures were compared with the responses observed in the laboratory negative controls and reference area sediments. The statistical analyses performed by the laboratories followed those outlined by ASTM and USEPA.

Negative controls for *H. azteca* and *C. dilutus* consisted of field-collected clean sediment from Beaver Creek, approximately 8 miles south of Newport, Oregon. These control sediments were homogenized with stainless steel implements and stored in the dark at 4°C prior to testing. *C. dubia* were exposed to clean silica sand (20 mesh, washed) as a control sediment, and a second negative control for *C. dubia* was conducted with overlying water (reconstituted synthetic water) and no sediment. Control sediments were used to assess test acceptability criteria, as a demonstration of test organism responses in the absence of chemical stressors, whereas comparisons with reference sample responses were the basis of evaluating relationships between toxicity responses and chemistry for Phase 1 UCR sediment samples. Refer to Appendix B for details regarding the use of control sediments.

Overlying water added to *H. azteca* test chambers above the tested sediments consisted of modified tap water—adjusted to a hardness of 70±5 milligrams per liter (mg/L) $CaCO_3$. Reconstituted synthetic water adjusted to a hardness of 72 to 74 mg/L $CaCO_3$ was used as overlying water for testing with *C. dilutus* and *C. dubia.*

For *H. azteca* and *C. dilutus*, the endpoints measured were as follows:

- Survival—Total number of organisms (larvae, pupae, and emerged adults) surviving at termination divided by number of organisms added at initiation
- Weight—Ash-free dry weight (dry weight minus ash weight) of surviving organisms divided by the number of surviving organisms
- Biomass—Ash-free dry weight of surviving organisms divided by the initial number of organisms; biomass indicates the total mass of organisms sustained in each sample and controls for any density-dependent growth that may occur when a constant supply of food is available for fewer organisms

For *C. dubia*, the endpoints measured were survival (total number of adults surviving at test termination divided by the number added at initiation) and reproduction (total number of neonates produced through the first three broods from each adult).

4.2.4 Quality Assurance/Quality Control

Phase 1 sediment data collection and analyses generated data of known quality appropriate for project needs in terms of end decisions. This objective was accomplished through the following cycle:

- DQO process identified project data needs and decision rules and was documented as an appendix to the QAPP (CEE, 2005).
- QAPP defined organization, functional activities, procedures, and policies that were implemented to obtain project-specific data of known and appropriate quality.
- Laboratory statements of work detailed laboratory analytical procedures and QA/QC procedures, including documentation.
- Laboratory and field QA/QC were performed through internal and external audits.
- Data quality and usability reviews outside the laboratory were documented in data validation reports.
- Individual data points were qualified by applying data validation report flags to the project database.
- An overall assessment of data quality was performed to evaluate the usability of the data within the context of the project objectives.

For each analytical parameter and method, the standard USEPA analytical method references and the associated laboratory statements of work were provided in the Phase 1 Sediment QAPP (CEE, 2005). These documents identified QC requirements that included the following:

- Method-specific QC procedures
- Level of effort (frequency of QC checks) for each QC procedure
- Quantitative acceptance limits for QC data
- Corrective action requirements for the laboratories for QC data that are outside the acceptance limits
- Documentation

The target method reporting limits (RLs) for metals are provided in Table 3-2 and were equivalent to USEPA CLP contract-required detection levels. “Target” implies that final sample RLs may be higher because of sample matrix effects. The analytical laboratories established method detection limits (MDLs) in accordance with Title 40 Code of Federal Regulations (CFR) Part 136, Appendix B, before starting this work to ensure that laboratory-specific limits complied with the specifications. Some of the target RLs were higher than regulatory limits because no practicable methodology for lower detection was available. Laboratory-specific MDLs were significantly below reporting limits (CEE, 2005).

In addition, data were evaluated for each of the precision, accuracy, representativeness, comparability, and completeness (PARCC) parameters. These assessments were performed on the Phase 1 sediment chemistry and toxicity data where appropriate. Associated data for the PARCC parameters are available in the chemistry laboratory data package.

Precision is a measure of the data spread when more than one measurement has been collected from the same sample. Precision can be expressed as the relative percent difference (RPD).

Accuracy measurement data included laboratory control sample and matrix spike recovery data for organic and inorganic analytical parameters, as well as surrogate recovery data for organic parameters.

Representativeness is a measure of how closely the measured results reflect the actual concentration or distribution of the chemical compounds in the sampled media. Representativeness is assessed in qualitative and quantitative terms. The project report discusses the qualitative aspects of representativeness in terms of design of the field sampling plan, sampling techniques, sample handling protocols, and associated documentation. Quantitative measures of representativeness include field and laboratory blank measurements to identify whether contamination was introduced through field or laboratory operations. Field duplicate measurements are used to establish variability. Laboratory and trip blank measurements were detailed on a sample- and parameter-specific basis in the validation reports. All qualifications, as a result of laboratory and trip blank effects, were incorporated into the project sample/analyte specific data.

Comparability expresses the confidence with which one dataset can be compared with another. Comparability of data has been established through use of the following:

- Standard analytical methods and QC procedures established in the QAPP (CEE, 2005)
- USEPA CLP and Manchester Regional Laboratory protocols
- Consistent reporting units for a specified procedure
- MDLs for all analytical parameters that were established in accordance with 40 CFR 136, Appendix B, before the start of the analyses to meet the project requirements

Completeness—The data QA/QC analysis assessed completeness as a measure of the amount of valid data obtained from the analytical measurements. Field activity completeness was assessed within the context of the overall sampling design.

SECTION 4

Evaluation Methodology

This section presents an overview of the approach and scope of the data evaluation used to identify sediment toxicity. Data quality and handling procedures, calculation of sediment quality metrics, identification of reference stations, relative toxicity, sediment chemistry metrics, statistical analyses, and approaches for defining concentration response models are described.

5.1 Approach and Scope

Various methods can be used for evaluating toxicity data and all have their advantages and limitations. Using multiple approaches provides a better understanding of the data in terms of a weight-of-evidence and improves confidence in conclusions when multiple lines-of-evidence point to similar conclusions. In order to assess the potential toxicity of sediment-associated COIs for the UCR, the following data evaluation approach was used:

- Establish and apply criteria for reference sediment samples (based on MacDonald et al., 2009 and Ingersoll et al., 2001) to identify the sediment samples from the 2005 dataset that qualified as reference-sediment samples.
  - Develop a reference envelope for each toxicity test endpoint
  - Categorize sediment sample toxicity by the RPD from reference envelope criteria
- Assess potential relationships between sediment chemistry and sediment toxicity for metal contaminants of potential concern (COPCs) identified in the UCR Screening Level Ecological Risk Assessment (SLERA; TAI, 2009), for example, arsenic, cadmium, copper, chromium, lead, mercury, nickel, and zinc, as well as COPC mixtures (that is, SEM-AVS, (SEM-AVS)/f_{OC}, mean PEC-$Q_{metals(1\%OC)}$, summed PEC-Qs, PW-TUs).
- Identify reaches and samples that were significantly different from the reference samples.

5.2 Data Evaluation Methods

The following sections provide details of the data evaluation methods.

5.2.1 Calculation of Sediment Metrics

The UCR sediment toxicity program was intended to produce data that would indicate any relationships between sediment chemistry and sediment toxicity. Several exposure metrics were used in addition to simple chemical concentrations to determine whether there were relationships between metals and toxicity. Individual metals and metal mixtures were evaluated based on the following matrices (that is, SEM-AVS, (SEM-AVS)/f_{OC}, mean PEC-$Q_{metals(1\%OC)}$, summed PEC-Q, PW-TUs), which were found to be predictive of toxicity at other sites.

Simultaneously Extracted Metals—Acid Volatile Sulfides

SEM is a measure of the total metals that can be leached from sediment using a cold, weak acid (for example, 1 molar hydrochloric acid) digestion and represents a conservative measure of the bioavailable fraction of certain dissolved metals from sediments into water. The concentration of AVS represents the fraction of sulfide extracted by the cold-acid digestion method that is available to bind SEM under anoxic conditions (Allen et al., 1993).

USEPA (2005) presents a model to evaluate the toxicity of divalent metals (that is, cadmium, copper, lead, nickel, and zinc) to sediment-dwelling organisms. The model is based on the assumption that divalent metals can cause or contribute to sediment toxicity when the sum of the molar concentrations of cadmium, copper, lead, nickel, and/or zinc exceeds the molar concentration of AVS, the binding phase. Under such conditions, insufficient AVS is available to bind all of the divalent metals (SEM) in the particulate matrix, and metals can accumulate in pore water to levels that are toxic to sediment-dwelling organisms. To assess the predictability of this model, the metric ∑SEM-AVS (that is, excess SEM or simply SEM-AVS where the sum of simultaneously extracted metals is implied) for a sample was compared with toxicity test results (USEPA, 2005).

Because metals can also bind to organic carbon in the sediment, the reliability of the model has been improved by incorporating the fraction of TOC of the sediment (that is, the f_{OC} into the model). The SEM–AVS was divided by the f_{OC} to generate an index of metal bioavailability based on influence of both AVS and TOC ((SEM–AVS)/f_{OC}); this is the basis for equilibrium partitioning-based sediment benchmarks (ESBs), that is, (SEM-AVS)/f_{OC}. Acute toxicity is predicted when the (SEM-AVS)/f_{OC} is greater than 3,000 micromoles ($u$mol) per gram organic carbon (g_{OC}), uncertain when the concentration is between 130 and 3,000 $u$mol/g_{OC}, and not likely when the concentration is less than 130 $u$mol/g_{OC} (USEPA, 2005). The probability of chronic toxicity was not evaluated by USEPA (2005) but these data indicated chronic toxicity may be observed in samples where (SEM-AVS)/f_{OC} was between 130 and 3,000 $u$mol/g_{OC}.

PEC Quotients

PECs represent concentrations above which harmful effects on sediment-dwelling organisms are likely to be frequently observed (MacDonald et al., 2000; Swartz, 1999). PEC-Qs were calculated for sediment metals for which a PEC was available (Table 4-1). This was calculated by dividing the measured total concentration of a substance in a sediment sample by the corresponding PEC to provide an indicator of each metal concentration relative to the concentration likely to elicit an effect.

PEC-Q = chemical concentration (dry weight) / corresponding PEC value

Sediments are often contaminated with a variety of analytes rather than a single metal and PECs are one approach to evaluating metal mixtures. To address potential toxicity from multiple contaminants, Ingersoll et al. (2001) found the frequency of toxicity to midges and amphipods in sediments with mean PEC-Qs of 1.0 or more was over 50 percent. This mean PEC-Q approach was used on UCR sediments to consider metal mixtures.

The mean PEC-Q_{metals} for a sample was calculated as the average of PEC-Qs for all metals with PECs, except mercury (arsenic, cadmium, chromium, copper, lead, nickel, and zinc) due to the lack of sufficient data for MacDonald et al. (2000) to evaluate the predictive

ability of the PEC for mercury. An organic carbon normalized mean PEC-$Q_{metals(1\%OC)}$ metric was also calculated for each sample. For this calculation, the mean PEC-Q_{metals} for each sample was divided by the percent of organic carbon measured in that sediment sample to assess the influence of organic carbon on toxicity. In addition, a summed PEC-Q was calculated to potentially describe the effects of sediment metal mixtures, where one or few metals may account for the majority of toxicity.

Pore Water Toxic Units

Pore water chemistry was evaluated on separate collocated samples to the toxicity sediments and PW-TUs were calculated as another approach for evaluating risks from sediment metal mixtures (USEPA, 2005). PW-TUs for each metal in each pore water sample (for example, $PW\text{-}TU_{ZINC}$) were calculated by dividing the detected concentrations of each metal in pore water (dissolved) by the corresponding chronic National Recommended Water Quality Criteria (NRWQC) (USEPA, 2009; USEPA, 2006). Therefore, a potential for toxicity exists when pore water TUs exceed 1.0, and the potential for toxicity increases with increasing TUs (USEPA, 2005). PW-TUs (TU = metal concentration/chronic water quality criterion) were calculated and summed for cationic metals (that is, cadmium, copper, lead, nickel, and zinc) and all metals in each sample to consider the potential effects from metal mixtures.

Chronic NRWQC were hardness corrected with hardness values calculated from measured calcium and magnesium concentrations. There were insufficient pore water data to calculate a chronic criterion for copper using the biotic ligand model defined by USEPA (2007b); instead, the USEPA (2006) chronic criterion for copper (for example, 9 micrograms per liter [µg/L] at 100 mg/L $CaCO_3$) was used (Table 4-2). This approach also assumed that the measured pore water in split-sediment samples would be approximately equivalent to the pore water that midges and possibly, *Hyalella*, would be exposed to during toxicity tests.

5.2.2 Calculation of Reference Envelope

A reference envelope approach was used as a means of evaluating sediment toxicity based on the methods in MacDonald et al. (2009). All sediment samples, including those originally designated as from reference sites, were assessed to identify those unlikely to be affected by anthropogenic releases or unmeasured stressors. The resulting samples and their toxicity results represent a range of baseline responses that could be expected in the absence of stressors. The reference envelope method was conducted as follows:

- The "mean PEC-Q for metals" was estimated for the metals chemistry of each sample, following the methods described above.
- Samples with a mean PEC-Q_{metals} (normalized to 1 percent organic carbon) less than 0.2 were identified as potential reference samples.
- From that preliminary reference set, only samples with survival of at least 75 percent of the control survival were retained.
- The lower 5th percentile of each reference envelope was calculated for each species-endpoint to define the lower limit of the reference envelope response.

Both test batches (that is, duplicate toxicity tests) with each of the six reference samples were considered as separate samples in reference envelope calculations. Although only six unique

samples were collected, the toxicity results from both batches account for test variability in clean samples.

5.2.3 Relative Sediment Toxicity

Phase 1 sediment sample bioassays were characterized relative to the reference envelope in this evaluation. Samples with endpoint responses (that is, survival, growth, or reproduction) greater than the 5th percentile reference envelope performed the same as the reference samples and were considered to be within the reference envelope. In contrast, if any one of the toxicity endpoints was less than the 5th percentile value of that endpoint in the reference envelope (Section 4.2.2), the sample did not meet the reference envelope criterion (REC). The RECs are very conservative thresholds, and samples can easily fail to meet them while still meeting a high survival threshold (that is, test acceptability criteria for control survival) or without resulting in significant adverse environmental effects. Therefore, further evaluation of each species-endpoint not meeting its REC provided perspective on the likelihood of an environmentally relevant adverse effect. An RPD for each toxicity endpoint and its REC was calculated as:

RPD = ((toxicity endpoint result/REC) – 1) * 100

where

RPD = relative percent difference; and,

REC = reference envelope criterion.

Samples were placed into the following categories for each test endpoint for discussion purposes:

1. The response was greater (that is, better) than or equal to the REC.
2. The response was less than or equal to 10 percent lower than the REC.
3. The endpoint response was greater than 10 percent and less than or equal to 20 percent lower than the REC.
4. The endpoint response was more than 20 percent lower than the REC.

Toxicity assessments consider varying degrees of differences from control or reference conditions to be unacceptable or toxic. Effect levels greater than 20 percent were considered by Suter et al. (2000) to be of environmental significance and changes in natural populations of less than 20% cannot generally be differentiated from natural variability. Thursby et al. (1997) and Field et al. (2002) also considered 20 percent from the control in combination with statistical significance to designate samples as toxic. These approaches may be considered further in the BERA for determinations of unacceptable risks, which are not determined here. Rather, this report is intended to assess the Phase 1 data for potential relationships between sediment characteristics and toxicity endpoints relative to reference conditions.

5.2.4 Concentration-Response Models

Sediment chemistry and physical characteristics were compared with all toxicity sample results to test for possible causal (and correlative) relationships between site characteristics and toxicity. Simple, linear regression results were used to predict toxicity results from the

site sample metrics. Chemistry results were log-transformed to improve normality. Survival data were arcsin square-root transformed to improve normality of the data distribution (a common transformation for proportions). Linear regression statistics were computed using Statview 5.0 (SAS, 1998), and the significance of regression resulting from chance was judged at a probability level of 5 percent ($p < 0.05$). Results showing statistically-significant linear, negative relationships between toxicity endpoints and chemistry (represented by PEC-Qs) were considered to show possible causal relationships. In contrast, positive relationships between toxicity endpoints and PEC-Qs or regressions with $p > 0.05$ were judged as not showing meaningful causal relationships (because a positive relationship would indicate less toxicity with greater sediment contaminant concentrations).

Linear relationships from appropriately transformed variables were examined in the dataset for evidence of statistically-significant relationships. The variables were not examined for nonlinear relationships because there was no desire to describe all the possible models, but rather, to determine the presence or absence of a significant relationship and the direction (positive or negative) of that relationship. Similarly, there was no need to examine extensive non-parametric relationships between variables (for example, rank-based models) because the transformed variables allowed their examination using standard linear regression techniques. Any variety of linear or nonlinear models using various transformations of variables may be explored in the future as more data are collected, if there is a need to refine a model between sediment chemistry and toxicity endpoints.

The effects of non-chemical attributes of the substrate on toxicity results were also examined by evaluating regression relationships between the percentage of various size classes of sand in the sample and the toxicity results.

5.2.5 Statistical Differences among River Reaches and Samples

In addition to the reference envelope approach, ANOVA was performed on the toxicity data (survival, growth, and biomass in *Hyalella* and chironomids; reproduction in *Ceriodaphnia*) to identify significant differences in organism responses between river reaches and the reference envelope samples. Survival in *Ceriodaphnia* was not evaluated using ANOVA because the data were inappropriate for this statistical method. Each replicate in the *Ceriodaphnia* test contains a single organism. This resulted in a proportion of survival of either 0 or 1 in each replicate, resembling a discrete variable rather than the continuous variable pursued with ANOVA. Evaluating the more sensitive reproduction endpoint for *Ceriodaphnia* provides an assessment of this organism's response, and the lack of a statistical analysis for *Ceriodaphnia* survival data was not considered a particular weakness in this study.

For each of these seven species-endpoints, the ANOVA was performed using rank-transformed results, which resulted in a nonparametric approach that did not rely on assumptions of statistical distribution (for example, normality) or homogeneity of variance. In addition to this nonparametric approach, parametric ANOVA was performed on untransformed results (for most of the species-endpoints) or arcsine-transformed results (for survival because this is a common transformation for proportions). These calculations were performed on data containing the individual replicate values per sample (8 replicates per sample tested with *Hyalella*, 8 replicates per sample tested with chironomids, and 10 replicates per sample tested with *Ceriodaphnia*).

Checks of normality of the ANOVA residuals, using the Shapiro-Wilk test for normality and Bartlett's test for homogeneity of variance, were performed during the parametric ANOVA. These two assumptions (homogeneity of variance and normality) help to support whether ANOVA results (other than the nonparametric rank-transformed approach) support defensible conclusions. A Tukey's post-hoc test was performed to demonstrate whether individual reaches or samples exceed reference conditions.

SECTION 5

Analytical and Toxicity Results

This section discusses the results of the sediment toxicity tests, bulk sediment chemistry, sediment toxicity metrics, designation of reference stations, pore water chemical analysis, and statistical analyses results.

6.1 Toxicity

6.1.1 Toxicity Test Results

Sediment toxicity tests were conducted in April and May 2005 at CH2M HILL's ASL (Corvallis, Oregon) and the NAS (Newport, Oregon) using amphipods (*H. azteca*), cladocerans (*C. dubia*), and midges (*C. dilutus*) as representative test organisms. The toxicity results are summarized by test species and for each sample in Table 5-1, including mean survival (all species), growth *(H. azteca* and *C. dilutus*), and reproduction (*C. dubia*).

6.1.2 Data Quality Assessment for Bioassays

Laboratory certification was verified for both toxicity laboratories, and a strict QA/QC program was followed by each laboratory. In addition, an outside consultant was contracted to audit each laboratory during the testing and to review the procedures and results of the sediment toxicity testing. Paul Dinnel (Dinnel Marine Resources, Anacortes, Washington) conducted the QA/QC reviews. The findings of these audits are presented in Appendix B. Test acceptability criteria were met for all toxicity tests, and no significant issues were identified by the laboratories or external auditor that could have affected the test results. A discussion of these tests is also presented in the UCR BERA work plan (TAI, 2011).

Each laboratory also provided documentation of the sensitivity of the test organisms used for the sediment toxicity tests. Reference toxicant tests were conducted using a standard toxicant solution (for example, cadmium chloride or sodium chloride). All organisms used for testing were determined to be within their normal sensitivity ranges.

No deviations were reported by NAS for the *H. azteca* testing on either test date. ASTM (2003) and USEPA (2000b) caution that reconstituted water can affect *H. azteca* toxicity results (that is, researchers have found inconsistent results when using reconstituted water in long-term sediment toxicity tests with *H. azteca*). Rather, natural water demonstrating acceptable toxicity test results over long-term tests should be used in *H. azteca* sediment toxicity tests. However, the methods indicate that aged reconstitution water may also be used. River water from the UCR was initially considered for use as overlying water for these tests, but collection and transport of large volumes of water would have been required to conduct the toxicity tests. Additionally, the potential for contamination in the river water would add uncertainty to the test results. Therefore, it was determined that aged reconstituted water would be used. Control performance within the test acceptability criteria supports the conclusion that reconstituted water did not likely have a significant negative effect on *H. azteca* toxicity results.

Several deviations were reported by ASL for *C. dilutus* tests. Because of a laboratory error, there were no available data from the RM 685R1 reference sample on Day 2 (test initiated on April 28, 2005). Dissolved oxygen concentrations, below the ASTM (2009) recommended level of 2.5 mg/L, were found in several *C. dilutus* samples during the tests initiated on April 28, 2005 (RM 685R1 and RM 739A1[X3]) and on May 6, 2005 (RM 734A1, RM 736A1[X1], and the Beaver Creek control). However, these concentrations were not low for more than 1 day and did not fall below the 1.5 mg/L threshold of tolerance reported for *C. dilutus* (ASTM, 2009). These temporarily low dissolved oxygen concentrations did not appear to affect results (survival of 72.5 percent and above 81 percent during April 28, 2005 and May 6, 2005 testing) and were consistent with other samples (Table 5-1).

The ages of tested organisms were within the method requirements. *C. dilutus* were received from Aquatic Bio Systems (ABS), Fort Collins, Colorado, and were second to third instar at the time of test initiation. *C. dubia* were obtained from ASLs in-house cultures and were less than 24-hours old and within an 8-hour range at test initiation. These test organisms appeared vigorous and in good condition prior to testing. *H azteca* were received from Chesapeake cultures, Hayes, Virginia, 1 to 2 days prior to testing and were 7 to 8 days old at test initiation. Although some *Chironomids* had formed pupae or emerged by the end of testing, this is a normal occurrence during toxicity testing. Emergent or pupating *Chironomids* were counted as surviving but were excluded from weight measurements.

No deviations were reported by NAS for the *C. dubia* testing on either test date.

Reference toxicant testing with cadmium chloride was completed by NAS concurrently with *H. azteca* testing. These tests resulted in 96-hour LC50s of 7.89 µg/L on April 28, 2005, and 4.40 µg/L on May 5, 2005, and were within the laboratory's reported control chart warning limits (3.34 to 10.8 µg/L). *C. dubia* and *C. dilutus* reference toxicity testing by ASL also indicated that organisms were within their expected sensitivity range with a 7-day sodium chloride IC25 of 1.42 and 0.42 gram per liter for *C. dubia* and a 48-hour sodium chloride LC50 of 6.6 and 5.1 grams per liter for *C. dilutus.*

Mean organism responses to reference site sediments were similar among the two dates when sediments were tested. *H. azteca* survival, weights, and biomass were within 2 percent (Table 5-2). Likewise, *C. dubia* survival among test dates was greater than 90 percent and within 3 percent of each other for survival and reproduction endpoints. *C. dilutus* showed a 14 percent difference (86 percent similarity) among test dates, with a Round 1 (April 28, 2005) survival of 69.4 percent and a Round 2 (May 4, 2005) survival in reference site sediments averaging 80 percent. *Chironomid* weights were 99 percent similar among test dates, but biomass differed by 12 percent and was lower in Round 1 testing (1.3 mg) than in Round 2 testing (1.5 mg). These differences were not sufficiently large to require separate data analyses among test dates and data were pooled for all statistical analyses.

Water quality in test chambers was reported by the test laboratories. Results are shown in Appendix B and summarized in Table 5-3. There were minimal differences in the overlying water quality parameters (ammonium, hardness, alkalinity, dissolved oxygen, temperature, pH, and conductivity) between UCR sediments among test dates. Water quality models, such as those from the biotic ligand model (BLM), could not be used with this dataset to assess potential difference because not all required BLM parameters were measured in the test chamber water.

6.1.3 Inorganic Compounds

Bulk sediment chemistry results for metals are provided by sample in Table 5-4. AVS and SEM concentrations are provided with organic carbon in Table 5-5. Grain sizes are provided in Table 5-6 and shown in Figure 5-1. The 50 site sediment samples used for bioassays were generally representative of the range of metal concentrations found in over 387 Phase 1 sediment samples collected. However, only half of the metals (antimony, chromium, copper, lead, and zinc) had concentrations in the upper 10th percentile range and concentrations were only representative up to the 80th percentile of the range for arsenic, beryllium, cadmium, mercury, nickel, and silver. Frequency distributions of metal and TOC concentrations in Phase 1 samples presented in Appendix C illustrate the range of concentrations in bioassays samples relative to the range of concentrations encountered across the site.

Carbon normalization is an important aspect of the sediment chemistry characterization for both metals and organic compounds. TOC was greater in reference sites (mean of 24,163 milligrams per kilogram [mg/kg]) than in site samples (mean of 4,777 mg/kg; Table 5-5). None of the reference samples had TOC less than 0.5 percent (5,000 mg/kg) while 52 percent of site samples used for bioassays (26 of 50) and 59 percent of all Phase 1 sediment sample had TOC less than 0.5 percent (Appendix C, Exhibit 12).

6.1.4 Organic Compounds

The majority of organic chemicals analyzed in sediment samples occurred at concentrations below detection limits (Table 5-7). Only 29 of the 105 organic compounds analyzed in site sediments had concentrations above detection limits, and only 13 of those had at least 20 percent of the samples with detected concentrations. The other 76 organic compounds were below detection limits in all bioassay samples.

The UCR SLERA found that PCBs, PAHs, and semivolatile organic compounds did not exceed screening values for sediment and were not retained as possible risk drivers (TAI, 2009). Dioxins, furans, methoxychlor, and dichlorodiphenyltrichloroethane (DDTs) were not eliminated as potential risk drivers for benthic resources in the SLERA because of screening value exceedances.

Assessing the influence of organic compounds on sediment toxicity is complicated due to the lack of toxicity reference values for all compounds and the high percentage of concentrations below detection. Potential effects from dioxins and furans also could not be evaluated for the Phase 1 toxicity data because concentrations were not measured in bioassay sediment samples. The one detected concentration of methoxychlor was below the screening effects threshold (Table 4-1). The threshold effect concentrations (TECs) for total DDTs were exceeded by maximum detected concentrations in two samples (RM680A1[X1] and RM687A1) but not the PEC. These results suggest that organic compounds are not risk drivers for Phase 1 UCR sediments. More extensive evaluations of the 2005 UCR sediment toxicity data are presented in Ecology (2012), where it was reported that organic compounds were not helpful in explaining toxicity (that is, there were no relationships or relationship were driven by a few samples with concentrations exceeding threshold effect levels [for example, DDTs]).

The remainder of this sediment toxicity evaluation focuses on metals, the primary risk drivers at the UCR site. Organic compounds are not considered further in this report.

6.1.5 Data Quality Assessment for Bulk Sediment Chemistry

The chemical data met and exceeded project quality goals, as further described by CEE (2006). More than 90 percent of the chemistry data were within the acceptable RPD criteria, thus meeting project goals for precision. The validation reports detailed duplicates outside of control limits, if any. More than 90 percent of the chemistry data were within the specified recovery criteria, thus meeting project goals for accuracy. Data completeness was found to be above 90 percent at large and met project objectives. Furthermore, all data (100 percent) were evaluated independently of the laboratory by project chemists. All sample data were reviewed for the QC specifications identified in the QAPP (CEE, 2005) and USEPA CLP statements of work for each specific parameter. Data were flagged in accordance with the QAPP (CEE, 2005) and USEPA functional validation guidelines as referenced in sample- and parameter-specific data validation reports, which are available on request.

USEPA data validation functional guidelines and QAPP criteria were used to determine flagging conventions. Sample- and analyte-specific data validation findings/qualifying flags for laboratory internal QC data were at the end of each validation report. Data validation flags were entered into the project database.

Detection limits in excess of the required levels identified in the QAPP (CEE, 2005) were reported for a number of samples. However, the values listed for results below detection are the CLP-required RLs. The laboratory-specific MDLs are significantly lower than the CLP RLs. MDLs are shown on laboratory data sheets and are available upon request. Elevated detection levels (the results for uranium were most affected by detection limit issues) resulted from sediment moisture correction because the data were reported on a dry weight basis. The initial laboratory detection limits prior to moisture correction were set according to standard state-of-the-art methods (inductively coupled plasma atomic emission and mass spectrometry); therefore, these levels are not the result of laboratory deficiency (CEE, 2006).

6.2 Sediment Toxicity Metrics

The metrics used to evaluate COI mixtures (that is, SEM-AVS, (SEM-AVS)/ f_{OC}, mean PEC-Q_{metals}, mean PEC-$Q_{metals(1\%OC)}$, Summed PEC-Q_{metals},) are provided in Table 5-8.

Reference site sediment metal concentrations were lower than UCR site sediment concentrations for all metal COIs (arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc; Table 5-4). Further, the mean PEC-$Q_{metals(1\%OC)}$ ranged from 0.26 to 44 (mean of 5.7) in site sediments while (SEM-AVS)/f_{OC} ranged from 120 to 143,000 (mean 14,400; Table 5-8). Mean PEC-Qs in bioassay samples represent up to the 95th percentile range of mean PEC-Q encountered in all Phase 1 sediment samples (Appendix C, Exhibit 13); however, the maximum of 6.5 mean PEC-Q in bioassay samples fell short of the 13 mean PEC-Q maximum encountered site-wide.

6.3 Reference Envelope Designation

All six tributary reference samples met the criteria for inclusion as reference envelope samples for each species-endpoint. The mean PEC-$Q_{metals(1\%OC)}$ values were less than 0.2 for all reference site samples and two additional site samples (RM706A2[X7] and RM724A1[X1]) met this criterion with mean PEC-$Q_{metals(1\%OC)}$ values of 0.06 and 0.17. All tributary samples had mean PEC-$Q_{metals(1\%OC)}$ values below 0.1. In addition, none of these internal or tributary reference samples contained metal concentrations exceeding PECs for any metal and the mean PEC-Qs, a threshold for low likelihood of toxicity (Ingersoll et al., 2001) were all less than 0.2.

Hyalella survival ranged from 97 to 103 percent of controls and from 94 to 118 percent of controls for *Ceriodaphnia* in all six reference sediments and the two additional site sediments. Midge survival ranged from 77 to 103 percent of control survival in the six reference sediments but was below 75 percent in the two potential internal reference sites. Therefore, RM706A2(X7) and RM724A1(X1) were only considered reference samples for *Hyalella* and *Ceriodaphnia* test data because they did not meet the criteria for reference envelope samples for the chironomid tests.

The USEPA (2005) threshold for low toxicity based on (SEM-AVS)/f_{OC} < 130 was also met in all reference and one of the internal samples, with values up to 42, while the other internal reference sample RM724A1(X1) was 749 (Table 5-8). Organic COIs were below detection in all six reference sediments or below benchmarks (Table 5-7). The sum of equilibrium partitioning sediment benchmarks for PAHs (ESB-TU_{FCV}; USEPA, 2003) were also below thresholds for toxicity of 0.1 for all six tributary reference samples and the two internal reference samples.

All six reference samples were generally within the REC calculated for each species-endpoint (Table 5-1). However, it was not unexpected for several reference envelope sample results to fall outside of this calculated 5th percentile. This occurrence does not invalidate the sample as a reference; rather, it describes the variability that can occur among reference samples. Four of the reference samples had at least one test endpoint less than the REC:

- Chironomid growth fell below the reference envelope 5th percentile in reference sample RM 685R1 on the second test run but not on the first test run.
- *Hyalella* survival fell below the reference envelope 5th percentile in the second run of RM 686R1 but not on the first run, and survival was still within the 80-percent test acceptability criterion for controls.
- Chironomid survival and biomass both fell below the reference envelope 5th percentile in reference sample RM 721R1 on the first test run but not on the second.
- *Hyalella* growth fell below the reference envelope 5th percentile in the internal reference sample RM 706A2(X7).

6.4 Pore Water Analytical Results

Pore water metals analyses were completed on all samples except one (RM692A1[X3]), where the sediment sample did not liberate a sufficient volume of pore water during

centrifugation. Concentrations of dissolved metals in pore water are presented in Table 5-9 and the calculated chronic TUs are presented in Table 5-10.

Four of ten pore water metals (cadmium, copper, silver, and zinc) exceeded available chronic or acute (silver) NRWQC based on measured concentrations or detection limits (Table 5-9). Of these, silver exceeded its acute NRWQC based entirely on concentrations below detections (that is, detection limits exceeded the NRWQC). Exceedances for cadmium, copper, and zinc were based on detected concentrations, but these exceedances occurred infrequently and were of low magnitude (Table 5-10). The maximum chronic TU was 2.3 for copper. All other TUs for detected concentrations were below 2 (Table 5-10). The remaining five metals with chronic NRWQC (arsenic, chromium, lead, mercury, and nickel) did not exceed chronic criteria based on detected concentrations or detection limits.

6.4.1 Data Quality Assessment for Pore Water Analyses

As with bulk sediment, the chemical data met or exceeded project quality goals, as further described by CEE (2006). However, the contract-required RLs exceeded water quality criteria for some metals (that is, cadmium, copper, and silver) and risk characterizations were at least partially based on concentrations below the RLs.

6.5 Concentration-Response Models

Regression analyses were performed to explore the potential relationships between sediment toxicity and sediment PEC-Qs, SEM-AVS, PW-TUs, and physical sediment characteristics (that is, TOC and grain size). For the exposure metric evaluations, the exposure metric was plotted rather than the measured metal concentration because the metric provides an indication of where toxicity is expected. These measures were compared with toxicity results to assess whether effects could be predicted. If so, a concentration-response relationship could be determined. The level of significance for regressions between toxicity results and sediment parameters is summarized in Table 5-11, and statistical parameter summaries for these regression analyses are provided in Table 5-12. Statistical analyses are detailed further in Section 6.2.2 and Appendix D.

6.6 Statistical Differences Among Reaches and Samples

Data checks to assess the normality and homogeneity of variance of the dataset were performed during the parametric ANOVA using the Shapiro-Wilk test and Bartlett's test, respectively. Parametric data failed either the test for normality or the test for homogeneity of variance (or both) at a significance level of 0.05 (their calculated probabilities were below 0.05). This failure was not surprising because a relatively large number of results leads to enhanced sensitivity in these tests. Fortunately, there were many results in these datasets, which often leads to similarity of nonparametric and parametric conclusions. Considerable similarity in conclusions was noted between the nonparametric and parametric approaches for the evaluation of samples and reaches. While both versions of the ANOVA (parametric and nonparametric) could be considered useful, the nonparametric approach is presented for focus in this evaluation (resulting from the lack of reliance on assumptions such as normality and the apparent overall redundancy that the parametric conclusions offer).

The ANOVA probability calculated for each species-endpoint was always far below a significance level of 0.05 ($p < 0.0005$). This high level of significance indicated there are significant differences between at least two of the samples or reaches. Therefore, post-hoc tests were pursued in every case. Tukey groupings (based on an experiment-wise error rate of 0.05) are reported for comparisons among reaches and samples in Tables 5-13 and 5-14, respectively. This approach accomplishes the goal of limiting false positives when a large number of pair-wise comparisons are evaluated.

For each species-endpoint, the group with the largest mean value was assigned the letter A. If the mean values of all areas were statistically similar to one another, then they were all assigned the letter A. If the mean value of an area was statistically lower than the one designated as A, then it was assigned the next letter. If the mean value was not statistically different between two different areas (for example, A or B), it was given the designation AB. Thus, an area designated as AB lies between two areas significantly different from each other, but the AB area was not significantly different from either A or B. This pattern continued through the alphabet, depending on how many significantly different partitions exist (for example, ABCDE, EFGHIJK, etc.).

All reference samples were combined in this study, thus there was a unique character sequence serving as the reference Tukey grouping for each species-endpoint. A comparison of this Tukey grouping with those for each individual sample enables a decision of how that individual sample compares with the reference. For instance, for a reference Tukey grouping of ABCD, a sample with grouping EFG would be seen to be significantly smaller in magnitude than the reference. On the other hand, a sample with grouping CDEFG would not be significantly different than the reference because the reference and sample groupings shared the characters C and D.

Ceriodaphnia and midge bioassay species-endpoints were significantly different from the reference in only two and three samples, respectively, whereas *Hyalella* growth and biomass endpoints were significantly lower than the reference in 28 of the 50 site samples (Table 5-14). This represents a 90-percent agreement between the results of statistical analyses showing significant differences from the reference in *Hyalella* toxicity endpoints and the reference envelope evaluation findings where at least one *Hyalella* toxicity endpoint was outside of the REC.

SECTION 6

Discussion

This section details the results of the data evaluation, including the determination of sample toxicity, spatial pattern of toxicity, and the relationships between sediment toxicity and key bulk sediment metrics. Pore water concentrations in some samples were in excess of chronic NRWQC (USEPA, 2009; Tables 5-9 and 5-10), although, these were infrequent and the magnitude of exceedances were low (Section 5.5). As a result, no significant relationships were apparent between pore water concentrations and any measurements of sediment toxicity (Table 5-12) and relationships to pore water could not be used to derive meaningful conclusions about site toxicity or spatial heterogeneity. The most meaningful comparisons to toxicity were in terms of bulk sediment chemistry.

7.1 Sediment Toxicity Designations

7.1.1 Comparisons to the Reference Envelope

Test stations were compared to the reference envelope to determine the relative percent difference category (Section 4.2.3) for each endpoint as well as for each sample (Table 6-1). Results for each test species-endpoint are presented as the relative percent difference from the reference envelope. A negative relative percent difference indicates that the endpoint was less than the reference envelope by the percentage value shown. These results for each test species-endpoint are also plotted by sample, which is an approximation of the RM (Figures 6-1 through 6-8). A general trend is apparent where effects were greatest near the U.S.-Canada border. Figures 6-9 through 6-11 depict the number of samples in each relative percent difference category for each species-endpoint.

Overall, 5 site sediment samples (RM616A1[X3], RM641A1[X1], RM723A1[X1], RM723A2[X3], and RM740A1[X1]) met the REC for all species-endpoints and are not considered to pose a risk to benthic macroinvertebrates (Table 6-1). An additional 2 samples (RM729A1[X1] and RM739A1[X3]) met the REC for all species-endpoints, except *Hyalella* survival, but survival in these 2 samples was within the test acceptability criterion for control survival for this species and these samples were therefore not likely to pose a risk to benthic resources. The remaining 43 samples did not meet the reference envelope for at least one species-endpoint. Of these, 14 samples had one or more endpoint response that was less than or equal to 10 percent below the reference envelope, 13 samples had one or more endpoint response that was greater than 10 percent and less than or equal to 20 percent lower than the reference envelope, and 16 samples had one or more endpoint response that was greater than 20 percent below the reference envelope (Table 6-1).

Across all test species and endpoints, a large portion of the results were within the reference envelope (Table 6-1, Figures 6-9 through 6-11), though different responses were apparent among test organisms. The chironomid tests exhibited the greatest number of samples with at least one endpoint response that was below the reference envelope (39 samples), followed by *Hyalella* (34 samples), and least by *C. dubia* (15 samples). Of these, 11 samples were greater than 20 percent below the REC for chironomid biomass, 8 samples were greater than

20 percent below the REC for *Hyalella* biomass, and 6 samples were greater than 20 percent below the REC for *C. dubia*. It should be noted that survival of *Hyalella* in 26 samples was below the REC; however, survival in all but one of these samples was within the test acceptability criteria for *Hyalella* controls. Therefore, 25 of these samples are not likely to adversely affect *Hyalella* survival. *C. dubia* is a water column organism, so its relative lack of toxicity compared with the other test species is not surprising for these sediment tests.

To explore spatial patterns of effects, sediment stations with species-endpoints below the reference envelope were plotted on maps (Figures 6-12 to 6-22). Spatially, samples with responses more than 20 percent below the reference envelope tended to be from stations in Reaches 1 to 3 (see Figures 6-9 through 6-14; Table 6-1), which are located nearer to the Canadian border. Few samples causing reductions in survival, growth, or reproduction were observed in the sampled sediments of Reaches 2 and 3 (Figure 6-14). There was a higher incidence of effects in Reach 4a than in reaches immediately upstream or downstream (Figures 6-15 to 6-17). Sporadic effects to only *C. dubia* were observed in Reaches 5 and 6 of the lower Reservoir (Figures 6-19, 6-20, and 6-22).

7.1.2 Significant Differences from Reference Samples

Statistically significant differences between UCR sediment samples and reference samples were in general agreement with the toxicity designations made with the reference envelope approach. All 16 samples demonstrating effects of 20 percent or more below the reference envelope for at least one species-endpoint were also significantly different from the reference samples (Table 5-14). However, the statistical evaluation identified a total of 28 samples that were significantly different from the reference samples for at least one species-endpoint. Most of the 28 samples that were significantly different from the reference were the result of effects on *Hyalella* growth. Only three samples, two in Reach 1 and one in Reach 4b, had significant differences for chironomid growth. Likewise, only two samples from Reach 1 had significant differences for *Ceriodaphnia* reproduction relative to the reference samples. Significant *Hyalella* effects were inclusive of all samples with differences for either chironomid or *Ceriodaphnia.*

Significant differences existed among all river reaches within the study area with respect to sediment effects (Table 5-13). *Hyalella* survival differed significantly from the reference envelope only in samples from Reach 1 (Table 5-13). However, chironomid survival did not differ significantly among reaches. *Hyalella* biomass differed significantly from reference samples in all reaches, and all but Reaches 2 and 5 differed significantly for growth. Chironomid growth or biomass measures differed significantly from reference samples in Reaches 1, 3, and 4a. *Ceriodaphnia* reproduction did not differ significantly from reference samples when compared on a reach-by-reach basis. Reach 1 had the greatest number of samples with species-endpoint effects that were significantly different from other reaches and from reference samples.

These results appear somewhat consistent with the sediment characteristics in the river. Effects were greatest in the upper reach near the U.S.-Canada border (that is, Reach 1), where areas of slag can comprise a significant portion of the available sediment in depositional areas. The riverbed is dominated by sand and rock in Reach 2 and portions of Reach 3, and the higher velocity flows reduces sedimentation in these areas. Sedimentation occurs as river velocities slow in the upper portion of the Middle Reservoir where the river

enters the reservoir (Reach 4a), and a second cluster of sediments resulting in elevated effects was observed. The river widens and flows slow to allow deposition in the Marcus Flats area of Reach 3; however, observed effects in the four samples from this area were generally low. Differences between observed effects in Reaches 3 and 4a may be related to hydraulic conditions that existed and affected contaminant fate and transport prior to operation of the Grand Coulee Dam.

7.2 Relationships between Sediment Toxicity and Chemistry

7.2.1 Exposure Metrics

PEC-Qs ranged from less than 1.0 to 31 (Zn at RM738A1[X3]) and were generally higher in Reaches 1 through 3 (Table 5-8). Organic carbon normalized mean PEC-Qs were also reasonable predictors of effects in UCR sediments when significantly elevated (Table 5-12). It is interesting to note that 18 of the 19 samples between RM 724 and RM 744—including all of Reach 1 and part of Reach 2 in the 20 miles nearest the U.S.-Canada border—had mean PEC-$Q_{metals(1\%OC)}$ greater than 1.0, ranging from 1.4 to 44. The 7 samples from Reach 1 with multiple species-endpoints less than 80 percent of the REC had mean PEC-$Q_{metals(1\%OC)}$ greater than 5, whereas only 10 of the other 31 samples collected downstream of RM 724 had mean PEC-$Q_{metals(1\%OC)}$ greater than 1.0, ranging from 1.0 to 2.6.

Predictive relationships between metals exposure metrics and effects have been reported for a wide range of sites (for example, USEPA, 2000c; Ingersoll et al., 2001) and the incidence of toxicity in laboratory tests reported by USEPA (2000b) was more than 97 percent for 25-day *Hyalella* bioassays and 52 percent for 10-day chironomid sediment tests when the mean PEC-Q was greater than 1. In the current study, 28 of the 2005 UCR sediment samples had mean PEC-$Q_{metals(1\%OC)}$ greater than 1.0, but only 10 of those samples (36 percent) had effects greater than 20 percent below the REC (Table 6-2). Likewise, potential toxicity was overestimated by PEC-$Q_{metals(1\%OC)}$ when compared with the statistically significant differences in only 15 of 28 samples (54 percent). The reference envelope and mean PEC-$Q_{metals(1\%OC)}$ found agreement that there were relatively low levels of effects (that is, effects not more than 20 percent below the reference envelope) when the mean PEC-$Q_{metals(1\%OC)}$ was less than 1. Therefore, the mean PEC-$Q_{metals(1\%OC)}$ was a good predictor of no toxicity but a poor predictor of when effects would be observed.

Likewise, toxicity was overestimated by (SEM-AVS)/f_{OC} when compared with the statistically significant differences in only 9 of 15 samples (60 percent; Table 6-3). The molar sum of metal concentrations in SEM exceeded the available binding capacity of AVS in 32 of the 50 site sediments, including all of the sediment collected in Reaches 1 through 3a (Table 5-8). The SEM-AVS in Reaches 1 to 3 ranged from 1.9 to 184 µmol/g, while many were below 1.0, and the maximum was 14 µmol/g in the reservoir (Reaches 4 through 6). SEM metals in excess of AVS are considered ''potentially bioavailable'' (USEPA, 2005) and an indicator of potential toxicity. Sediment may be toxic to sediment-dwelling organisms when the (SEM-AVS)/f_{OC} is greater than 130 µmol/g_{OC}, while toxicity is probable when (SEM-AVS)/f_{OC} is greater than 3,000 µmol/g_{OC} (USEPA, 2005). There were 15 sediment samples where the (SEM-AVS)/f_{OC} was greater than 3,000 µmol/g_{OC}, ranging from 3,244 to 143,000 µmol/g_{OC} (Table 5-8). All of these samples were collected in Reaches 1 and 2 between RM 724 and RM 744—the 20 miles nearest the U.S.-Canada border. Seven of these 15 samples, with (SEM-AVS)/f_{OC} greater than 3,000 (47 percent), were found to cause effects of

more than 20 percent lower than the reference envelope for at least one species-endpoint (Table 6-3).

7.2.2 Statistical Relationships

Metals concentrations exceeding effect concentrations were good predictors of toxicity endpoints significantly different from the reference envelope. Mean PEC-$Q_{metals(1\%OC)}$, ΣPEC-Q, (SEM-AVS)/f_{OC}, and the PEC-Qs for chromium, copper, and zinc, were highly correlated with effects (Table 5-11). In contrast, arsenic, cadmium, lead, mercury, and nickel showed little or no significant relationship with the toxicity results. PW-TUs were also not significantly related to any species-endpoint. Toxicity endpoints for each test species and exposure metrics with significant relationships are presented graphically on Figures 6-23 through 6-58 (untransformed data are presented).

Mean PEC-$Q_{metals(1\%OC)}$ was negatively correlated with *Hyalella* survival and growth, chironomid growth, and *Ceriodaphnia* reproduction, but not with chironomid or *Ceriodaphnia* survival (Table 5-11). For *Hyalella* survival, significant differences from the reference envelope was observed in only one sample at RM 744 (Table 6-1) and did not occur until the mean PEC-$Q_{metals(1\%OC)}$ was 44 (Figure 6-23). In contrast, measures of growth (for *Hyalella* and chironomids) and reproduction (*Ceriodaphnia*) were more sensitive measures of effects, with reduced survival, growth, or reproduction generally observed in samples between RM 737 and RM 744 (Table 6-1), with mean PEC-$Q_{metals(1\%OC)}$ values greater than 18 (Figures 6-26, 6-27, and 6-28). It should be noted, however, that there was high variability surrounding these relationships, and samples with mean PEC-$Q_{metals(1\%OC)}$ less than 18 also had statistically significant effects below the REC.

Similarly, the ΣPEC-Q_{metals} were negatively correlated with *Hyalella* survival and growth, chironomid growth, and *Ceriodaphnia* reproduction, but not with chironomid or *Ceriodaphnia* survival (Tables 6-1 and 5-11). These relationships generally had a lower goodness of fit than those calculated for mean PEC-$Q_{metals(1\%OC)}$ (Table 5-12). For example, the only sample causing significant *Hyalella* mortality (RM 744A2[X3]) did not have the highest ΣPEC-Q_{metals} (Figure 6-29), but it did have the highest mean PEC-$Q_{metals(1\%OC)}$ (Table 5-8). *Hyalella* growth and *Ceriodaphnia* reproduction effects were variable, with ΣPEC-Q_{metals} values less than 35 and 42, respectively (Figures 6-32 and 6-34, respectively), and a clear trend seems to appear only at higher levels. No clear trend was observed for chironomid growth (Figure 6-33).

(SEM-AVS)/f_{OC} was negatively correlated with *Hyalella* survival, growth, and biomass and chironomid growth, but not chironomid survival, nor was (SEM-AVS)/f_{OC} significantly related to *Ceriodaphnia* survival or reproduction. USEPA (2005) indicated that toxicity from certain metals is likely at (SEM-AVS)/f_{OC} values greater than 3,000 µmole/g_{OC}. However, higher metal concentrations may have been a threshold for effects exceeding the variability among UCR sediments. Effects did not clearly exceed the variability among samples until (SEM-AVS)/f_{OC} was greater than 10,000 µmole/g_{OC} for *Hyalella* growth (Figure 6-38) and chironomid growth effects do not exceed variability among samples even at these high levels of (SEM-AVS)/f_{OC} (Figure 6-39). Sediments with high (SEM-AVS)/f_{OC} values were concentrated in Reach 1 of the UCR (that is, above RM 733; Table 6-1).

For individual metals, PEC-Qs for chromium were negatively correlated with *Hyalella* growth and biomass, chironomid growth and biomass, and *Ceriodaphnia* survival and reproduction, but not with *Hyalella* or chironomid survival (Tables 5-8 and 5-11; Figures 6-41

to 6-46). Despite these apparent relationships with observed effects, PEC-Q values were all 1.0 or less. These significant relationships suggest that the PEC for chromium is greater than the concentration associated with effects in UCR sediments, or that chromium co-varies with another contaminant with a significant contribution to toxicity.

PEC-Qs for copper were also negatively correlated with *Hyalella* survival, growth, and biomass; chironomid growth; and *Ceriodaphnia* reproduction (Tables 5-8 and 5-11; Figures 6-47 through 6-52). A PEC-Q of 10 for copper was associated with the only sediment sample that significantly reduced *Hyalella* survival (RM 744A2[X3]). These data suggest that a site-specific PEC for copper in UCR sediments may be 10 times greater than the MacDonald et al. (2000) published value. The greatest reductions in *Hyalella* growth and *Ceriodaphnia* reproduction were observed in copper PEC-Qs greater than 10, but this pattern was less apparent for chironomid growth (Figures 6-50, 6-51, and 6-52).

The PEC-Q for zinc was correlated with *Hyalella* survival, growth, and biomass, as well as chironomid growth (Table 5-11; Figures 6-53 through 6-58). The sample reducing *Hyalella* survival (RM 744A2[X3]) had a PEC-Q for zinc of more than 20; however, two other samples (RM 737A1[X3] and RM 738A1[X3]) had higher zinc concentrations and were not associated with a significant reduction in *Hyalella* survival. A site-specific zinc concentration for chronic effects to *Hyalella* or *Chironomids* is not clear. However, samples with zinc PEC-Qs greater than 25 appeared to have an adverse effect on *Ceriodaphnia* reproduction, despite the lack of a significant regression (Figure 6-58). PEC-Qs for zinc were also the highest magnitude among metal PEC-Qs in most samples, indicating that zinc, and to a lesser degree copper, may be drivers of adverse effects in sediment samples.

Although metals were seemingly important in affecting sediment toxicity, other factors must be acknowledged. Negative relationships between sediment chemistry and effects predominate in the dataset, but the strength of these relationships was generally very low (that is, $r^2 < 0.3$), even when statistically significant (Table 5-12). Pair-wise regression relationships for all comparisons, including these examples, are shown in Appendix D. The strongest causally suggestive relationship was the negative relationship between *H. azteca* survival as determined by the mean PEC-$Q_{metals(1\%OC)}$. However, that model explains only 27 percent of the variance (Table 5-12).

Physical characteristics of the sediments may have helped to mitigate toxicity. The percentage of sand was significantly positively associated with *C. dilutus* and *H. azteca* survival (Tables 5-11 and 5-12). Closer examination showed that the associations were attributable to the fine sand percentage for *H. azteca* and the medium sand percentage for *C. dilutus*. These additional associations with grain size may be important co-variates in some cases where metals are associated with certain grain sizes.

The exposure metrics and regression models were reasonable indicators of effects in sediment toxicity tests. There are sufficient sediment metals to cause effects in many of the samples; however, effects were not as great as predicted based on the mean PEC-$Q_{metals(1\%OC)}$ and (SEM-AVS)/f_{OC} models. These differences may result from the presence of metals that are not bioavailable. Possibly, larger grains of slag contain metals that are not entirely bioavailable. This hypothesis is supported by the negative relationship between the presence of sand-sized sediment particles and effects, where survival, growth, or reproduction was reduced in sediments with more sand.

As noted previously, detected concentrations of metals in pore water generally did not exceed hardness-adjusted chronic water quality criteria. Exceedances of these criteria were infrequent and of low magnitude (that is, below 2 chronic TUs). Other studies began to see effects on *Hyalella* survival and midge biomass only at 1 to 2 chronic TUs (that is, Ankley et al., 1996; MacDonald et al., 2009) and the lack of clear effects at pore water concentrations observed in Phase I sediment samples is consistent with these other studies.

7.2.3 Slag Characterization

Exploratory analyses of the relationships between sediment chemical properties and toxicity results were performed to determine if the predictive power of dose-response models could be improved by incorporating slag characterization into the analyses. Samples with elevated zinc concentrations (enriched in slag discharged from the Trail smelter) were normalized by the concentrations of vanadium to identify samples that were slag-associated (TAI, 2011). Concentration-response relationships were improved for slag-associated samples. These preliminary analyses are summarized in Appendix E to illustrate the potential usefulness of similar analyses on future UCR sediment toxicity datasets.

7.3 Comparisons to Other Recent Studies

The potential toxicity of Lake Roosevelt sediments have been assessed in a range of investigations from 1986 to 2004. The studies are summarized in the following sections and the results are compared and contrasted with the Phase 1 results. Additional study details are provided in Appendix A and in the BERA work plan (TAI, 2011).

1) ***An Assessment of Metals Contamination in Lake Roosevelt*** (Johnson et al., 1989)

Sediment samples were collected by the State of Washington Department of Ecology (Ecology) in 1986 within Lake Roosevelt from four locations: Deadman's Eddy (RM 738), Marcus Island (RM 708), Gifford (RM 676), and Seven Bays (RM 636). Metals analysis and whole sediment toxicity tests using *Hyalella azteca* (10-day exposure) and *Daphnia pulex* (48-hour exposure) were conducted at each location. Ecology made the following conclusions:

- Lake sediments did not appear to be toxic to *H. azteca*. Survival ranged from 74 to 90 percent.
- Survival of *D. pulex* ranged from 35 to 75 percent. However, a statistically significant reduction in survival (that is, 35 percent) was observed only at the Seven Bays sediment sampling location.
- Neither toxicity test demonstrated a pattern of response that correlated with metals concentrations or physical characteristics of the sediments.

As a result of these findings, Ecology concluded that "the bioassays suggest an absence of toxicity in the upper reaches of the lake where the sediments are apparently contaminated by slag."

In contrast, the Phase 1 results indicate adverse effects to at least one species-endpoint (that is, survival, growth, or reproduction for at least one of the three test organisms) in 16 of 50 site sediment samples, based on a reference envelope comparison. For all three test species,

effects were generally more prevalent in the upper reach of the river (that is, Reach 1; RM 733 and above) and were more variable downstream. Significant relationships existed between toxicity endpoints and one or more metrics of sediment metal concentrations (that is, SEM-AVS, (SEM-AVS)/f_{OC}, mean PEC-Q_{metals}, mean PEC-$Q_{metals(1\%OC)}$, summed PEC-Q_{metals}).

2) ***Survival and Water Quality Results of Bioassays on Five Species of Aquatic Organisms Exposed to Slag from Cominco's Trail Operations*** (Nener, 1992)

Water-granulated fumed slag was collected from the Teck Cominco smelter in Trail, British Columbia, in March 1992 and tested for toxicity using five species of aquatic organisms of various trophic levels. The slag was acutely toxic to rainbow trout (*Oncorhynchus mykiss,* 24-hour exposure), algae (*Selenastrum capricornutum,* 96-hour exposure), an amphipod (*H. azteca,* 10-day exposure), a midge (*Chironomus dilutus,* 10-day exposure), and a cladoceran (*D. magna,* 48-hour and 96-hour exposures). In some cases, the supernatant prepared from the slag was also acutely toxic. The author indicated that elevated levels of copper and zinc may have been at least partly responsible for the acute toxicity observed.

The Phase 1 results and analysis are consistent with the conclusions drawn by the slag study, in that chromium, copper, and zinc were the most common determinants of sediment toxicity in the Phase 1 samples.

3) ***Sediment-Quality Assessment of Franklin Roosevelt Lake and the Upstream Reach of the Columbia River*** (USGS, 1994)

Sixteen sediment samples were collected in 1992 from the Columbia River and six major tributaries to the river by the USGS. Analyses of metals, dioxins and furans, and whole sediment toxicity tests using *H. azteca* (7-day exposure), *Ceriodaphnia dubia* (7-day exposure), and *Photobacterium phosphoreum* (Microtox® test; 15-minute exposure) were conducted with each sample. In addition, pore water was tested at all locations using Microtox®. The USGS made the following conclusions:

- *H. azteca* and *C. dubia* survival ranged from 10 to 96.7 percent and 0 to 100 percent, respectively.
- Generally, *H. azteca* and *C. dubia* were most affected near the U.S.-Canada border, and Microtox® was affected farther downstream.
- The sediments causing low survival or reproduction rates for *H. azteca* and *C. dubia* contained slag with highly elevated concentrations of copper and zinc.
- Adverse effects were observed for at least one or all three test organisms in the upper reaches of Columbia River, from the U.S.-Canada border to 15 miles downstream.

Phase 1 results were consistent with this study in that greater toxicity was observed in samples from upstream reaches.

4) ***Columbia River Integrated Environmental Monitoring Program (CRIEMP), 1991-1993 Interpretive Report*** (Aquametrix Research Ltd., 1994)

Sediment samples were collected in September 1992 from eight locations on the Columbia River north of the U.S.-Canada border and from Arrow Lake (Canada) as a reference

location. Sediment was tested for toxicity using *H. azteca* (exposure duration unspecified) and Microtox® tests. *H. azteca* mortality was highest from the samples collected downstream from Celgar (33 percent mortality) and downstream from Teck Cominco (27 percent mortality). Microtox® tests results were more variable with inconclusive results. The authors concluded that sediment toxicity was greatest immediately downstream from both the Celgar and Teck Cominco discharges, although these data were considered preliminary.

Phase 1 results are consistent with this study in that more toxicity was observed in the upstream reaches of the site.

5) ***Lower Columbia River from Birchbank to the International Border: Water Quality Assessment and Recommended Objectives - Technical Report*** (MacDonald Environmental Sciences Ltd., 1997)

This report reviewed and summarized various toxicity studies. Sediment from Beaver Creek (downstream from Teck Cominco) was found to be toxic to *D. magna* (10-day exposure) reproduction and survival (0 percent survival). However, samples from Genelle Island and a back eddy pool at Genelle were found to be non-toxic (100 percent survival) in a study by Godin and Hagen (1992). In another study by Norecol Environmental Consultants Ltd. (1993), sediment samples collected near Beaver Creek and downstream of Celgar were found to be acutely toxic to *H. azteca* (10-day exposure), while sediment from Birchbank was only slightly toxic and sediments from the vicinity of Ryan Creek and Waneta were non-toxic. None of these sediments were toxic to *D. magna* (48-hour exposures).

Phase 1 results are consistent with this study in that more toxicity was observed in the upstream reaches of the site.

6) ***Assessment of Columbia River Receiving Waters - Final Report*** (Teck Cominco Ltd., 2001)

The purpose of this study (conducted by G3 Consulting for Teck Cominco) was to assess the changes in the health of the Columbia River following upgrades of the Teck Cominco smelter operations. Results are reported for toxicity tests conducted on water, bottom sediments, and suspended sediments from the Columbia River in 1995 and for bioassays conducted with whole sediment in 1999. The bottom sediments were collected from Birchbank (upstream of Teck Cominco) and Waneta (downstream of Teck Cominco); suspended sediments were collected from New Bridge immediately below Teck Cominco. Additional bottom sediments were collected from Birchbank and Waneta in 1999 for comparison. The sediment samples were assessed with the 14-day *C. dilutus* bioassay. The 1995 results showed considerably higher *C. dilutus* mortality for New Bridge (88 percent) than for Birchbank (7 percent) or Waneta (13 percent). Although no significant difference in survival was seen between Birchbank and Waneta in either 1995 or 1999, growth at Waneta was significantly lower than at Birchbank in both years. In 1995, growth was highest at Birchbank, intermediate at Waneta, and lowest at New Bridge. The 1999 sampling results confirmed this trend for Birchbank and Waneta.

Phase 1 results are consistent with this study in that more toxicity was observed in the upstream reaches of the site.

7) ***Reassessment of Toxicity of Lake Roosevelt Sediments*** (Era and Serdar, 2001)

Nine sediment samples were collected by Ecology in May 2001 from between the U.S.-Canada border and the Grand Coulee Dam, as well one sample at a reference station in Lower Arrow Lake. Metals analyses, whole sediment bioassays using *H. azteca* (10-day exposure) and *C. dilutus* (20-day exposure), and sediment pore water bioassays using Microtox® (15-min exposure) were conducted at each location. Statistically significant toxicity, when compared with the laboratory controls, was observed in at least one bioassay test at all locations, except for the farthest downstream locations (near the Grand Coulee Dam). Statistically significant toxicity, when compared with the reference area, was observed at six of nine sample locations. The highest toxicity to *H. azteca* and *C. dilutus* was observed at Goodeve Creek, just upstream of Northport, followed by the Auxiliary Gage location farther upstream. These locations also had the highest metals concentrations measured during the study. Microtox® test results did not correlate well with the invertebrate test results. In general, *Chironomid*s were the most sensitive species tested, and sediments collected in the UCR were more toxic than sediments collected downstream in Lake Roosevelt.

The Phase 1 results are consistent with the Ecology study. Adverse effects in at least one species-endpoint were seen in 16 of 50 site sediment samples, based on a comparison with a reference envelop. For all three test species, effects were generally more prevalent in the upper reaches of the river (that is, Reach 1; RM 733 and above) and were more variable downstream. Significant relationships existed between toxicity endpoints and one or more metrics of sediment metal concentrations.

8) ***Teck Cominco Aquatic Ecological Risk Assessment Field Summary Report for 2003*** (Golder Associates, 2004)

Whole sediment toxicity tests using *C. dilutus* were conducted on Columbia River sediments collected by Teck Cominco in 2003 at seven locations downstream and three locations upstream of the Teck Cominco facility. Both 10- and 20-day survival and growth bioassays were conducted on whole sediments using *C. dilutus* larvae. The lowest survival and growth rates were associated with samples collected downstream of the Teck Cominco facility.

The 20-day *C. dilutus* tests were conducted using third instars instead of less than 24-hour-old larvae as prescribed by the ASTM 20-day protocol (method sensitive to contaminants than the third or fourth instars). For example, first instar *C. dilutus* have been reported to be up to 27-fold more sensitive to acute copper exposure than fourth instar larvae, and first-instar *Chironomus riparius* have been reported to be up to 127-fold more sensitive to acute cadmium exposure than second instar larvae (ASTM, 2003 and 2009). Given this, it is possible that the degree of sediment toxicity reported by Golder Associates (2004) for river sediments downstream of Teck Cominco was underestimated.

Phase 1 results are consistent with this study in that more toxicity was observed in the upstream reaches of the site.

9) Biological and Chemical Characterization of Metal Bioavailability in Sediments from Lake Roosevelt, Columbia River, Washington (USGS, 2008)

The USGS conducted a study of metal bioavailability to *Lumbriculus variegatus* (28-day exposures) and toxicity of sediments to *Chironomus dilutus* (12-day exposures) and *Hyalella azteca* (28-day exposures) from the UCR in September 2004 (Besser et al., 2008). The study focused on the bioavailability of copper, zinc, arsenic, cadmium, and lead in sediment. Besser et al. (2008) reported strong relationships between PEC-Qs and effects with the strongest associations with the individual metals copper, lead, and zinc. They did not find significant reductions in *Hyalella* growth relative to reference sites, but chironomid growth was significantly reduced in site sediments. PEC-Qs, (SEM-AVS)/f_{OC} and PW-TUs were good predictors of chronic effects to chironomids.

Conclusions by Besser et al. (2008) on the toxicity of UCR sediment are generally consistent with the results of the Phase 1 toxicity testing program reported here. The Phase 1 results indicated significant relationships between sediment metals, namely chromium, copper, and zinc. Likewise, metal mixtures as indicated by PEC-Qs, (SEM-AVS)/ f_{OC} were strongly correlated with toxicity in both studies. In contrast, PW-TUs were not a good indicator of toxicity to *Chironomid*s in the Phase 1 data. The consistent conclusion drawn from both of these studies is that cationic metals such as chromium, copper, lead, and zinc are bioavailable, and if elevated above threshold levels, these metals have the potential to cause toxicity in sediments from the UCR.

7.4 Uncertainties

Uncertainties are inherent in any toxicity evaluation. They may arise in all stages of the process, including those associated with the sampling design and process, the analytical methods, and the toxicity testing procedures. Uncertainties related to the sediment toxicity evaluation for the UCR site are as follows:

- Pore water samples were collected from samples collocated with bioassay and whole sediment chemistry samples but were not from homogenized splits. Pore water sample data indicate these media were collected on different dates, after bioassay and whole sediment chemistry samples. There can be small-scale spatial variability in sediment concentrations, and the lack of synoptic collections of pore water from homogenized splits of samples used for bioassays adds uncertainty to the relationship between pore water chemistry and sediment toxicity.

- Pore water chemistry was not determined from samples taken directly from toxicity test chambers during the bioassays where test organisms are exposed. Therefore, the usefulness of pore water metal concentration data for interpreting toxicity data may be compromised. The predictive relationship between pore water and toxicity could be improved in future toxicity testing by collecting pore water from chemistry-only replicate exposure chambers during each bioassay.

- The upper range of metal concentrations found in Phase 1 UCR sediment samples were not well represented in bioassays samples. Bioassay samples did not include metal concentrations in the upper 10th percentile for six metals (arsenic, beryllium, cadmium,

mercury, nickel, and silver). Therefore, toxicity to benthic invertebrates at the UCR may be underestimated in these Phase 1 investigations.

- The contract-required RLs exceeded water quality criteria for some metals (that is, cadmium, copper, and silver) and risk characterizations were at least partially based on concentrations below the RLs. Therefore, risks are uncertain and data analyses are compromised by these values. Future assessments should ensure that RLs are below water quality criteria.

- BLM parameters were not collected from pore water or tested sediments as part of the Phase 1 sediment sampling and testing efforts. These data would be useful for determining BLM-adjusted NRWQC for copper in the tested samples. It would be helpful to collect and analyze select BLM parameters in pore water from test chambers (that is, using mini-peepers) or from centrifuged sediments in future UCR toxicity tests.

- Aged, reconstituted water was used for the *Hyalella* survival and growth toxicity tests. Although USEPA (2000b) and ASTM (2003) methods indicate that aged, reconstituted water may be used, they caution that the test results may be affected. Ongoing investigations (pers. comm. Dave Mount, USEPA and Chris Ingersoll, USGS) are evaluating the nutritional effects of overlying water and recommended feeding on *Hyalella* reproduction, and revision to the USEPA (2002) test methods may be recommended to improve test performance. Control results in the Phase 1 *Hyalella* bioassays were within the test acceptability criteria, and reference toxicant results were within the acceptable range; therefore, these uncertainties do not invalidate test results and are is not likely to have had a significant impact on the *Hyalella* toxicity results.

- The 2005 sediment sampling effort collected grain size data, but there were no observations or measures of the proportion or type of slag present in each sample. Historical slag discharges from the Teck Cominco smelter in Trail have contributed to elevated metal concentrations in UCR sediments. It is possible that the abundance or type of slag in a sediment sample may help in predicting sediment toxicity. There are no established methods for measuring slag content in sediments, but if a method could be identified, its use would be helpful in assessing future toxicity samples. Exploratory analyses considering the use of metal ratios to identify samples containing slag are provided in Appendix E.

- Potential interactions among all parameters were not evaluated in this report; rather, the explanatory power of single factors (single metal concentrations, risk quotients, or exposure metrics that integrate exposure from multiple metals) were assessed. A multivariate approach could consider the physical and chemical data simultaneously to predict toxicity (USEPA, 2005) and may produce better predictions of toxicity in UCR sediments than were found with single factors.

- The chironomid life stage most sensitive to metals (first to second instar larvae) was not tested in the Phase 1 sediment sampling and toxicity program. Therefore, results of toxicity tests with *Chironomus dilutus* may underestimate the potential for toxicity from UCR sediments.

- Evaluations using TOC-normalized data (for example, for SEM-AVS, mean PEC-Q_{metals}) may be affected by samples with low TOC. As an example, normalization is not

recommended in sediments with TOC of less than 0.2 percent when evaluating non-polar organic compounds because other factors such as grain size and sorption to nonorganic mineral fractions become relatively more important to partitioning to pore water than TOC (Di Toro et al., 1991). These issues may also be of concern for some metals. Ecology (2012) used a minimum value of 0.5 percent organic carbon when normalizing metal metrics to reduce the artificial inflation of the organic carbon normalized product when the denominator is well below 1, but this did not prove helpful in determining concentration-response for 2005 UCR data. An example of the data differences when normalizing to organic carbon with a minimum of 0.5 percent is shown in Figure 6-40 where some values shift to slightly lower normalized values on the x-axis, but the patterns are relatively unchanged.

- Indications of metal stressors in samples defining the REC (that is, sample RM724A1[X1] where (SEM-AVS)/f_{OC} > 130) may have increased the range of acceptable chronic toxicity effects and contributed to an underestimation of toxicity in samples relative to the REC.
- Although the simple evaluation in this report and the supporting evidence from Ecology (2012) suggest that including organic compounds in the current evaluation was not warranted, exclusion of this group of chemicals may underestimate the magnitude and extent of estimated toxicity. Future evaluations with new UCR samples should include organic compounds for which the potential for adverse effects to benthic organisms has not been excluded.

SECTION 7

Conclusions and Recommendations

Contaminants in the UCR may be present in surface sediment at concentrations that pose unacceptable risk to benthic/epibenthic resources. To assess whether measures are needed to prevent exposure of benthic/epibenthic resources to contaminants in sediment, the USEPA initiated a sediment sampling and laboratory toxicity testing program that was conducted in 2005. USEPA collected sediment samples from a total of 50 locations within the UCR. Six additional sediment samples were collected from reference locations. A broad range of COIs were measured in each of the 50 site-associated and 6 reference site sediment samples. Bioassays included 10-day whole sediment toxicity tests with the midge, *Chironomus dilutus*; 28-day whole sediment toxicity tests with the amphipod, *Hyalella azteca*; and 7-day toxicity tests with the cladoceran, *Ceriodaphnia dubia*. In addition to bulk sediment chemistry, pore water chemistry was measured from collocated samples. These data were collected to evaluate the potential for toxicity to benthic macroinvertebrates from UCR sediments and to identify relationships between sediment chemistry and sediment toxicity.

UCR sediment produced adverse effects in at least one of three endpoints (that is, survival, growth, reproduction) for at least one test organism, relative to a reference envelope in 43 of 50 site sediment samples; however, only 16 samples produced an endpoint response 20 percent lower than the reference envelope for at least one species response (Table 6-1). All 16 of these samples were also significantly different from the reference samples. Statistically significant effects were observed in 28 samples and occurred in all reaches. *Hyalella* growth and biomass were the most sensitive endpoints and samples for which *Hyalella* growth and biomass effects were significantly different from reference samples included samples where significant effects were observed for either *Chironomids* or *Ceriodaphnia.* For all three test species, effects were generally more prevalent closest to the U.S.-Canada border (above RM 730) and were more variable downstream.

Despite elevated concentrations of metals in most of the UCR sediment samples, there were relatively low magnitudes of effects and concentration-response relationships were poor (that is, $r^2 < 0.3$). Significant relationships existed between toxicity endpoints and metrics of sediment metal concentrations (that is, SEM-AVS, (SEM-AVS)/ f_{OC}, mean PEC-Q_{metals}, mean PEC-$Q_{metals(1\%OC)}$, summed PEC-Q_{metals}) and PEC-Qs for individual metals (that is, chromium, copper, and zinc) but not for pore water metal TUs. Zinc and copper PEC-Qs were the highest in most samples, suggesting that these two metals may be drivers of adverse effects in sediment samples. The weight of evidence indicated that benthic/epibenthic resources may be at risk. However, there is moderate uncertainty about these results because of the poor predictive ability of the exposure metric-response /concentration-response relationships. Additional sampling and toxicity testing are recommended to confirm these findings, and additional sample information would be helpful to explain better the relationship between sediment quality and risks.

Additional data are needed to support DQOs for the UCR RI/FS. These additional data will help determine whether measures are needed to prevent exposure of benthic/epibenthic

resources to contaminants in sediment and to determine the necessary level of action. The following recommendations for future sampling can be made based on analysis of the Phase 1 sediment toxicity data:

- Additional sediment sampling and toxicity testing should be conducted on a greater density of samples from the upper segment of UCR, particularly above RM 733. This effort would provide additional data from locations where metal concentrations and adverse effects were observed to be the highest and may support the development of stronger exposure metric-response /concentration-response relationships.
- Future sampling events should consider sediment sampling and toxicity testing in a focused reach of the UCR between RM 676 and RM 698 (Reaches 4a and 4b) to confirm and better understand the causes of toxicity observed in *Hyalella* and *Chironomids* during Phase 1 testing.
- Future data collection should include BLM parameters from overlying water and pore water metal concentrations from test chambers to support the development of concentration-response relationships. Mini-peepers could be used for this purpose and detection limits must be adequately low to allow comparisons with chronic water quality criteria.
- Future sediment toxicity testing would benefit by the inclusion of bioaccumulation testing (that is, ASTM, 2009; USEPA, 2000a), possibly in follow-up testing in a subset of sediments representing a range of metal concentrations and sediment types (that is, varying AVS and TOC) when effects are not readily explained by sediment or pore water chemistry. The bioavailability of metals determined from these tests might aid the interpretation of toxicity test results.
- Future evaluations should consider the abundance or type of slag in sediment samples, if such measurements are feasible, to support the development of concentration-response relationships. An example of these analyses is provided in Appendix E and also by Ecology (2012) showing improved concentration-response relationships when only the slag-associated samples are considered in the evaluations.
- Future sampling and test data could be combined with the 2005 dataset and be analyzed by multivariate statistics to assess the interactive effects among contaminants and physical properties of each sample (for example, grain size) that may modify toxicity if responses are not otherwise explained by sediment and pore water chemistry.
- A reference envelope should be used as one method for evaluating Phase II data. However, it may be helpful to consider whether alternative methods for calculating and assessing reference envelopes are available (for example, Ecology, 2012; Besser et al., 2009; Ingersoll et al., 2009; Hunt et al., 2001; and Kemble et al., in press). An example of the method refinements could include the designation of a reference envelope based on the range of responses observed among reference samples. Future analyses may also consider including more robust reference envelope sample selection criteria for metals such as mean PEC-$Q_{metals(1\%OC)}$ < 0.1; (SEM-AVS)/ f_{OC} < 130 (Ecology, 2012). In addition, while organic compounds were not frequently present or present at concentrations exceeding screening effect levels (TAI, 2009) in Phase 1 samples, future analyses may want to ensure that organic compounds are not affecting toxicity results in reference

envelope samples by selecting only those samples where organic compounds are below TECs (MacDonald et al., 2000) and summed ESB-TU_{FCV} < 0.1 (USEPA, 2003).

- Phase II sediment toxicity data evaluations may be refined by normalizing the response data to control results to improve comparisons among multiple batches of toxicity data that otherwise meet acceptability criteria. This normalization may account for large differences in organism sensitivity among batches.
- Chemistry and bioassay samples should, where possible, be made from splits of the same homogenized sample. Pore water extractions from separate samples in the Phase 1 data may have contributed to the poor concentration-response relationships.
- Organic carbon normalization is not recommended in sediments with TOC of less than 0.2 percent when evaluating non-polar organic compounds because other factors such as grain size and sorption to nonorganic mineral fractions become relatively more important to partitioning to pore water than TOC (Di Toro et al., 1991). Using a minimum level of TOC when normalizing metal metrics may be helpful in clarifying concentration-response relationships. While not necessarily helpful in reducing variability for Phase 1 UCR sediment toxicity data (Ecology, 2012), minimizing this artifact of data analyses may be helpful for Phase II data.
- Future sampling and toxicity testing should assess chronic toxicity to organisms and life stages most sensitive to metals. These tests could include the following:
  - 53-day whole sediment toxicity tests with the midge, *Chironomus dilutus* (endpoints: survival, weight, biomass, emergence, eggs/surviving female, egg hatching, viability of young; using the adapted method starting with 7-day-old larvae [USEPA, 2000b; ASTM, 2009])
  - 42-day whole sediment toxicity tests with the amphipod, *Hyalella azteca* (endpoints: survival, weight, biomass, neonates/surviving female [USEPA, 2000b; ASTM, 2009])

SECTION 8

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Table 3-1
Data Quality Objectives (from CEE, 2005)
Upper Columbia River RI/FS

Step 1. State the Problem—Benthic Risk Assessment

(1)	Identify members of the planning team	Kevin Rochlin and Sally Thomas—USEPA Marc Stifelman, Burt Shepard, Bruce Duncan—USEPA Risk Staff Jim Stefanoff—CH2M HILL Project Manager Chuck Gruenenfelder—CH2M HILL RI Task Leader Dennis Shelton—CH2M HILL Risk Assessment Task Leader Frank Dillon—- CH2M HILL Lead Biologist Artemis Antipas—CH2M HILL Quality Assurance Officer/Chemist
(2)	Identify the primary decision-maker	Decisions will be made by consensus between USEPA and CH2M HILL managers and risk assessment task leaders.
(3)	Develop a concise description of the problem	Contaminants may be present in surface sediment at concentrations that pose unacceptable risk to benthic/epibenthic resources in the UCR site.
(4)	Specify available resources and relevant deadlines for the study	Historical sediment data are not of adequate quantity, quality, or coverage to assess potential risk. Phase I sampling is scheduled to begin in April 2005 and last into May 2005. Project resources are described in the FSP (Appendix B). The need for and schedule of additional sediment sampling events will be determined following evaluation of Phase I data.

Step 2. Identify the Decision—Benthic Risk Assessment

(1)	Identify the principal study question	Determine whether measures are needed to prevent exposure of benthic/epibenthic resources to contaminants in sediment.
(2)	Define alternative actions that could result from resolution of the principal study question	(a) No action. (b) Additional data are needed. (c) Remedial action alternatives are developed.
(3)	Combine the principal study question and the alternative actions into a decision statement	Compare representative COI concentrations to risk-based concentrations protective of benthic resources and determine the appropriate action: no action, additional data collection, or remedial action development.
(4)	Organize multiple decisions	If the weight of evidence indicates that benthic/epibenthic communities are not potentially at risk, with acceptable uncertainty about the result, then no further action may be taken. If the weight of evidence indicates that benthic/epibenthic communities are not potentially at risk, with moderate to high uncertainty about the result, then additional data collection may be necessary. If the weight of evidence indicates that benthic/epibenthic communities are potentially at risk, with moderate to high uncertainty about the result, then additional data collection may be necessary. If the weight of evidence indicates that benthic/epibenthic communities are potentially at risk, with acceptable uncertainty about the result, then remedial action alternatives will need to be developed.

Step 3. Identify Inputs to the Decision—Benthic Risk Assessment

(1)	Identify information that will be required to resolve the decision statement	Defined conceptual exposure model. Measured contaminant levels in submerged and periodically exposed surface sediment. Measured TAL metals concentrations in pore water. Surface sediment bioassay results (including data for reference locations).
(2)	Determine the sources for each item of information required	Chemical analysis of Phase I sediment samples, including geochemical parameters that govern toxicity and availability of contaminants to biota. Chemical analysis of Phase I pore water samples. Surface sediment bioassay results (including data for reference locations).
(3)	Identify the information that is needed to establish the action level	Ecological hazard quotient estimates for each exposure area. Surface sediment bioassay results (including data for reference locations).
(4)	Confirm the appropriate measurement methods exist to provide the necessary data	Methods consistent with the above needs are identified in the QAPP.

Step 4. Define the Boundaries for the Study—Benthic Risk Assessment

(1)	Specify the characteristics that define the population of interest	Surface sediment (approximately the upper 10 to 15 cm) located in periodically exposed and submerged portions of the UCR site. Potential contaminants include all CLP analytes (VOCs excepted). Pore water in surface sediment located in periodically exposed and submerged portions of the UCR site. Potential contaminants include all TAL metals and uranium.
(2)	Define the spatial boundary of the decision statement	Decisions will be made using a variety of spatial boundaries as determined by the conceptual exposure model and the distribution of contaminant concentrations in periodically exposed and submerged[2] sediment across the site (note that, for the purposes of Phase I, the study area is bounded by the U.S.-Canadian Border and Grand Coulee Dam).
(3)	Define the temporal boundary of the decision statement	Phase I sampling will be completed in May 2005; decisions regarding risk or need for additional data will be made within 2 years after Phase I data are received.
(4)	Define the scale of decision-making	The scale of the decision will be made based on the conceptual exposure model and the distribution of contaminant concentrations in periodically exposed and submerged sediment across the site.

(5)	Identify practical constraints on data collection	The exposure units may range in size from individual reaches to the entire UCR site. It is not practical to collect data based on the smallest potential exposure unit size. However, the number of samples and methods of aggregation need to be robust enough to demonstrate the representativeness of concentrations used in assessing risk. Laboratory analytical costs for certain potential contaminants are costly (for example, dioxins and furans).

Step 5. Develop a Decision Rule—Benthic Risk Assessment

(1)	Specify the statistical parameter that characterizes the population of interest	Representative concentrations for each COI may be determined through statistical analysis (for example, 95 percent UCL) or may be based on the maximum detected concentration or other suitable method depending on the number of samples and variability in the data set.
(2)	Specify the action level for the study	Potential ARAR values for all CLP analytes have been identified for the purpose of defining the laboratory reporting limits (see Table A-3). However, receptor-specific protective concentrations will also be developed for use in the benthic risk assessment.
(3)	Develop a decision rule (an "if...then..." statement	If representative COI concentrations are above protective concentrations, a remedial action alternative may need to be developed or additional data gathered; otherwise, no further evaluation is necessary for benthic risk reasons.

Step 6. Specify Tolerable Limits on Decision Errors— Benthic Risk Assessment

(1)	Determine the range of the parameters of interest	Analytical results for historical sediment samples have been reviewed and compiled in a database from which the potential ranges of certain contaminant concentrations have been derived. However, the quality and coverage of the samples in the historical database are not sufficient to fully define the expected range of contaminants in surface sediment at the site. Toxicity tests results could range from no significant effect on survival, growth, and/or reproduction, to complete mortality.
(2)	Identify the decision errors and choose a null hypothesis	The key decision error is an understatement of risk (that is, no risk identified when risk is actually present); therefore, sufficient samples need to be collected to allow for higher confidence in the null hypothesis. The "hit/no hit" designation for the toxicity test results will be based on statistical comparisons with appropriate controls. The PARCC criteria listed in the QAPP and the minimum detection limits listed in Table A-3 will be used to evaluate the usability of analytical data in making decisions about potential risk. Analyte-specific accuracy and precision ranges are shown in the QAPP. The project completeness goal is set at 90 percent. Because the error for precision and accuracy is on average about 30 percent, the consequences of decision errors based on sample results less than half the specified detection levels or greater than twice the specified detection levels are expected to be relatively small.
(3)	Specify a range of possible values of the parameter of interest where the consequences of decision error are relatively minor	The risk assessments will provide multiple descriptors of risk, and the uncertainty analysis portion of the risk assessments will address the range of possible values influencing overall decisions regarding risk.

(4)	Assign probability values to points above and below the action level that reflect the tolerable probability for the occurrence of decision errors.	Not applicable to the decision.

Step 7. Optimize the Design—Benthic Risk Assessment

(1)	Review the DQO outputs and existing data	See Steps 1 to 6.
(2)	Develop general data collection design alternatives	The rationale for the sampling design is described in *Draft Phase I Sediment Sampling Approach and Rationale – Upper Columbia River CERCLA RI/FS* (CH2M HILL 2004).
(3)	Formulate the mathematical expressions necessary for each design alternative	The methods to be used in aggregating data and evaluating results for the benthic risk assessment will be determined as part of the data evaluation process.
(4)	For each data collection design alternative, select the optimal sample size that satisfies the DQOs	All data collection designs require collection of a statistically valid number of samples, which can range from 3 to greater than 100 samples, depending on the desired power level for decision. Because the risk decisions will be made using a variety of spatial boundaries that cannot be determined at this time, it is necessary to collect a larger number of samples throughout the overall study area in order to provide sufficient samples for smaller subareas.
(5)	Select the most resource-effective data collection design that satisfies the DQOs	The rationale for the sampling design is described in *Draft Phase I Sediment Sampling Approach and Rationale – Upper Columbia River CERCLA RI/FS* (CH2M HILL 2004). This design includes: (a) sampling of periodically exposed and submerged surface sediment at regular intervals (transects) and positions along the length of UCR, with different distances between transects depending on river reach (closer spacing in upper reaches, farther spacing in lower reaches); (b) collection of samples for bioassay testing at the same locations where samples are collected for chemical analysis; (c) collection of reference samples for bioassay analysis at locations that appear to be unaffected by UCR contaminants; and (d) collection of pore water samples for possible use in interpretation of biotoxicity results (Note: This procedure is specifically designed to mimic the pore water that the bioassay species are exposed to rather than an attempt to draw conclusions about in situ pore water). The sampling program is summarized on Table A-2. Target analytes and geochemical parameters are listed in Table A-3.
(6)	Document the operational details and theoretical assumptions of the selected design in sampling and analysis plan	The FSP (Appendix B) provides the operational details and assumptions for the sediment sampling design.

Notes:
References to tables and appendices can be found in CEE (2005).
Table A-3 is reproduced in part as Table 3-1 in this report.

Table 3-2

Metals Target Analyte List and Corresponding CLP Analytical Limits

Upper Columbia River RI/FS

	Contract-Required Quantitation (Reporting) Limits[1]		
Analyte	**ICP/AES Water (µg/L)**	**ICP/MS Water (µg/L)**	**ICP/AES Sediment (mg/kg)**
Aluminum	200	--	20
Antimony	60	2	6
Arsenic	10	1	1
Barium	200	10	20
Beryllium	5	1	0.5
Cadmium	5	1	0.5
Calcium	5000	--	500
Chromium	10	2	1
Cobalt	50	1	5
Copper	25	2	2.5
Iron	100	--	10
Lead	10	1	1
Magnesium	5000	--	500
Manganese	15	1	1.5
Mercury	0.2	--	0.1
Nickel	40	1	4
Potassium	5000	--	500
Selenium	35	5	3.5
Silver	10	1	1
Sodium	5000	--	500
Thallium	25	1	2.5
Uranium	NA	NA	5
Vanadium	5	1	5
Zinc	6	2	6

Notes:

Adapted from Table 2-2d and Table A-3 in CEE 2005

CLP = Contract Laboratory Program

ICP/AES = inductively coupled plasma/atomic emission spectrophotometry

ICP/MS = inductively coupled plasma/mass spectroscopy

µg/L = micrograms per liter

mg/kg = milligrams per kilogram

NA = not applicable (analyte is not typically part of CLP)

[1] ICP/MS may also be used to achieve lower detection limits in sediments where necessary.

Table 4-1

Sediment Quality Screening Values

Upper Columbia River RI/FS

Analyte	TEC (mg/kg DW)	PEC (mg/kg DW)
Arsenic	9.79	33
Cadmium	0.99	4.98
Chromium (III)	43.4	111
Copper	31.6	149
Lead	35.8	128
Mercury	0.18	1.06
Nickel	22.7	48.6
Zinc	121	459
	TEC (µg/kg DW)	**PEC (µg/kg DW)**
Anthracene	57.2	845
Benz(a)anthracene	108	1050
Benzo(a)pyrene	150	1450
Chrysene	166	1290
Dibenz(a,h)anthracene	33	-
Fluorene	77.4	536
Fluoranthene	423	2230
Naphthalene	176	561
Phenanthrene	204	1170
Pyrene	195	1520
total PAHs	1610	22800
total PCBs	59.8	676
Chlordane	3.24	17.6
Dieldrin	1.9	61.8
total DDTs	5.28	572
Endrin	2.22	207
Heptachlor epoxide	2.47	16
Lindane	2.37	4.99
Methoxychlor	13.3[a]	-

Notes:

DDT = dichlorodiphenyltrichloroethane

DW = dry weight

µg/kg = micrograms per kilogram

mg/kg = milligrams per kilogram

PAH = polycyclic aromatic hydrocarbon

PCB = polychlorinated biphenyl

PEC = Probable Effect Concentration (MacDonald et al. 2000)

TEC = Threshold Effect Concentration (MacDonald et al. 2000)

[a] Methoxychlor screening ecotox value (SEV) from TCAI (2010)

Table 4-2

Water Quality Criteria for Dissolved Metals

Upper Columbia River RI/FS

Analyte	Acute Ambient Water Qualtiy Criteria (µg/L)	Chronic Ambient Water Qualtiy Criteria (µg/L)
Arsenic	340	150
Cadmium*	2	0.25
Chromium (III)*	570	74
Copper*	13.7	9
Lead*	65	2.5
Mercury	1.4	0.77
Nickel*	468	52
Selenium	-	-
Silver	3.2	-
Zinc*	120	120

Notes:

µg/L = micrograms per liter

Values from EPA (2009) except for the chronic criterion for copper, which is from EPA (2006)

*Chronic and acute criteria presented here are based on a hardness of 100 mg/L $CaCO_3$.

Caclulated hardness values were used for evaluting pore water concentration data (see Table 5-9 and Section 4.2.1)

Table 5-1
Summary of the Bioassay Test Results
Upper Columbia River RI/FS

Sample ID/Location	Reach	*Hyalella azteca*							*Chironomus dilutus*							*Ceriodaphnia dubia*				
			Survival (%)		Weight (mg)		Biomass (mg)			Survival (%)		Weight (mg)		Biomass (mg)			Survival (%)		Reproduction (neonates/female)	
		Test	Mean	StDev	Mean	StDev	Mean	StDev	Test	Mean	StDev	Mean	StDev	Mean	StDev	Test	Mean	StDev	Mean	StDev
RM603A1(X1)	6	2	96.3	7.4	0.32	0.05	0.310	0.05	2	71.3	10	1.90	0.25	1.26	0.19	2	100.0	0	12	3.0
RM605A1(X1)	6	2	92.5	8.9	0.49	0.07	0.446	0.05	2	77.5	18	1.81	0.70	1.24	0.30	2	100.0	0	25.8	3.6
RM605A2(X8)	6	2	93.8	7.4	0.33	0.05	0.312	0.05	2	81.3	10	1.85	0.25	1.37	0.13	2	90.0	31.6	23.3	9.3
RM606A1(X3)	6	2	93.8	7.4	0.42	0.07	0.395	0.08	2	72.5	28	2.04	0.94	1.12	0.64	2	100.0	0	25.4	3.6
RM616A1(X3)	6	2	96.3	7.4	0.48	0.07	0.463	0.05	2	83.8	9	2.22	0.80	1.53	0.34	2	100.0	0	25.3	3.5
RM622A1(X3)	5	2	95.0	10.7	0.52	0.09	0.488	0.09	2	77.5	14	1.82	0.28	1.24	0.32	2	100.0	0	23.5	3.4
RM628A1(X1)	5	2	83.8	25.6	0.52	0.05	0.442	0.14	2	87.5	12	1.93	0.44	1.57	0.20	2	70.0	48.3	18.6	11.2
RM634A1(X1)	5	2	91.3	8.3	0.37	0.05	0.338	0.05	2	80.0	15	1.92	0.62	1.29	0.17	2	60.0	51.7	8.2	8.2
RM637A1(X1)	5	2	96.3	5.2	0.45	0.05	0.434	0.05	2	77.5	10	1.79	0.38	1.29	0.37	2	100.0	0	28.5	3.3
RM640A1(X3)	5	2	96.3	7.4	0.40	0.07	0.383	0.06	2	60.0	24	2.52	0.54	1.19	0.69	2	90.0	31.6	13.2	5.3
RM641A1(X1)	4b	2	95.0	7.6	0.35	0.06	0.333	0.06	2	86.3	15	1.93	0.30	1.54	0.24	2	100.0	0	25.6	5.0
RM642A1(X1)	4b	2	96.3	7.4	0.30	0.06	0.291	0.07	2	66.3	30	1.97	0.28	1.18	0.47	2	100.0	0	20.8	8.2
RM644A1(X3)	4b	2	92.5	17.5	0.34	0.06	0.324	0.10	2	70.0	24	1.82	0.57	1.03	0.28	2	100.0	0	16.1	3.2
RM658A1(X3)	4b	2	98.8	3.5	0.41	0.04	0.408	0.05	2	80.0	14	1.78	0.43	1.32	0.21	2	100.0	0	18	4.7
RM661A1(X1)	4b	2	97.5	4.6	0.35	0.03	0.337	0.03	2	81.3	8	1.84	0.23	1.42	0.24	2	100.0	0	23.3	4.9
RM676A1(X3)	4b	1	92.5	11.6	0.35	0.03	0.319	0.03	1	46.3	27	2.10	0.62	0.796	0.29	1	100.0	0	19.2	5.1
RM677A1(X3)	4a	1	90.0	14.1	0.28	0.09	0.249	0.09	1	42.5	24	1.99	0.35	0.799	0.36	1	100.0	0	22.9	4.4
RM678A1(X1)	4a	1	97.5	4.6	0.33	0.07	0.326	0.08	1	71.3	19	1.93	0.57	1.15	0.23	1	100.0	0	26.9	4.6
RM680A1(X1)	4a	1	96.3	7.4	0.33	0.09	0.316	0.09	1	38.8	26	2.17	0.52	0.717	0.47	1	90.0	31.6	20.7	6.4
RM686A1(X3)	4a	1	93.8	9.2	0.59	0.14	0.552	0.14	1	72.5	20	1.83	0.29	1.21	0.37	1	80.0	42.2	20.5	11.7
RM687A1	4a	1	93.8	10.6	0.27	0.06	0.247	0.03	1	73.8	18	1.62	0.36	1.13	0.20	1	90.0	31.6	20.1	7.5
RM689A1(X3)	4a	1	93.8	5.2	0.37	0.06	0.345	0.07	1	50.0	27	2.37	0.79	0.992	0.34	1	90.0	31.6	22	8.5
RM692A1(X1)	4a	1	95.0	5.3	0.41	0.08	0.391	0.08	1	72.5	17	1.83	0.28	1.25	0.28	1	100.0	0	27	2.2
RM698A1(X1)	4a	1	96.3	7.4	0.29	0.04	0.274	0.04	1	67.5	24	1.75	0.56	1.04	0.30	1	80.0	42.2	19.8	10.8
RM704A1(X1)	3	1	96.3	5.2	0.38	0.06	0.368	0.06	1	62.5	27	2.02	1.01	1.01	0.31	1	100.0	0	25	2.8
RM706A1(X1)	3	1	95.0	7.6	0.31	0.05	0.294	0.03	1	68.8	22	1.69	0.24	1.12	0.29	1	80.0	42.2	18.7	8.8
RM706A2(X7)[a]	3	-	-	-	-	-	-	-	1	55.0	26	2.05	0.53	0.979	0.35	1	-	-	-	-
RM708A1(X3)	3	1	92.5	7.1	0.34	0.05	0.313	0.05	1	70.0	23	1.65	0.33	1.11	0.28	1	70.0	48.3	23.8	9.3
RM713A1(X3)	2	2	100.0	0.0	0.33	0.05	0.334	0.05	2	75.0	21	2.23	0.70	1.47	0.36	2	100.0	0	21.4	6.1
RM723A1(X1)	2	1	96.3	5.2	0.65	0.04	0.626	0.03	2	83.8	12	2.14	0.36	1.65	0.36	2	100.0	0	27.5	5.4
RM723A2(X3)	2	2	95.0	7.6	0.42	0.07	0.404	0.08	2	83.8	11	1.96	0.41	1.57	0.26	2	100.0	0	25	4.7
RM724A1(X1)[a]	2	-	-	-	-	-	-	-	1	56.3	19	2.13	0.79	1.04	0.16	1	-	-	-	-
RM724A2(X3)	2	1	95.0	7.6	0.64	0.10	0.604	0.07	1	65.0	23	2.44	0.69	1.28	0.37	1	100.0	0	25.8	3.4
RM727A1(X1)	2	2	97.5	4.6	0.41	0.03	0.401	0.03	2	92.5	12	1.74	0.20	1.54	0.36	2	90.0	31.6	22.2	8.4
RM729A1(X1)	2	2	92.5	7.1	0.45	0.06	0.415	0.06	2	90.0	8	2.01	0.27	1.73	0.36	2	100.0	0	25.8	5.1
RM730A1	2	2	86.3	10.6	0.34	0.05	0.289	0.04	2	82.5	15	1.96	0.24	1.49	0.28	2	100.0	0	23.1	6.1
RM733A1(X1)	1	2	91.3	11.3	0.50	0.09	0.453	0.09	2	83.8	13	1.76	0.24	1.35	0.25	2	100.0	0	26.8	4.4
RM734A1[b]	1	2	86.3	10.6	0.23	0.06	0.198	0.06	2	81.3	8	1.61	0.29	1.18	0.21	2	90.0	31.6	22.5	8.4
RM736A1(X1)[b]	1	1	88.8	11.3	0.34	0.04	0.299	0.06	2	81.3	11	1.94	0.29	1.50	0.38	2	70.0	48.3	18.9	11.1
RM737A1(X3)	1	1	90.0	13.1	0.19	0.04	0.174	0.04	2	82.5	18	1.47	0.26	1.12	0.25	2	50.0	52.7	3.7	7.6

Table 5-1

Summary of the Bioassay Test Results

Upper Columbia River RI/FS

Sample ID/Location	Reach	*Hyalella azteca*							*Chironomus dilutus*							*Ceriodaphnia dubia*				
		Test	Survival (%)		Weight (mg)		Biomass (mg)		Test	Survival (%)		Weight (mg)		Biomass (mg)		Test	Survival (%)		Reproduction (neonates/female)	
			Mean	StDev	Mean	StDev	Mean	StDev		Mean	StDev	Mean	StDev	Mean	StDev		Mean	StDev	Mean	StDev
RM738A1(X3)	1	1	86.3	13.0	0.18	0.03	0.155	0.04	1	67.5	15	1.14	0.27	0.760	0.24	1	0.0	0	0	0
RM739A1(X3)[b]	1	1	91.3	6.4	0.46	0.06	0.418	0.05	1	72.5	13	2.04	0.22	1.44	0.33	1	100.0	0	21.6	4.3
RM740A1(X1)	1	1	97.5	4.6	0.51	0.10	0.502	0.10	1	75.0	11	2.08	0.35	1.42	0.13	1	100.0	0	23	5.7
RM741A1(X3)	1	1	80.0	12.0	0.46	0.06	0.363	0.04	1	67.5	26	2.18	0.82	1.24	0.38	1	100.0	0	24.8	2.8
RM742A1(X1)	1	1	88.8	11.3	0.27	0.07	0.242	0.06	1	82.5	16	1.18	0.28	0.946	0.17	1	100.0	0	10	8.9
RM742A2(X5)	1	1	95.0	5.3	0.32	0.04	0.304	0.05	1	73.8	20	1.31	0.37	0.914	0.29	1	90.0	31.6	19	9.1
RM743A1(X1)	1	1	91.3	8.3	0.49	0.07	0.442	0.06	1	82.5	15	1.60	0.32	1.27	0.22	1	90.0	31.6	25.8	3.6
RM743A2(X3)	1	1	81.3	8.3	0.32	0.08	0.258	0.06	1	80.0	18	1.43	0.29	1.10	0.16	1	100.0	0	20	4.4
RM744A1(X1)	1	1	83.8	13.0	0.35	0.04	0.296	0.07	1	61.3	14	1.98	0.35	1.12	0.19	1	80.0	42.2	22.6	8.2
RM744A2(X3)	1	1	75.0	9.3	0.17	0.05	0.126	0.05	1	76.3	12	1.31	0.31	0.965	0.21	1	80.0	42.2	18.5	10.7
Reference Envelope Samples																				
RM685R1[b]	1	1	98.8	7.6	0.53	0.07	0.523	0.07	1	72.5	13	2.03	0.22	1.40	0.19	1	na	na	na	na
RM685R1-RE	2	2	95.0	7.6	0.47	0.06	0.445	0.07	2	88.8	13	1.91	0.22	1.62	0.23	2	100.0	0	21.6	3.89
RM686R1	1	1	96.3	5.2	0.41	0.02	0.397	0.01	1	70.0	17	1.94	0.47	1.29	0.16	1	80.0	42.2	20.2	11.3
RM686R1-RE	2	2	93.8	14.1	0.42	0.06	0.400	0.10	2	75.0	15	2.15	0.47	1.40	0.36	2	100.0	0	26.5	2.5
RM705R1	1	1	96.3	7.4	0.58	0.05	0.555	0.05	1	70.0	17	2.12	0.19	1.40	0.29	1	100.0	31.6	23.5	9.8
RM705R1-RE	2	2	97.5	4.6	0.53	0.04	0.527	0.04	2	75.0	14	2.20	0.19	1.49	0.26	2	90.0	31.6	25.3	9.8
RM706A2(X7)[a]	1	1	95.0	5.3	0.33	0.05	0.318	0.05	1	-	-	-	-	-	-	1	80.0	42.2	23	5.6
RM721R1	1	1	100.0	4.6	0.43	0.03	0.432	0.03	1	66.3	16	1.93	0.20	1.25	0.12	1	100.0	0	23.6	8.5
RM721R1-RE	2	2	97.5	4.6	0.39	0.04	0.380	0.04	2	81.3	16	1.94	0.33	1.45	0.28	2	80.0	42.2	19.7	8.5
RM724A1(X1)[a]	1	1	98.8	3.5	0.37	0.05	0.366	0.05	1	-	-	-	-	-	-	1	100.0	0	26.8	2.7
RM726R1	1	1	96.3	5.2	0.58	0.09	0.553	0.03	1	67.5	13	2.00	0.26	1.31	0.17	1	100.0	0	23.8	10.1
RM726R1-RE	2	2	97.5	4.6	0.52	0.09	0.506	0.08	2	81.3	13	1.98	0.26	1.56	0.28	2	90.0	31.6	21.7	10.1
RM732R1	1	1	96.3	5.2	0.58	0.05	0.561	0.05	1	70.0	7.6	1.95	0.25	1.30	0.18	1	100.0	31.6	22.1	7.6
RM732R1-RE	2	2	95.0	5.3	0.50	0.05	0.471	0.05	2	78.8	17	1.96	0.24	1.46	0.44	2	90.0	31.6	22.2	7.6
Ref. Average	1	1	97.2	1.7	0.48	0.10	0.463	0.10	1	69.4	2.2	2.00	0.07	1.32	0.06	1	94.3	9.8	23.3	2.0
Ref. Average	2	2	96.0	1.7	0.47	0.06	0.455	0.06	2	80.0	5.1	2.02	0.12	1.50	0.08	2	91.7	7.5	22.8	2.6
5th Percentile	1/2	94.1		0.34		0.330		1/2	66.5		1.92		1.25		1/2	80.0		19.8	
Control	1	1	96.3	7.4	0.41	0.04	0.390	0.02	1	83.8	15	1.51	0.40	1.22	0.26	1	80.0	42.2	22.8	11.5
Control[b]	2	2	97.5	4.6	0.38	0.04	0.372	0.04	2	88.8	14	1.97	0.18	1.67	0.18	2	90.0	31.6	24.0	9.0

Notes:

1/2 = used data from both tests

mg = milligram

na = not applicable. *Ceriodaphnia* toxicity was not evaluated for reference sampole RM685R1 in the Round 1 sample testing due to a lab error.

STDev = Standard Deviation

[a] Sample was included as a reference for *Hyalella* and *Ceriodaphnia* tests, but not *Chironomid* tests based on the reference envelope analysis approach.

[b] Dissolved oxygen conentrations fell below the ASTM (2000) recommended level of 2.5 mg/L for not more than one day in these Chironomid bioassays. Dissolved oxygen did not fall below 1.5 mg/L, the minimal level tolerated by the test species (ASTM 2000).

Toxicity tests were conducted during two rounds. *Hyalella* tests were on (1) April 28th and (2) May 4th. *Chironomid* tests were on (1) April 29th and (2) May 6th. *Ceriodaphnia* tests were on (1) April 28th and (2) May 5th.

Table 5-2

Percent Similarity for Reference Site Toxicity Testing Among Test Rounds

Upper Columbia River RI/FS

Sample ID/Location	*Hyalella azteca*							*Chironomus dilutus*							*Ceriodaphnia dubia*				
	Test	Survival (%)		Weight (mg)		Biomass (mg)		Test	Survival (%)		Weight (mg)		Biomass (mg)		Test	Survival (%)		Reproduction (neonates/female)	
		Mean	StDev	Mean	StDev	Mean	StDev		Mean	StDev	Mean	StDev	Mean	StDev		Mean	StDev	Mean	StDev
Reference Envelope Samples																			
Ref. Average	1	97.2	1.7	0.48	0.10	0.463	0.10	1	69.4	2.2	2.00	0.07	1.32	0.06	1	94.3	9.8	23.3	2.0
Ref. Average	2	96.0	1.7	0.47	0.06	0.455	0.06	2	80.0	5.1	2.02	0.12	1.50	0.08	2	91.7	7.5	22.8	2.6
RPD	-	99%		99%		98%		-	86%		99%		88%		-	97%		98%	
Control	1	96.3	7.4	0.41	0.04	0.390	0.02	1	83.8	15	1.51	0.40	1.22	0.26	1	80.0	42.2	22.8	11.5
Control[b]	2	97.5	4.6	0.38	0.04	0.372	0.04	2	88.8	14	1.97	0.18	1.67	0.18	2	90.0	31.6	24.0	9.0

Notes:

mg = milligram

RPD = relative percent difference calculated as (the difference between the mean of test results in round 1 minus round 2)*100 / (the average of round 1 and round 2 test reults)

STDev = Standard Deviation

Toxicity tests were conducted during two rounds. *Hyalella* tests were on (1) April 28th and (2) May 4th. *Chironomid* tests were on (1) April 29th and (2) May 6th. *Ceriodaphnia* tests were on (1) April 28th and (2) May 5th.

Table 5-3

Summary of Overlying Water Quality Measurements in Bioassay Test Chambers

Upper Columbia River RI/FS

Test	Test Date	Ammonium (mg/L) Mean ± StDev	Hardness (mg/L) Mean ± StDev	Alkalinity (mg/L) Mean ± StDev	Dissolved Oxygen (mg/L) Mean ± StDev	Temperature (°C) Mean ± StDev	pH Mean ± StDev	Conductivity (µS/cm) Mean ± StDev
C. dubia [1]	28-Apr	0.21 ± 0.20	104 ± 20	73 ± 18	7.33 ± 0.53	25.0 ± 0.6	7.4 ± 0.2	284 ± 18
Control		0.15 (n=2)	82 (n=2)	57 (n=2)	7.42 ± 0.50	25.1 ± 0.8	7.3 ± 0.2	285 (n=1)
C. dubia [1]	4-May	0.15 ± 0.12	103 ± 23	76 ± 23	6.80 ± 0.47	24.5 ± 0.5	7.3 ± 0.2	278 ± 32
Control		0.13 (n=2)	86 (n=2)	59 (n=2)	7.61 ± 0.45	24.8 ± 0.5	7.5 ± 0.1	276 (n=2)
C. dilutus [1]	29-Apr	0.35 ± 0.24	94 ± 12	84 ± 14	5.39 ± 1.56	23.2 ± 0.3	7.2 ± 0.3	305 ± 31
Control		0.33 (n=2)	74 (n=2)	71 (n=2)	4.18 ± 1.04	23.3 ± 0.3	7.15 (n=2)	324 (n=2)
C. dilutus [1]	6-May	0.32 ± 0.19	97 ± 11	89 ± 12	5.73 ± 1.49	23.1 ± 0.3	7.2 ± 0.4	296 ± 23
Control		0.39 (n=2)	81 (n=2)	76 (n=2)	4.00 ± 1.35	23.5 ± 0.2	7.25 (n=2)	321 (n=2)
H. azteca [2]	28-Apr	0.22 ± 0.2	91 ± 14	75 ± 15	6.4 ± 0.9	23.0 ± 0.3	7.0 ± 0.2	291 ± 15
Control		0.3 ± 0.3	68 ± 0	63 ± 5	6.3 ± 0.7	23.0 ± 0.3	7.4 ± 0.1	272 ± 8
H. azteca2	5-May	0.2 ± 0.2	92 ± 15	78 ± 19	6.5 ± 0.8	23.0 ± 0.2	7.0 ± 0.2	289 ± 15
Control		0.16 ± 0.08	68 ± 0	64 ± 5	6.4 ± 0.8	23.0 ± 0.2	7.4 ± 0.1	275 ± 5

Notes:

µS/cm = micro-Siemens per centimeter

mg/L = milligrams per liter

STDev = Standard Deviation

[1] *Ceriodaphia dubia* and *Chironomus dilutus* tests were conducted at CH2M HILL's Applied Science Laboratories, Corvallis, OR.

[2] *Hyalella azteca* tests were conducted at Northwestern Aquatic Sciences, Newport, OR.

Table 5-4
Sediment Chemistry - Metals
Upper Columbia River RI/FS

Sample ID/ Location	Aluminum (mg/kg)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Calcium (mg/kg)	Chromium (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Iron (mg/kg)	Lead (mg/kg)
RM603A1(X1)	12000	5.6 U	6	125	1.3	0.23 J	8370	14	11	11.8	24900	11.1
RM605A1(X1)	4680	7.4 U	3	35.5	0.35 J	0.62 U	5370	6.4	2.7 J	6	9830	3.9
RM605A2(X8)	10500	6 U	4.2	74.2	0.86	0.67	2690	13.5	6.3	11.5	17800	16.8
RM606A1(X3)	8020	8 U	3.1	56.8	0.73	0.28 J	2290	12.6	5.4 J	7.9	15300	10.4
RM616A1(X3)	6140	7.3 U	4.9	47.8	0.51 J	0.14 J	4510	10.7	4.5 J	8.5	12100	6.1
RM622A1(X3)	9630	6.1 U	13.7	68.7	0.77	0.16 J	15300	12	5.7	11.6	17800	10.9
RM628A1(X1)	5870	6.9 U	7.1	38.7	0.46 J	0.058 J	8050	7.2	3.6 J	8.7	12400	7.4
RM634A1(X1)	10400	6.3 U	13.5	97.2	0.99	0.14 J	19400	14	9.7	16.5	24800	12.7
RM637A1(X1)	5620	7 U	3.9	41.1	0.57 J	0.58 U	11300	8.3	4.4 J	7	12400	5.7
RM640A1(X3)	11200	7 U	9.3	120	1	0.35 J	4000	21.3	13.4	17.8	19900	17.9
RM641A1(X1)	13500	11.3 U	3.4	128	1.3	2.4	3770	24.1	10.3	**28**	20500	67.7
RM642A1(X1)	10100	7.3 U	4.1	94.9	0.91	2.1	2620	17.9	7.7	19.9	16900	82.4
RM644A1(X3)	14000	7.2 U	14.1	162	1.2	0.15 J	10200	25.9	15	22.6	25900	17.7
RM658A1(X3)	13300	7.7 U	5	149	1.2	0.41 J	4990	30.5	12.5	23.1	23400	19.4
RM661A1(X1)	7830	1 J	3	76.6	0.77	0.32 J	2430	16.6	7.3	11.3	13700	21.1
RM676A1(X3)	10400	7.6 U	3.7	122	1 E	0.2 J	11300	24.3	9.8	22.3	20700	10.5 E
RM677A1(X3)	11800	8.6 U	2.7	139	1.2 E	0.4 J	14800	29.7	10.9	23.7	21200	12 E
RM678A1(X1)	6660	0.35 J	1.6	60.1	0.67 E	0.27 J	4280	16.9	5.6 J	11.8	13500	9.7 E
RM680A1(X1)	9870	7.6 U	2.4	83.5	0.78 E	0.26 J	8360	23.8	9.3	17.9	21700	11.7 E
RM686A1(X3)	5470	6.9 U	1.3	49.6	0.46 E	0.11 J	2390	9.1	3.6 J	10.8	10400	6.6 E
RM687A1	11000	1.4 J	5.7	160	0.91	2.1	4170	21.2	8.4	27	19600	136
RM689A1(X3)	7540	7.4 U	2.1	78.3	0.8	0.13 J	4870	16.9	6.7	14.7	15000	12.3
RM692A1(X1)	3460	0.62 J	0.65 J	30.5	0.34 J	0.55 U	1960	6.8	2.6 J	5.3	6640	3.9
RM698A1(X1)	14000	3.5 J	7.9	546	1.5	5.3	16000	34.9	11.6	**164**	29800	**309**
RM704A1(X1)	10000	1.4 J	4.9	141	1.1	2	5470	22.8	8.2	25.9	18900	72.4
RM706A1(X1)	7390	3.8 J	4.5	445	0.97 J	3.8	15000	21.3	6.7 J	**78.8**	18800	197
RM708A1(X3)	7960	1.4 J	5.8	526	0.8 E	4.8	37600	20.7	7.3 J	**106**	26300	192 E
RM713A1(X3)	7810	10.6 U	6	291	0.92	3.6	9510	22.7	8.2 E	**80.3**	19100	183
RM723A1(X1)	5030	1.5 J	2.3	109	0.44 J	0.53 J	6940	12.6	4.8 J	22.2	13600	24.5
RM723A2(X3)	6410	7 J	4.4	368	0.69 J	2.7	18200	20.3	9.1	**195**	34900	203
RM724A2(X3)	12300	24.6	2.1	769	1.1	2.2	34300	49	20.7	**969**	114000 D	**267**
RM727A1(X1)	6040	5.6 J	9.1	371	0.61 J	3	27200	20.1	7.3	**126**	24900	170
RM729A1(X1)	3080	9.9	2	172	0.32 J	1.1	11100	14.5	6.1 E	**183**	16200	68.4
RM730A1	6250	14.9	2.4	424	0.61	3.5	23600	25.4	10.3 E	**400**	46400	**266**
RM733A1(X1)	9510	17.4	6.6	489	0.88	2.9	29700	38.6	20 E	**641**	88400 D	**1390**
RM734A1	7280	11.6	1.3 U	318	0.67	1.8	21200	25.9	10.1	**396**	57600	148
RM736A1(X1)	6390	5.1 J	4.8	540	0.71	4.3	35300	20.7	7.5	**129**	27400	214
RM737A1(X3)	14600	62.5	3.6	1490	1.3	1.2	47100	111	59.4	**1920**	172000 D	163
RM738A1(X3)	21100	25.2	8.5	1140	1.5	0.27 J	58300	100	38.1	**1630**	207000 D	215

Table 5-4
Sediment Chemistry - Metals
Upper Columbia River RI/FS

Sample ID/ Location	Aluminum (mg/kg)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Calcium (mg/kg)	Chromium (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Iron (mg/kg)	Lead (mg/kg)
RM739A1(X3)	7030	25.4	7.9	327	0.7 J	1.8	18000	29.1	12.2	**367**	35700	114
RM740A1(X1)	5740	6.2 J	5.2	268	0.73 E	2	17800	21.5	8.3	**181**	25200	118 E
RM741A1(X3)	6590	24.1	8.2	437	0.61 E	2.1	21900	33.1	14.3	**458**	44600	166 E
RM742A1(X1)	6080	19	6.3	516	0.6 E	3.4	41700	29.6	14.3	**399**	39200	182 E
RM742A2(X5)	12100	41.7	8.2	966	0.99 E	0.65	34500	72.3	34.9	**1240**	99700 D	**221** E
RM743A1(X1)	7370	20.7	8.7	406	0.72 E	2	18800	28.5	10.1	**356**	42500	201 E
RM743A2(X3)	5560	14.1	4.7	398	0.71	1.7	18100	28.6	11.8	**325**	34200	142
RM744A1(X1)	5310	21.2	6.9	415	0.54 J	1.5	20000	26.4	13.6	**390**	35800	141
RM744A2(X3)	12300	29.6	10.7	1200	1.2	0.62 U	38400	89.3	50.1	**1540**	124000 D	183
Site Average	*8796*	*11*	*5.4*	*315*	*0.83*	*1.49*	*16315*	*27*	*12.1*	**264**	*37345*	*126*
95UCL [1]	*9687 a*	*12.7 b*	*6.3 b*	*468 c*	*0.91 d*	*2.36 e*	*20202 a*	*41.2 f*	*19.2 f*	**549** *f*	*63290 f*	**257** *f*
Reference Envelope Samples												
RM685R1	8840	11.6 U	1.9 U	221	0.7 J	0.85 J	45500	23.8	7.5 E	16.3	15600	10.1
RM686R1	6310	8.2 U	1.4 U	61.5	0.7	0.19 J	3450	8.9	3.8 E	5.5	7560	3.8
RM705R1	4030	10.5 U	1.8 U	45.4	0.51 J	0.16 J	3480	6.9	3.4 E	7.9	7010	6.2
RM706A2(X7)[2]	10700	14 U	1.4 J	102	1.3 E	0.42 J	5300	24.9	7.7 J	26.2	19500	14.7 E
RM721R1	7730	14.7 U	3.4	119	0.62 J	0.57 J	40600	24.6	6.8 J	19.1	15500	16.4
RM724A1(X1)[2]	9990	1.3 J	3.1	99.4	1 E	0.14 J	4730	22.1	9.4	21	19300	16 E
RM726R1	6900	10.3 U	3.1	101	0.42 J	0.58 J	62800	23.9	5.8 J	16.7	14400	14.5
RM732R1	3170	11.3 U	3.4	234	0.075 J	1.3	229000	7.4	2.1 J	6.6	5090	25.5
Ref. Average	*7209*	*10*	*2.4*	*123*	*0.67*	*0.53*	*49358*	*18*	*5.8*	*15*	*12995*	*13.4*
95UCL [1]	*9002 d*	*na*	*3.3 b*	*169 d*	*0.91 d*	*0.79 d*	*155178 a*	*31 f*	*7.5 d*	*19.9 d*	*16792 d*	*17.9 d*

Table 5-4
Sediment Chemistry - Metals
Upper Columbia River RI/FS

Sample ID/ Location	Magnesium (mg/kg)	Manganese (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Potassium (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Sodium (mg/kg)	Thallium (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
RM603A1(X1)	8090	457	0.017 J	12.7	2430	2.3 J	0.93 U	320 J	2.3 U	18.6 U	33.4	94.2
RM605A1(X1)	4000	138	0.006 J	5.7	747	3 J	1.2 U	99 J	3.1 U	24.8 U	8.9	27.9
RM605A2(X8)	5940	243	0.075 J	11.3	1740	1.7 J	1 U	184 J	2.5 U	20 U	21.1	140
RM606A1(X3)	4110	217	0.013 J	10	1400	3.1 J	1.3 U	159 J	3.3 U	26.8 U	20.1	102
RM616A1(X3)	4240	225	0.009 J	9.5	1120	2.8 J	1.2 U	112 J	3 U	24.4 U	14.3	49.5
RM622A1(X3)	9140	413	0.019 J	10	1810	2.7 J	1 U	137 J	2.5 U	20.2 U	17.8	62.5
RM628A1(X1)	4890	257	0.007 J	7	1020	3.6 J	1.2 U	92 J	2.9 U	23.1 U	9	40.7
RM634A1(X1)	7330	458	0.008 J	13.4	1860	3.9	1 U	136 J	2.6 U	20.9 U	28.1	76.4
RM637A1(X1)	4700	214	0.006 J	6.4	1180	2.6 J	1.2 U	111 J	2.9 U	23.3 U	14.5	30.9
RM640A1(X3)	5180	489	0.018 J	21.7	2290	3.1 J	1.2 U	170 J	2.9 U	23.3 U	29.8	86.5
RM641A1(X1)	5230	379	0.34	20.5	2430	4.8 J	1.9 U	254 J	4.7 U	37.7 U	29.6	355
RM642A1(X1)	4010	314	0.23	14.8	1800	3.1 J	1.2 U	171 J	3 U	24.3 U	22.8	292
RM644A1(X3)	7260	641	0.01 J	26.4	2310	3.5 J	1.2 U	197 J	3 U	24 U	34.4	64
RM658A1(X3)	7030	563	0.015 J	27.4	2550	4 J	1.3 U	291 J	3.2 U	25.6 U	38.7	88.6
RM661A1(X1)	3280	162	0.016 J	14.4	1490	2.3 J	1.2 U	153 J	3 U	24.2 U	22	83.5
RM676A1(X3)	6760	501	0.012 J	22.3	1990	3.7 J	1.3 U	244 J	3.2 U	25.4 U	32.9	61.1
RM677A1(X3)	8570	466	0.012 J	25.4	2370	5	1.4 U	270 J	3.6 U	28.5 U	38.8	70.4
RM678A1(X1)	4030	268	0.012 J	13.9	1040	2.4 J	1.3 U	150 J	3.1 U	25.2 U	22.9	58.7
RM680A1(X1)	5730	343	0.022 J	25.2	1300	3.6 J	1.3 U	167 J	3.2 U	25.3 U	27	76.6
RM686A1(X3)	3300	161	0.01 J	10.6	714	1.4 J	1.2 U	172 J	2.9 U	23.1 U	18.2	40.7
RM687A1	4480	291	0.41	21	1870	4.4 U	1.2 U	120 J	3.1 U	5.1 J	27.6	281
RM689A1(X3)	4020	319	0.034 J	15.1	1370	4.3 U	1.2 U	165 J	3.1 U	24.8 U	25.9	62.6
RM692A1(X1)	1980	103	0.14 U	6.3	474 J	3.9 U	1.1 U	74.6 J	2.8 U	22 U	11.7	28.7
RM698A1(X1)	11600	417	0.87	25.3	2110	7.1 U	2 U	249 J	5.1 U	11.5 J	40	954
RM704A1(X1)	5800	433	0.23	19.8	1950	4.6 U	1.3 U	215 J	3.3 U	5.6 J	31.2	204
RM706A1(X1)	10400	317	0.66	15.5	1600	7.7 U	2.2 U	137 J	5.5 U	9.6 J	26.3	764
RM708A1(X3)	21800	380	0.43	16.4	1330	9.6	1.6 U	172 J	4 U	32.4 U	28.8	1340
RM713A1(X3)	7830	294	0.65	18.4	1420	7	1.8 U	126 J	4.4 U	35.4 U	29.7	643
RM723A1(X1)	4530	195	0.038 J	12	890	3.6 J	1.1 U	112 J	2.7 U	21.4 U	19.1	179
RM723A2(X3)	10600	558	0.39	12.2	1250	7.7	1.6 U	243 J	4 U	32.2 U	22.5	**2290**
RM724A2(X3)	7940	1980	0.11 J	10.6	2520	10.6	1.2 U	933	3 U	24.4 U	30	**8410** D
RM727A1(X1)	14500	374	0.37	12.6	1030	6.5	1.2 U	251 J	3.1 U	24.5 U	25.7	1310
RM729A1(X1)	5090	371	0.06 J	6.3	611	3.9 J	1.2 U	157 J	3 U	24.1 U	11	1250
RM730A1	7880	1030	0.16	7.7	1220	4.4	1.1 U	394 J	2.7 U	21.3 U	20	**4690**
RM733A1(X1)	5860	2490	0.083 J	9.5	2480	3.7	0.98 U	957	2.4 U	19.6 U	28	**8200** D
RM734A1	5470	1140	0.09 J	6.6	1500	6.4	1.3 U	460 J	3.3 U	26.7 U	20	**4610**
RM736A1(X1)	20700	378	0.33	15.1	1330	9.8	1.4 U	197 J	3.5 U	28.3 U	27	1760
RM737A1(X3)	5270	3050	0.22	11.6	3200	13	1.2 U	1630	3 U	23.8 U	35.1	**12300** D

Table 5-4

Sediment Chemistry - Metals

Upper Columbia River RI/FS

Sample ID/ Location	Magnesium (mg/kg)	Manganese (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Potassium (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Sodium (mg/kg)	Thallium (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
RM738A1(X3)	6810	3410	0.12 U	9.3	4020	19.5	1.2 U	1770	3 U	23.8 U	41.3	**14400** D
RM739A1(X3)	8130	570	0.3	12	1180	4.8 J	1.5 U	390 J	3.7 U	29.9 U	22.6	**2120**
RM740A1(X1)	8440	429	0.14 J	11	1190	5 U	1.4 U	226 J	1.5 J	9.4 J	21.4	1480
RM741A1(X3)	8340	819	0.17	9.9	1120	7.4	1.2 U	438 J	3.1 U	24.8 U	21.5	**3190**
RM742A1(X1)	17700	745	0.16	10.6	1050	9.2	1.3 U	534 J	3.2 U	25.3 U	23.1	**2920**
RM742A2(X5)	4630	2080	0.052 J	10.9	2130	11.4	1.2 U	1220	3.1 U	24.4 U	28.1	**8330** D
RM743A1(X1)	7950	616	0.17	11.1	1060	7	1.3 U	386 J	3.2 U	25.9 U	24.2	**2560**
RM743A2(X3)	8140	613	0.12 J	9.9	1210	4.7 U	1.3 U	251 J	3.3 U	16.4 J	20.6	**2380**
RM744A1(X1)	7440	718	0.15	9.7	1010	4.1 U	1.2 U	368 J	1.1 J	11.4 J	20.1	**2480**
RM744A2(X3)	3960	2410	0.048 J	11.2	2400	4.3 U	0.71 J	1390	3.1 U	54.7	28.3	**9940** D
Site Average	*7294*	*697*	*0.158*	*13.7*	*1627*	*5.4*	*1.3*	*357*	*3.2*	*23.5*	*24.9*	**2104**
95UCL [1]	*8255 g*	*1180 f*	*0.331 h*	*15.2 a*	*1809 a*	*5.9 b*	*na*	*607 f*	*1.5 i*	*13.6 i*	*26.8 d*	**4266** *f*
Reference Envelope Samples												
RM685R1	4710	447	0.026 J	24.3	1590	3.4 J	1.9 U	173 J	4.8 U	38.7 U	33.9	72.8
RM686R1	2070	138	0.008 J	5.8	1030	2.6 J	1.4 U	91.6 J	3.4 U	27.3 U	12.9	26.1
RM705R1	2220	210	0.19 U	4.9 J	831 J	2.2 J	1.8 U	60.8 J	4.4 U	35.1 U	12.8	31.1
RM706A2(X7)[2]	5130	276	0.044 J	15.9	1180	4.1 J	2.3 U	229 J	5.8 U	46.7 U	36.9	97.5
RM721R1	5070	625	0.062 J	15.4	940 J	4.7 J	2.5 U	176 J	6.1 U	49 U	27.7	60.8
RM724A1(X1)[2]	5770	358	0.017 J	21.7	1690	5.1 U	1.4 U	154 J	3.6 U	29 U	28.2	93.1
RM726R1	4530	196	0.02 J	15.2	789 J	4.9 J	1.7 U	163 J	4.3 U	34.3 U	25	60.5
RM732R1	3840	316	0.015 J	5.3 J	675 J	10.3	1.9 U	199 J	4.7 U	37.6 U	8.5 J	49
Ref. Average	*4168*	*321*	*0.048*	*13.6*	*1091*	*4.7*	*1.9*	*156*	*4.6*	*37.2*	*23.2*	*61*
95UCL [1]	*5082 d*	*426 d*	*0.040 j*	*18.6 d*	*1340 d*	*6.0 b*	*na*	*193 d*	*na*	*na*	*30.3 d*	*78.8 d*

Notes:

95UCL = 95th percent upper confidence limit on the arithmetic mean

mg/kg = milligrams per kilogram

D = Reported value is from a dilution

E = Value estimated due to interference

J = Estimated Value

U = Analyte was not detected at or above the reported value

[1]95UCL Type Recommended by the ProUCL 4.1 (USEPA, 2010) Software:

a - 95% Approximate Gamma UCL
b - 95% KM (BCA) UCL
c - 95% H-UCL
d - 95% Student's-t UCL
e - 95% KM (Chebyshev) UCL
f - 95% Chebyshev (Mean, Sd) UCL
h - 97.5% KM (Chebyshev) UCL
i - 95% KM (% Bootstrap) UCL
j - 95% KM (Percentile Bootstrap) UCL
na - not processed by ProUCL because too few detects in the dataset.

[2] Sample was included as a reference for *Hyalella* and *Ceriodaphnia* tests, but not *Chironomid* tests based on the reference envelope analysis approach.

Concentrations reported on a dry weight basis

Where a Field Duplicate was collected, Primary sample was used

Highlited cells exceed the Probable Effects Concentration (PEC) for one of As, Cd, Cr, Cu, Pb, Hg, Ni, or Zn.

Values in bold exceed the STT for one of Cd, Cu, Pb, or Zn.

Averages calculated using the detection limit

Table 5-5

Sediment Chemistry - Simultaneously Extracted Metals (SEM)

Upper Columbia River RI/FS

Sample ID/ Location	Reach	Acid Volatile Solids (uMol/g)	Total Organic Carbon (uMol/g)	Antimony (uMol/g)	Cadmium (uMol/g)	Chromium (uMol/g)	Copper (uMol/g)	Lead (uMol/g)	Mercury (uMol/g)	Nickel (uMol/g)	Zinc (uMol/g)
RM603A1(X1)	6	0.0251 U	996	0.0015 U	0.0021	0.0106	0.0677	0.0212	0.0000090	0.0341	0.1499
RM605A1(X1)	6	0.0069	641	0.0011 U	0.0010	0.0062	0.0378	0.0097	0.0000026 U	0.1022	0.1361
RM605A2(X8)	6	0.0233 U	4130	0.0014 U	0.0056	0.0088	0.0456	0.0550	0.0000034 U	0.0204	1.1075
RM606A1(X3)	6	0.0224 U	2730	0.0004 E	0.0028	0.0123	0.0362	0.0405	0.0000015 J	0.0204	0.8414
RM616A1(X3)	6	0.0206 U	1210	0.0021 E	0.0018	0.0106	0.0441	0.0251	0.0000038	0.0204	0.3503
RM622A1(X3)	5	0.0194 U	1190	0.0007 J	0.0025	0.0167	0.0708	0.0473	0.0000030 U	0.0324	0.4008 E
RM628A1(X1)	5	0.0270	1210	0.0011 U	0.0016	0.0079	0.0283	0.0179	0.0000027 U	0.0124	0.1943
RM634A1(X1)	5	0.0191 U	658	0.0011 U	0.0007	0.0115	0.0346	0.0188	0.0000014 J	0.0307	0.0964
RM637A1(X1)	5	0.0190	366	0.0011 U	0.0004	0.0077	0.0220	0.0101	0.0000023 J	0.0100	0.0811
RM640A1(X3)	5	0.0227 U	2110	0.0014 U	0.0016	0.0346	0.0677	0.0642	0.0000024 J	0.1209	0.2400
RM641A1(X1)	4b	0.0690	14100	0.0020 U	0.0214	0.0269	0.2203	0.3407	0.0000027 J	0.1209	4.4975
RM642A1(X1)	4b	0.0870	7160	0.0028 E	0.0302	0.0346	0.2738	0.4764	0.0000055	0.0715	4.0691
RM644A1(X3)	4b	0.0078	1380	0.0014 U	0.0018	0.0481	0.0710	0.0410	0.0000039	0.0954	0.1882
RM658A1(X3)	4b	0.0239 U	2360	0.0014 U	0.0076	0.0808	0.6200	0.0770	0.0000039	2.5549	0.6792
RM661A1(X1)	4b	0.0184 U	1360	0.0011 U	0.0011	0.0250	0.0928	0.0767	0.0000026	0.4514	0.4314
RM676A1(X3)	4b	0.0233 U	918	0.0014 U	0.0012	0.0288	0.0913	0.0280	0.0000034 U	0.0732	0.1698
RM677A1(X3)	4a	0.0284 U	5330	0.0017 U	0.0047	0.0404 E	0.1763	0.0560	0.0000022 J	0.1277	0.2922
RM678A1(X1)	4a	0.0720	1410	0.0013 U	0.0023	0.0404	0.1920	0.0454	0.0000032 U	0.8091	0.4681
RM680A1(X1)	4a	0.0233 U	2710	0.0014 U	0.0024	0.0192	0.0834	0.0449	0.0000034 U	0.0511	0.4299
RM686A1(X3)	4a	0.0194 U	644	0.0011 U	0.0011	0.0085 E	0.0378	0.0208	0.0000017 J	0.0123	0.1652
RM687A1	4a	0.0254 U	16700	0.0008 J	0.0391	0.0385 E	0.5051	2.1718	0.0000135	0.0937	8.9491
RM689A1(X3)	4a	0.0218 J	3870	0.0016 U	0.0038	0.0269 E	0.1558	0.0714	0.0000023 J	0.0647	0.6180
RM692A1(X1)	4a	0.0197 U	391	0.0011 U	0.0009	0.0065 E	0.0205	0.0150	0.0000065	0.0095	0.1637
RM698A1(X1)	4a	0.0333 U	21700	0.0021 U	0.0356	0.1058 E	2.0143	1.1680	0.0000090	0.1192	10.2799
RM704A1(X1)	3	0.0248 U	8000	0.0015 U	0.0098	0.0308 E	0.2172	0.2042	0.0000043	0.0766	1.4273
RM706A1(X1)	3	0.1270 J	19600	0.0023 U	0.0302	0.0904 E	1.0182	1.1728	0.0000075	0.1039	11.8097
RM708A1(X3)	3	0.3750	14700	0.0018	0.0160	0.0827 E	0.8702	0.6950	0.0000044	0.0681	10.3870
RM713A1(X3)	2	0.0840	8710	0.0016	0.0151	0.1039	1.0056	0.8301	0.0000135	1.8055	6.5015
RM723A1(X1)	2	0.2873	3750	0.0090	0.0178	0.0789	0.9662	0.4778	0.0000060	0.0647	7.5723
RM723A2(X3)	2	0.0340	14400	0.0023	0.0214	0.1269	1.7782	0.9363	0.0000055	0.7767	17.8981
RM724A2(X3)	2	12.3000	6350	0.0008 J	0.0160	0.3846	5.0042	0.7867	0.0000019 J	0.0477	77.5000 D
RM727A1(X1)	2	0.0840	6600	0.0067 E	0.0160	0.1250	1.5359	0.8784	0.0000039	0.0715	16.2154
RM729A1(X1)	2	0.3400	2630	0.0090 E	0.0078	0.1654	1.7625	0.3494	0.0000013 J	0.0409	17.8981
RM730A1	2	2.1000	1540	0.0075 E	0.0240	0.3693	4.1387	1.2452	0.0000016 J	0.0307	88.5000 D
RM733A1(X1)	1	0.6900	3830	0.0011 E	0.0205	0.5635	5.3032	2.5097	0.0000022 J	0.0426	101.2697 D
RM734A1	1	25.0000	609	0.0238	0.0196	0.3443	3.9027	0.6805	0.0000035	0.0221	76.3347
RM736A1(X1)	1	0.6100	6280	0.0074	0.0151	0.1100	1.3345	0.7867	0.0000050	0.5996	13.8749

Table 5-5

Sediment Chemistry - Simultaneously Extracted Metals (SEM)

Upper Columbia River RI/FS

Sample ID/ Location	Reach	Acid Volatile Solids (uMol/g)	Total Organic Carbon (uMol/g)	Antimony (uMol/g)	Cadmium (uMol/g)	Chromium (uMol/g)	Copper (uMol/g)	Lead (uMol/g)	Mercury (uMol/g)	Nickel (uMol/g)	Zinc (uMol/g)
RM737A1(X3)	1	2.5000	1440	0.0945	0.0222	1.5386	13.8325	0.6419	0.0000030 U	0.3662	171.3324
RM738A1(X3)	1	1.3940	3250	0.0038	0.0133	0.7828	0.0004 U	0.0555	0.0000027 U	0.4480	125.5928
RM739A1(X3)	1	2.1000	5690	0.0164	0.0160	0.1692	1.5894	0.4537	0.0000033 J	0.2265	14.9304
RM740A1(X1)	1	1.0584	5430	0.0189	0.0081	0.1692	1.8569	0.4078	0.0000027 J	1.2230	15.1752
RM741A1(X3)	1	3.7000	4310	0.0329	0.0066	0.2481	3.0529	0.5792	0.0000028 J	0.0443	29.8302
RM742A1(X1)	1	4.7000	896	0.0501	0.0084	0.4385 E	5.2718	0.7915	0.0000030 J	0.0477	54.9182
RM742A2(X5)	1	11.6420	1430	0.0386	0.0001 U	0.6577	6.8454	0.6178	0.0000031 U	0.0409	84.5954
RM743A1(X1)	1	0.9646	7020	0.0361	0.0125	0.2231	2.9742	0.8060	0.0000055	0.0630	29.3713
RM743A2(X3)	1	2.6000 J	2460	0.0246	0.0081	0.2519 E	3.6352	0.6178	0.0000049	0.0443	31.5129
RM744A1(X1)	1	0.0470	4000	0.0411	0.0048	0.2885 E	3.9814	0.6322	0.0000060	0.0477	39.6206 D
RM744A2(X3)	1	8.7000 D	1120	0.1372	0.0001 U	1.4636	15.4062	0.7095	0.0000015 J	0.0784	152.6694 D
Site Average		*1.7112*	*4777*	*0.0125*	*0.0105*	*0.1972*	*1.9228*	*0.4752*	*0.0000041*	*0.2383*	*25.6612*
Reference Envelope Samples											
RM685R1		0.0230 U	31800	0.0014 U	0.0029	0.0133	0.0504	0.0208	0.0000023 J	0.0273	0.1622
RM686R1		0.0236 U	15200	0.0005 J	0.0011	0.0106	0.0315	0.0092	0.0000035	0.0138	0.1010
RM705R1		0.0120	21400	0.0019 U	0.0011	0.0156	0.0818	0.0169	0.0000080	0.0221	0.2646
RM706A2(X7)[a]		0.7900	29100	0.0030 U	0.0020	0.0539 E	0.1967	0.0569	0.0000090	0.0511	0.5584
RM721R1		3.4000	20300	0.0021 U	0.0036	0.0539	0.2219	0.0512	0.0000049 U	0.7137	0.4253
RM724A1(X1)[a]		1.7000	10700	0.0031	0.0081	0.0942	0.8482	0.3538	0.0000023 J	0.2129	8.2913
RM726R1		0.0393 U	39100	0.0023 U	0.0069	0.0539	0.3541	0.1071	0.0000070	0.7988	0.4069
RM732R1		0.0333 U	25700	0.0019 U	0.0133	0.0250	0.0551	0.1062	0.0000036 J	0.1380	0.4880
Ref. Average		*0.7526*	*24163*	*0.0020*	*0.0049*	*0.0400*	*0.2300*	*0.0903*	*0.0000051*	*0.2472*	*1.3372*

Notes:

µMol/g = micromoles per gram

D = Reported value is from a dilution

E = Value estimated due to interference

J = Estimated Value

U = Analyte was not detected at or above the reported value

[a] Sample was included as a reference for *Hyalella* and *Ceriodaphnia* tests, but not *Chironomid* tests based on the reference envelope analysis approach.

Concentrations reported on a dry weight basis

Where a Field Duplicate was collected, Primary sample was used

Averages calculated using the detection limit

Table 5-6
Sediment Physical Characteristics
Upper Columbia River RI/FS

Sample ID/ Location	Reach	% Gravel	% Sand	% Coarse Sand	% Fine Sand	% Med. Sand	% Silt	% Clay	% Colloid	<200 µm
RM603A1(X1)	6	4	47.1	4.4	32.3	10.4	36.92	9.05	2.93	48.9
RM605A1(X1)	6	19.5	78.3	12.9	5.6	59.8	2.17	0.02	0.01	2.2
RM605A2(X8)	6	0	70.4	0.0	42.2	28.2	26.05	1.78	1.78	29.6
RM606A1(X3)	6	3.1	77.4	2.0	44.6	30.8	18.43	0.78	0.29	19.5
RM616A1(X3)	6	1.7	84.6	2.6	63.8	18.2	13.15	0.41	0.14	13.7
RM622A1(X3)	5	1.4	82.8	1.7	55.8	25.3	14.69	0.71	0.40	15.8
RM628A1(X1)	5	0.2	95.9	6.3	6.9	82.7	3.82	0.06	0.02	3.9
RM634A1(X1)	5	0	85.4	2.2	22.0	61.2	13.65	0.66	0.29	14.6
RM637A1(X1)	5	14.7	82.6	6.0	33.8	42.8	2.65	0.04	0.01	2.7
RM640A1(X3)	5	2.4	55	1.2	51.4	2.4	34.08	3.83	4.69	42.6
RM641A1(X1)	4b	0.2	13.8	0.0	12.8	1.0	61.92	15.48	8.60	86
RM642A1(X1)	4b	0	49.8	0.0	48.4	1.4	39.16	7.03	4.02	50.2
RM644A1(X3)	4b	0.6	54.6	2.6	45.2	6.8	33.15	6.27	5.38	44.8
RM658A1(X3)	4b	0.6	48	1.8	39.8	6.4	37.52	9.77	4.11	51.4
RM661A1(X1)	4b	8.6	60.4	1.6	56.6	2.2	29.45	0.93	0.62	31
RM676A1(X3)	4b	0	42.4	0.2	39.8	2.4	48.38	3.46	5.76	57.6
RM677A1(X3)	4a	0	7	0.0	6.6	0.4	67.89	12.09	13.02	93
RM678A1(X1)	4a	0.9	77	3.0	60.9	13.1	20.55	0.88	0.66	22.1
RM680A1(X1)	4a	3.8	70.6	7.2	47.0	16.4	22.02	1.79	1.79	25.6
RM686A1(X3)	4a	4.9	88.5	6.8	45.4	36.3	6.34	0.13	0.13	6.6
RM687A1	4a	9.2	30.8	3.2	18.6	9.0	57.00	3.00	0.00	60
RM689A1(X3)	4a	0	40.4	0.0	40.0	0.4	48.87	6.56	4.17	59.6
RM692A1(X1)	4a	0.1	97.3	1.1	67.7	28.5	2.55	0.03	0.03	2.6
RM698A1(X1)	4a	0	9.8	0.2	9.2	0.4	64.94	15.33	9.92	90.2
RM704A1(X1)	3	0	49	0.0	48.2	0.8	40.29	7.14	3.57	51
RM706A1(X1)	3	0	22.6	0.2	21.8	0.6	62.69	9.29	5.42	77.4
RM708A1(X3)	3	0	56.6	0.0	56.2	0.4	36.46	3.47	3.47	43.4
RM713A1(X3)	2	0	65	2.0	60.8	2.2	32.90	1.40	0.70	35
RM723A1(X1)	2	0	83.3	0.5	39.2	43.6	15.78	0.84	0.08	16.7
RM723A2(X3)	2	0	69	0.2	58.6	10.2	27.59	2.79	0.62	31
RM724A2(X3)	2	0	85.8	0.0	37.9	47.9	13.42	0.64	0.14	14.2
RM727A1(X1)	2	0.4	80.5	0.9	78.2	1.4	17.86	0.96	0.29	19.1
RM729A1(X1)	2	6.5	87.8	8.2	51.6	28.0	5.61	0.06	0.03	5.7
RM730A1	2	0	93	0.2	88.0	4.8	6.83	0.07	0.11	7
RM733A1(X1)	1	3.1	88.3	1.2	61.1	26.0	8.43	0.09	0.09	8.6
RM734A1	1	0.4	94.7	0.3	92.6	1.8	4.73	0.17	0.00	4.9
RM736A1(X1)	1	20.6	59.9	1.3	56.4	2.2	18.53	0.78	0.20	19.5
RM737A1(X3)	1	0	97.7	0.0	39.9	57.8	2.21	0.08	0.01	2.3
RM738A1(X3)	1	0	96.9	0.0	45.1	51.8	2.98	0.11	0.02	3.1
RM739A1(X3)	1	4.8	80.4	1.6	75.5	3.3	13.91	0.74	0.15	14.8
RM740A1(X1)	1	9.3	79.4	4.7	68.0	6.7	10.85	0.23	0.23	11.3
RM741A1(X3)	1	0	87.9	0.3	85.7	1.9	11.62	0.24	0.24	12.1
RM742A1(X1)	1	0	95.4	0.0	92.8	2.6	4.46	0.05	0.09	4.6
RM742A2(X5)	1	0.1	94	0.0	82.1	11.9	5.69	0.06	0.15	5.9
RM743A1(X1)	1	0.6	91	0.7	84.7	5.6	8.02	0.17	0.21	8.4
RM743A2(X3)	1	0.1	90.8	0.0	90.0	0.8	8.65	0.14	0.32	9.1
RM744A1(X1)	1	0	91.7	0.2	84.0	7.5	7.97	0.12	0.21	8.3
RM744A2(X3)	1	0	96.4	0.1	61.8	34.5	3.53	0.05	0.02	3.6
Site Average		*2.5*	*70.6*	*1.9*	*51.2*	*17.5*	*22.4*	*2.7*	*1.8*	*26.9*

Table 5-6
Sediment Physical Characteristics
Upper Columbia River RI/FS

Sample ID/ Location	Reach	% Gravel	% Sand	% Coarse Sand	% Fine Sand	% Med. Sand	% Silt	% Clay	% Colloid	<200 µm
Reference Envelope Samples										
RM685R1		4.4	56.6	6.0	34.2	16.4	35.10	2.34	1.56	39.0
RM686R1		0	68.0	0.3	65.9	1.8	30.24	0.96	0.80	32.0
RM705R1		7.4	77.0	4.7	51.3	21.0	15.05	0.31	0.23	15.6
RM706A2(X7)[a]		0.4	35.2	0.6	32.4	2.2	52.16	7.08	5.15	64.4
RM721R1		14.8	55.0	6.4	40.0	8.6	27.18	2.42	0.60	30.2
RM724A1(X1)[a]		0	80.8	0	79.7	1.1	17.76	0.48	0.96	19.2
RM726R1		5.2	69.6	4.4	39.2	26.0	21.92	2.27	1.01	25.2
RM732R1		8.4	50.0	2.8	38.0	9.2	34.11	4.99	2.50	41.6
Ref. Average		*5.1*	*61.5*	*3.2*	*47.6*	*10.8*	*29.2*	*2.6*	*1.6*	*33.4*

Notes:

µm = micrometer

[a] Sample was included as a reference for *Hyalella* and *Ceriodaphnia* tests, but not *Chironomid* tests based on the reference envelope analysis approach.

Where a Field Duplicate was collected, Primary sample was used

TABLE 5-7

Summary Statistics for Organic Analytes in UCR Sediments and Reference Samples

Upper Columbia River RI/FS

Analyte	Detected	ND	n	Detection Frequency	Minimum Detected Concentration	Maximum Detected Concentration	Mean of Detected Concentrations	Standard Deviation of Detected Concentrations
PAH (Site Sediments)								
2-Methylnaphthalene	42	6	48	88%	0.2	4	0.75	0.68
Acenaphthene	2	46	48	4%	0.2	0.2	0.2	0
Acenaphthylene	0	48	48	0%				
Anthracene	4	44	48	8%	0.2	1	0.55	0.34
Benz(a)anthracene	27	21	48	56%	0.2	6	1.2	1.2
Benzo(a)pyrene	12	36	48	25%	0.6	7	2.0	1.8
Benzo(b)fluoranthene	13	35	48	27%	0.2	6	2.3	1.8
Benzo(g,h,i)perylene	19	29	48	40%	0.4	6	1.3	1.3
Benzo(k)fluoranthene	14	34	48	29%	0.2	5	1.3	1.3
Chrysene	30	18	48	63%	0.2	12	2.2	2.4
Dibenz(a,h)anthracene	4	44	48	8%	0.6	1	0.83	0.21
Dibenzofuran	9	39	48	19%	0.2	2	0.78	0.55
Fluoranthene	29	19	48	60%	0.2	23	2.9	4.6
Fluorene	2	46	48	4%	0.6	1	0.8	0.28
Indeno(1,2,3-c,d)pyrene	21	27	48	44%	0.2	6	1.3	1.3
Naphthalene	48	0	48	100%	0.9	5.1	2.5	1.6
Phenanthrene	32	16	48	67%	0.2	22	2.3	4.1
Pyrene	29	19	48	60%	0.2	18	2.5	3.8
total PAHs	*48*	*0*	*48*	*100%*	*1.4*	*86*	*13*	*18*
PCB (Site Sediments)								
Aroclor 1016	1	47	48	2%	25	25	25	-
Aroclor 1221	0	48	48	0%				
Aroclor 1232	0	48	48	0%				
Aroclor 1242	0	48	48	0%				
Aroclor 1248	0	48	48	0%				
Aroclor 1254	0	48	48	0%				

TABLE 5-7
Summary Statistics for Organic Analytes in UCR Sediments and Reference Samples
Upper Columbia River RI/FS

Analyte	Detected	ND	n	Detection Frequency	Minimum Detected Concentration	Maximum Detected Concentration	Mean of Detected Concentrations	Standard Deviation of Detected Concentrations
Aroclor 1260	1	47	48	2%	9.4	9.4	9.4	-
Total PCBs	*1*	*47*	*48*	*2%*	*34*	*34*	*34*	-
Pesticide (Site Sediments)								
Aldrin	0	48	48	0%				
Atrazine	0	48	48	0%				
Chlordane, cis-	0	48	48	0%				
Chlordane, trans-	0	48	48	0%				
Dieldrin	0	48	48	0%				
Endosulfan sulfate	0	48	48	0%				
Endosulfan-alpha	0	48	48	0%				
Endosulfan-beta	0	48	48	0%				
Endrin	0	48	48	0%				
Endrin aldehyde	0	48	48	0%				
Endrin ketone	0	48	48	0%				
gamma-BHC (Lindane)	0	48	48	0%				
Heptachlor	0	48	48	0%				
Heptachlor epoxide	0	48	48	0%				
Hexachlorobenzene	1	47	48	2%	0.45	0.45	0.45	-
Methoxychlor	1	47	48	2%	2.4	2.4	2.4	-
Nonachlor, cis-	0	48	48	0%				
Nonachlor, trans-	0	48	48	0%				
o,p'-DDD	0	48	48	0%				
o,p'-DDE	2	46	48	4%	0.48	0.48	0.48	0
o,p'-DDT	2	46	48	4%	0.86	0.89	0.88	0.021
p,p'-DDD	1	47	48	2%	0.89	0.89	0.89	-
p,p'-DDE	11	37	48	23%	0.12	5.2	0.93	1.4
p,p'-DDT	8	40	48	17%	0.23	10	3.0	4.2

TABLE 5-7

Summary Statistics for Organic Analytes in UCR Sediments and Reference Samples

Upper Columbia River RI/FS

Analyte	Detected	ND	n	Detection Frequency	Minimum Detected Concentration	Maximum Detected Concentration	Mean of Detected Concentrations	Standard Deviation of Detected Concentrations
total DDTs	14	34	48	29%	0.12	14.8	2.7	4.8
Oxychlordane	0	48	48	0%				
Toxaphene	0	48	48	0%				
SVOC (Site Sediments)								
1,2,4-Trichlorobenzene	0	48	48	0%				
1,2-Dichlorobenzene	0	48	48	0%				
1,3-Dichlorobenzene	0	48	48	0%				
1,4-Dichlorobenzene	0	48	48	0%				
2,2'-oxybis(1-chloropropane)	0	48	48	0%				
2,4,5-Trichlorophenol	0	48	48	0%				
2,4,6-Trichlorophenol	0	48	48	0%				
2,4-Dichlorophenol	0	48	48	0%				
2,4-Dimethylphenol	0	48	48	0%				
2,4-Dinitrophenol	0	48	48	0%				
2,4-Dinitrotoluene	0	48	48	0%				
2,6-Dinitrotoluene	0	48	48	0%				
2-Chloronaphthalene	0	48	48	0%				
2-Chlorophenol	0	48	48	0%				
2-Fluorobiphenyl	0	48	48	0%				
2-Methylphenol	0	48	48	0%				
2-Nitroaniline	0	48	48	0%				
2-Nitrophenol	0	48	48	0%				
3,3'-Dichlorobenzidine	0	48	48	0%				
3-Nitroaniline	0	48	48	0%				
4-Bromophenyl phenyl ether	0	48	48	0%				
4-Chloro-3-methylphenol	0	48	48	0%				
4-Chloroaniline	0	48	48	0%				

TABLE 5-7
Summary Statistics for Organic Analytes in UCR Sediments and Reference Samples
Upper Columbia River RI/FS

Analyte	Detected	ND	n	Detection Frequency	Minimum Detected Concentration	Maximum Detected Concentration	Mean of Detected Concentrations	Standard Deviation of Detected Concentrations
4-Chlorophenyl phenyl ether	0	48	48	0%				
4-Methylphenol	0	48	48	0%				
4-Nitroaniline	0	48	48	0%				
4-Nitrophenol	0	48	48	0%				
Acetophenone	0	48	48	0%				
Benzaldehyde	0	48	48	0%				
Benzoic acid	0	48	48	0%				
Benzyl alcohol	0	48	48	0%				
bis(2-Chloroethoxy)methane	0	48	48	0%				
Bis(2-chloroethyl)ether	0	48	48	0%				
Bis(2-ethylhexyl) phthalate	4	44	48	8%	25	110	53	39
Butyl benzyl phthalate	0	48	48	0%				
Caprolactam	1	47	48	2%	43	43	43	-
Carbazole	0	48	48	0%				
Diethyl phthalate	0	48	48	0%				
Dimethyl phthalate	0	48	48	0%				
Di-n-butyl phthalate	0	48	48	0%				
Dinitro-o-cresol	0	48	48	0%				
Di-N-octyl phthalate	0	48	48	0%				
Hexachlorobutadiene	0	48	48	0%				
Hexachlorocyclohexane-alpha	2	46	48	4%	0.18	0.5	0.34	0.23
Hexachlorocyclohexane-beta	0	48	48	0%				
Hexachlorocyclohexane-delta	0	48	48	0%				
Hexachlorocyclopentadiene	0	48	48	0%				
Hexachloroethane	0	48	48	0%				
Isophorone	0	48	48	0%				
Nitrobenzene	0	48	48	0%				

TABLE 5-7

Summary Statistics for Organic Analytes in UCR Sediments and Reference Samples

Upper Columbia River RI/FS

Analyte	Detected	ND	n	Detection Frequency	Minimum Detected Concentration	Maximum Detected Concentration	Mean of Detected Concentrations	Standard Deviation of Detected Concentrations
N-Nitrosodi-n-propylamine	0	48	48	0%				
N-Nitrosodiphenylamine	0	48	48	0%				
Pentachlorophenol	0	48	48	0%				
Phenol	0	48	48	0%				
PAH (Reference)								
2-Methylnaphthalene	7	1	8	88%	0.3	1	0.61	0.25
Acenaphthene	0	8	8	0%				
Acenaphthylene	0	8	8	0%				
Anthracene	0	8	8	0%				
Benz(a)anthracene	4	4	8	50%	0.3	2	1	0.73
Benzo(a)pyrene	1	7	8	13%	4	4	4	-
Benzo(b)fluoranthene	1	7	8	13%	6	6	6	-
Benzo(g,h,i)perylene	1	7	8	13%	4	4	4	-
Benzo(k)fluoranthene	1	7	8	13%	3	3	3	-
Chrysene	4	4	8	50%	1	6	2.5	2.4
Dibenz(a,h)anthracene	0	8	8	0%				
Dibenzofuran	1	7	8	13%	0.7	0.7	0.7	-
Fluoranthene	6	2	8	75%	0.6	16	5.7	6.5
Fluorene	1	7	8	13%	0.7	0.7	0.7	-
Indeno(1,2,3-c,d)pyrene	1	7	8	13%	4	4	4	-
Naphthalene	8	0	8	100%	0.9	7.7	2.6	2.2
Phenanthrene	7	1	8	88%	0.3	22	4.3	7.7
Pyrene	5	3	8	63%	1	34	9.6	14
total PAHs	*8*	*0*	*8*	*100%*	*1.3*	*73*	*22*	*28*
PCB (Reference)								
Aroclor 1016	0	8	8	0%				
Aroclor 1221	0	8	8	0%				

TABLE 5-7
Summary Statistics for Organic Analytes in UCR Sediments and Reference Samples
Upper Columbia River RI/FS

Analyte	Detected	ND	n	Detection Frequency	Minimum Detected Concentration	Maximum Detected Concentration	Mean of Detected Concentrations	Standard Deviation of Detected Concentrations
Aroclor 1232	0	8	8	0%				
Aroclor 1242	0	8	8	0%				
Aroclor 1248	0	8	8	0%				
Aroclor 1254	0	8	8	0%				
Aroclor 1260	0	8	8	0%				
Total PCBs	*0*	*8*	*8*	*0%*				
Pesticide (Reference)								
Aldrin	0	8	8	0%				
Atrazine	0	8	8	0%				
Chlordane, cis-	0	8	8	0%				
Chlordane, trans-	0	8	8	0%				
Dieldrin	0	8	8	0%				
Endosulfan sulfate	0	8	8	0%				
Endosulfan-alpha	0	8	8	0%				
Endosulfan-beta	0	8	8	0%				
Endrin	0	8	8	0%				
Endrin aldehyde	0	8	8	0%				
Endrin ketone	0	8	8	0%				
gamma-BHC (Lindane)	0	8	8	0%				
Heptachlor	0	8	8	0%				
Heptachlor epoxide	0	8	8	0%				
Hexachlorobenzene	1	7	8	13%	0.3	0.3	0.3	-
Methoxychlor	0	8	8	0%				
Nonachlor, cis-	0	8	8	0%				
Nonachlor, trans-	0	8	8	0%				
o,p'-DDD	0	8	8	0%				
o,p'-DDE	0	8	8	0%				

TABLE 5-7
Summary Statistics for Organic Analytes in UCR Sediments and Reference Samples
Upper Columbia River RI/FS

Analyte	Detected	ND	n	Detection Frequency	Minimum Detected Concentration	Maximum Detected Concentration	Mean of Detected Concentrations	Standard Deviation of Detected Concentrations
o,p'-DDT	0	8	8	0%				
Oxychlordane	0	8	8	0%				
p,p'-DDD	0	8	8	0%				
p,p'-DDE	1	7	8	13%	0.57	0.57	0.57	-
p,p'-DDT	0	8	8	0%				
total DDTs	1	7	8	13%	0.57	0.57	0.57	-
Toxaphene	0	8	8	0%				
SVOC (Reference)		0						
1,2,4-Trichlorobenzene	0	8	8	0%				
1,2-Dichlorobenzene	0	8	8	0%				
1,3-Dichlorobenzene	0	8	8	0%				
1,4-Dichlorobenzene	0	8	8	0%				
2,2'-oxybis(1-chloropropane)	0	8	8	0%				
2,4,5-Trichlorophenol	0	8	8	0%				
2,4,6-Trichlorophenol	0	8	8	0%				
2,4-Dichlorophenol	0	8	8	0%				
2,4-Dimethylphenol	0	8	8	0%				
2,4-Dinitrophenol	0	8	8	0%				
2,4-Dinitrotoluene	0	8	8	0%				
2,6-Dinitrotoluene	0	8	8	0%				
2-Chloronaphthalene	0	8	8	0%				
2-Chlorophenol	0	8	8	0%				
2-Fluorobiphenyl	0	8	8	0%				
2-Methylphenol	0	8	8	0%				
2-Nitroaniline	0	8	8	0%				
2-Nitrophenol	0	8	8	0%				
3,3'-Dichlorobenzidine	0	8	8	0%				

TABLE 5-7
Summary Statistics for Organic Analytes in UCR Sediments and Reference Samples
Upper Columbia River RI/FS

Analyte	Detected	ND	n	Detection Frequency	Minimum Detected Concentration	Maximum Detected Concentration	Mean of Detected Concentrations	Standard Deviation of Detected Concentrations
3-Nitroaniline	0	8	8	0%				
4-Bromophenyl phenyl ether	0	8	8	0%				
4-Chloro-3-methylphenol	0	8	8	0%				
4-Chloroaniline	0	8	8	0%				
4-Chlorophenyl phenyl ether	0	8	8	0%				
4-Methylphenol	1	7	8	13%	200	200	200	-
4-Nitroaniline	0	8	8	0%				
4-Nitrophenol	0	8	8	0%				
Acetophenone	0	8	8	0%				
Benzaldehyde	0	8	8	0%				
Benzoic acid	0	8	8	0%				
Benzyl alcohol	0	8	8	0%				
bis(2-Chloroethoxy)methane	0	8	8	0%				
Bis(2-chloroethyl)ether	1	7	8	13%	63	63	63	-
Bis(2-ethylhexyl) phthalate	1	7	8	13%	82	82	82	-
Butyl benzyl phthalate	0	8	8	0%				
Caprolactam	0	8	8	0%				
Carbazole	0	8	8	0%				
Diethyl phthalate	0	8	8	0%				
Dimethyl phthalate	0	8	8	0%				
Di-n-butyl phthalate	0	8	8	0%				
Dinitro-o-cresol	0	8	8	0%				
Di-N-octyl phthalate	0	8	8	0%				
Hexachlorobutadiene	0	8	8	0%				
Hexachlorocyclohexane-alpha	2	6	8	25%	0.48	0.69	0.585	0.15
Hexachlorocyclohexane-beta	0	8	8	0%				
Hexachlorocyclohexane-delta	0	8	8	0%				

TABLE 5-7

Summary Statistics for Organic Analytes in UCR Sediments and Reference Samples

Upper Columbia River RI/FS

Analyte	Detected	ND	n	Detection Frequency	Minimum Detected Concentration	Maximum Detected Concentration	Mean of Detected Concentrations	Standard Deviation of Detected Concentrations
Hexachlorocyclopentadiene	0	8	8	0%				
Hexachloroethane	0	8	8	0%				
Isophorone	0	8	8	0%				
Nitrobenzene	0	8	8	0%				
N-Nitrosodi-n-propylamine	0	8	8	0%				
N-Nitrosodiphenylamine	0	8	8	0%				
Pentachlorophenol	0	8	8	0%				
Phenol	0	8	8	0%				

Notes:

DDD = dichlorodiphenyldichloroethane

DDE = dichlorodiphenyldichloroethylene

DDT = dichlorodiphenyltrichloroethane

µg/kg = micrograms per kilogram

ND = not detected

n = number of samples

PAH = polycyclic aromatic hydrocarbon

PCB = polychlorinated biophenyl

SVOC = semi-volatile organic compound

Concentrations in µg/kg

Shaded rows indicate analytes with at least one detected concentration

Table 5-8
Sediment Sample Exposure Metrics
Upper Columbia River RI/FS

Sample ID/ Location	Reach	PEC-Q(As)	PEC-Q(Cd)	PEC-Q(Cr)	PEC-Q(Cu)	PEC-Q(Pb)	PEC-Q(Hg)	PEC-Q(Ni)	PEC-Q(Zn)	Sum PEC-Q_{metals}	Mean PEC-Q_{metals} [1]	Mean PEC-Q_{metals} (Normalized to 1% OC)	SEM-AVS	SEM-AVS (Normalized to measured fraction OC) [2]
RM603A1(X1)	6	0.18	0.05	0.13	0.08	0.09	0.02	0.26	0.21	1.00	0.14	1.42	0.3	264
RM605A1(X1)	6	0.09	0.12	0.06	0.04	0.03	0.01	0.12	0.06	0.53	0.07	1.02	0.3	437
RM605A2(X8)	6	0.13	0.13	0.12	0.08	0.13	0.07	0.23	0.31	1.20	0.16	0.39	1.2	296
RM606A1(X3)	6	0.09	0.06	0.11	0.05	0.08	0.01	0.21	0.22	0.84	0.12	0.43	0.9	341
RM616A1(X3)	6	0.15	0.03	0.10	0.06	0.05	0.01	0.20	0.11	0.69	0.10	0.80	0.4	357
RM622A1(X3)	5	0.42	0.03	0.11	0.08	0.09	0.02	0.21	0.14	1.08	0.15	1.27	0.5	457
RM628A1(X1)	5	0.22	0.01	0.06	0.06	0.06	0.01	0.14	0.09	0.65	0.09	0.76	0.2	188
RM634A1(X1)	5	0.41	0.03	0.13	0.11	0.10	0.01	0.28	0.17	1.22	0.17	2.64	0.2	261
RM637A1(X1)	5	0.12	0.12	0.07	0.05	0.04	0.01	0.13	0.07	0.61	0.09	2.11	0.1	286
RM640A1(X3)	5	0.27	0.07	0.20	0.12	0.14	0.02	0.47	0.20	1.48	0.21	0.94	0.6	279
RM641A1(X1)	4b	0.10	0.48	0.22	0.19	0.53	0.32	0.42	0.77	3.03	0.39	0.28	5.1	364
RM642A1(X1)	4b	0.12	0.42	0.16	0.13	0.64	0.22	0.30	0.64	2.64	0.35	0.48	4.8	675
RM644A1(X3)	4b	0.43	0.03	0.23	0.15	0.14	0.01	0.54	0.14	1.67	0.24	1.72	0.4	282
RM658A1(X3)	4b	0.15	0.08	0.28	0.16	0.15	0.02	0.56	0.19	1.59	0.22	0.90	2.5	1060
RM661A1(X1)	4b	0.09	0.06	0.15	0.08	0.16	0.02	0.30	0.18	1.04	0.15	1.09	1.0	768
RM676A1(X3)	4b	0.10	0.04	0.22	0.14	0.08	0.04	0.45	0.13	1.20	0.17	1.54	0.4	409
RM677A1(X3)	4a	0.08	0.08	0.27	0.16	0.09	0.01	0.52	0.15	1.37	0.19	0.36	0.6	121
RM678A1(X1)	4a	0.05	0.05	0.15	0.08	0.08	0.01	0.29	0.13	0.84	0.12	0.83	1.4	1025
RM680A1(X1)	4a	0.07	0.05	0.21	0.12	0.09	0.02	0.52	0.17	1.26	0.18	0.68	0.6	221
RM686A1(X3)	4a	0.04	0.02	0.08	0.07	0.05	0.01	0.22	0.09	0.58	0.08	1.20	0.2	353
RM687A1	4a	0.17	0.42	0.19	0.18	1.06	0.39	0.43	0.61	3.46	0.44	0.26	11.7	703
RM689A1(X3)	4a	0.06	0.03	0.15	0.10	0.10	0.03	0.31	0.14	0.92	0.13	0.33	0.9	230
RM692A1(X1)	4a	0.02	0.12	0.07	0.04	0.03	0.12	0.13	0.07	0.61	0.07	1.66	0.2	443
RM698A1(X1)	4a	0.24	1.06	0.31	1.10	2.41	0.82	0.52	2.08	8.55	1.10	0.51	13.6	627
RM704A1(X1)	3	0.15	0.40	0.21	0.17	0.57	0.22	0.41	0.44	2.56	0.34	0.42	1.9	240
RM706A1(X1)	3	0.14	0.76	0.19	0.53	1.54	0.62	0.32	1.66	5.77	0.73	0.37	14.0	715
RM708A1(X3)	3	0.18	0.96	0.19	0.71	1.50	0.41	0.34	2.92	7.20	0.97	0.66	11.7	793
RM713A1(X3)	2	0.14	0.57	0.18	0.44	1.16	0.52	0.33	1.17	4.51	0.57	0.63	8.1	928
RM723A1(X1)	2	0.07	0.11	0.11	0.15	0.19	0.04	0.25	0.39	1.30	0.18	0.48	8.8	2350
RM723A2(X3)	2	0.13	0.54	0.18	1.31	1.59	0.37	0.25	4.99	9.36	1.28	0.90	21.4	1484

Table 5-8
Sediment Sample Exposure Metrics
Upper Columbia River RI/FS

Sample ID/ Location	Reach	PEC-Q(As)	PEC-Q(Cd)	PEC-Q(Cr)	PEC-Q(Cu)	PEC-Q(Pb)	PEC-Q(Hg)	PEC-Q(Ni)	PEC-Q(Zn)	Sum PEC-Q_{metals}	Mean PEC-Q_{metals} [1]	Mean PEC-Q_{metals} (Normalized to 1% OC)	SEM-AVS	SEM-AVS (Normalized to measured fraction OC) [2]
RM724A2(X3)	2	0.06	0.44	0.44	6.50	2.09	0.10	0.22	18.3	28.2	4.01	6.32	71.1	11190
RM727A1(X1)	2	0.24	0.60	0.17	0.87	1.32	0.31	0.25	2.79	6.56	0.89	1.36	17.6	2667
RM729A1(X1)	2	0.06	0.22	0.13	1.23	0.53	0.06	0.13	2.72	5.08	0.72	2.77	19.7	7498
RM730A1	2	0.07	0.70	0.23	2.68	2.08	0.15	0.16	10.2	16.3	2.31	15.0	91.8	59635
RM733A1(X1)	1	0.20	0.58	0.35	4.30	10.9	0.08	0.20	17.9	34.4	4.91	12.8	108	28317
RM734A1	1	0.04	0.36	0.23	2.66	1.16	0.08	0.14	10.0	14.7	2.09	34.3	56.0	91888
RM736A1(X1)	1	0.15	0.86	0.19	0.87	1.67	0.31	0.31	3.83	8.19	1.13	1.79	16.0	2548
RM737A1(X3)	1	0.11	0.24	1.00	12.9	1.27	0.21	0.24	26.8	42.8	6.08	42.2	183.7	127566
RM738A1(X3)	1	0.26	0.05	0.90	10.9	1.68	0.11	0.19	31.4	45.5	6.49	20.0	124.7	38374
RM739A1(X3)	1	0.24	0.36	0.26	2.46	0.89	0.28	0.25	4.62	9.37	1.30	2.28	15.1	2657
RM740A1(X1)	1	0.16	0.40	0.19	1.21	0.92	0.13	0.23	3.22	6.47	0.91	1.67	17.6	3244
RM741A1(X3)	1	0.25	0.42	0.30	3.07	1.30	0.16	0.20	6.95	12.7	1.78	4.46	29.8	6917
RM742A1(X1)	1	0.19	0.68	0.27	2.68	1.42	0.15	0.22	6.36	12.0	1.69	18.8	56.3	62877
RM742A2(X5)	1	0.25	0.13	0.65	8.32	1.73	0.05	0.22	18.15	29.5	4.21	29.4	80.5	56264
RM743A1(X1)	1	0.26	0.40	0.26	2.39	1.57	0.16	0.23	5.58	10.8	1.53	2.17	32.3	4596
RM743A2(X3)	1	0.14	0.34	0.26	2.18	1.11	0.11	0.20	5.19	9.53	1.35	5.47	33.2	13503
RM744A1(X1)	1	0.21	0.30	0.24	2.62	1.10	0.14	0.20	5.40	10.2	1.44	3.60	44.2	11060
RM744A2(X3)	1	0.32	0.12	0.80	10.34	1.43	0.05	0.23	21.7	35.0	4.99	44.4	160	143003
Site Average		*0.16*	*0.30*	*0.24*	*1.77*	*0.98*	*0.15*	*0.28*	*4.58*	*8.46*	*1.19*	*5.7*	*26.5*	*14391*
Reference Envelope Samples														
RM685R1		0.06	0.17	0.21	0.11	0.08	0.02	0.50	0.16	1.31	0.18	0.057	0.25	7.9
RM686R1		0.04	0.04	0.08	0.04	0.03	0.01	0.12	0.06	0.41	0.06	0.036	0.14	9.5
RM705R1		0.05	0.03	0.06	0.05	0.05	0.18	0.10	0.07	0.60	0.06	0.026	0.37	17.5
RM706A2(X7)		0.04	0.08	0.22	0.18	0.11	0.04	0.33	0.21	1.22	0.17	0.058	0.08	2.6
RM721R1		0.07	0.08	0.20	0.10	0.10	0.03	0.30	0.12	1.00	0.14	0.057	-4.29	-212
RM724A1(X1)		0.09	0.03	0.20	0.14	0.13	0.02	0.45	0.20	1.25	0.18	0.165	8.01	749
RM726R1		0.09	0.12	0.22	0.11	0.11	0.02	0.31	0.13	1.11	0.16	0.040	1.65	42.3
RM732R1		0.10	0.26	0.07	0.04	0.20	0.01	0.11	0.11	0.90	0.13	0.051	0.78	31.1
Ref. Average		*0.07*	*0.10*	*0.16*	*0.10*	*0.10*	*0.04*	*0.28*	*0.13*	*0.98*	*0.13*	*0.061*	*0.88*	*81.0*

Notes:

Table 5-8
Sediment Sample Exposure Metrics
Upper Columbia River RI/FS

Sample ID/ Location	Reach	PEC-Q(As)	PEC-Q(Cd)	PEC-Q(Cr)	PEC-Q(Cu)	PEC-Q(Pb)	PEC-Q(Hg)	PEC-Q(Ni)	PEC-Q(Zn)	Sum PEC-Q_{metals}	Mean PEC-Q_{metals} [1]	Mean PEC-Q_{metals} (Normalized to 1% OC)	SEM-AVS	SEM-AVS (Normalized to measured fraction OC)[2]

AVS = acid volatile sulfides

OC = organic carbon

PEC-Q = probable effects concentration quotient

SEM = simultaneously extraced metals for divalent cationic metals (i.e., Cd, Cu, Pb, Ni, Zn)

[1] Mean PEC-Q metals > 1 are highlited to indicate samples likely to be toxic (Ingersoll et al. 2001)

[2] SEM-AVS / foc > 3000 are highlited to indicate samples with a potential for toxicity (USEPA 2005)

Mean PEC-Q is calculated for As, Cd, Cr, Cu, Pb, Ni, and Zn

Where a field duplicate was collected, the primary sample concentration is presented

Table 5-9

Dissolved Metal Concentrations in Pore Water

Upper Columbia River RI/FS

Sample ID/ Location	Reach	Hardness mg/L $CaCO_3$	Aluminum (µg/L)	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Cadmium[1] (µg/L)	Calcium (µg/L)	Chromium[1] (µg/L)	Cobalt (µg/L)	Copper[1] (µg/L)	Iron (µg/L)	Lead[1] (µg/L)
RM603A1(X1)	6	117	91.4 J	60 U	10 U	159 J	5 U	5 U	32500	3.2 J	50 U	25 U	118	10 U
RM605A1(X1)	6	95	53.6 J	60 U	10 U	189 J	5 U	0.31 J	27100	15.7	0.76 J	25 U	85.4 J	10 U
RM605A2(X8)	6	175	63.6 J	60 U	10 U	308	5 U	0.06 J	50700	5.4 J	2.5 J	2.3 J	223	5.2 J
RM606A1(X3)	6	245	120 J	60 U	15.5	311	5 U	0.43 J	70700	12.7	7 J	25 U	9990	10 U
RM616A1(X3)	6	224	125 J	60 U	10 U	278	5 U	0.51 J	65000	7 J	1.7 J	25 U	130	2.4 J
RM622A1(X3)	5	313	80.3 J	60 U	31.5	350	5 U	0.65 J	93000	36.3	3.7 J	2.1 J	187	10 U
RM628A1(X1)	5	210	116 J	60 U	10 U	323	5 U	0.25 J	63500	5.8 J	1.1 J	1.6 J	111	10 U
RM634A1(X1)	5	156	82.9 J	60 U	10 U	102 J	5 U	0.85 J	45300	36.5	1.4 J	1.6 J	165	10 U
RM637A1(X1)	5	78	69.7 J	60 U	10 U	34.5 J	5 U	5 U	23600	3.1 J	50 U	25 U	93.2 J	10 U
RM640A1(X3)	5	315	121 J	60 U	10 U	345	5 U	0.27 J	91400	5.8 J	3.8 J	25 U	119	10 U
RM641A1(X1)	4b	198	78.9 J	60 U	12	271	5 U	0.45 J	56000	7.9 J	5.9 J	25 U	3340	5.7 J
RM642A1(X1)	4b	111	526	60 U	8.1 J	326	5 U	1.8 J	31300	4.4 J	3 J	8.3 J	1880	45.4
RM644A1(X3)	4b	149	248	60 U	10 U	168 J	5 U	5 U	42800	9 J	50 U	25 U	173	10 U
RM658A1(X3)	4b	161	473	60 U	10 U	189 J	5 U	0.27 J	47400	1.6 J	1 J	5.6 J	424	10 U
RM661A1(X1)	4b	174	45 J	60 U	10 U	176 J	5 U	5 U	49700	0.99 J	50 U	2.5 J	64 J	10 U
RM676A1(X3)	4b	191	111 J	60 U	5.7 J	255	5 U	5 U	56900	2.1 J	1.4 J	7.1 J	102	5 J
RM677A1(X3)	4a	192	101 J	60 U	5 J	350	5 U	5 U	57700	2 J	1.4 J	5.5 J	114	2 J
RM678A1(X1)	4a	177	122 J	60 U	10 U	285	5 U	5 U	60600	1.2 J	50 U	5.3 J	80.5 J	10 U
RM680A1(X1)	4a	173	110 J	60 U	10 U	221	5 U	5 U	52500	10 U	50 U	3.4 J	66.7 J	10 U
RM686A1(X3)	4a	158	74.3 J	60 U	10 U	206	5 U	5 U	48200	10 U	50 U	3.3 J	43.8 J	10 U
RM687A1	4a	123	595	60 U	7.5 J	280	5 U	3.9 J	33300	1.2 J	1 J	20.9 J	359	24.8
RM689A1(X3)	4a	152	312	60 U	6.4 J	86.2 J	5 U	0.46 J	46900	1.9 J	50 U	10.1 J	236	11.1
RM692A1(X1)	4a	--	--	--	--	--	--	--	--	--	--	--	--	--
RM698A1(X1)	4a	153	366	60 U	10 U	148 J	5 U	4 J	45400	0.99 J	50 U	36.4	459	45.7
RM704A1(X1)	3	192	133 J	60 U	9.6 J	136 J	5 U	0.78 J	56500	2.1 J	1.1 J	7.1 J	401	4.4 J
RM706A1(X1)	3	135	184 J	60 U	10 U	353	0.11 J	2.1 J	39200	4 J	50 U	18.9 J	907	50.8
RM708A1(X3)	3	439	43.6 J	60 U	6.7 J	732	5 U	5 U	162000	1.2 J	50 U	1.9 J	2950	10 U
RM713A1(X3)	2	208	44.9 J	60 U	10 U	326	5 U	5 U	58400	1.6 J	1.7 J	5 J	160	2.3 J
RM723A1(X1)	2	419	47.7 J	60 U	10 U	503	5 U	5 U	120000	3 J	2.3 J	5.9 J	79.3 J	10 U
RM723A2(X3)	2	389	200 U	60 U	10 U	546	5 U	5 U	111000	1.1 J	50 U	5.3 J	88.3 J	10 U
RM724A2(X3)	2	510	72.5 J	60 U	9.6 J	734	5 U	0.84 J	153000	3.5 J	2.9 J	70.3	87.4 J	10 U
RM727A1(X1)	2	230	66.4 J	60 U	10 U	404	5 U	0.45 J	73100	4.2 J	1.6 J	7.6 J	80.4 J	7.1 J
RM729A1(X1)	2	230	106 J	8 J	10 U	418	5 U	0.9 J	69700	4.7 J	1.5 J	19.4 J	232	4.8 J
RM730A1	2	141	64.7 J	7.7 J	10 U	152 J	5 U	0.5 J	42300	3.9 J	50 U	10.7 J	101	3.1 J
RM733A1(X1)	1	227	66.6 J	60 U	10 U	150 J	5 U	0.96 J	65900	4.4 J	3.5 J	38.5	113	10 U
RM734A1	1	89	72.3 J	18.3 J	10 U	187 J	5 U	5 U	26600	10 U	50 U	14 J	461	8.6 J
RM736A1(X1)	1	363	87.9 J	60 U	10 U	457	5 U	5 U	113000	2.1 J	4.6 J	3.5 J	169	10 U
RM737A1(X3)	1	78	200 U	27.8 J	10 U	172 J	5 U	5 U	22900	10 U	50 U	12 J	97.7 J	10 U

Table 5-9

Dissolved Metal Concentrations in Pore Water

Upper Columbia River RI/FS

Sample ID/ Location	Reach	Hardness mg/L $CaCO_3$	Aluminum (µg/L)	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Cadmium[1] (µg/L)	Calcium (µg/L)	Chromium[1] (µg/L)	Cobalt (µg/L)	Copper[1] (µg/L)	Iron (µg/L)	Lead[1] (µg/L)
RM738A1(X3)	1	81	200 U	15.9 J	10 U	255	5 U	5 U	23500	1.1 J	50 U	13 J	110	10 U
RM739A1(X3)	1	579	62.8 J	60 U	10 U	694	5 U	5 U	164000	4.5 J	5.3 J	2.2 J	1660	10 U
RM740A1(X1)	1	388	63.9 J	60 U	10 U	382	5 U	0.37 J	108000	10 U	2.6 J	13.8 J	94.1 J	10 U
RM741A1(X3)	1	315	55.2 J	60 U	10 U	478	5 U	0.65 J	98600	10 U	2.9 J	23 J	52.2 J	10 U
RM742A1(X1)	1	152	65.9 J	7.1 J	10 U	256	5 U	0.67 J	46900	117	2.7 J	21.6 J	392	10 U
RM742A2(X5)	1	137	80.5 J	9.6 J	10 U	309	5 U	5 U	39900	10 U	50 U	32.4	116	2.3 J
RM743A1(X1)	1	199	82.1 J	60 U	10 U	532	5 U	1.4 J	56700	2 J	4.5 J	58.1	155	10 U
RM743A2(X3)	1	153	80.2 J	60 U	10 U	389	5 U	0.29 J	49900	10 U	50 U	23.1 J	138	2.5 J
RM744A1(X1)	1	158	79.7 J	20.9 J	10 U	199 J	5 U	0.38 J	48700	10 U	50 U	24.1 J	121	2.4 J
RM744A2(X3)	1	120	103 J	32.4 J	10 U	77.8 J	5 U	5 U	36400	10 U	50 U	20.4 J	115	10 U
Sample Average		*212*	*135*	*52*	*10*	*302*	*5*	*3*	*63355*	*9*	*23*	*16.3*	*584*	*11.0*
Reference Envelope Samples														
RM685R1		488	67 J	60 U	10 U	384	5 U	5 U	142000	22.9	2.4 J	3.5 J	239	10 U
RM686R1		198	91 J	60 U	10 U	296	5 U	0.26 J	61300	40.7	1.4 J	3.6 J	582	10 U
RM705R1		279	99.9 J	60 U	10 U	234	5 U	5 U	74800	2.7 J	3.2 J	3.3 J	636	10 U
RM706A2(X7)		203	75.2 J	60 U	10 U	313	5 U	5 U	62400	1.3 J	0.65 J	2.4 J	239	10 U
RM721R1		362	87.5 J	60 U	10 U	237	5 U	5 U	107000	1.9 J	0.67 J	2.2 J	57.2 J	10 U
RM724A1(X1)		337	200 U	60 U	10 U	550	5 U	5 U	89900	1.4 J	50 U	6.9 J	105	4.8 J
RM726R1		342	200 U	60 U	10 U	261	5 U	5 U	106000	10 U	1.2 J	2.6 J	110	10 U
RM732R1		322	73.9 J	60 U	10 U	232	5 U	5 U	75700	1 J	50 U	1.7 J	80.4 J	10 U
Ref. Average		*316*	*112*	*60*	*10*	*313*	*5*	*4*	*89888*	*10*	*14*	*3.3*	*256*	*9.4*

Table 5-9
Dissolved Metal Concentrations in Pore Water
Upper Columbia River RI/FS

Sample ID/ Location	Reach	Magnesium (µg/L)	Manganese (µg/L)	Mercury (µg/L)	Nickel[1] (µg/L)	Potassium (µg/L)	Selenium (µg/L)	Silver[1] (µg/L)	Sodium (µg/L)	Thallium (µg/L)	Uranium (µg/L)	Vanadium (µg/L)	Zinc[1] (µg/L)
RM603A1(X1)	6	8710	12.8 J	0.2 U	40 U	1630 E	35 U	**10** U	5070	25 U	200 U	7.6 J	29.2 J
RM605A1(X1)	6	6570	6 J	0.2 U	9.8 J	730 E	35 U	**10** U	3400 J	25 U	200 U	5.4 J	63.7
RM605A2(X8)	6	11700	3650	0.019 J	6.8 J	1550 J	35 U	**10** U	4980 J	25 U	200 U	7 J	84.2
RM606A1(X3)	6	16600	12800	0.2 U	7.1 J	2350 E	10.6 J	10 U	4930 J	6.8 J	200 U	10.6 J	69.3
RM616A1(X3)	6	14900	5120	0.2 U	5 J	2560 E	35 U	10 U	6750	25 U	200 U	12.7 J	53 J
RM622A1(X3)	5	19600	4380	0.021 J	27.2 J	3010 J	35 U	10 U	4080 J	25 U	200 U	13.4 J	160
RM628A1(X1)	5	12500	2510	0.2 U	4.7 J	1200 E	35 U	10 U	4680 J	25 U	200 U	8.4 J	62.6
RM634A1(X1)	5	10500	38.5	0.2 U	26.1 J	2360 E	35 U	**10** U	2960 J	25 U	200 U	6.3 J	142
RM637A1(X1)	5	4730 J	4.8 J	0.2 U	40 U	1360 E	35 U	**10** U	2380 J	25 U	200 U	2.7 J	9.5 J
RM640A1(X3)	5	21100	4740	0.2 U	4.7 J	936 E	35 U	10 U	5350	25 U	200 U	12.8 J	73.3
RM641A1(X1)	4b	14100	5760	0.2 U	6 J	1300 E	35 U	10 U	4610 J	25 U	200 U	8.2 J	83.4
RM642A1(X1)	4b	7880	2260	0.12 J	3.5 J	1440 E	35 U	**10** U	5340	25 U	200 U	3.8 J	116
RM644A1(X3)	4b	10300	7.8 J	0.2 U	5.4 J	600 E	35 U	**10** U	3940 J	25 U	200 U	7.1 J	50.7 J
RM658A1(X3)	4b	10400	702	0.014 J	40 U	1700 J	35 U	**10** U	3220 J	25 U	200 U	50 U	39.6 J
RM661A1(X1)	4b	12000	456	0.2 U	40 U	1990 J	35 U	**10** U	3550 J	25 U	200 U	50 U	26.8 J
RM676A1(X3)	4b	11800	2710	0.2 U	3.6 J	2110 J	35 U	**10** U	7850	25 U	200 U	2.1 J	42 J
RM677A1(X3)	4a	11700	2800	0.015 J	3.8 J	2110 J	35 U	**10** U	7850	25 U	200 U	50 U	64.8
RM678A1(X1)	4a	6300	966	0.019 J	40 U	2600 J	35 U	**10** U	5210	25 U	200 U	2.1 J	60.5
RM680A1(X1)	4a	10200	151	0.2 U	40 U	1500 J	35 U	**10** U	3750 J	25 U	200 U	50 U	43.8 J
RM686A1(X3)	4a	9160	296	0.017 J	40 U	2100 J	35 U	**10** U	4220 J	25 U	200 U	2.1 J	60.3
RM687A1	4a	9590	766	0.26	40 U	1660 J	35 U	**10** U	4740 J	25 U	200 U	50 U	89.2
RM689A1(X3)	4a	8490	2320	0.042 J	40 U	1690 J	35 U	**10** U	3240 J	25 U	200 U	1.7 J	18.1 J
RM692A1(X1)	4a	--	--	--	--	--	--	--	--	--	--	--	--
RM698A1(X1)	4a	9530	802	0.34	40 U	1640 J	35 U	**10** U	3080 J	25 U	200 U	50 U	37.7 J
RM704A1(X1)	3	12400	2690	0.029 J	40 U	2050 J	35 U	**10** U	3070 U	25 U	200 U	50 U	16.9 J
RM706A1(X1)	3	8930	1320	0.2 U	11.8 J	1580 J	35 U	**10** U	4090 J	25 U	200 U	50 U	200
RM708A1(X3)	3	8360	1990	0.2 U	40 U	3170 J	35 U	10 U	4980 J	25 U	200 U	50 U	34.7 J
RM713A1(X3)	2	15000	2070	0.2 U	40 U	1990 J	35 U	10 U	3100 J	25 U	200 U	50 U	69.7
RM723A1(X1)	2	29000	2780	0.2 U	40 U	4860 J	12.5 J	10 U	10900	25 U	200 U	2.1 J	46.9 J
RM723A2(X3)	2	27100	470	0.2 U	40 U	3830 J	9.5 J	10 U	6850	25 U	27.7 J	50 U	34.2 J
RM724A2(X3)	2	31000	4140	0.019 J	5.1 J	4770 J	12.3 J	10 U	6850	25 U	200 U	1.9 J	103
RM727A1(X1)	2	11500	1940	0.021 J	40 U	1850 E	35 U	10 U	4710 J	25 U	200 U	5.7 J	97.2
RM729A1(X1)	2	13600	1370	0.02 J	40 U	1980 E	35 U	**10** U	5960	25 U	200 U	7.1 J	133
RM730A1	2	8580	22.2	0.02 J	4.1 J	880 E	35 U	**10** U	2780 J	25 U	200 U	3.7 J	94.7
RM733A1(X1)	1	15200	2880	0.2 U	3.4 J	2340 E	35 U	10 U	3790 J	25 U	200 U	7.6 J	138
RM734A1	1	5400	16.9	0.086 J	40 U	986 J	35 U	**10** U	2900 J	25 U	200 U	50 U	112
RM736A1(X1)	1	19600	2520	0.2 U	40 U	4640 J	35 U	10 U	4260 J	25 U	200 U	50 U	59 J
RM737A1(X3)	1	5060	4.9 J	0.015 J	40 U	799 J	35 U	**10** U	2730 J	25 U	200 U	50 U	50.3 J

Table 5-9

Dissolved Metal Concentrations in Pore Water

Upper Columbia River RI/FS

Sample ID/ Location	Reach	Magnesium (µg/L)	Manganese (µg/L)	Mercury (µg/L)	Nickel[1] (µg/L)	Potassium (µg/L)	Selenium (µg/L)	Silver[1] (µg/L)	Sodium (µg/L)	Thallium (µg/L)	Uranium (µg/L)	Vanadium (µg/L)	Zinc[1] (µg/L)
RM738A1(X3)	1	5320	4.2 J	0.2 U	40 U	921 J	35 U	**10** U	3050 J	25 U	200 U	50 U	70.7
RM739A1(X3)	1	41100	6060	0.2 U	40 U	8830	20.7 J	10 U	7400	25 U	200 U	50 U	51.7 J
RM740A1(X1)	1	28700	1010	0.016 J	40 U	3690 J	11 J	10 U	5630	25 U	200 U	50 U	147
RM741A1(X3)	1	16600	1270	0.2 U	4.5 J	5230	35 U	10 U	6340	25 U	42.2 J	50 U	492
RM742A1(X1)	1	8570	138	0.02 J	81.1	2120 J	35 U	**10** U	4130 J	25 U	200 U	50 U	188
RM742A2(X5)	1	8950	13.7 J	0.026 J	40 U	1560 J	35 U	**10** U	4390 J	25 U	200 U	50 U	96.3
RM743A1(X1)	1	13900	2050	0.036 J	40 U	3510 J	35 U	10 U	5000	25 U	200 U	50 U	274
RM743A2(X3)	1	6970	17.3	0.021 J	40 U	2080 J	35 U	**10** U	4160 J	25 U	200 U	50 U	221
RM744A1(X1)	1	8830	5.8 J	0.027 J	3.8 J	2290 J	35 U	**10** U	3950 J	25 U	200 U	50 U	162
RM744A2(X3)	1	7140	4.1 J	0.016 J	40 U	1490 J	35 U	**10** U	3110 J	25 U	200 U	50 U	61.5
Sample Average		*13089*	*1873*	*0.12*	*28*	*2289*	*32*	10	*4666*	*25*	*193*	*29*	*94*
Reference Envelope Samples													
RM685R1		32500	1950	0.20 U	18.1 J	6990 E	17.7 J	10 U	12800	25 U	200 U	50 U	94
RM686R1		10900	733	0.20 U	26.3 J	2590 E	35 U	10 U	6290	25 U	200 U	50 U	132
RM705R1		22500	3410	0.20 U	40 U	3810 J	10.5 J	10 U	8280	25 U	23.8 J	50 U	51.5 J
RM706A2(X7)		11400	1440	0.02 J	40 U	2500 J	35 U	10 U	4910 J	25 U	200 U	50 U	81.2
RM721R1		22900	1980	0.20 U	40 U	4280 J	35 U	10 U	6320	25 U	200 U	50 U	42.2 J
RM724A1(X1)		27200	376	0.20 U	40 U	5260	35 U	10 U	9590	25 U	200 U	1.5 J	59.1 J
RM726R1		18800	199	0.20 U	40 U	5000	35 U	10 U	5460	25 U	200 U	50 U	46.8 J
RM732R1		32200	449	0.20 U	40 U	3910 J	19.8 J	10 U	4130 J	25 U	200 U	50 U	24.4 J
Ref. Average		*22300*	*1317*	*0.18*	*36*	*4293*	*28*	*10*	*7223*	*25*	*178*	*44*	*66*

Notes:

µg/L = micrograms per liter

E = Value estimated due to interference

J = Estimated Value

U = Analyte was not detected at or above the reported value

[1] Hardness dependent National Recommended Water Quality Criteria (NRWQC; USEPA 2009)

Pore water data for RM692A1(X1) were not available because the sample did not liberate sufficient volume during centrifugation to allow for analyses.

Where a Field Duplicate was collected, only the primary sample is reported.

Highlited cells exceed the chronic water quality criteria for one of As, Cd, Cr, Cu, Pb, Hg, Ni, or Zn

Highlited cells exceed the acute water quality criteria for Ag

Table 5-10
Dissolved Metal Toxic Units in Pore Water
Upper Columbia River RI/FS

Sample ID/ Location	Reach	Arsenic	Cadmium*	Chromium	Copper*	Lead*	Mercury	Nickel*	Silver	Zinc*	Sum TUs	Sum $TU_{cationic\ metals}$
RM603A1(X1)	6			0.005						0.2	0.2	0.2
RM605A1(X1)	6		0.16	0.03				0.02		0.6	0.8	0.8
RM605A2(X8)	6		0.02	0.01	0.1	0.04	0.02	0.01		0.4	0.6	0.6
RM606A1(X3)	6	0.10	0.09	0.01				0.01		0.3	0.5	0.4
RM616A1(X3)	6		0.11	0.01		0.01		0.01		0.2	0.4	0.4
RM622A1(X3)	5	0.21	0.10	0.03	0.1		0.03	0.02		0.5	1.0	0.7
RM628A1(X1)	5		0.06	0.01	0.1			0.01		0.3	0.4	0.4
RM634A1(X1)	5		0.27	0.04	0.1			0.04		0.8	**1.3**	**1.2**
RM637A1(X1)	5			0.01						0.1	0.1	0.1
RM640A1(X3)	5		0.04	0.004				0.004		0.2	0.3	0.3
RM641A1(X1)	4b	0.08	0.11	0.01		0.04		0.01		0.4	0.6	0.6
RM642A1(X1)	4b	0.05	0.81	0.01	0.6	0.64	0.16	0.01		0.9	**3**	**3**
RM644A1(X3)	4b			0.01				0.01		0.3	0.3	0.3
RM658A1(X3)	4b		0.08	0.002	0.3		0.02			0.2	0.6	0.6
RM661A1(X1)	4b			0.001	0.1					0.1	0.3	0.3
RM676A1(X3)	4b	0.04		0.002	0.3	0.04		0.004		0.2	0.6	0.5
RM677A1(X3)	4a	0.03		0.002	0.2	0.01	0.02	0.005		0.3	0.6	0.6
RM678A1(X1)	4a			0.001	0.2		0.02			0.3	0.6	0.5
RM680A1(X1)	4a				0.2					0.2	0.4	0.4
RM686A1(X3)	4a				0.2		0.02			0.3	0.5	0.5
RM687A1	4a	0.05	**1.6**	0.002	**1.3**	0.30	0.34			0.6	**4.2**	**3.8**
RM689A1(X3)	4a	0.04	0.15	0.002	0.5	0.10	0.05			0.1	1.0	0.9
RM692A1(X1)	4a	--	--	--	--	--	--	--	--	--	--	--
RM698A1(X1)	4a		**1.3**	0.001	**1.8**	0.43	0.44			0.2	**4.2**	**3.8**
RM704A1(X1)	3	0.06	0.20	0.002	0.3	0.03	0.04			0.1	0.7	0.6
RM706A1(X1)	3		0.78	0.01	**1.1**	0.55		0.02		**1.3**	**3.7**	**3.7**
RM708A1(X3)	3	0.04		0.001	0.0					0.1	0.2	0.1
RM713A1(X3)	2			0.002	0.2	0.01				0.3	0.5	0.5
RM723A1(X1)	2			0.002	0.1					0.1	0.2	0.2
RM723A2(X3)	2			0.001	0.1					0.1	0.2	0.2
RM724A2(X3)	2	0.06	0.08	0.002	**1.1**		0.02	0.003		0.2	**1.5**	**1.4**
RM727A1(X1)	2		0.10	0.004	0.3	0.04	0.03			0.4	0.8	0.8
RM729A1(X1)	2		0.19	0.004	0.7	0.03	0.03			0.6	**1.5**	**1.4**
RM730A1	2		0.18	0.01	0.6	0.03	0.03	0.01		0.6	**1.4**	**1.4**
RM733A1(X1)	1		0.21	0.004	**1.3**			0.004		0.6	**2.1**	**2.1**
RM734A1	1				**1.2**	0.16	0.11			**1.1**	**2.5**	**2.4**
RM736A1(X1)	1			0.001	0.1					0.2	0.2	0.2
RM737A1(X3)	1				**1.1**		0.02			0.5	**1.7**	**1.7**

Table 5-10

Dissolved Metal Toxic Units in Pore Water

Upper Columbia River RI/FS

Sample ID/ Location	Reach	Arsenic	Cadmium*	Chromium	Copper*	Lead*	Mercury	Nickel*	Silver	Zinc*	Sum TUs	Sum $TU_{cationic\ metals}$
RM738A1(X3)	1			0.002	**1.2**					0.7	**1.9**	**1.9**
RM739A1(X3)	1			0.002	0.03					0.1	0.1	0.1
RM740A1(X1)	1		0.05		0.3		0.02			0.4	0.8	0.7
RM741A1(X3)	1		0.10		0.6			0.004		**1.6**	**2.3**	**2.3**
RM742A1(X1)	1		0.22	0.15	**1.1**		0.03	0.12		**1.1**	**2.7**	**2.5**
RM742A2(X5)	1				**1.8**	0.02	0.03			0.6	**2.5**	**2.5**
RM743A1(X1)	1		0.35	0.002	**2.3**		0.05			**1.3**	**4.0**	**3.9**
RM743A2(X3)	1		0.09		**1.1**	0.02	0.03			**1.3**	**2.6**	**2.6**
RM744A1(X1)	1		0.12		**1.2**	0.02	0.04	0.01		0.9	**2.3**	**2.3**
RM744A2(X3)	1				**1.3**		0.02			0.4	**1.7**	**1.7**
Reference Envelope Samples												
RM685R1				0.01	0.06			0.01		0.2	0.3	0.3
RM686R1			0.06	0.04	0.14			0.03		0.6	0.9	0.9
RM705R1				0.00	0.09					0.2	0.3	0.3
RM706A2(X7)				0.001	0.09		0.03			0.4	0.5	0.5
RM721R1				0.001	0.05					0.1	0.2	0.2
RM724A1(X1)				0.001	0.16	0.02				0.2	0.4	0.4
RM726R1					0.06					0.1	0.2	0.2
RM732R1				0.001	0.04					0.1	0.1	0.1

Notes:

TU = Toxic Unit (chronic)

* Cationic metals (Cd, Cu, Pb, Ni, Zn)

Values in bold exceed chronic National Recommended Water Quality Criteria (NRWQC)

Pore water data for RM692A1(X1) were not available because the sample did not liberate sufficient volume during centrifugation to allow for analyses.

Where a Field Duplicate was collected, only the primary sample is reported.

Toxic Units are shown for detected concentrations.

Table 5-11

Toxicity Tests Showing Significant Regression Relationships

Upper Columbia River RI/FS

	H. azteca			*C. dilutus*			*C. dubia*	
Exposure Metrics	**Survival**	**Growth**	**Biomass**	**Survival**	**Growth**	**Biomass**	**Survival**	**Reproduction**
PEC-Q - As	-	NS	-	NS	-	NS	NS	- -
PEC-Q - Cd	NS	NS	NS	NS	-	NS	NS	NS
PEC-Q - Cr	NS	- - -	- - -	NS	- -	- - -	-	- - -
PEC-Q - Cu	- - -	-	- - -	NS	- - -	NS	NS	-
PEC-Q - Pb	-	-	- -	NS	- -	NS	NS	NS
PEC-Q - Hg	NS	NS	-	NS	NS	NS	NS	NS
PEC-Q - Ni	NS	- -	-	- -	NS	-	NS	NS
PEC-Q - Zn	- - -	-	- - -	NS	- - -	NS	NS	NS
Mean PEC-Q_{METALS}	- - -	- -	- - -	NS	- - -	NS	NS	-
Mean PEC-$Q_{METALS/Foc}$	- - -	- - -	- - -	NS	- - -	-	NS	- -
Sum PEC-Q_{METALS}	- - -	- -	- - -	NS	- - -	NS	NS	-
SEM-AVS	- -	-	- -	NS	- -	NS	NS	NS
SEM-AVS/Foc	- - -	- -	- - -	NS	- - -	NS	NS	NS
Pore Water TUs (all metals)	NS	NS	NS	NS	NS	NS	NS	NS
Pore Water TUs (cationic metals)[1]	NS	NS	NS	NS	NS	NS	NS	NS
TOC	++	+	+	NS	NS	NS	NS	NS
% Sand (various fractions)	++	NS	NS	+++	+	NS	NS	NS
% coarse sand	+	++	+++	NS	NS	++	NS	NS
% fine sand	+	NS	NS	NS	NS	NS	NS	NS
% medium sand	NS	NS	+	+	NS	NS	NS	NS

Notes:

'-' = p <0.05, '--'= p <0.01, '---'= p <0.001; as significant negative relationships

'+' = p <0.05, '++'= p <0.01, '+++' = p <0.001; as significant positive relationships

'+' shaded = positive relationship

AVS = acid volatile sulfides

PEC-Q = probable effects concentration quotient

NS = not statistically significant or showing non-explanatory positive relationships

SEM = simultaneously extracted metals

TOC = total organic carbon

TU = toxic unit

[1] Cd, Cu, Pb, Ni, and Zn

Chemical concentrations log-transformed to improve normality; linear regression.

Table 5-12
Regression Statistics Between Sediment Metrics and Toxicity Endpoints
Upper Columbia River RI/FS

	Hyalella azteca								
	Survival			**Growth**			**Biomass**		
Sediment Paramter	P	r^2	regression	P	r^2	regression	P	r^2	regression
PEC-Q - As	0.01	0.10	= 1.225 – 0.11*(log arsenic)	0.23	-	-	0.03	0.08	= 0.279 – 0.105*(log arsenic)
PEC-Q - Cd	0.45	-	-	0.29	-	-	0.12	-	-
PEC-Q - Cr	0.06	-	-	0.0002	0.20	= 0.2555 – 0.19*(log chromium)	<0.0001	0.30	= 0.217 – 0.216*(log chromium)
PEC-Q - Cu	0.0002	0.21	= 1.297 – 0.06*(log copper)	0.01	0.10	= 0.372 – 0.048*(log copper)	0.0003	0.19	= 0.344 – 0.063*(log copper)
PEC-Q - Pb	0.01	0.10	= 1.301 – 0.049*(log lead)	0.02	0.09	= 0.368 – 0.052*(log lead)	0.002	0.15	= 0.342 – 0.065*(log lead)
PEC-Q - Hg	0.44	-	-	0.053	-	-	0.02	0.09	= 0.31 – 0.053*(log mercury)
PEC-Q - Ni	0.09	-	-	0.005	0.13	= 0.276 – 0.201*(log nickel)	0.04	0.07	= 0.295 – 0.137*(log nickel)
PEC-Q - Zn	0.0003	0.20	= 1.317 – 0.051*(log zinc)	0.01	0.10	= 0.388 – 0.044*(log zinc)	0.0003	0.20	= 0.365 – 0.057*(log zinc)
Mean PEC-Q_{METALS}	0.0007	0.18	= 1.294 – 0.071*(log mean PECQ)	0.008	0.11	= 0.365 – 0.066*(log mean PECQ)	0.0001	0.22	= 0.336 – 0.087*(log mean PECQ)
Mean PEC-$Q_{METALS/Foc}$	< 0.0001	0.27	= 1.322 – 0.06*(log mean PECQ/OC)	0.0005	0.18	= 0.391 – 0.058*(log mean PECQ/OC)	< 0.0001	0.26	= 0.371 – 0.064*(log mean PECQ/OC)
Sum PEC-Q_{METALS}	0.0007	0.18	= 1.358 – 0.071*(log sum PECQ)	0.008	0.11	= 0.425 – 0.066*(log sum PECQ)	0.0001	0.22	= 0.414 – 0.087*(log sum PECQ)
SEM-AVS	0.003	0.14	= 1.34 – 0.036*(log AVS-SEM)	0.02	0.09	= 0.415 – 0.037*(log AVS-SEM)	0.002	0.15	= 0.398 – 0.043*(log AVS-SEM)
SEM-AVS/Foc	0.0002	0.22	= 1.434 – 0.039*(log [AVS-SEM]/OC)	0.001	0.17	= 0.52 – 0.043*(log [AVS-SEM]/OC)	0.0001	0.22	= 0.508 – 0.046*(log [AVS-SEM]/OC)
TOC	0.007	0.12	= 1.112 + 0.059*(log TOC)	0.02	0.09	= 0.178 + 0.06*(log TOC)	0.03	0.08	= 0.182 + 0.054*(log TOC)
% Sand (various fractions)	0.002	0.15	= 1.47 – 0.142*(arcsin%sand)	0.53	-	-	0.74	-	-
% coarse sand	0.03	0.08	= 1.295 + 0.296*(arcsin%coarse sand)	0.003	0.14	= 0.346 + 0.454*(arcsin% coarse sand)	<0.0001	0.26	= 0.311 + 0.587*(arcsin% coarse sand)
% fine sand	0.047	0.06	= 1.407 – 0.1*(arcsin % fine sand)	0.63	-	-	0.3	-	-
% medium sand	0.4	-	-	0.09	-	-	0.03	0.08	= 0.335 + 0.119*(arcsin%med.sand)
Pore Water TUs (all metals)	0.85	-	-	0.33	-	-	0.31	-	-
Pore Water TUs (cationic metals)	0.69	-	-	0.15	-	-	0.12	-	-

Table 5-12

Regression Statistics Between Sediment Metrics and Toxicity Endpoints

Upper Columbia River RI/FS

	Chironomus dilutus								
	Survival			**Growth**			**Biomass**		
Sediment Paramter	P	r^2	regression	P	r^2	regression	P	r^2	regression
PEC-Q - As	0.47	-	-	0.02	0.09	= 0.161 – 0.278*(log arsenic)	0.20	-	-
PEC-Q - Cd	0.12	-	-	0.046	0.07	= 1.777 – 0.136*(log cadmium)	0.33	-	-
PEC-Q - Cr	0.48	-	-	0.009	0.11	= 1.65 – 0.324*(log chromium)	0.0004	0.19	= 0.984 – 0.366*(log chromium)
PEC-Q - Cu	0.28	-	-	0.0008	0.17	= 1.813 – 0.149*(log copper)	0.12	-	-
PEC-Q - Pb	0.2	-	-	0.003	0.14	= 1.807 – 0.155*(log lead)	0.52	-	-
PEC-Q - Hg	0.7	-	-	0.1	-	-	0.92	-	-
PEC-Q - Ni	0.006	0.12	= -.906 – 0.212*(log nickel)	0.47	-	-	0.01	0.10	= 1.04 – 0.358*(log nickel)
PEC-Q - Zn	0.12	-	-	0.0008	0.17	= 1.863 – 0.132*(log zinc)	0.30	-	-
Mean PEC-Q_{METALS}	0.23	-	-	0.0006	0.18	= 1.798 – 0.197*(log mean PECQ)	0.14	-	-
Mean PEC-$Q_{METALS/Foc}$	0.23	-	-	0.0005	0.18	= 1.878 – 0.135*(log mean PECQ/OC)	0.02	0.08	= 1.248 – 0.078*(log mean PECQ/OC)
Sum PEC-Q_{METALS}	0.23	-	-	0.0006	0.18	= 1.975 – 0.197*(log sum PECQ)	0.14	-	-
SEM-AVS	0.16	-	-	0.002	0.16	= 1.946 – 0.112*(log AVS-SEM)	0.51	-	-
SEM-AVS/Foc	0.13	-	-	0.0003	0.20	= 2.201 – 0.108*(log [AVS-SEM]/OC)	0.15	-	-
TOC	0.58	-	-	0.11	-	-	0.07	-	-
% Sand (various fractions)	0.002	0.14	= 0.858 + 0.176*(arcsin %sand)	0.03	0.07	= 2.166 – 0.273*(Arcsin%sand)	0.39	-	-
% coarse sand	0.16	-	-	0.13	-	-	0.002	0.15	= 1.148 + 0.953*(arcsin %coarse sand)
% fine sand	0.25	-	-	0.15	-	-	0.99	-	-
% medium sand	0.02	0.09	= 0.981 + 0.147*(arsin %med. Sand)	0.56	-	-	0.16	-	-
Pore Water TUs (all metals)	0.45	-	-	0.45	-	-	0.44	-	-
Pore Water TUs (cationic metals)	0.44	-	-	0.19	-	-	0.36	-	-

Table 5-12

Regression Statistics Between Sediment Metrics and Toxicity Endpoints

Upper Columbia River RI/FS

	Ceriodaphnia dubia					
	Survival			**Reproduction**		
Sediment Paramter	P	r^2	regression	P	r^2	regression
PEC-Q - As	0.45	-	-	0.001	0.17	= 14.04 – 7.831*(log arsenic)
PEC-Q - Cd	0.86	-	-	0.43	-	-
PEC-Q - Cr	0.31	-	-	0.0008	0.18	= 15.198 – 8.224*(log chromium)
PEC-Q - Cu	0.11	-	-	0.025	0.08	= 20.267 – 2.066*(log copper)
PEC-Q - Pb	0.41	-	-	0.21	-	-
PEC-Q - Hg	0.45	-	-	0.71	-	-
PEC-Q - Ni	0.52	-	-	0.15	-	-
PEC-Q - Zn	0.16	-	-	0.06	-	-
Mean PEC-Q_{METALS}	0.11	-	-	0.03	0.08	= 20.083 – 2.649*(log mean PECQ)
Mean PEC-$Q_{METALS/Foc}$	0.62	-	-	0.009	0.11	= 21.162 – 2.115*(log mean PECQ/OC)
Sum PEC-Q_{METALS}	0.11	-	-	0.03	0.08	= 22.475 – 2.649*(log sum PECQ)
SEM-AVS	0.5	-	-	0.2	-	-
SEM-AVS/Foc	0.89	-	-	0.06	-	-
TOC	0.37	-	-	0.14	-	-
% Sand (various fractions)	0.45	-	-	0.39	-	-
% coarse sand	0.71	-	-	0.24	-	-
% fine sand	0.26	-	-	0.53	-	-
% medium sand	0.08	-	-	0.17	-	-
Pore Water TUs (all metals)	0.65	-	-	0.91	-	-
Pore Water TUs (cationic metals)	0.46	-	-	0.86	-	-

Notes:

AVS = acid volatile sulfides

PEC-Q = probable effects concentration quotient

SEM = simultaneously extracted metals

TOC = total organic carbon

TU = toxic unit

r^2 and regression equations presented if P <0.05

Survival data were arcsine square root transformed

TABLE 5-13

Statistically Significant Differences Among Reaches for Toxicity Species-Endpoints (Rank Transformed Non-parametric ANOVA, Tukeys post-hoc)

Upper Columbia River RI/FS

	Hyalella azteca			*Chironomus dilutus*			*Ceriodaphnia dubia*
Sample ID/ Location	**Survival**	**Growth**	**Biomass**	**Survival**	**Growth**	**Biomass**	**Reproduction**
1	B	C	D	AB	C	CD	B
2	A	AB	B	A	A	A	A
3	A	C	D	BC	BC	D	AB
4a	A	C	CD	C	ABC	D	AB
4b	A	C	CD	ABC	AB	BDC	B
5	A	AB	B	AB	AB	ABC	B
6	A	B	BC	AB	ABC	ABC	AB
Reference	A	A	A	ABC	A	AB	AB

Notes:

ANOVA comparisons were made within each species-endpoint.

$p < 0.0005$ for all significant results

Letters are presented for samples that are not signficantly different.

Shaded values indicates reaches with significantly smaller magnitudes than reference (per Tukey post-hoc tests)

TABLE 5-14

Statistically Significant Differences Among Samples for Toxicity Species-Endpoints (Rank Transformed Non-parametric ANOVA, Tukeys post-hoc)

Upper Columbia River RI/FS

		Hyalella azteca			*Chironomus dilutus*			*Ceriodaphnia dubia*
Sample ID/ Location	**Reach**	**Survival**	**Growth**	**Biomass**	**Survival**	**Growth**	**Biomass**	**Reproduction**
RM603A1(X1)	6	AB	KLMNOPQ	KLMNOPQRST	ABCDE	ABCDEF	ABCDEFGHIJ	GHIJ
RM605A1(X1)	6	ABC	ABCDEFG	ABCDEF	ABCDE	ABCDEF	ABCDEFGHIJ	ABCD
RM605A2(X8)	6	ABC	KLMNOPQ	KLMNOPQRST	ABCDE	ABCDEF	ABCDEFGHI	ABCDE
RM606A1(X3)	6	ABC	CDEFGHIJKL	CDEFGHIJKLM	ABCDE	ABCDEF	ABCDEFGHIJ	ABCDE
RM616A1(X3)	6	AB	ABCDEFG	ABCDE	ABCD	ABCD	ABCDEF	ABCDE
RM622A1(X3)	5	AB	ABCDE	ABCDE	ABCDE	ABCDEF	ABCDEFGHIJ	ABCDEFGH
RM628A1(X1)	5	ABC	ABCD	ABCDEFGH	ABC	ABCDEF	ABC	ABCDEFGHIJ
RM634A1(X1)	5	ABC	GHIJKLMNO	GHIJKLMNOPQ	ABCDE	ABCDEF	ABCDEFGHIJ	HIJ
RM637A1(X1)	5	ABC	ABCDEFGHI	ABCDEFGHI	ABCDE	ABCDEF	ABCDEFGHIJ	A
RM640A1(X3)	5	AB	DEFGHIJKLMN	CDEFGHIJKLMN	ABCDE	A	ABCDEFGHIJ	FGHIJ
RM641A1(X1)	4b	ABC	IJKLMNOP	HIJKLMNOPQR	ABC	ABCDEF	ABCDE	ABCDE
RM642A1(X1)	4b	AB	NOPQ	MNOPQRST	ABCDE	ABCDE	ABCDEFGHIJ	ABCDEFGHIJ
RM644A1(X3)	4b	AB	IJKLMNOPQ	FGHIJKLMNOPQ	ABCDE	ABCDEF	DEFGHIJ	EFGHIJ
RM658A1(X3)	4b	A	CDEFGHIJKLM	CDEFGHIJKL	ABCDE	ABCDEF	ABCDEFGHIJ	DEFGHIJ
RM661A1(X1)	4b	AB	JKLMNOPQ	GHIJKLMNOPQ	ABCDE	ABCDEF	ABCDEFG	ABCDEFGH
RM676A1(X3)	4b	ABC	JKLMNOPQ	JKLMNOPQRST	CDE	ABCDE	IJ	CDEFGHIJ
RM677A1(X3)	4a	ABC	NOPQ	OPQRST	DE	ABCDE	HIJ	ABCDEFGHI
RM678A1(X1)	4a	AB	KLMNOPQ	IJKLMNOPQRS	ABCDE	ABCDEF	ABCDEFGHIJ	ABC
RM680A1(X1)	4a	AB	KLMNOPQ	IJKLMNOPQRS	E	ABCD	HIJ	ABCDEFGHIJ
RM686A1(X3)	4a	ABC	ABC	ABC	ABCDE	ABCDEF	ABCDEFGHIJ	ABCDEFGH
RM687A1	4a	ABC	OPQ	PQRST	ABCDE	ABCDEF	ABCDEFGHIJ	ABCDEFGHIJ
RM689A1(X3)	4a	ABC	HIJKLMNO	FGHIJKLMNOP	CDE	ABC	DEFGHIJ	ABCDEFGHI
RM692A1(X1)	4a	ABC	CDEFGHIJKLM	CDEFGHIJKLM	ABCDE	ABCDEF	ABCDEFGHIJ	ABC
RM698A1(X1)	4a	AB	OPQ	NOPQRST	ABCDE	ABCDEF	CDEFGHIJ	ABCDEFGHI
RM704A1(X1)	3	ABC	EFGHIJKLMNO	DEFGHIJKLMNO	ABCDE	ABCDEF	DEFGHIJ	ABCDE
RM706A1(X1)	3	ABC	MNOPQ	MNOPQRST	ABCDE	ABCDEF	ABCDEFGHIJ	ABCDEFGHIJ
RM706A2(X7)	3	ABC	KLMNOPQ	JKLMNOPQRST	ABCDE	ABCDEF	EFGHIJ	ABCDEFGH
RM708A1(X3)	3	ABC	JKLMNOPQ	JKLMNOPQRST	ABCDE	ABCDEF	ABCDEFGHIJ	ABCDEF
RM713A1(X3)	2	A	KLMNOPQ	HIJKLMNOPQR	ABCDE	ABCD	ABCDEFG	ABCDEFGHIJ

TABLE 5-14

Statistically Significant Differences Among Samples for Toxicity Species-Endpoints (Rank Transformed Non-parametric ANOVA, Tukeys post-hoc)

Upper Columbia River RI/FS

		Hyalella azteca			*Chironomus dilutus*			*Ceriodaphnia dubia*
Sample ID/ Location	**Reach**	**Survival**	**Growth**	**Biomass**	**Survival**	**Growth**	**Biomass**	**Reproduction**
RM723A1(X1)	2	ABC	A	A	ABCD	ABC	AB	AB
RM723A2(X3)	2	ABC	CDEFGHIJK	CDEFGHIJKL	ABCD	ABCDEF	ABCD	ABCDEF
RM724A1(X1)	2	A	FGHIJKLMNO	EFGHIJKLMNO	CDE	ABCDEF	EFGHIJ	ABC
RM724A2(X3)	2	ABC	AB	AB	ABCDE	AB	ABCDEFGHIJ	ABCD
RM727A1(X1)	2	AB	CDEFGHIJKLM	CDEFGHIJKL	A	ABCDEF	ABCDE	ABCDEFGHI
RM729A1(X1)	2	ABC	BCDEFGHIJ	CDEFGHIJK	AB	ABCD	A	ABCD
RM730A1	2	ABC	KLMNOPQ	MNOPQRST	ABCD	ABCDE	ABCDEF	ABCDEFGH
RM733A1(X1)	1	ABC	ABCDEFG	ABCDEFG	ABCD	ABCDEF	ABCDEFGHIJ	ABCD
RM734A1	1	ABC	PQ	QRST	ABCDE	BCDEF	ABCDEFGHIJ	ABCDEFG
RM736A1(X1)	1	ABC	KLMNOPQ	LMNOPQRST	ABCDE	ABCDEF	ABCDEFG	ABCDEFGHIJ
RM737A1(X3)	1	ABC	PQ	RST	ABCDE	CDEF	ABCDEFGHIJ	IJ
RM738A1(X3)	1	ABC	PQ	ST	ABCDE	F	J	J
RM739A1(X3)	1	ABC	ABCDEFGH	BCDEFGHIJ	ABCDE	ABCD	ABCDEFG	ABCDEFGHIJ
RM740A1(X1)	1	AB	ABCDE	ABCD	ABCDE	ABCD	ABCDEFG	ABCDEFGH
RM741A1(X3)	1	BC	ABCDEFGH	EFGHIJKLMNO	ABCDE	ABCDE	ABCDEFGHIJ	ABCDEF
RM742A1(X1)	1	ABC	OPQ	OPQRST	ABCDE	EF	GHIJ	FGHIJ
RM742A2(X5)	1	ABC	LMNOPQ	LMNOPQRST	ABCDE	DEF	GHIJ	ABCDEFGHIJ
RM743A1(X1)	1	ABC	ABCDEFG	ABCDEFGH	ABCD	BCDEF	ABCDEFGHIJ	ABCD
RM743A2(X3)	1	BC	KLMNOPQ	OPQRST	ABCDE	CDEF	BCDEFGHIJ	BCDEFGHIJ
RM744A1(X1)	1	ABC	IJKLMNOPQ	LMNOPQRST	BCDE	ABCDEF	ABCDEFGHIJ	ABCDEFG
RM744A2(X3)	1	C	Q	T	ABCDE	DEF	FGHIJ	ABCDEFGHIJ
Reference (combined)		AB	ABCDEF	ABCDE	ABCDE	ABCD	ABCDEFGH	ABCDEFGH

Notes:

ANOVA comparisons were made within each species-endpoint.

$p < 0.0005$ for all significant results

Letters are presented for samples that are not signficantly different.

Shaded species-endpoints were significantly smaller magnitudes than reference (per Tukey post-hoc tests)

Shaded samples IDs were signficantly different from refernce in one or more species-endpoints

Table 6-1

Reference Envelope Evaluation of Sediment Sample Toxicity

Upper Columbia River RI/FS

	Hyalella azteca			*Chironomus dilutus*			*Ceriodaphnia dubia*	
	Survival[1]	Growth	Biomass	Survival	Growth	Biomass	Survival	Reproduction
Sample ID/ Location	**%**	**mg**	**mg**	**%**	**mg**	**mg**	**%**	**neo/fem**
REC	*94.1%*	*0.34*	*0.33*	*66.5%*	*1.92*	*1.25*	*80%*	*19.8*
TAC	*80%*	-	-	*70%*	-	-	*80%*	-
Reach 6								
RM603A1(X1)	≥ REC	-4.6	-5.9	≥ REC	-0.88	≥ REC	≥ REC	-39
RM605A1(X1)	-1.7	≥ REC	≥ REC	≥ REC	-5.7	-1.0	≥ REC	≥ REC
RM605A2(X8)	-0.37	-1.7	-5.40	≥ REC	-3.6	≥ REC	≥ REC	≥ REC
RM606A1(X3)	-0.37	≥ REC	≥ REC	≥ REC	≥ REC	-11	≥ REC	≥ REC
RM616A1(X3)	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC
Reach 5								
RM622A1(X3)	≥ REC	≥ REC	≥ REC	≥ REC	-5.2	-0.8	≥ REC	≥ REC
RM628A1(X1)	-11	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC	-13	-6.1
RM634A1(X1)	-3.0	≥ REC	≥ REC	≥ REC	-0.12	≥ REC	-25	-59
RM637A1(X1)	≥ REC	≥ REC	≥ REC	≥ REC	-6.8	≥ REC	≥ REC	≥ REC
RM640A1(X3)	≥ REC	≥ REC	≥ REC	-9.77	≥ REC	-5.2	≥ REC	-33
Reach 4b								
RM641A1(X1)	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC
RM642A1(X1)	≥ REC	-12	-12	-0.38	≥ REC	-5.7	≥ REC	≥ REC
RM644A1(X3)	-1.7	≥ REC	-1.8	≥ REC	-5.2	-18	≥ REC	-19
RM658A1(X3)	≥ REC	≥ REC	≥ REC	≥ REC	-7.4	≥ REC	≥ REC	-9.1
RM661A1(X1)	≥ REC	≥ REC	≥ REC	≥ REC	-4.3	≥ REC	≥ REC	≥ REC
RM676A1(X3)	-1.7	≥ REC	-3.3	-30	> REC	-36	> REC	-3.0
Reach 4a								
RM677A1(X3)	-4.4	-19	-25	-36	≥ REC	-36	≥ REC	≥ REC
RM678A1(X1)	≥ REC	-1.8	-1.4	≥ REC	≥ REC	-7.7	≥ REC	≥ REC
RM680A1(X1)	≥ REC	-4.1	-4.1	-42	≥ REC	-43	≥ REC	≥ REC
RM686A1(X3)	-0.37	≥ REC	≥ REC	≥ REC	-4.9	-2.9	≥ REC	≥ REC
RM687A1	-0.37	-21	-25	≥ REC	-16	-9.6	≥ REC	≥ REC
RM689A1(X3)	-0.37	≥ REC	≥ REC	-25	≥ REC	-21	≥ REC	≥ REC
RM692A1(X1)	≥ REC	≥ REC	≥ REC	≥ REC	-4.5	≥ REC	≥ REC	≥ REC
RM698A1(X1)	≥ REC	-16	-17	≥ REC	-9.0	-17	≥ REC	≥ REC

Table 6-1

Reference Envelope Evaluation of Sediment Sample Toxicity

Upper Columbia River RI/FS

	Hyalella azteca			*Chironomus dilutus*			*Ceriodaphnia dubia*	
	Survival[1]	Growth	Biomass	Survival	Growth	Biomass	Survival	Reproduction
Sample ID/ Location	**%**	**mg**	**mg**	**%**	**mg**	**mg**	**%**	**neo/fem**
REC	*94.1%*	*0.34*	*0.33*	*66.5%*	*1.92*	*1.25*	*80%*	*19.8*
TAC	*80%*	-	-	*70%*	-	-	*80%*	-
Reach 3								
RM704A1(X1)	≥ REC	≥ REC	≥ REC	-6.0	≥ REC	-19	≥ REC	≥ REC
RM706A1(X1)	≥ REC	-8.4	-11	≥ REC	-12	-11	≥ REC	-5.6
RM706A2(X7)	-	-	-	-17	≥ REC	-22	-	-
RM708A1(X3)	-1.7	-0.21	-5.1	≥ REC	-14	-12	-13	≥ REC
Reach 2								
RM713A1(X3)	≥ REC	-1.8	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC
RM723A1(X1)	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC
RM723A2(X3)	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC
RM724A1(X1)	-	-	-	-15	≥ REC	-17	-	-
RM724A2(X3)	≥ REC	≥ REC	≥ REC	-2.3	≥ REC	≥ REC	≥ REC	≥ REC
RM727A1(X1)	≥ REC	≥ REC	≥ REC	≥ REC	-9.6	≥ REC	≥ REC	≥ REC
RM729A1(X1)	-1.7	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC
RM730A1	-8.3	-1.3	-13	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC
Reach 1								
RM733A1(X1)	-3.0	≥ REC	≥ REC	≥ REC	-8.2	≥ REC	≥ REC	≥ REC
RM734A1	-8.3	-33	-40	≥ REC	-16	-5.8	≥ REC	≥ REC
RM736A1(X1)	-5.7	-1.2	-9.4	≥ REC	≥ REC	≥ REC	-13	-4.5
RM737A1(X3)	-4.4	-43	-47	≥ REC	-24	-10.1	-38	-81
RM738A1(X3)	-8.3	-48	-53	≥ REC	-40	-39	-100	-100
RM739A1(X3)	-3.0	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC
RM740A1(X1)	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC	≥ REC
RM741A1(X3)	-15	≥ REC	≥ REC	≥ REC	≥ REC	-0.9	≥ REC	≥ REC
RM742A1(X1)	-5.7	-19.8	-27	≥ REC	-38	-24	≥ REC	-49
RM742A2(X5)	≥ REC	-6.0	-7.9	≥ REC	-32	-27	≥ REC	-4.0
RM743A1(X1)	-3.0	≥ REC	≥ REC	≥ REC	-17	≥ REC	≥ REC	≥ REC
RM743A2(X3)	-14	-5.6	-22	≥ REC	-26	-12	≥ REC	≥ REC
RM744A1(X1)	-11	≥ REC	-10.4	-7.9	≥ REC	-10.2	≥ REC	≥ REC
RM744A2(X3)	-20	-51	-62	≥ REC	-32	-23	≥ REC	-6.6

Table 6-1

Reference Envelope Evaluation of Sediment Sample Toxicity

Upper Columbia River RI/FS

	Hyalella azteca			***Chironomus dilutus***			***Ceriodaphnia dubia***	
	Survival[1]	**Growth**	**Biomass**	**Survival**	**Growth**	**Biomass**	**Survival**	**Reproduction**
Sample ID/ Location	**%**	**mg**	**mg**	**%**	**mg**	**mg**	**%**	**neo/fem**
REC	*94.1%*	*0.34*	*0.33*	*66.5%*	*1.92*	*1.25*	*80%*	*19.8*
TAC	*80%*	-	-	*70%*	-	-	*80%*	-
Summary of Relative Percent Difference from the Reference Envelope Criteria								
RPD Criterion (# Samples[2])								
≥ REC	22	28	26	39	25	22	42	34
≤ 10 % Lower than REC	21	11	9	5	14	9	0	7
> 10 % and ≤ 20 % Lower than REC	4	4	5	2	5	10	3	1
> 20 % Lower than REC	1	5	8	4	6	9	3	6

Notes:

REC = reference envelope criteria

RPD = relative percent difference; RPD = ((endpoint response/REC))-1)*100

TAC = test acceptability criteria

1 = sample failed to meet reference envelope criterion, but was within test acceptability criterion for control survival

2 = sum of samples that met the relative percent difference criterion for at least one test endpoint

n/f = neonates per female

≥ REC = endpoint was within the reference envelope criterion

Yellow highlight = endpoint did not meet the REC, but did meet the the TAC (when applicable) and was > 10% and ≤ 20% lower than the REC).

Red highlight = endpoint was ≥ 20% lower than the reference envelope criterion

TABLE 6-2

Analysis of Sediment Toxicity Predictions Based on Mean PEC-$Q_{metals(1\%OC)}$

Upper Columbia River RI/FS

	Prediction		Reference Envelepe		Statistically Significant[1]	
Mean PEC-Q Category	**Category**	**N**	**>20 % difference**	**<20% differnce**	**Different**	**Not Different**
Study Site Sediments						
< 1	Not likely toxic	22	6	16	13	9
≥ 1	Possibly toxic	28	10	18	15	13
Reference Sediments						
< 1	Not likely toxic	14	0	14	0	14
≥ 1	Possibly toxic	0	-	-	-	-

Notes:

N = number of sampling sites

OC = organic carbon

PEC-Q = probable effects concentration quotient

[1] ANOVA (per Tukey's post-hoc tests)

TABLE 6-3

Analysis of Sediment Toxicity Predictions Based on (SEM-AVS)/f_{oc}

Upper Columbia River RI/FS

	Prediction		Reference Envelepe		Statistically Significant[1]	
Category	**Category**	**N**	**>20 % difference**	**<20% differnce**	**Different**	**Not Different**
Study Site Sediments						
≤ 130	Not likely toxic	2	2	0	2	0
130 - 3000	Uncertain	33	7	26	19	16
≥ 3000	Possibily toxic	15	7	8	9	6
Reference Sediments						
≤ 130	Not likely toxic	13	0	13	0	13
130 - 3000	Uncertain	1	0	1	0	1
≥ 3000	Possibily toxic	0	-	-	-	-

Notes:

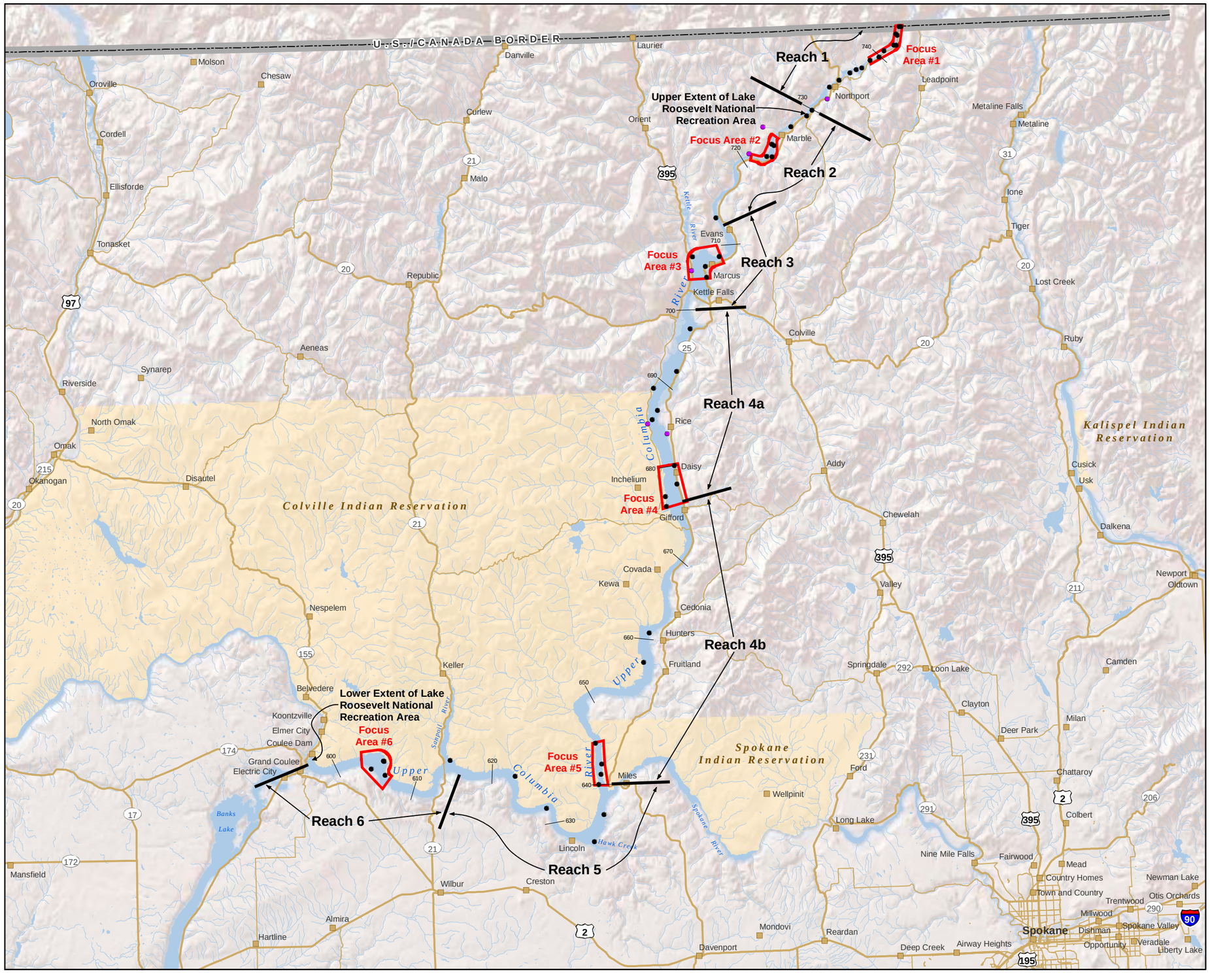
AVS = acid volatile sulfides

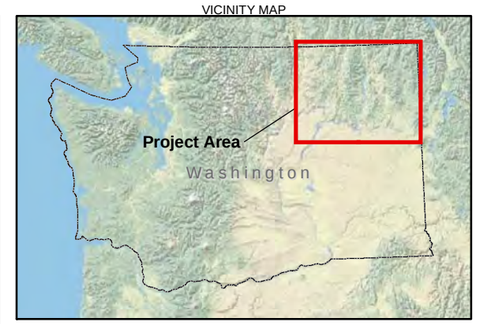
f_{OC} = fraction of organic carbon

N = number of sampling sites

SEM = simultaneously extraced metals

[1] ANOVA (per Tukey's post-hoc tests)





LEGEND

2005 Sediment Sampling

- Sediment Sampling Location
- Reference Sampling Location
- Focus Areas

Other Features

- Tribal Lands
- Water
- Cities
- Highway
- Major Road
- Columbia River Mile (RM)

Note:
1. Main Map and Vicinity Map background source: Environmental Systems Research Institute (ESRI)

N

0 2.5 5 10
Miles

FIGURE 3-1
Overview of 2005 Sediment Sampling Locations
CERCLA RI/FS 2005 Sediment Toxicity Evaluation
Upper Columbia River Project

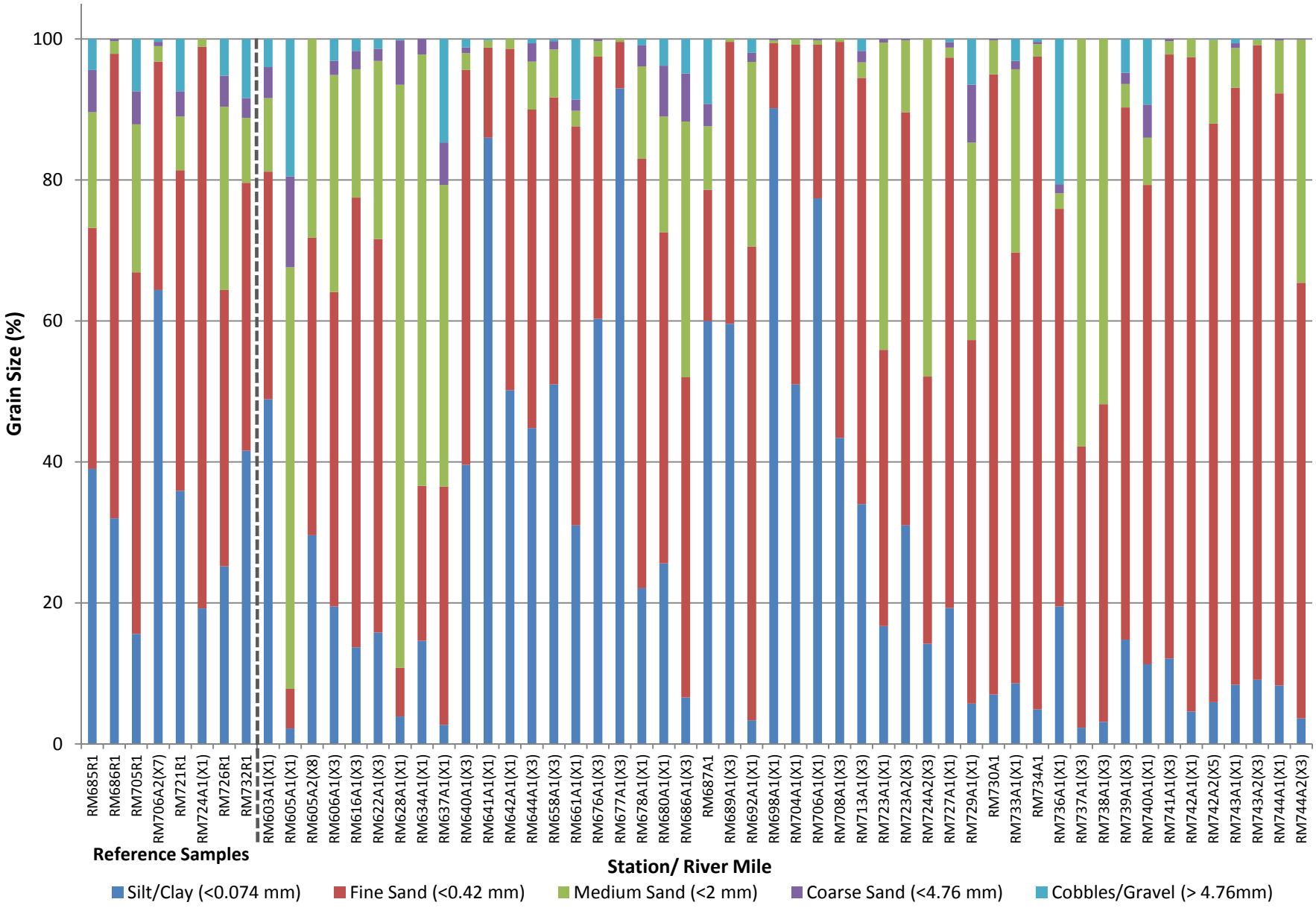


Figure 5-1
Grain Size in UCR Phase I Sediment Samples
Upper Columbia River RI/FS

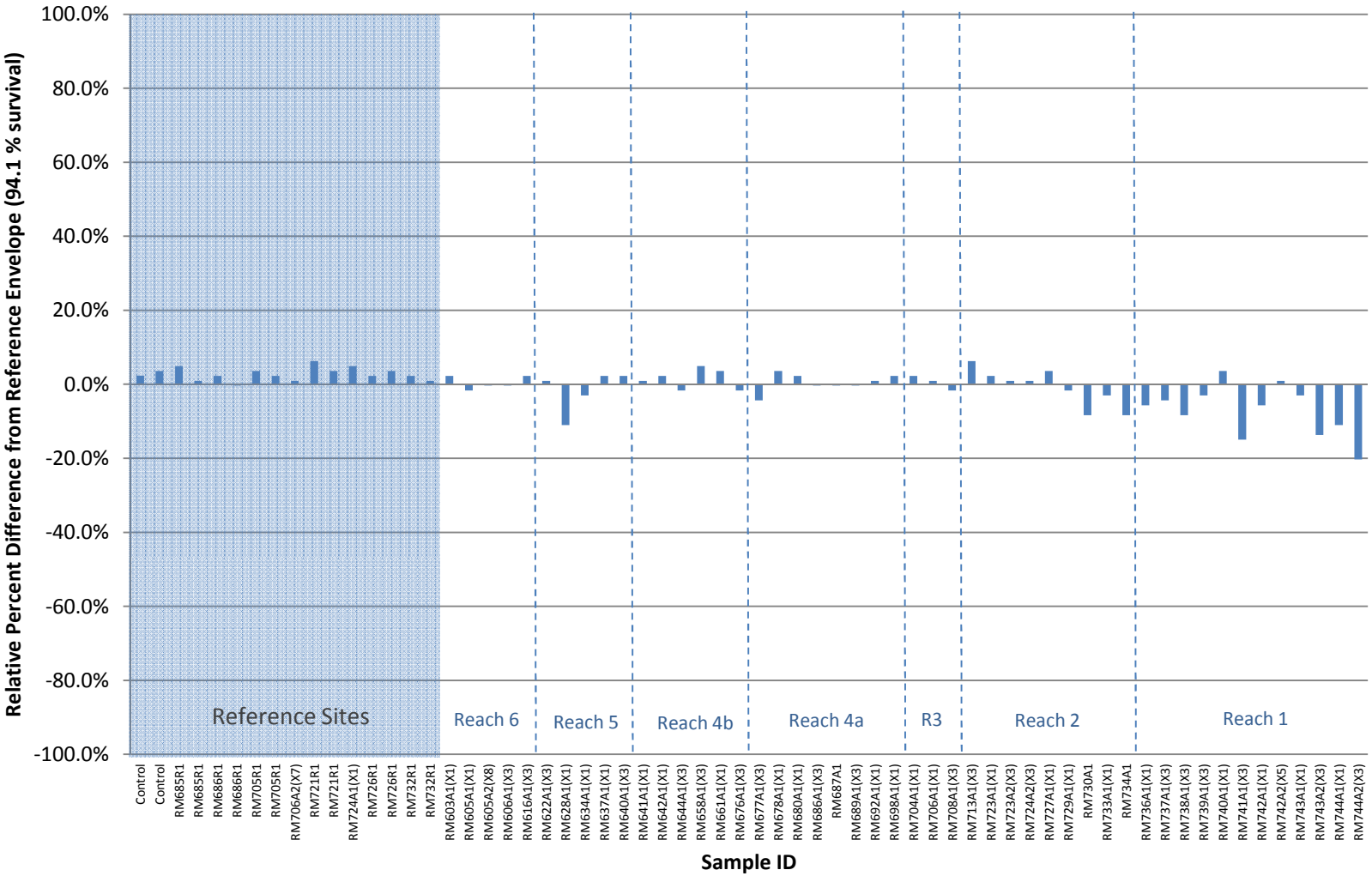


Figure 6-1

Hyalella Survival Compared to the Reference Envelope

Upper Columbia River RI/FS

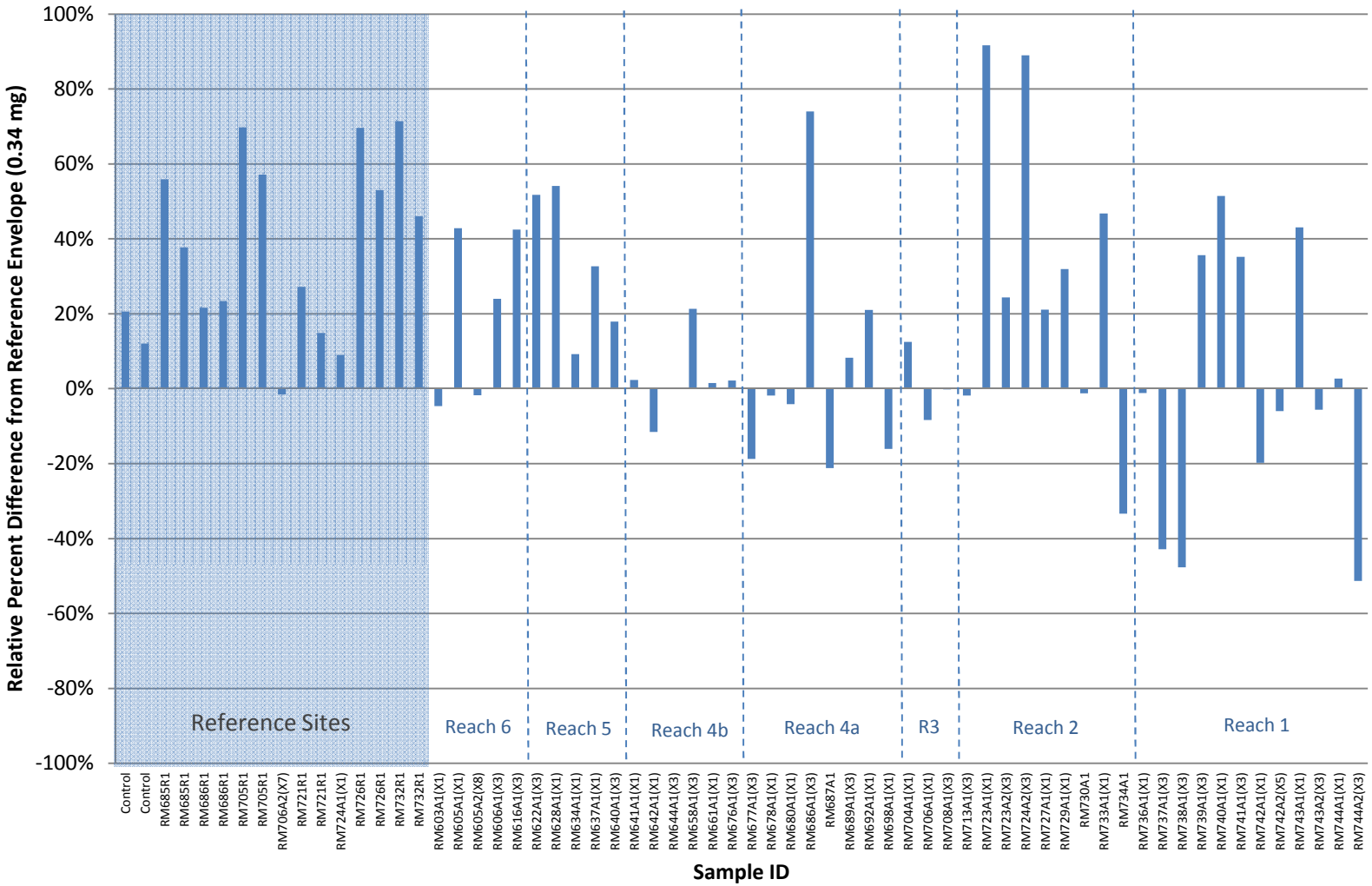


Figure 6-2

Hyalella Growth Relative to the Reference Envelope

Upper Columbia River RI/FS

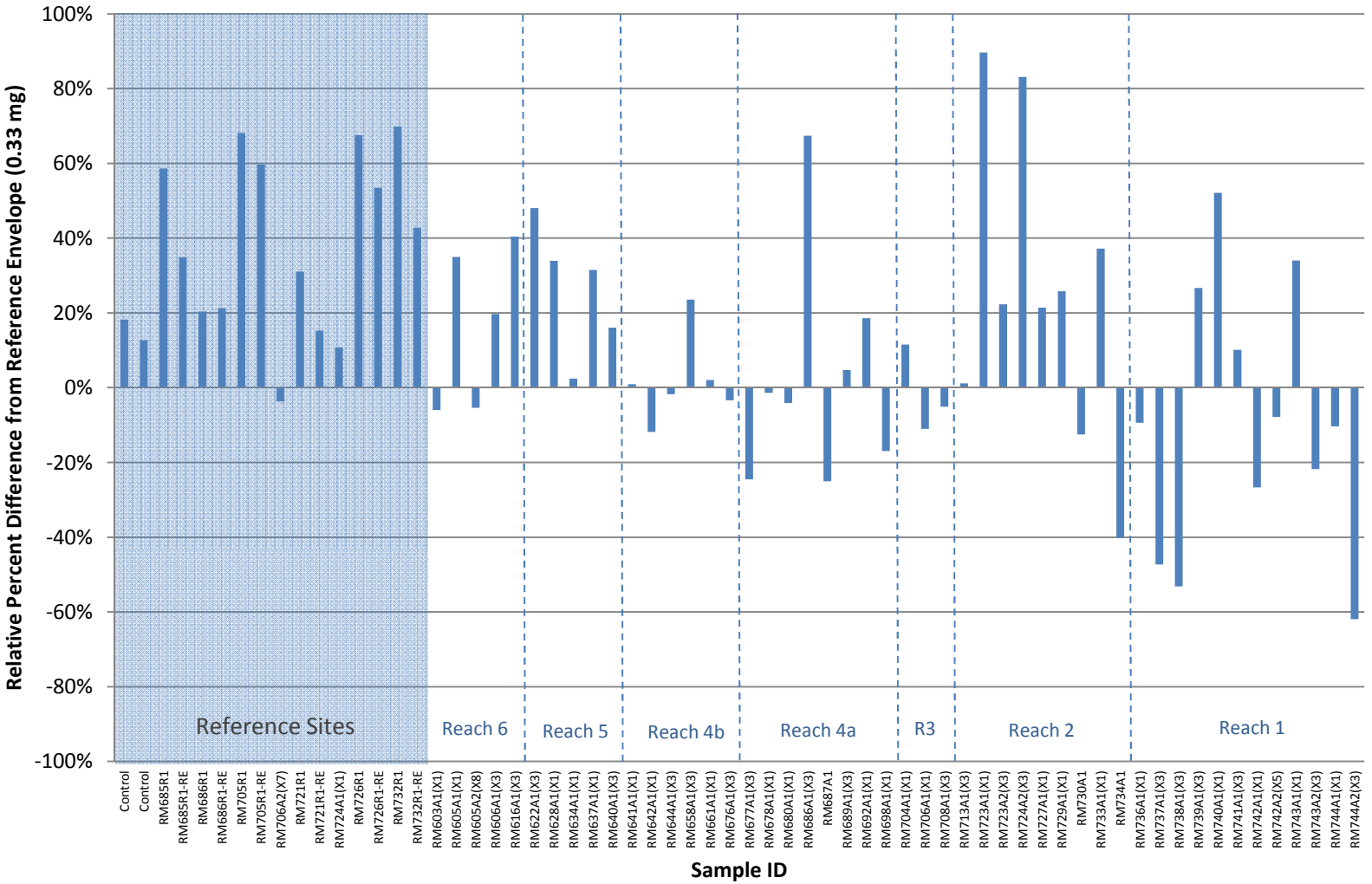


Figure 6-3

Hyalella Biomass Relative to the Reference Envelope

Upper Columbia River RI/FS

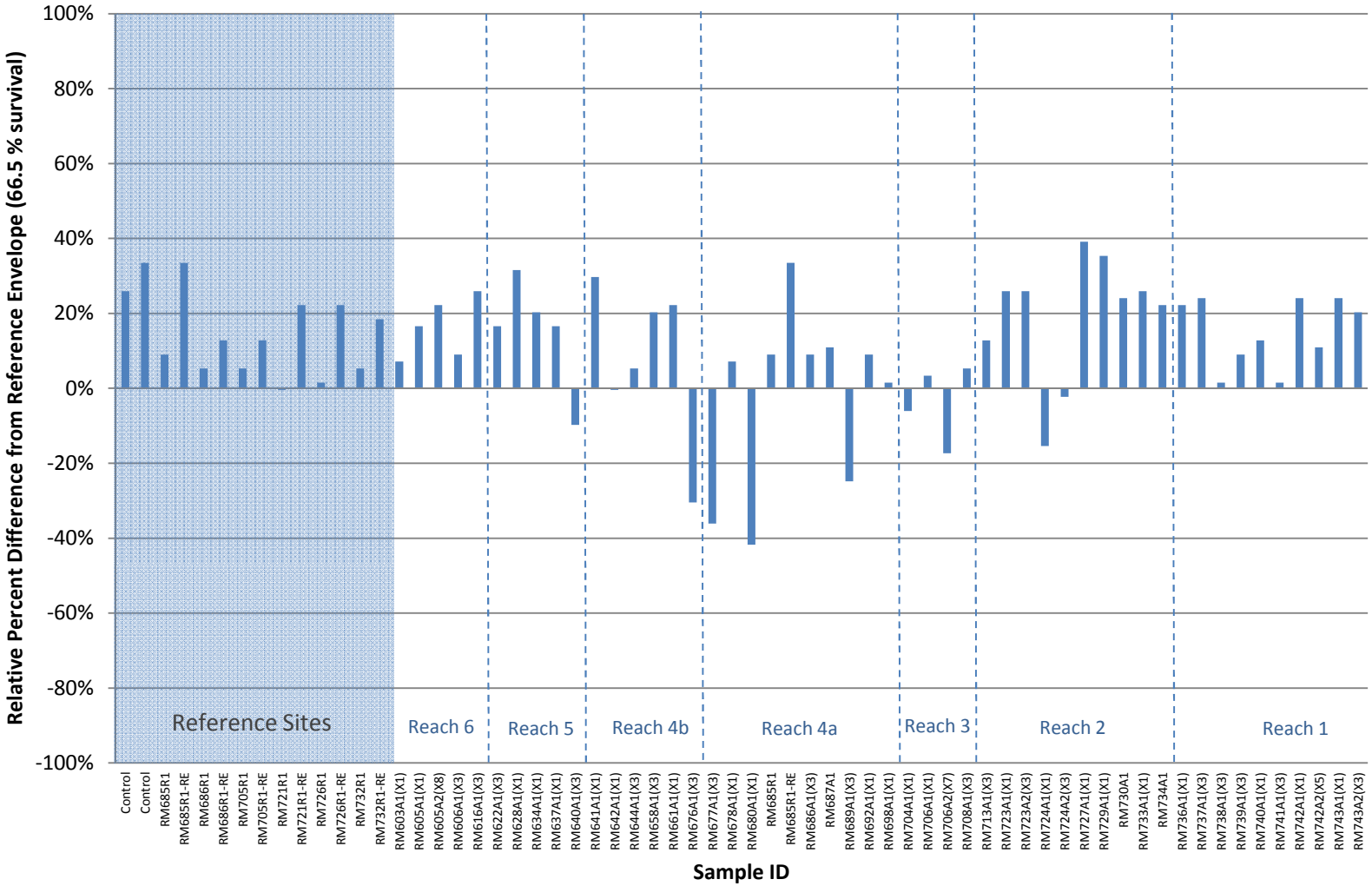


Figure 6-4

Chironomid Survival Compared to the Reference Envelope

Upper Columbia River RI/FS

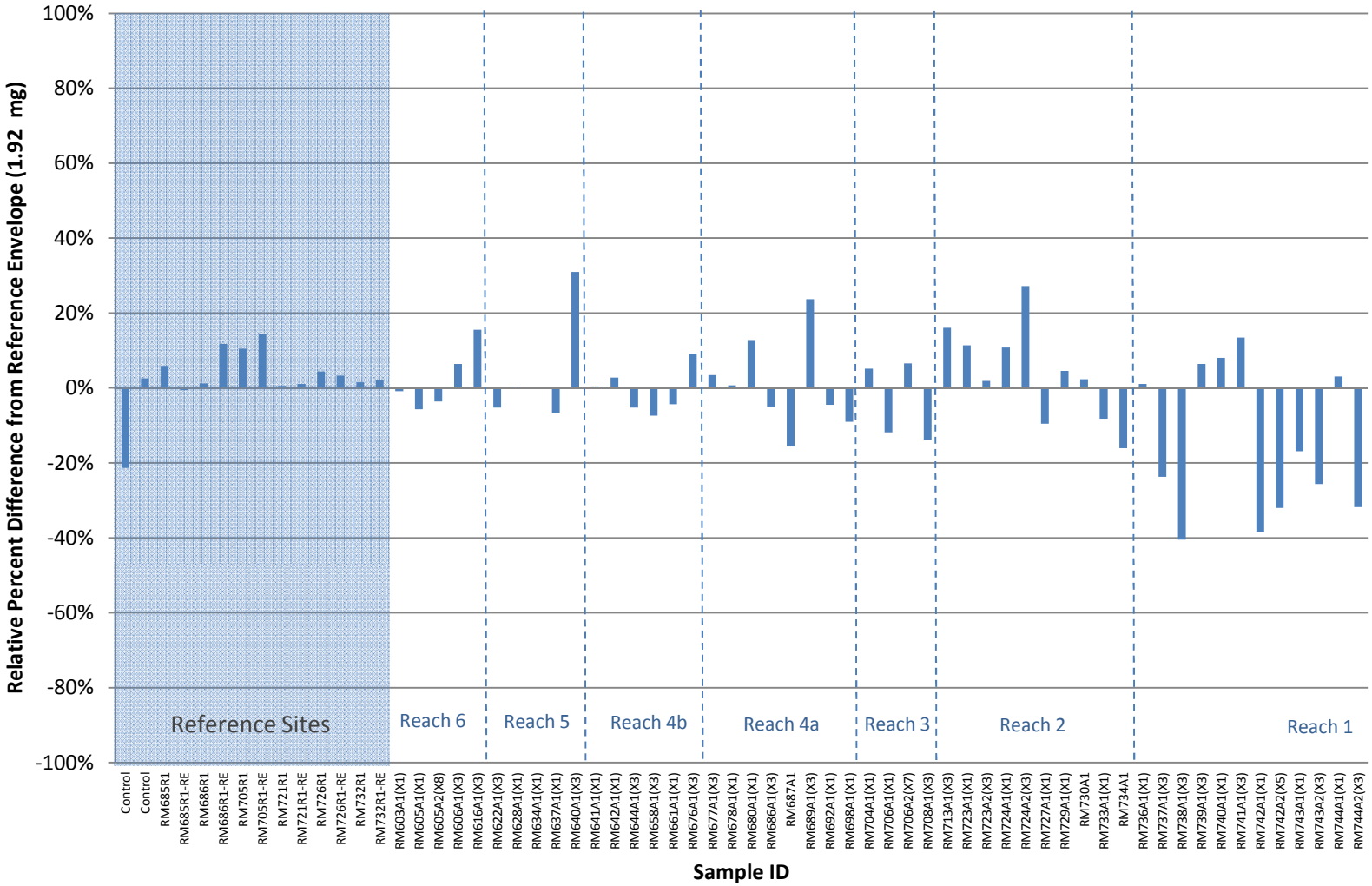


Figure 6-5
Chironomid Growth Relative to the Reference Envelope
Upper Columbia River RI/FS

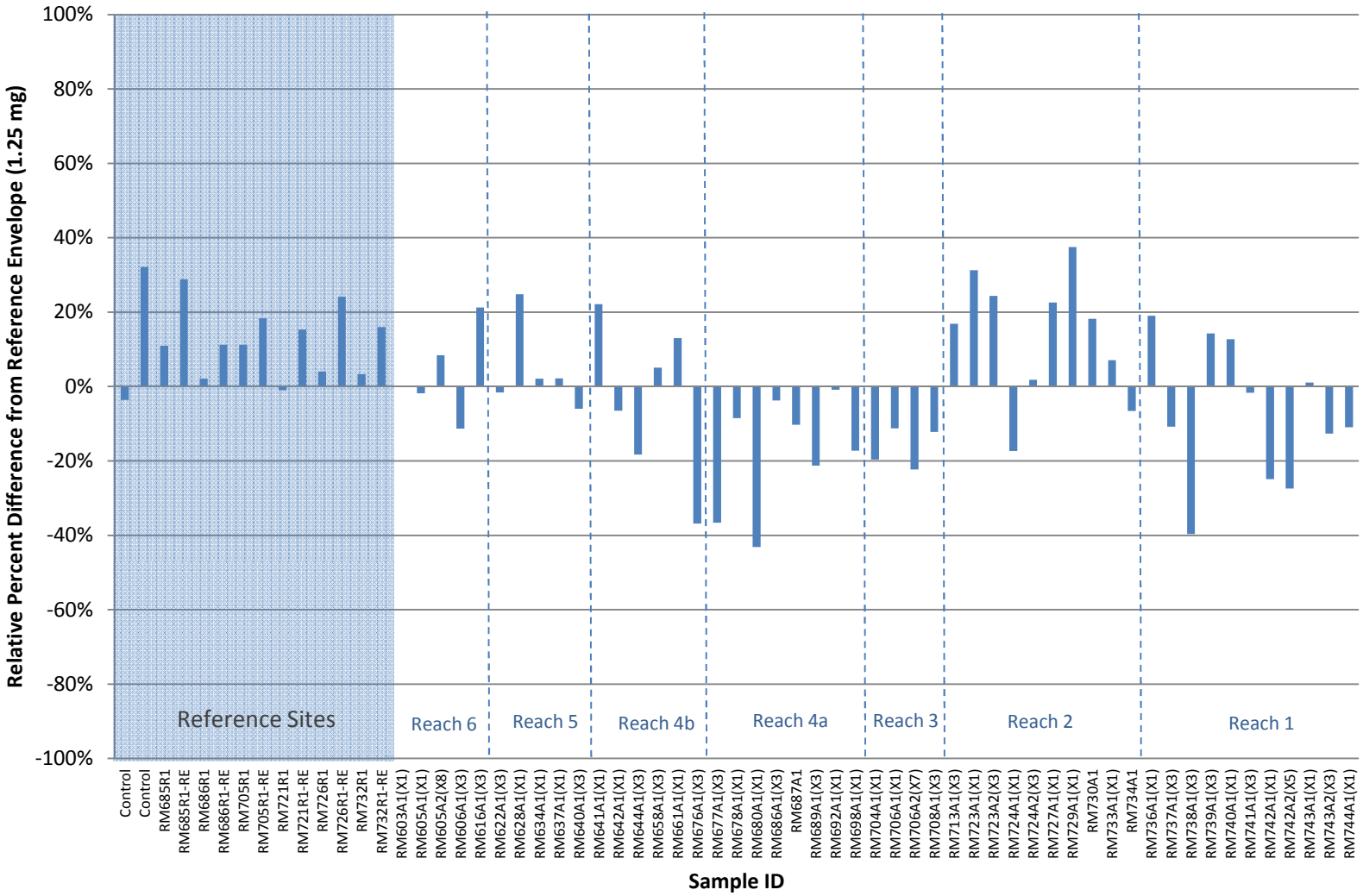


Figure 6-6

Chironomid Biomass Relative to the Reference Envelope

Upper Columbia River RI/FS

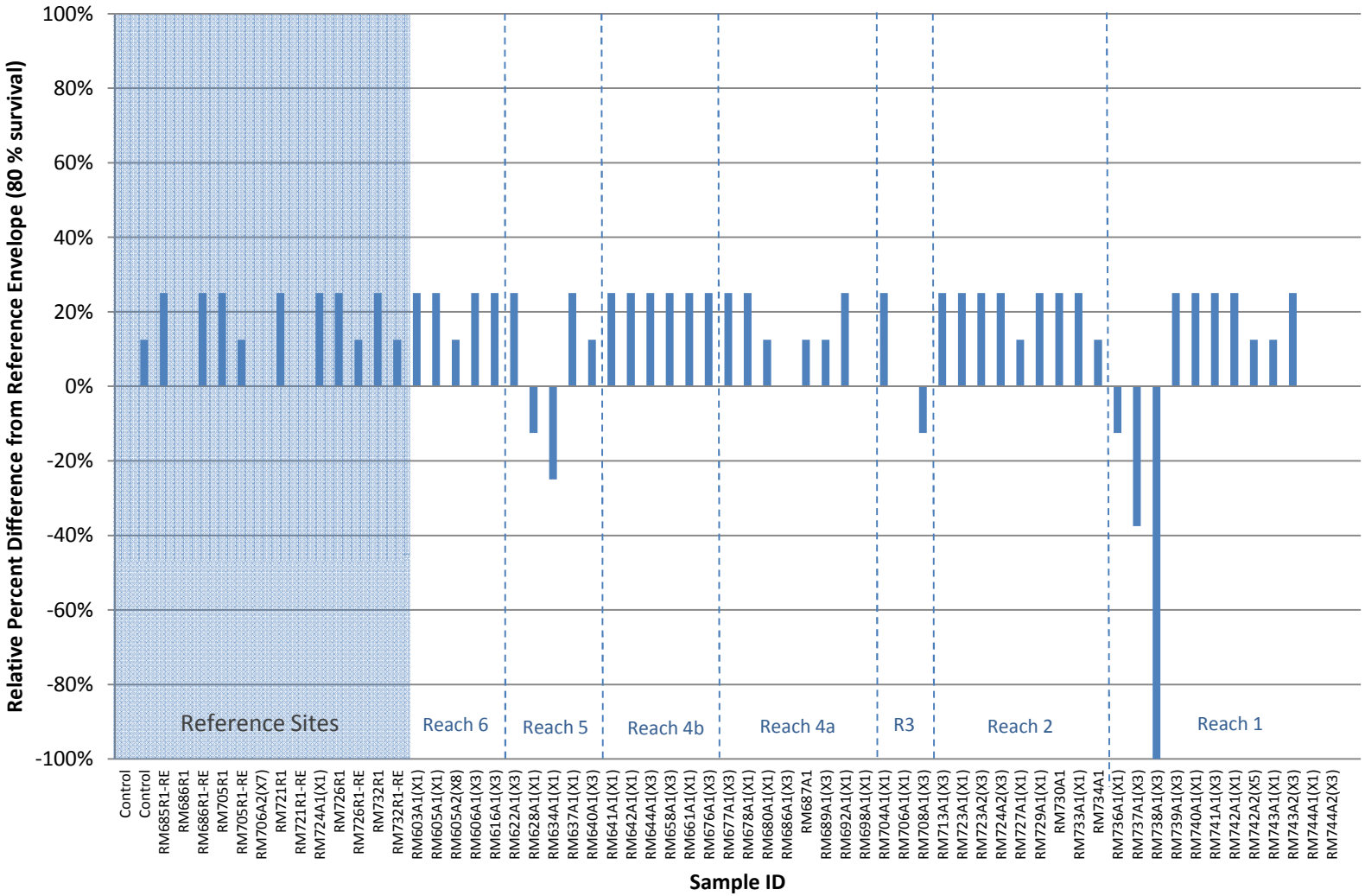


Figure 6-7

Ceriodaphnia Survival Compared to the Reference Envelope

Upper Columbia River RI/FS

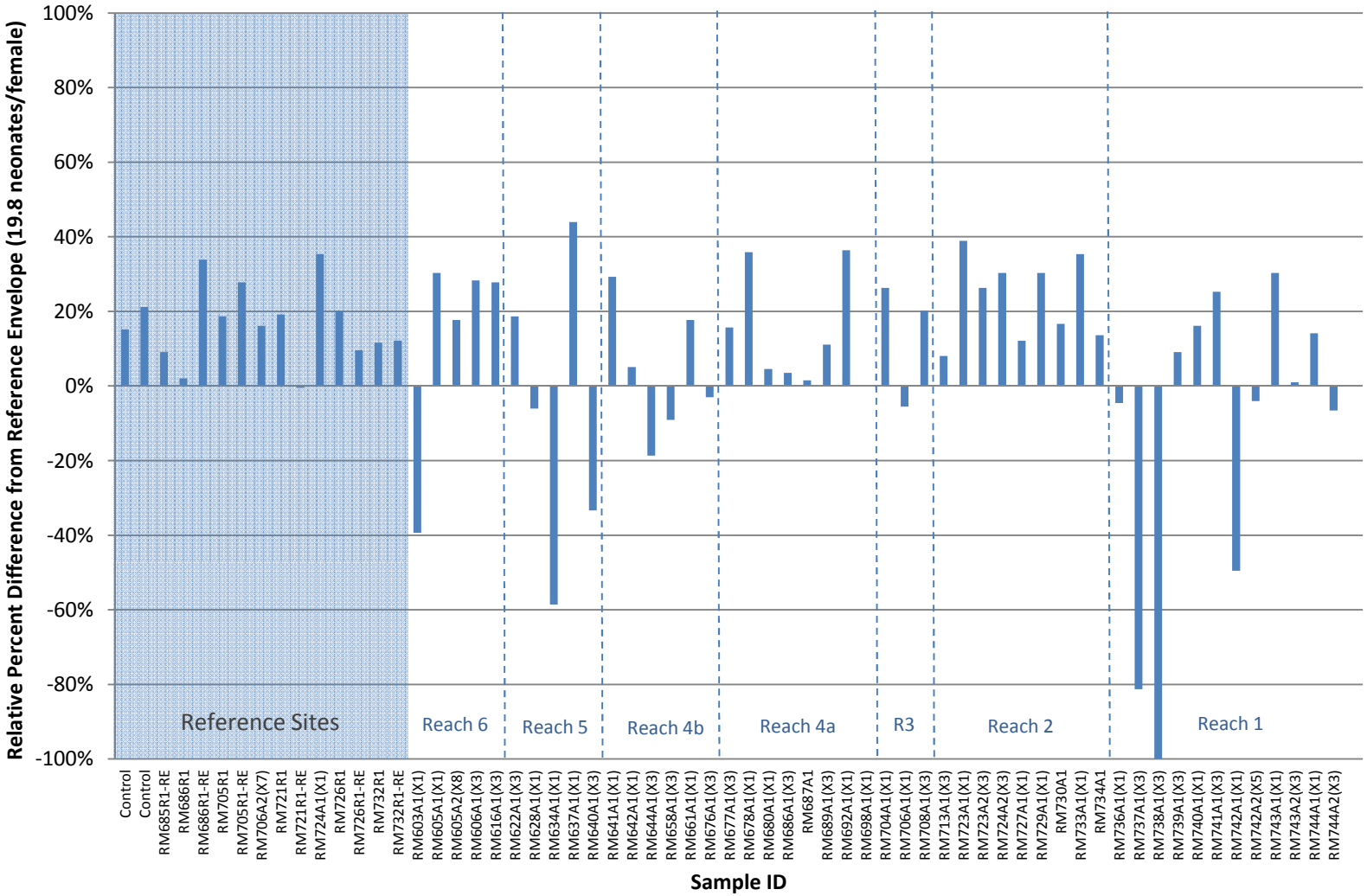


Figure 6-8

Ceriodaphnia Reproduction Relative to the Reference Envelope

Upper Columbia River RI/FS

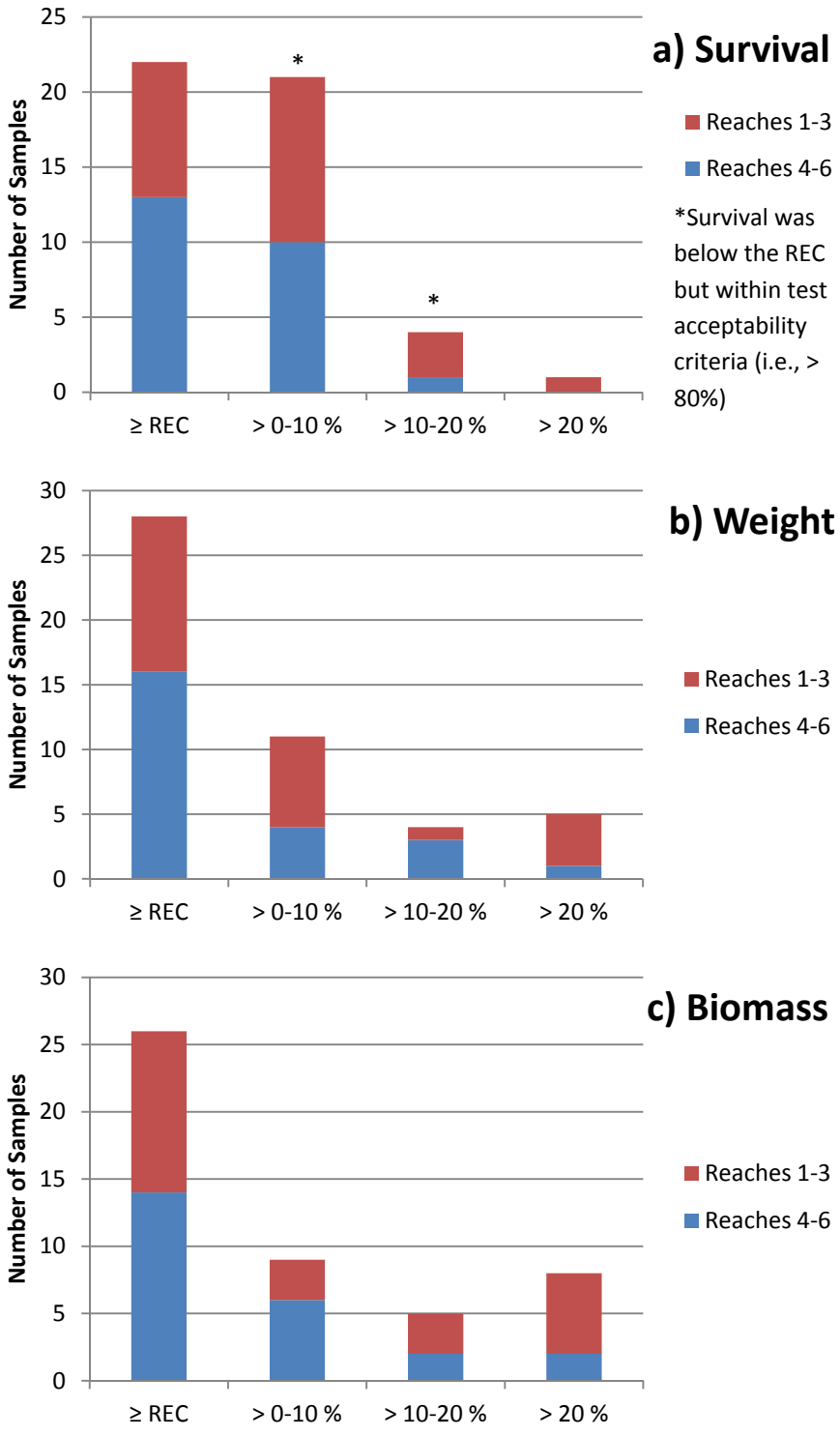


Figure 6-9

Summary of the Relative Percent Difference from the Reference Envelope Criteria for *Hyalella azteca* Bioassay Results (n=48)

Upper Columbia River RI/FS

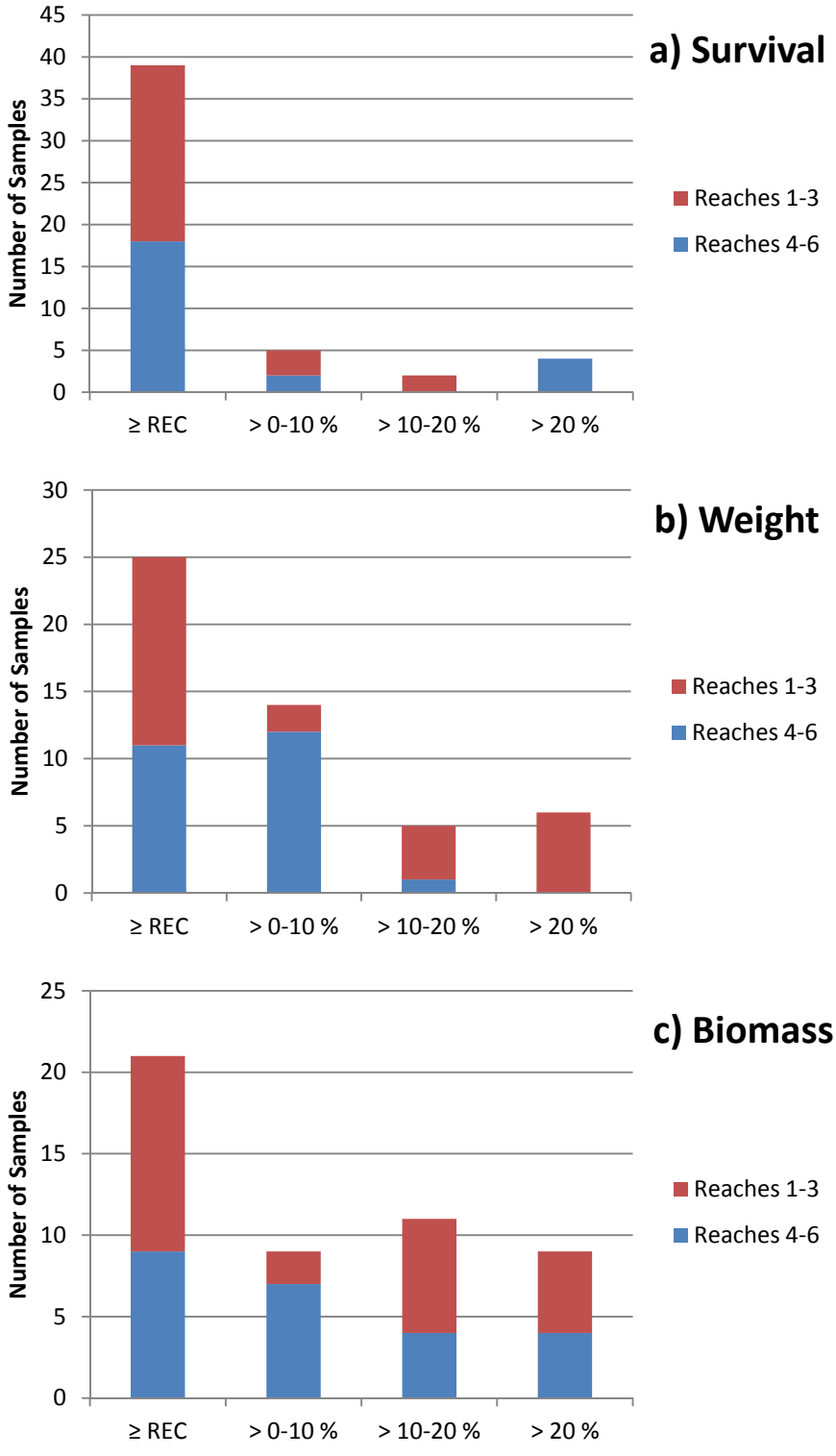


Figure 6-10

Summary of the Relative Percent Difference from the Reference Envelope Criteria for *Chironomus dilutus* Bioassay Results (n=50)

Upper Columbia River RI/FS

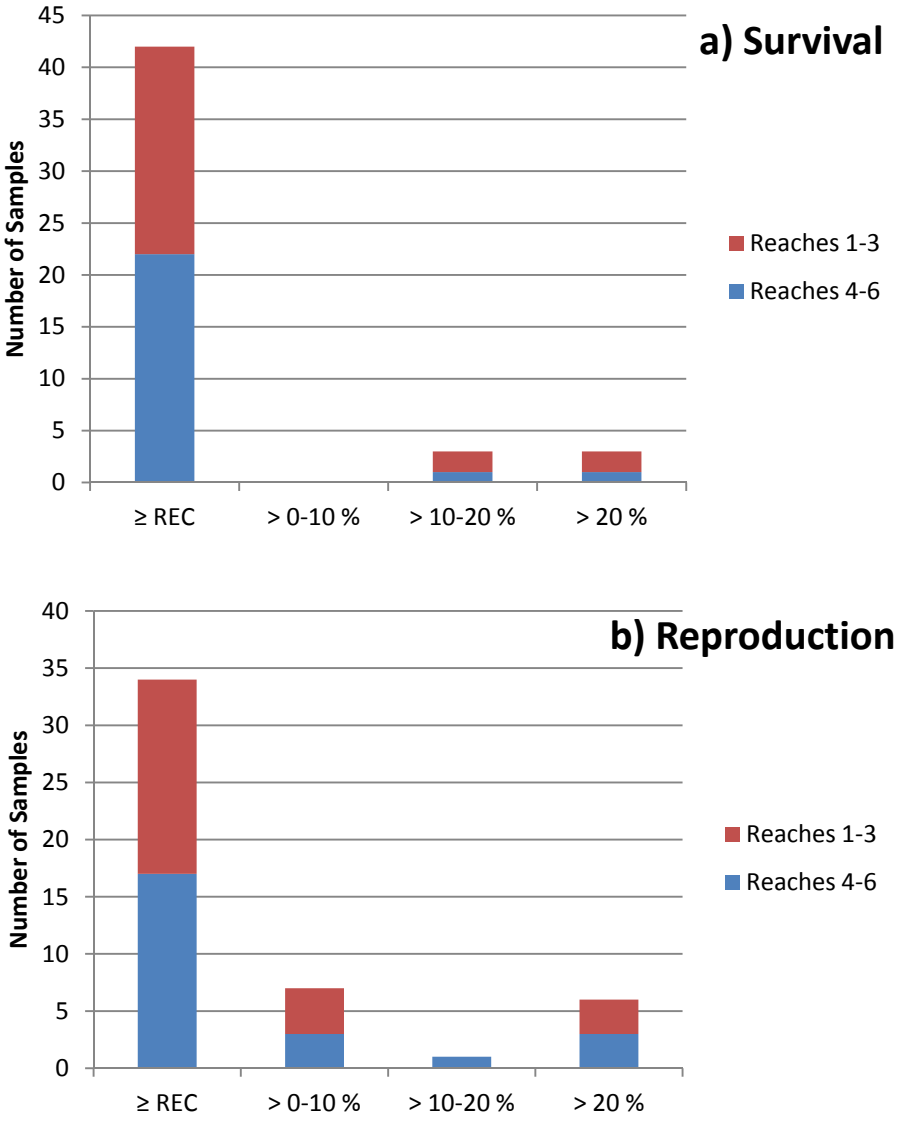
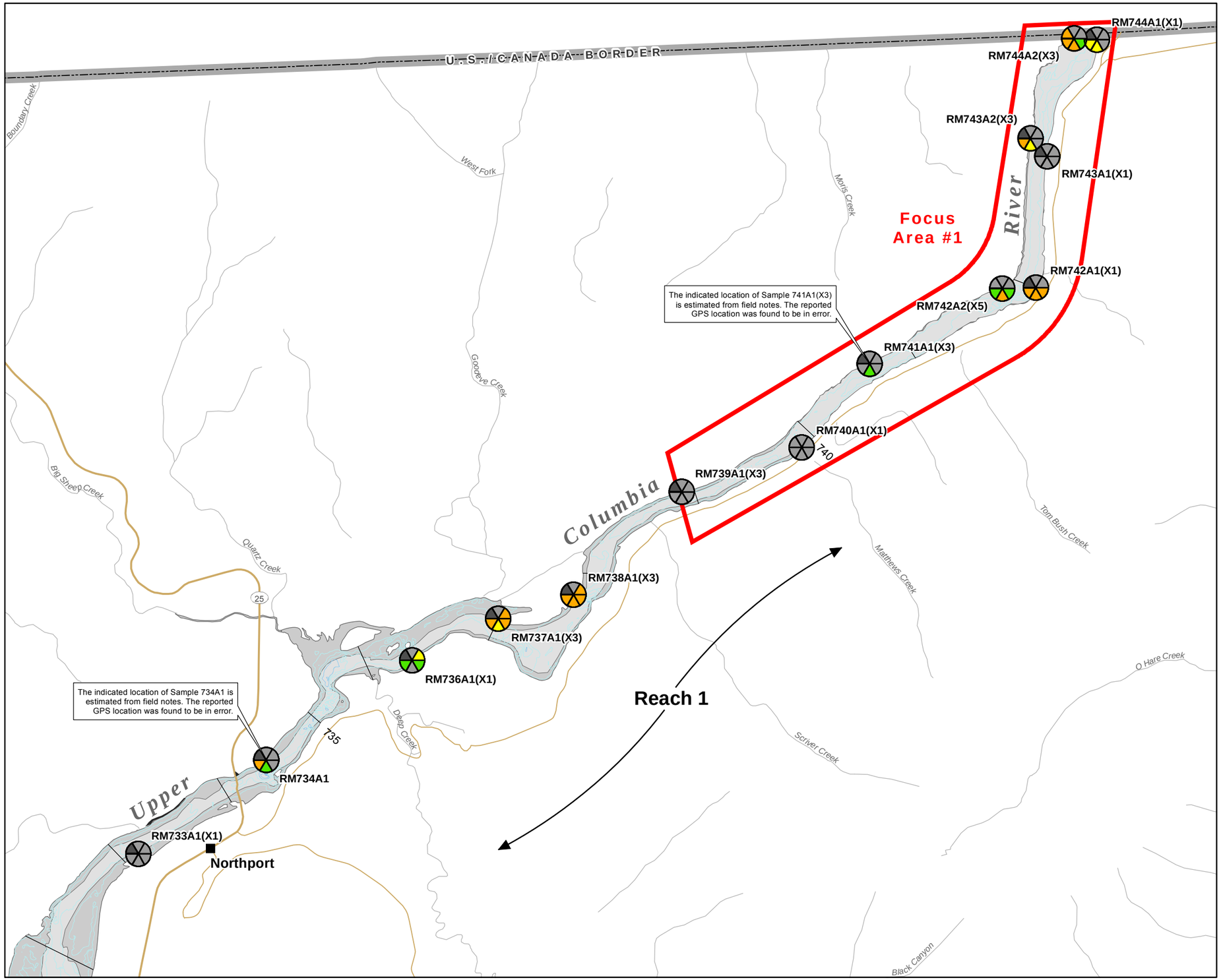


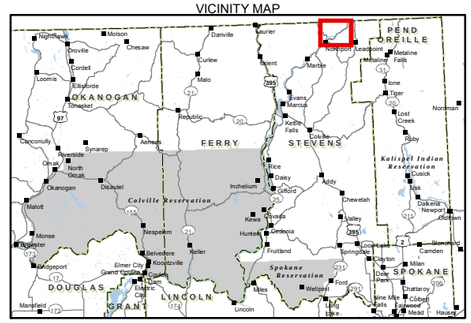
Figure 6-11

Summary of the Relative Percent Difference from the Reference Envelope Criteria for *Ceriodaphnia dubia* Bioassay Results (n=48)

Upper Columbia River RI/FS

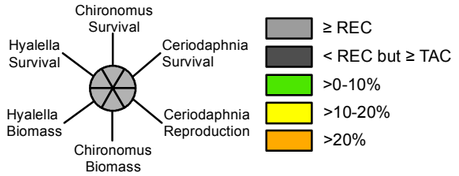


VICINITY MAP



LEGEND

2005 Sediment Sampling



Bottom Elevation

- 880 - 930
- 931 - 980
- 981 - 1030
- 1031 - 1080
- 1081 - 1130
- 1131 - 1180
- 1181 - 1230
- 1231 - 1280

Other Features

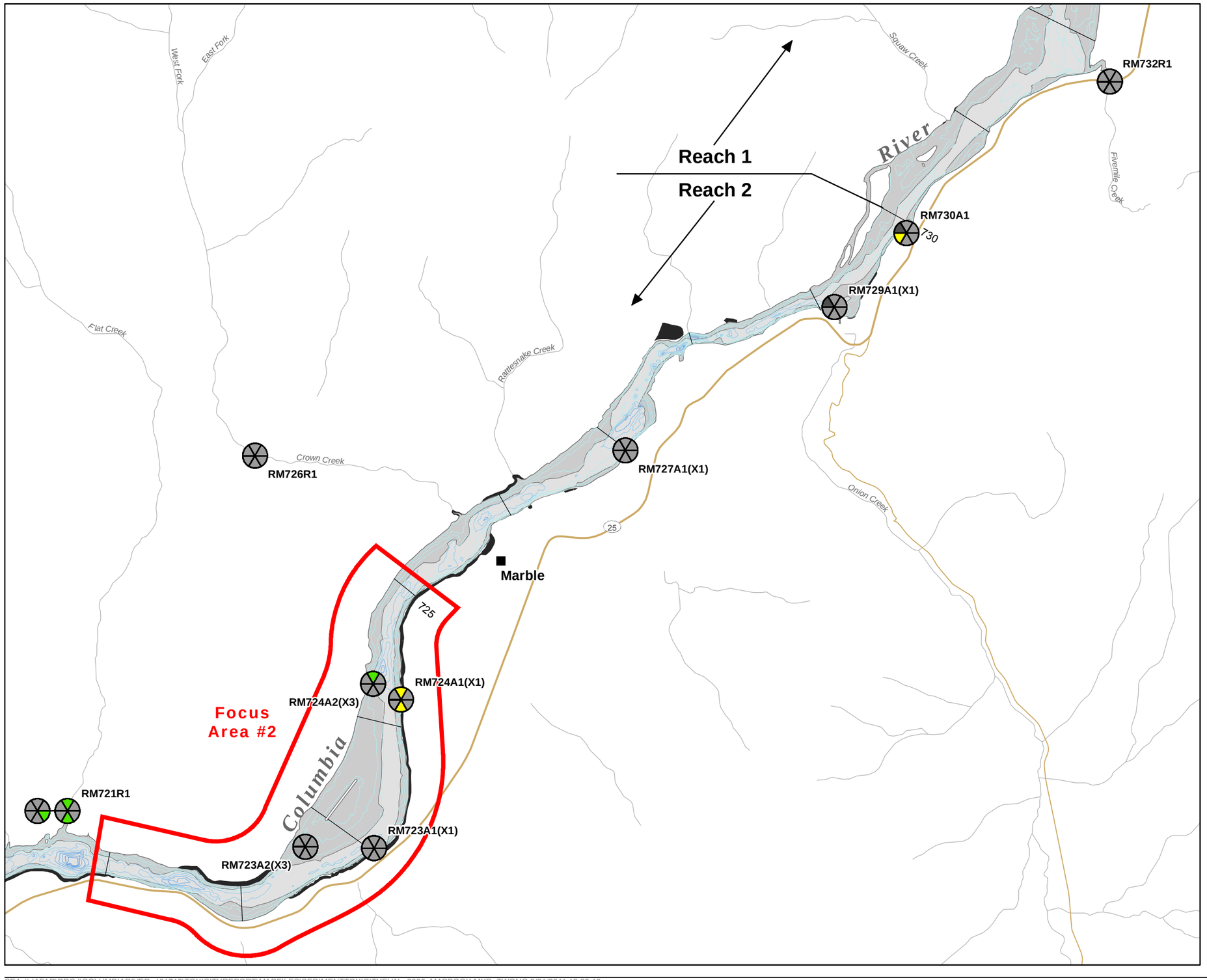
- Tribal Lands
- Water
- Original River Channel
- Landslides
- Cities
- Transect Lines
- Highway
- Major Road

Notes:
1. ≥ REC = endpoint was within the reference envelope criterion.
2. < REC but ≥ TAC = endpoint did not meet reference envelope criterion, but was within the test acceptability criterion for controls.
3. >0-10% = endpoint was less than or equal to 10 percent below the reference envelope criterion.
4. >10-20% = endpoint was greater than 10 and less than or equal to 20 percent below the reference envelope criterion.
5. >20% = endpoint was greater than 20 percent below the reference envelope criterion.
6. * Ceriodaphnia toxicity data were not available for this sample.
7. Due to differing results from the two test runs performed at RM685R1, RM686R1, and RM721R1, both charts are displayed at these locations.
8. Bottom elevations based on 1949 NOAA bathymetric survey.

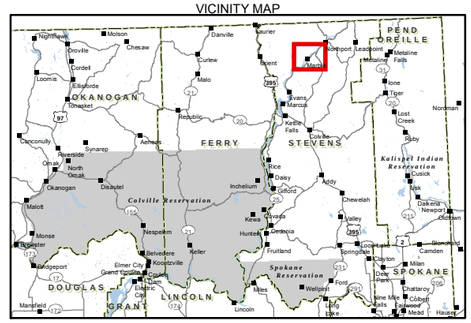
N

0 0.75
Miles

FIGURE 6-12
Results of Sediment Toxicity Testing Relative to the Reference Envelope for River Miles 732 to 744
CERCLA RI/FS 2005 Sediment Toxicity Evaluation
Upper Columbia River Project

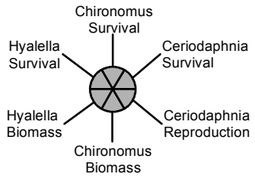


VICINITY MAP



LEGEND

2005 Sediment Sampling



- ≥ REC
- < REC but ≥ TAC
- >0-10%
- >10-20%
- >20%

Bottom Elevation

- 880 - 930
- 931 - 980
- 981 - 1030
- 1031 - 1080
- 1081 - 1130
- 1131 - 1180
- 1181 - 1230
- 1231 - 1280

Other Features

- Tribal Lands
- Water
- Original River Channel
- Landslides
- Cities
- Transect Lines
- Highway
- Major Road

Notes:
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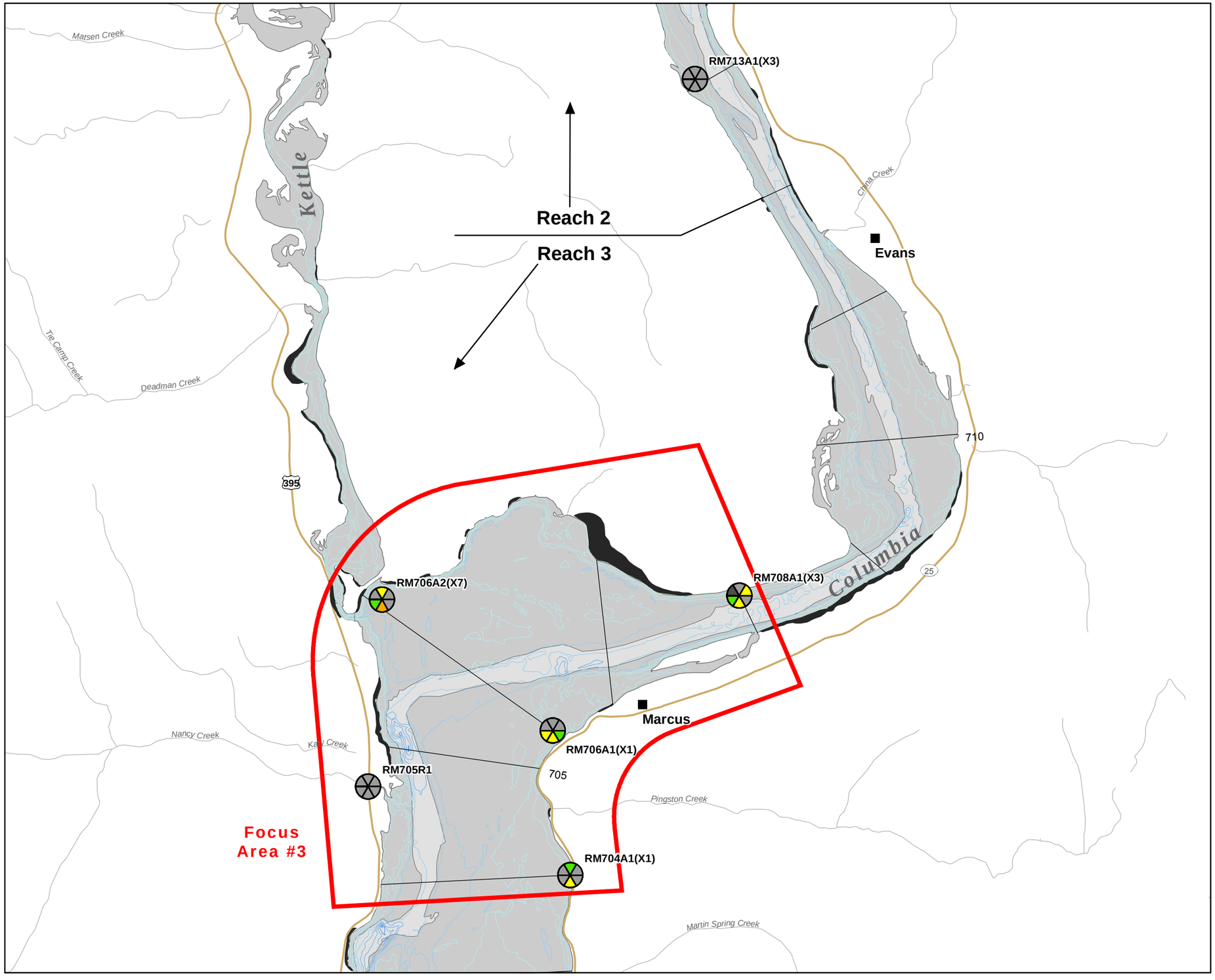
2. < REC but ≥ TAC = endpoint did not meet reference envelope criterion, but was within the test acceptability criterion for controls.
3. >0-10% = endpoint was less than or equal to 10 percent below the reference envelope criterion.
4. >10-20% = endpoint was greater than 10 and less than or equal to 20 percent below the reference envelope criterion.
5. >20% = endpoint was greater than 20 percent below the reference envelope criterion.
6. * Ceriodaphnia toxicity data were not available for this sample.
7. Due to differing results from the two test runs performed at RM685R1, RM686R1, and RM721R1, both charts are displayed at these locations.
8. Bottom elevations based on 1949 NOAA bathymetric survey.

N

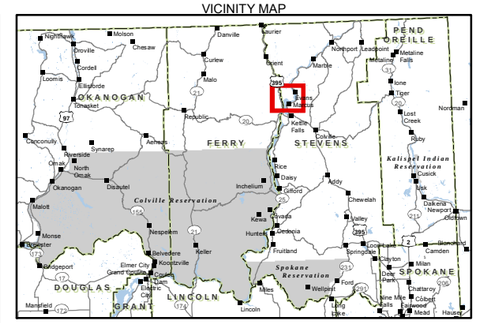
0 0.75
Miles

FIGURE 6-13
Results of Sediment Toxicity Testing Relative to the Reference Envelope for River Miles 721 to 732

CERCLA RI/FS 2005 Sediment Toxicity Evaluation
Upper Columbia River Project

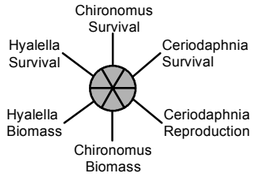


VICINITY MAP



LEGEND

2005 Sediment Sampling



- ≥ REC
- < REC but ≥ TAC
- >0-10%
- >10-20%
- >20%

Bottom Elevation

- 880 - 930
- 931 - 980
- 981 - 1030
- 1031 - 1080
- 1081 - 1130
- 1131 - 1180
- 1181 - 1230
- 1231 - 1280

Other Features

- Tribal Lands
- Water
- Original River Channel
- Landslides
- Cities
- Transect Lines
- Highway
- Major Road

Notes:
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2. < REC but ≥ TAC = endpoint did not meet reference envelope criterion, but was within the test acceptability criterion for controls.
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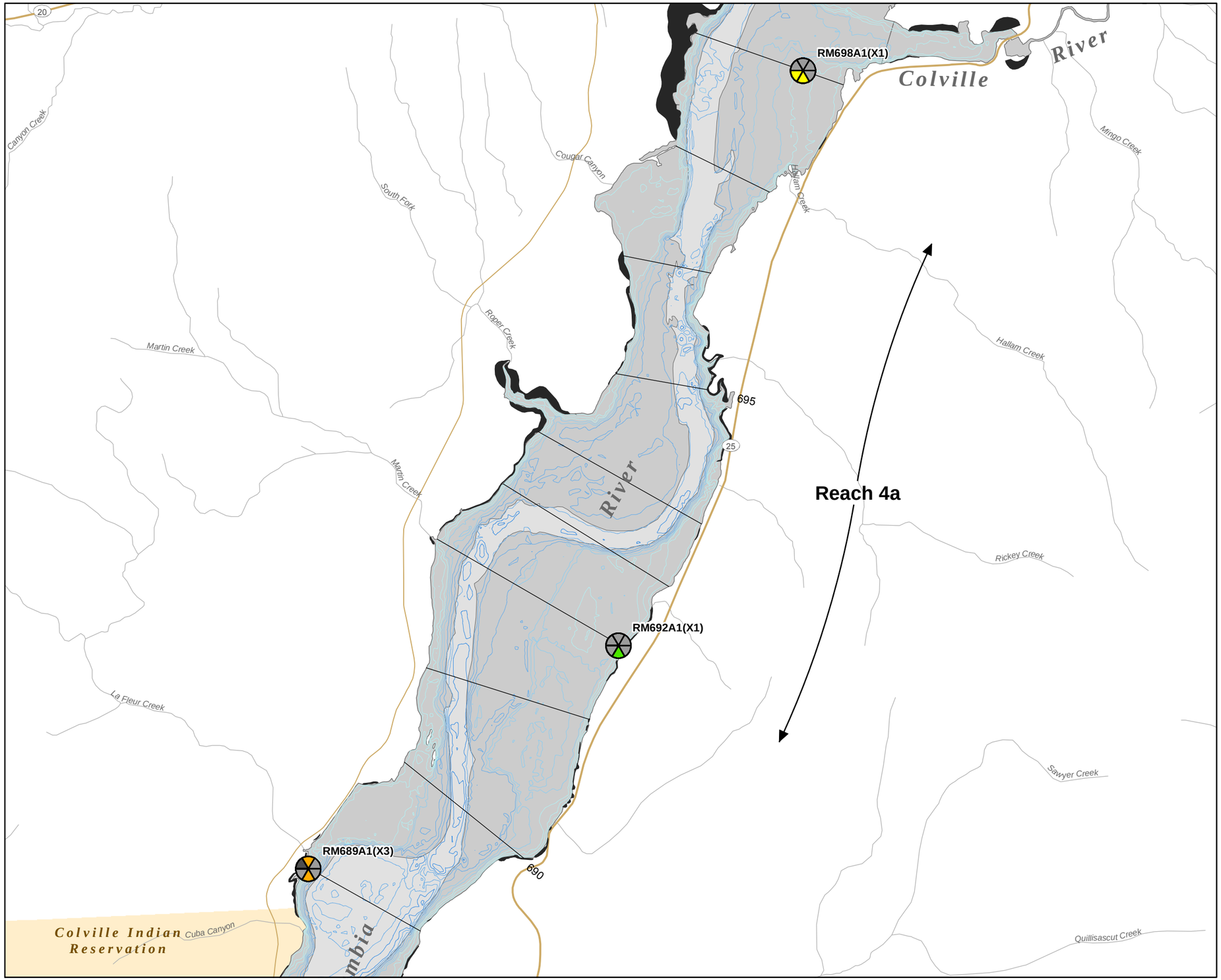
4. >10-20% = endpoint was greater than 10 and less than or equal to 20 percent below the reference envelope criterion.
5. >20% = endpoint was greater than 20 percent below the reference envelope criterion.
6. * Ceriodaphnia toxicity data were not available for this sample.
7. Due to differing results from the two test runs performed at RM685R1, RM686R1, and RM721R1, both charts are displayed at these locations.
8. Bottom elevations based on 1949 NOAA bathymetric survey.

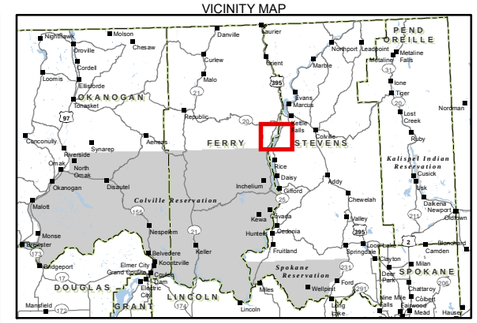
N

0 0.75
Miles

FIGURE 6-14
Results of Sediment Toxicity Testing Relative to the Reference Envelope for River Miles 704 to 713
CERCLA RI/FS 2005 Sediment Toxicity Evaluation
Upper Columbia River Project

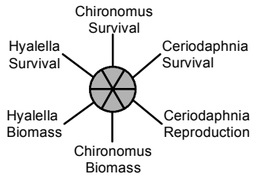


VICINITY MAP



LEGEND

2005 Sediment Sampling



- ≥ REC
- < REC but ≥ TAC
- >0-10%
- >10-20%
- >20%

Bottom Elevation

- 880 - 930
- 931 - 980
- 981 - 1030
- 1031 - 1080
- 1081 - 1130
- 1131 - 1180
- 1181 - 1230
- 1231 - 1280

Other Features

- Tribal Lands
- Water
- Original River Channel
- Landslides
- Cities
- Transect Lines
- Highway
- Major Road

Notes:
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2. < REC but ≥ TAC = endpoint did not meet reference envelope criterion, but was within the test acceptability criterion for controls.
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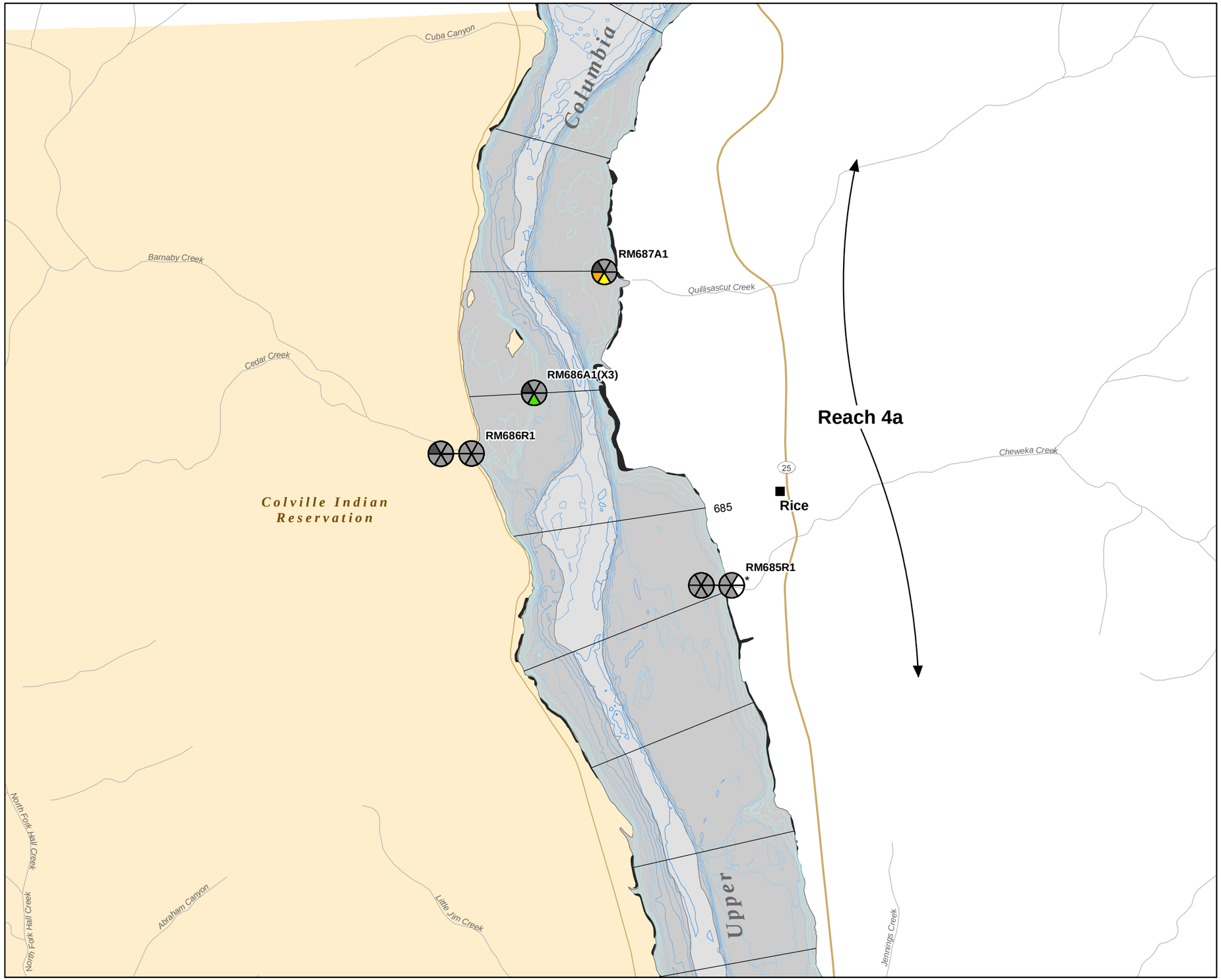
5. >20% = endpoint was greater than 20 percent below the reference envelope criterion.
6. * Ceriodaphnia toxicity data were not available for this sample.
7. Due to differing results from the two test runs performed at RM685R1, RM686R1, and RM721R1, both charts are displayed at these locations.
8. Bottom elevations based on 1949 NOAA bathymetric survey.

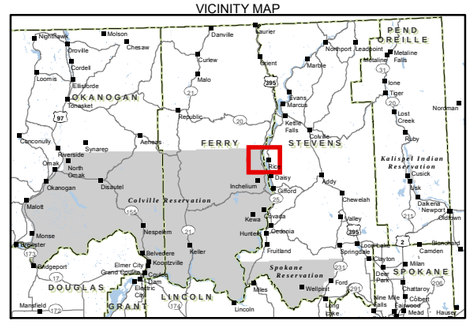
N

0 0.75
Miles

FIGURE 6-15
Results of Sediment Toxicity Testing Relative to the Reference Envelope for River Miles 689 to 698
CERCLA RI/FS 2005 Sediment Toxicity Evaluation
Upper Columbia River Project

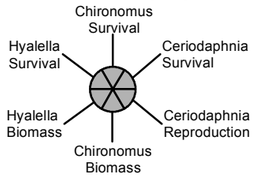


VICINITY MAP



LEGEND

2005 Sediment Sampling



- ≥ REC
- < REC but ≥ TAC
- >0-10%
- >10-20%
- >20%

Bottom Elevation

- 880 - 930
- 931 - 980
- 981 - 1030
- 1031 - 1080
- 1081 - 1130
- 1131 - 1180
- 1181 - 1230
- 1231 - 1280

Other Features

- Tribal Lands
- Water
- Original River Channel
- Landslides
- Cities
- Transect Lines
- Highway
- Major Road

Notes:
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2. < REC but ≥ TAC = endpoint did not meet reference envelope criterion, but was within the test acceptability criterion for controls.
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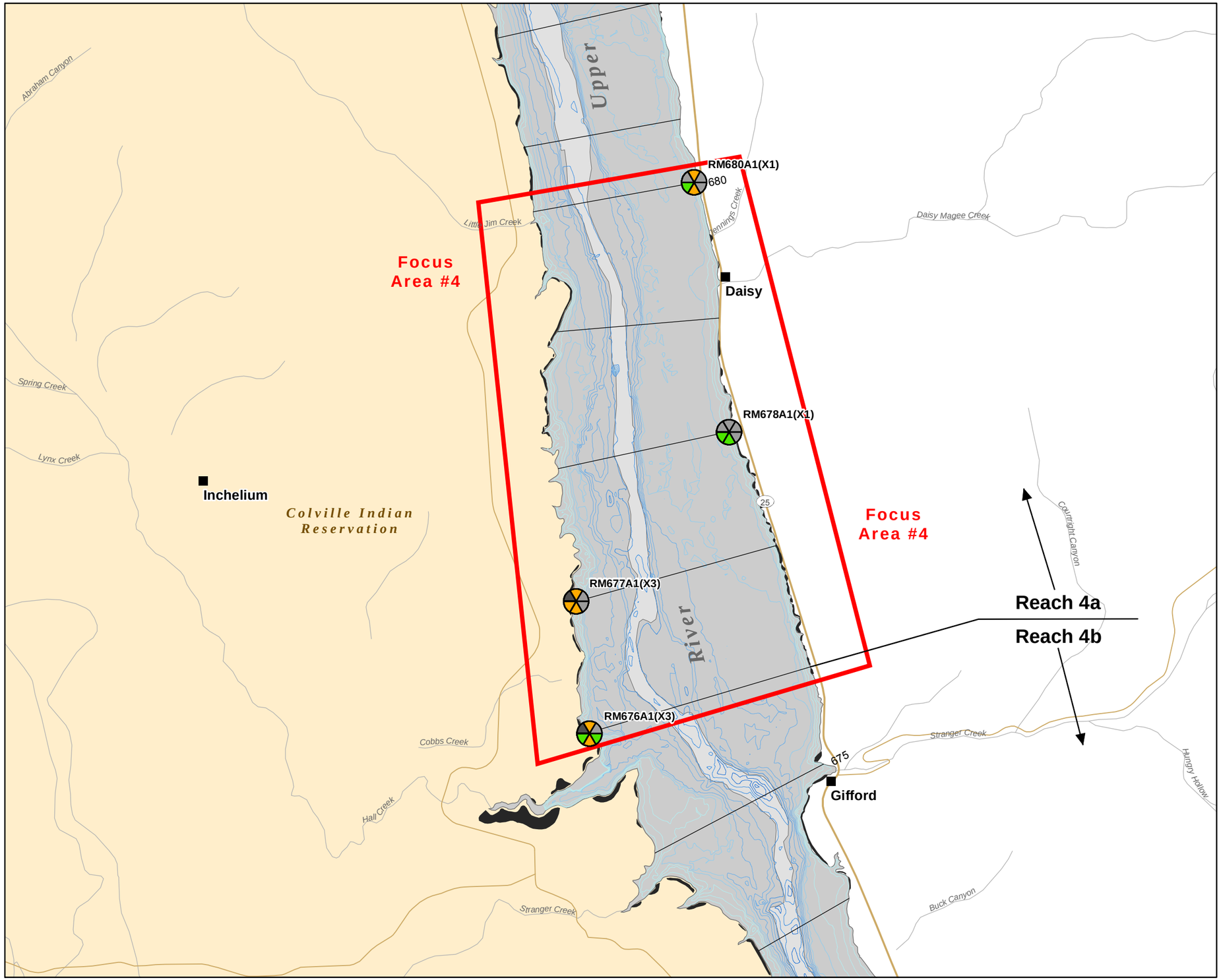
4. >10-20% = endpoint was greater than 10 and less than or equal to 20 percent below the reference envelope criterion.
5. >20% = endpoint was greater than 20 percent below the reference envelope criterion.
6. * Ceriodaphnia toxicity data were not available for this sample.
7. Due to differing results from the two test runs performed at RM685R1, RM686R1, and RM721R1, both charts are displayed at these locations.
8. Bottom elevations based on 1949 NOAA bathymetric survey.

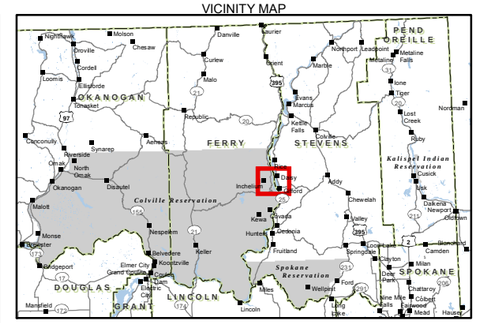
N

0 0.75
Miles

FIGURE 6-16
Results of Sediment Toxicity Testing Relative to the Reference Envelope for River Miles 681 to 689
CERCLA RI/FS 2005 Sediment Toxicity Evaluation
Upper Columbia River Project

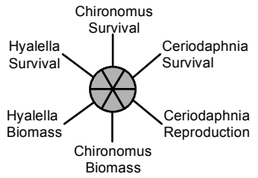


VICINITY MAP



LEGEND

2005 Sediment Sampling



- ≥ REC
- < REC but ≥ TAC
- >0-10%
- >10-20%
- >20%

Bottom Elevation

- 880 - 930
- 931 - 980
- 981 - 1030
- 1031 - 1080
- 1081 - 1130
- 1131 - 1180
- 1181 - 1230
- 1231 - 1280

Other Features

- Tribal Lands
- Water
- Original River Channel
- Landslides
- Cities
- Transect Lines
- Highway
- Major Road

Notes:
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2. < REC but ≥ TAC = endpoint did not meet reference envelope criterion, but was within the test acceptability criterion for controls.
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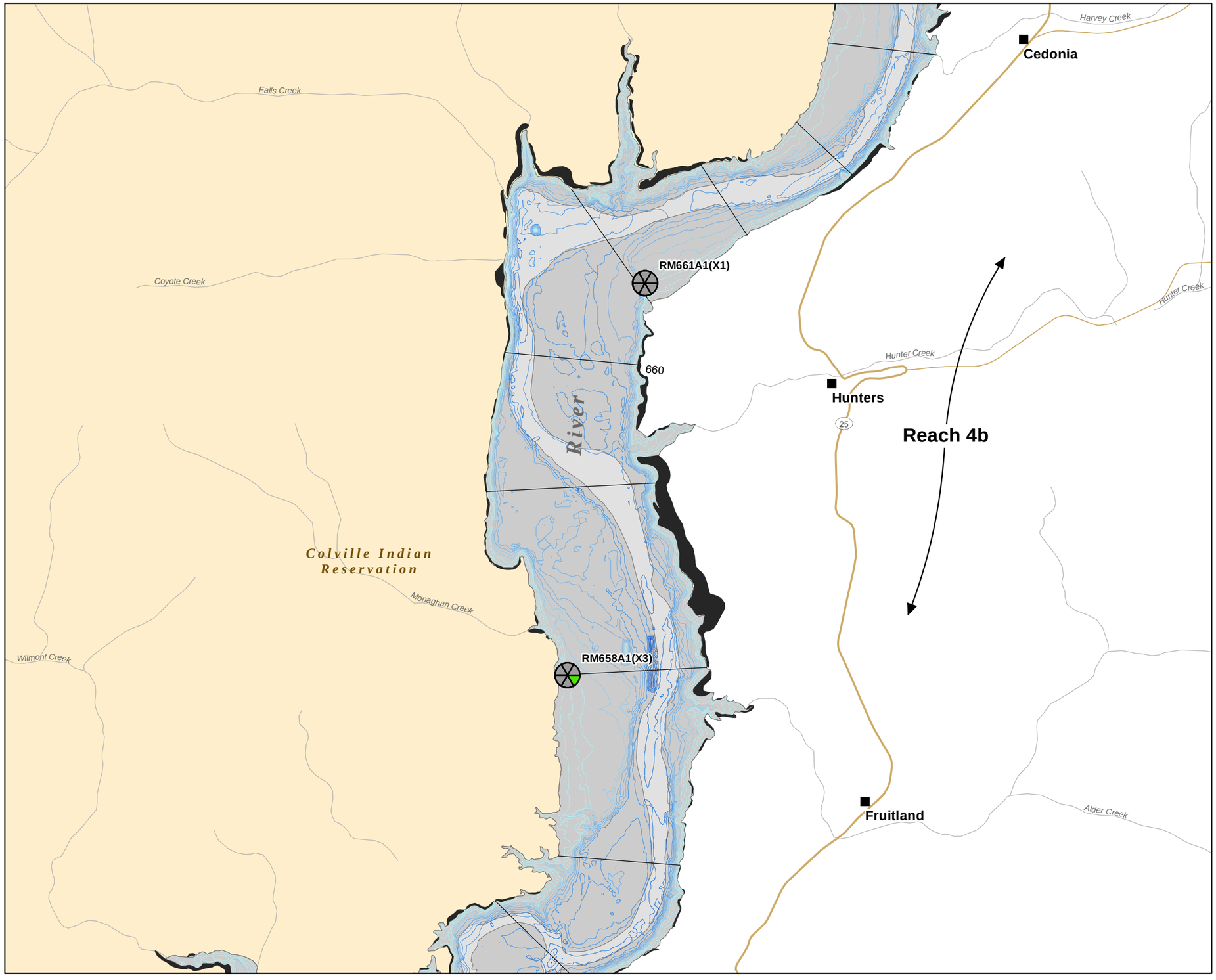
5. >20% = endpoint was greater than 20 percent below the reference envelope criterion.
6. * Ceriodaphnia toxicity data were not available for this sample.
7. Due to differing results from the two test runs performed at RM685R1, RM686R1, and RM721R1, both charts are displayed at these locations.
8. Bottom elevations based on 1949 NOAA bathymetric survey.

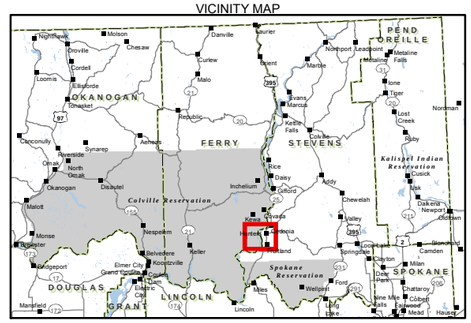
N

0 0.75
Miles

FIGURE 6-17
Results of Sediment Toxicity Testing Relative to the Reference Envelope for River Miles 674 to 682
CERCLA RI/FS 2005 Sediment Toxicity Evaluation
Upper Columbia River Project

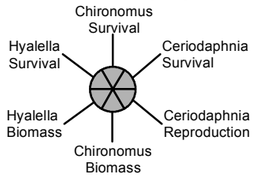


VICINITY MAP



LEGEND

2005 Sediment Sampling



- ≥ REC
- < REC but ≥ TAC
- >0-10%
- >10-20%
- >20%

Bottom Elevation

- 880 - 930
- 931 - 980
- 981 - 1030
- 1031 - 1080
- 1081 - 1130
- 1131 - 1180
- 1181 - 1230
- 1231 - 1280

Other Features

- Tribal Lands
- Water
- Original River Channel
- Landslides
- Cities
- Transect Lines
- Highway
- Major Road

Notes:
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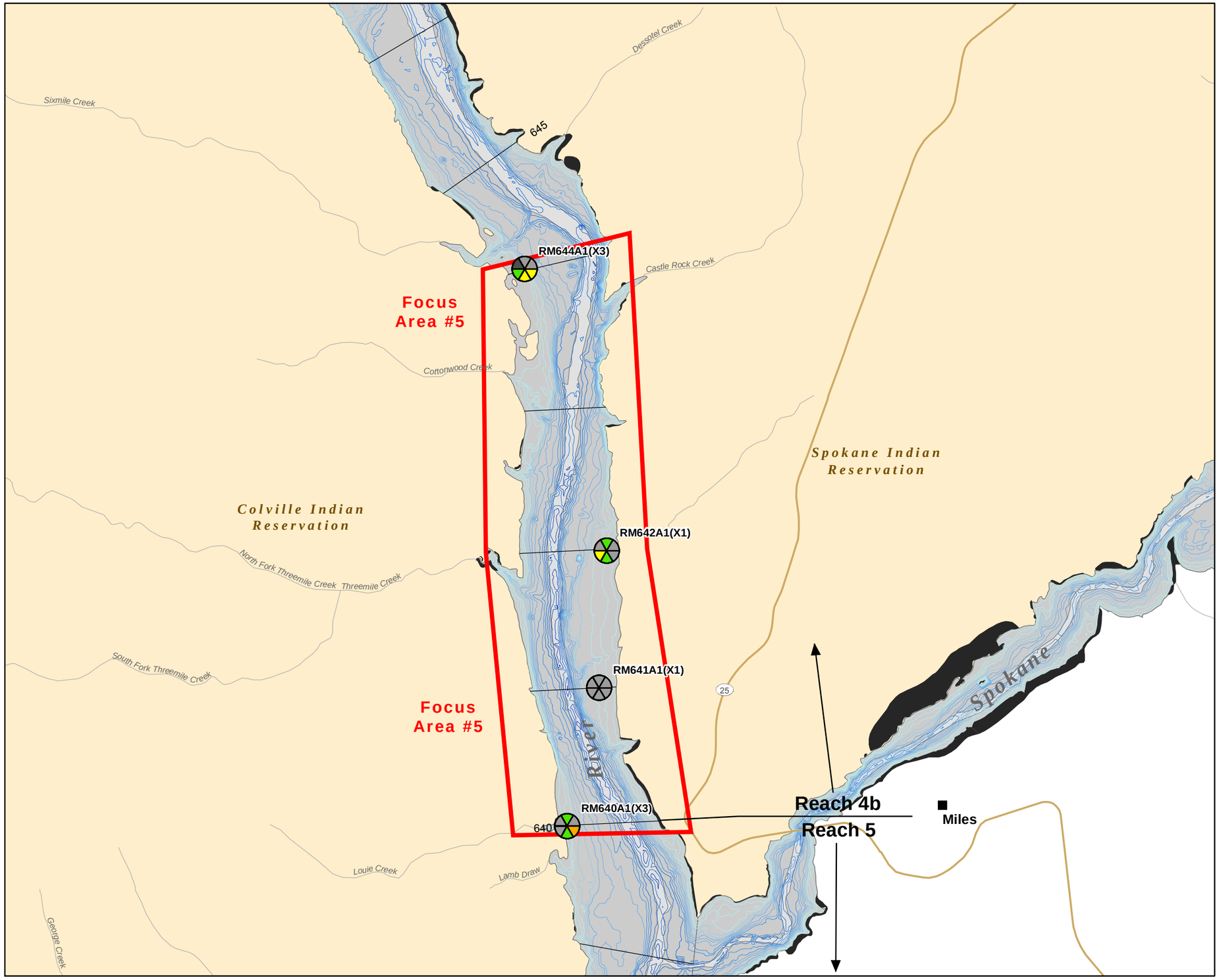
5. >20% = endpoint was greater than 20 percent below the reference envelope criterion.
6. * Ceriodaphnia toxicity data were not available for this sample.
7. Due to differing results from the two test runs performed at RM685R1, RM686R1, and RM721R1, both charts are displayed at these locations.
8. Bottom elevations based on 1949 NOAA bathymetric survey.

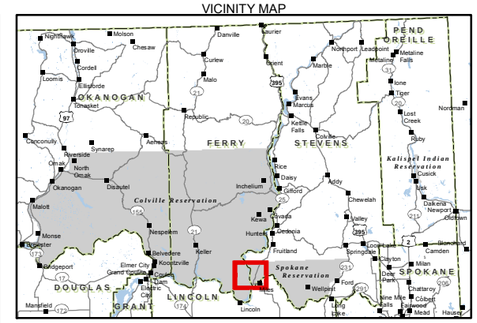
N

0 0.75
Miles

FIGURE 6-18
Results of Sediment Toxicity Testing Relative to the Reference Envelope for River Miles 656 to 664
CERCLA RI/FS 2005 Sediment Toxicity Evaluation
Upper Columbia River Project

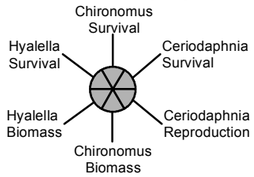


VICINITY MAP



LEGEND

2005 Sediment Sampling



- ≥ REC
- < REC but ≥ TAC
- >0-10%
- >10-20%
- >20%

Bottom Elevation

- 880 - 930
- 931 - 980
- 981 - 1030
- 1031 - 1080
- 1081 - 1130
- 1131 - 1180
- 1181 - 1230
- 1231 - 1280

Other Features

- Tribal Lands
- Water
- Original River Channel
- Landslides
- Cities
- Transect Lines
- Highway
- Major Road

Notes:
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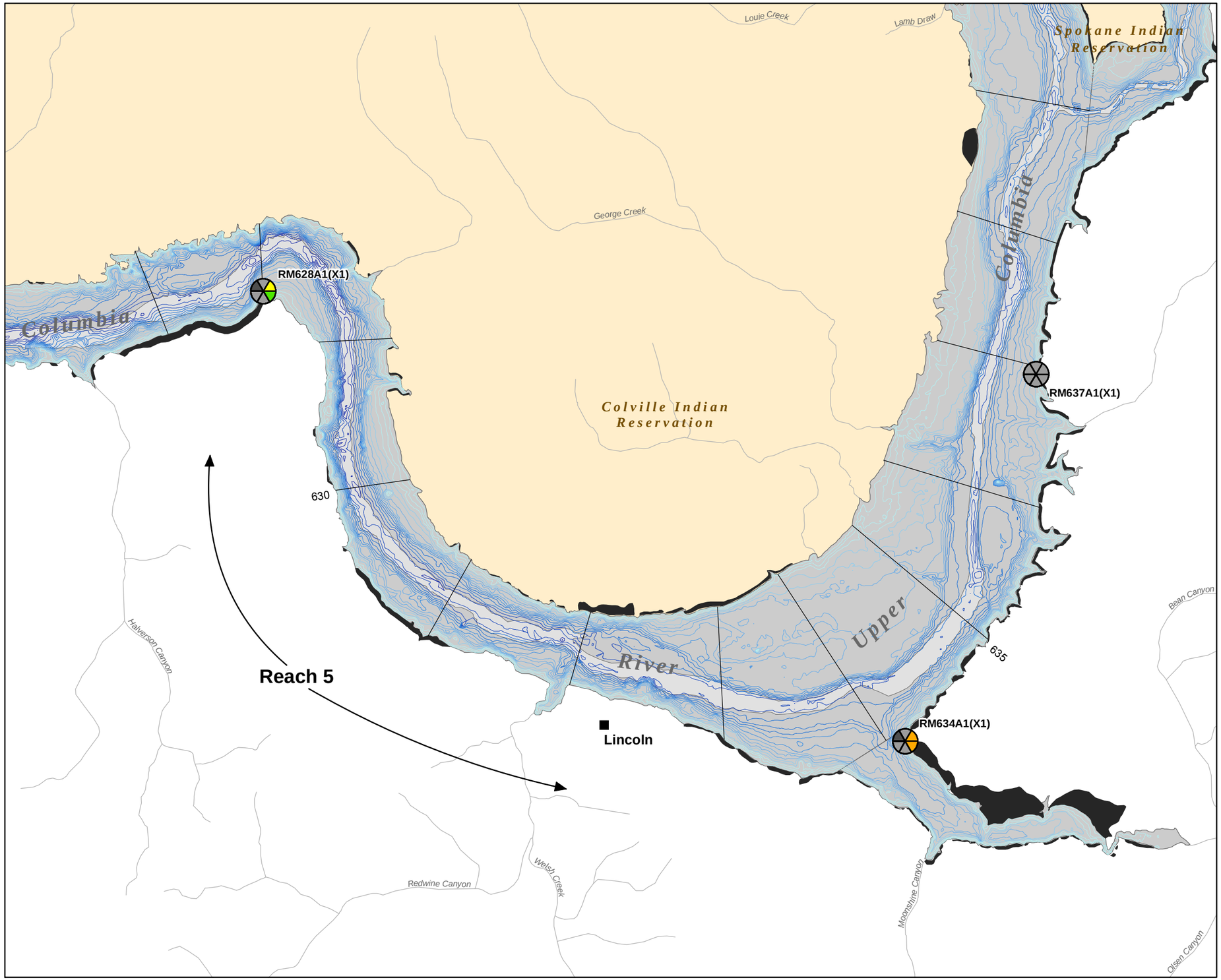
2. < REC but ≥ TAC = endpoint did not meet reference envelope criterion, but was within the test acceptability criterion for controls.
3. >0-10% = endpoint was less than or equal to 10 percent below the reference envelope criterion.
4. >10-20% = endpoint was greater than 10 and less than or equal to 20 percent below the reference envelope criterion.
5. >20% = endpoint was greater than 20 percent below the reference envelope criterion.
6. * Ceriodaphnia toxicity data were not available for this sample.
7. Due to differing results from the two test runs performed at RM685R1, RM686R1, and RM721R1, both charts are displayed at these locations.
8. Bottom elevations based on 1949 NOAA bathymetric survey.

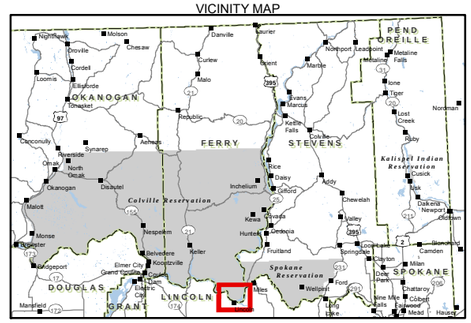
N

0 0.75
Miles

FIGURE 6-19
Results of Sediment Toxicity Testing Relative to the Reference Envelope for River Miles 639 to 646
CERCLA RI/FS 2005 Sediment Toxicity Evaluation
Upper Columbia River Project

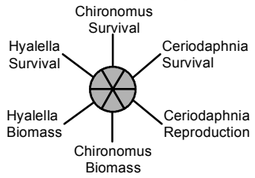


VICINITY MAP



LEGEND

2005 Sediment Sampling



- ≥ REC
- < REC but ≥ TAC
- >0-10%
- >10-20%
- >20%

Bottom Elevation

- 880 - 930
- 931 - 980
- 981 - 1030
- 1031 - 1080
- 1081 - 1130
- 1131 - 1180
- 1181 - 1230
- 1231 - 1280

Other Features

- Tribal Lands
- Water
- Original River Channel
- Landslides
- Cities
- Transect Lines
- Highway
- Major Road

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2. < REC but ≥ TAC = endpoint did not meet reference envelope criterion, but was within the test acceptability criterion for controls.
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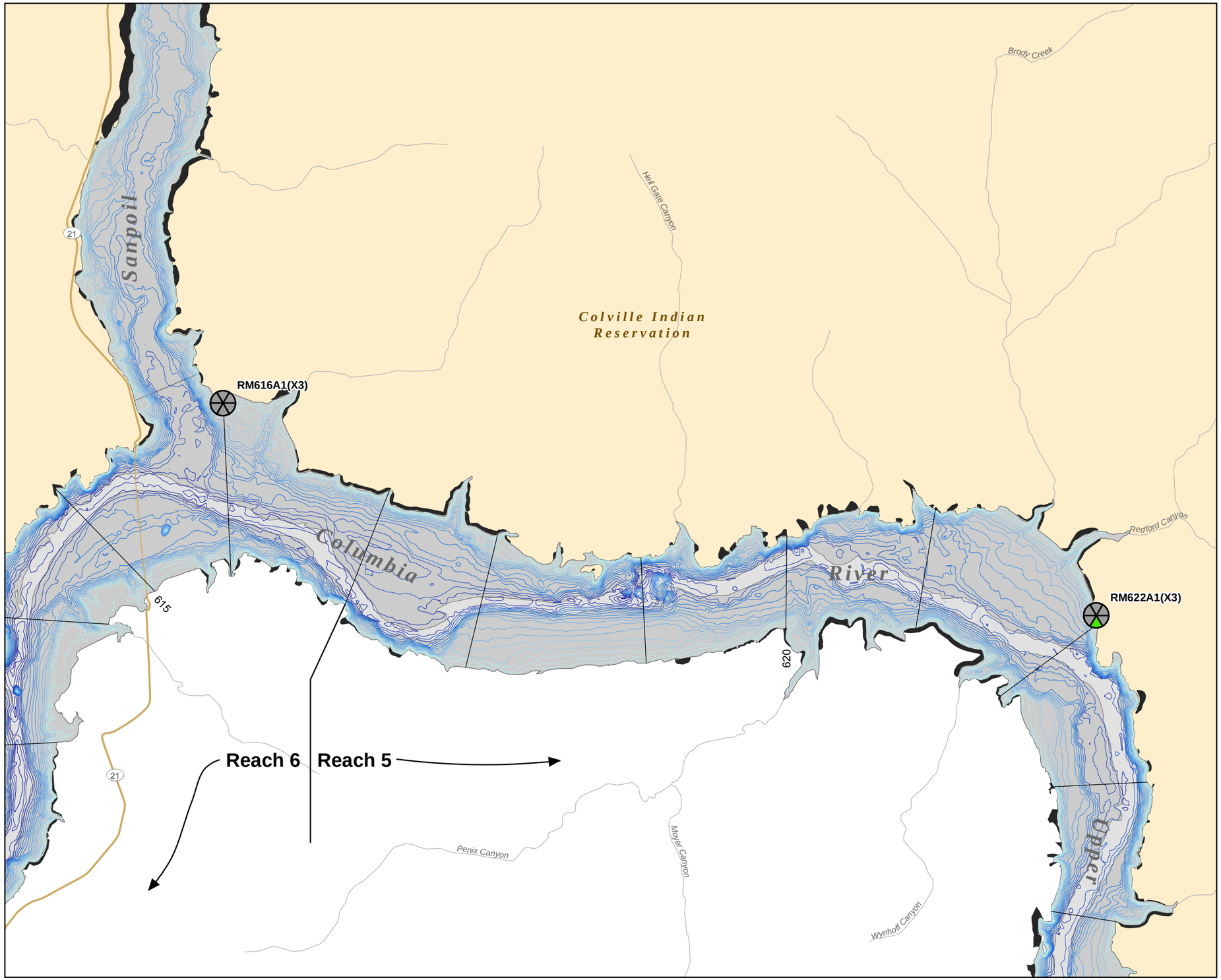
4. >10-20% = endpoint was greater than 10 and less than or equal to 20 percent below the reference envelope criterion.
5. >20% = endpoint was greater than 20 percent below the reference envelope criterion.
6. * Ceriodaphnia toxicity data were not available for this sample.
7. Due to differing results from the two test runs performed at RM685R1, RM686R1, and RM721R1, both charts are displayed at these locations.
8. Bottom elevations based on 1949 NOAA bathymetric survey.

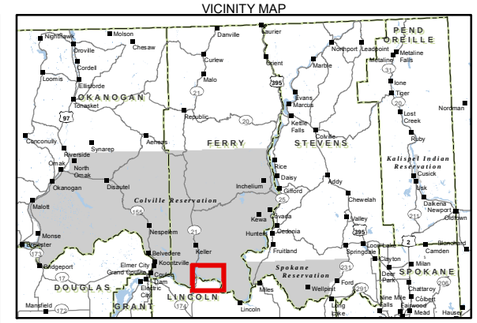
N

0 0.75
Miles

FIGURE 6-20
Results of Sediment Toxicity Testing Relative to the Reference Envelope for River Miles 627 to 639
CERCLA RI/FS 2005 Sediment Toxicity Evaluation
Upper Columbia River Project

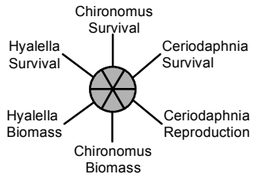


VICINITY MAP



LEGEND

2005 Sediment Sampling



- ≥ REC
- < REC but ≥ TAC
- >0-10%
- >10-20%
- >20%

Bottom Elevation

- 880 - 930
- 931 - 980
- 981 - 1030
- 1031 - 1080
- 1081 - 1130
- 1131 - 1180
- 1181 - 1230
- 1231 - 1280

Other Features

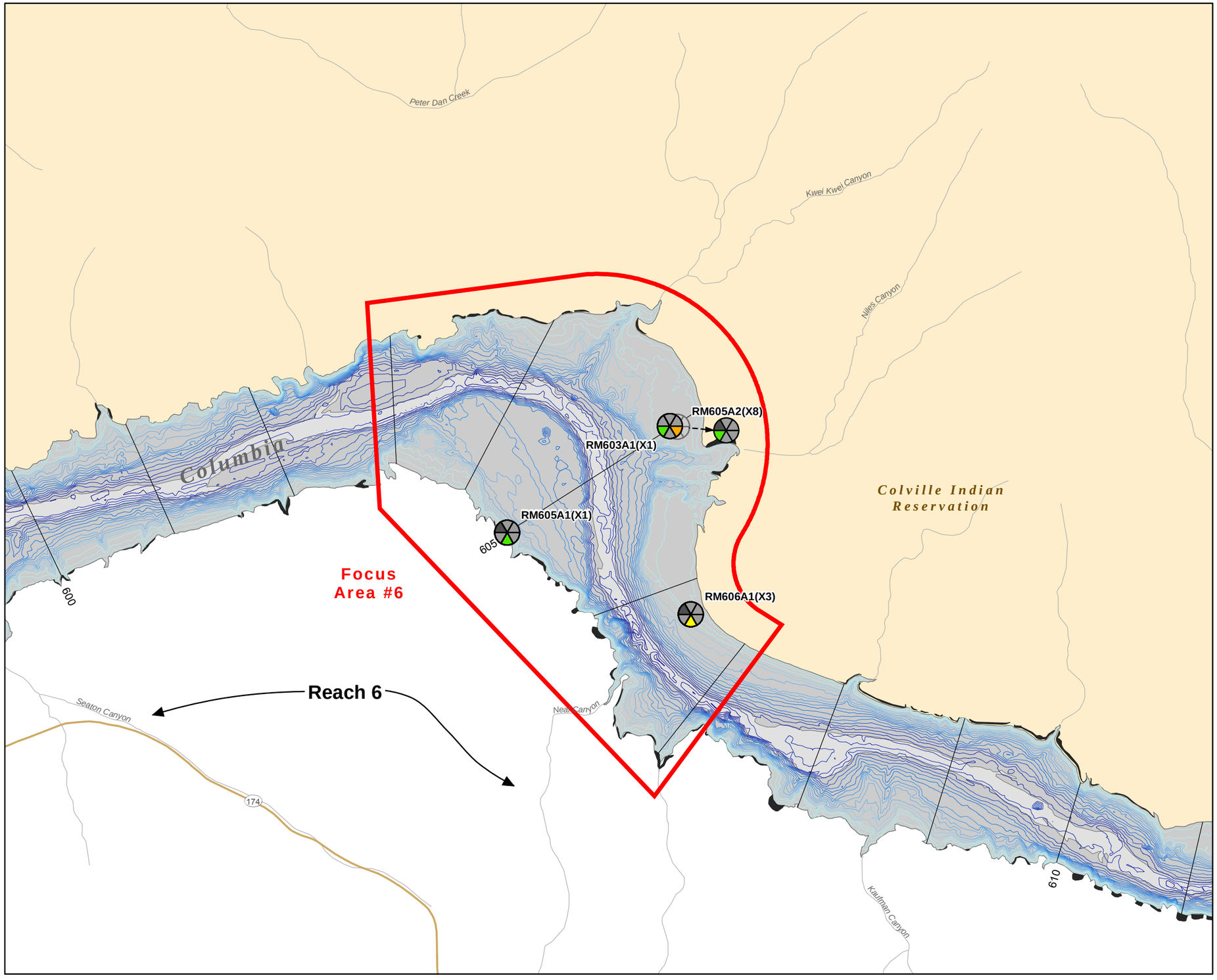
- Tribal Lands
- Water
- Original River Channel
- Landslides
- Cities
- Transect Lines
- Highway
- Major Road

Notes:
1. ≥ REC = endpoint was within the reference envelope criterion.
2. < REC but ≥ TAC = endpoint did not meet reference envelope criterion, but was within the test acceptability criterion for controls.
3. >0-10% = endpoint was less than or equal to 10 percent below the reference envelope criterion.
4. >10-20% = endpoint was greater than 10 and less than or equal to 20 percent below the reference envelope criterion.
5. >20% = endpoint was greater than 20 percent below the reference envelope criterion.
6. * Ceriodaphnia toxicity data were not available for this sample.
7. Due to differing results from the two test runs performed at RM685R1, RM686R1, and RM721R1, both charts are displayed at these locations.
8. Bottom elevations based on 1949 NOAA bathymetric survey.

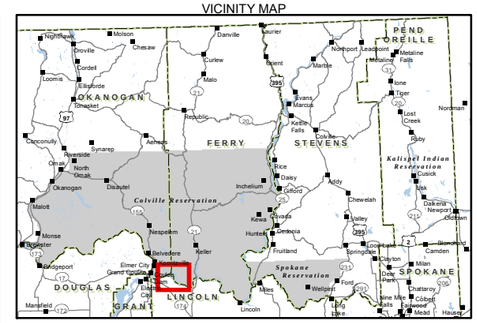
N

0 0.75
Miles

FIGURE 6-21
Results of Sediment Toxicity Testing Relative to the Reference Envelope for River Miles 613 to 624
CERCLA RI/FS 2005 Sediment Toxicity Evaluation
Upper Columbia River Project

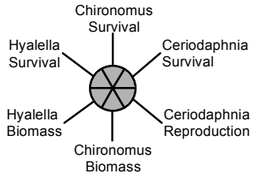


VICINITY MAP



LEGEND

2005 Sediment Sampling



- ≥ REC
- < REC but ≥ TAC
- >0-10%
- >10-20%
- >20%

Bottom Elevation

- 880 - 930
- 931 - 980
- 981 - 1030
- 1031 - 1080
- 1081 - 1130
- 1131 - 1180
- 1181 - 1230
- 1231 - 1280

Other Features

- Tribal Lands
- Water
- Original River Channel
- Landslides
- Cities
- Transect Lines
- Highway
- Major Road

Notes:
1. ≥ REC = endpoint was within the reference envelope criterion.
2. < REC but ≥ TAC = endpoint did not meet reference envelope criterion, but was within the test acceptability criterion for controls.
3. >0-10% = endpoint was less than or equal to 10 percent below the reference envelope criterion.
4. >10-20% = endpoint was greater than 10 and less than or equal to 20 percent below the reference envelope criterion.
5. >20% = endpoint was greater than 20 percent below the reference envelope criterion.
6. * Ceriodaphnia toxicity data were not available for this sample.
7. Due to differing results from the two test runs performed at RM685R1, RM686R1, and RM721R1, both charts are displayed at these locations.
8. Bottom elevations based on 1949 NOAA bathymetric survey.

N

0 0.75
Miles

FIGURE 6-22
Results of Sediment Toxicity Testing Relative to the Reference Envelope for River Miles 600 to 611

CERCLA RI/FS 2005 Sediment Toxicity Evaluation
Upper Columbia River Project

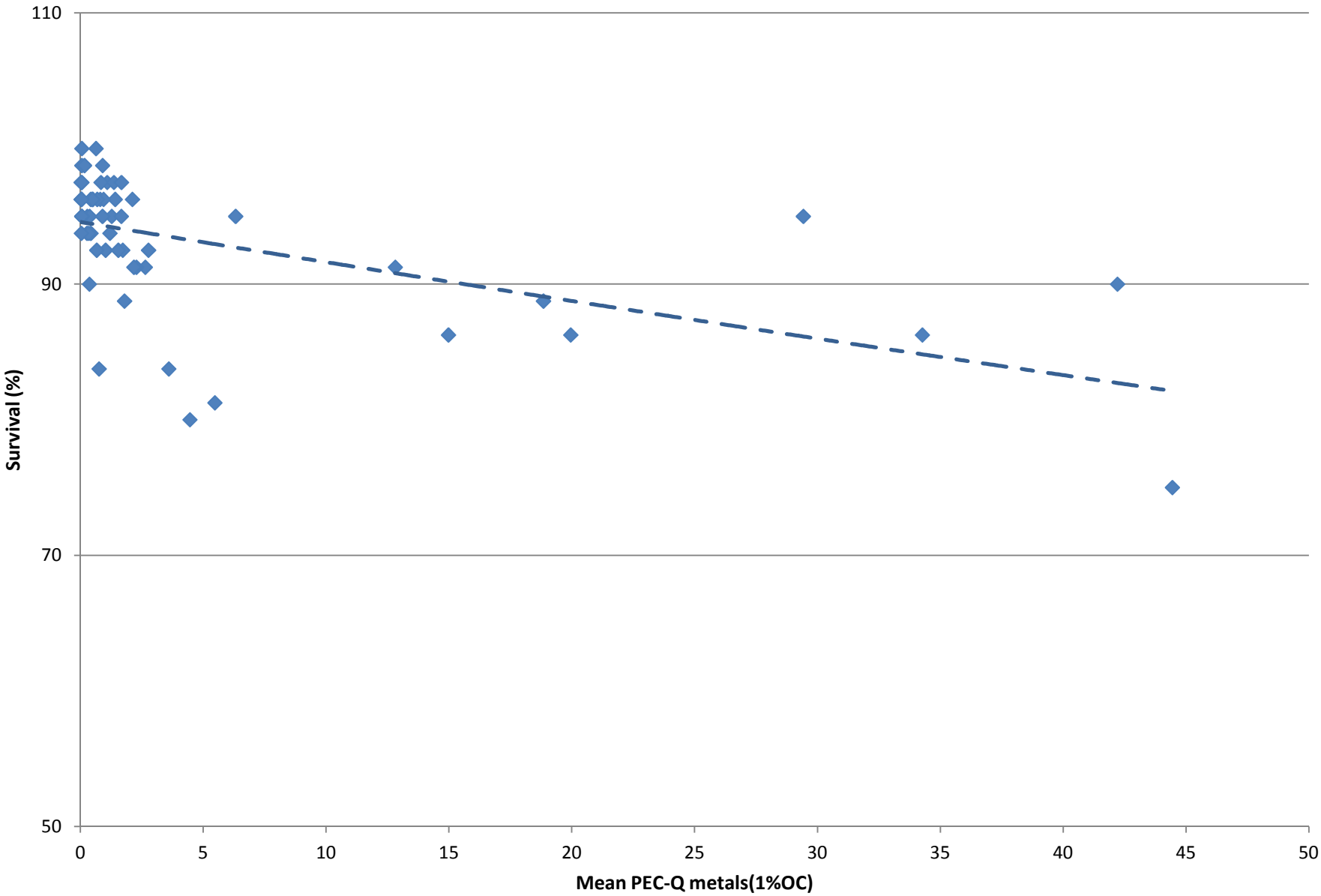


Figure 6-23

Relationship Between *Hyalella* Survival and Mean PEC-$Q_{metals(1\% OC)}$

Upper Columbia River RI/FS

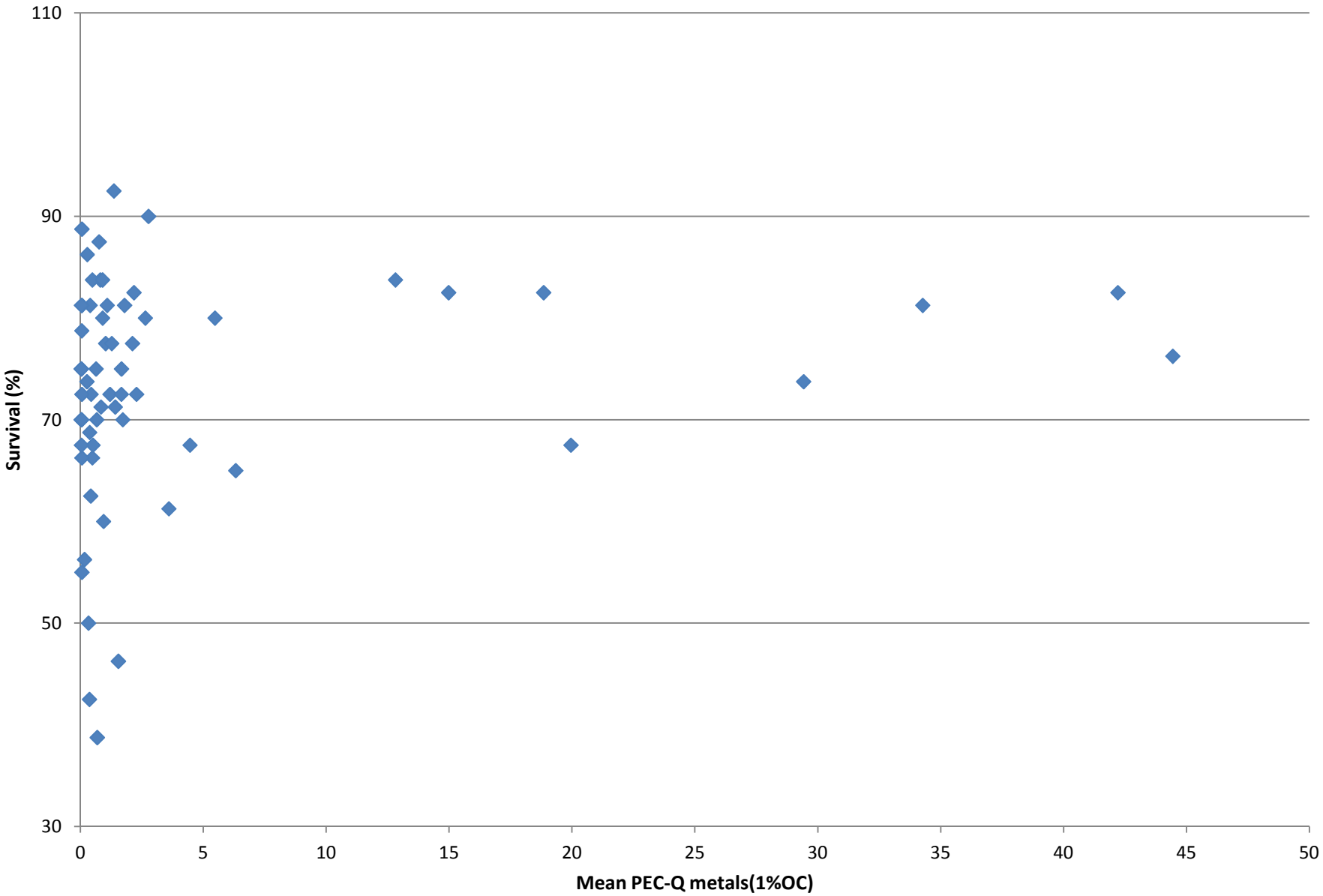


Figure 6-24

Relationship Between *Chironomus* Survival and Mean PEC-$Q_{metals(1\% OC)}$

Upper Columbia River RI/FS

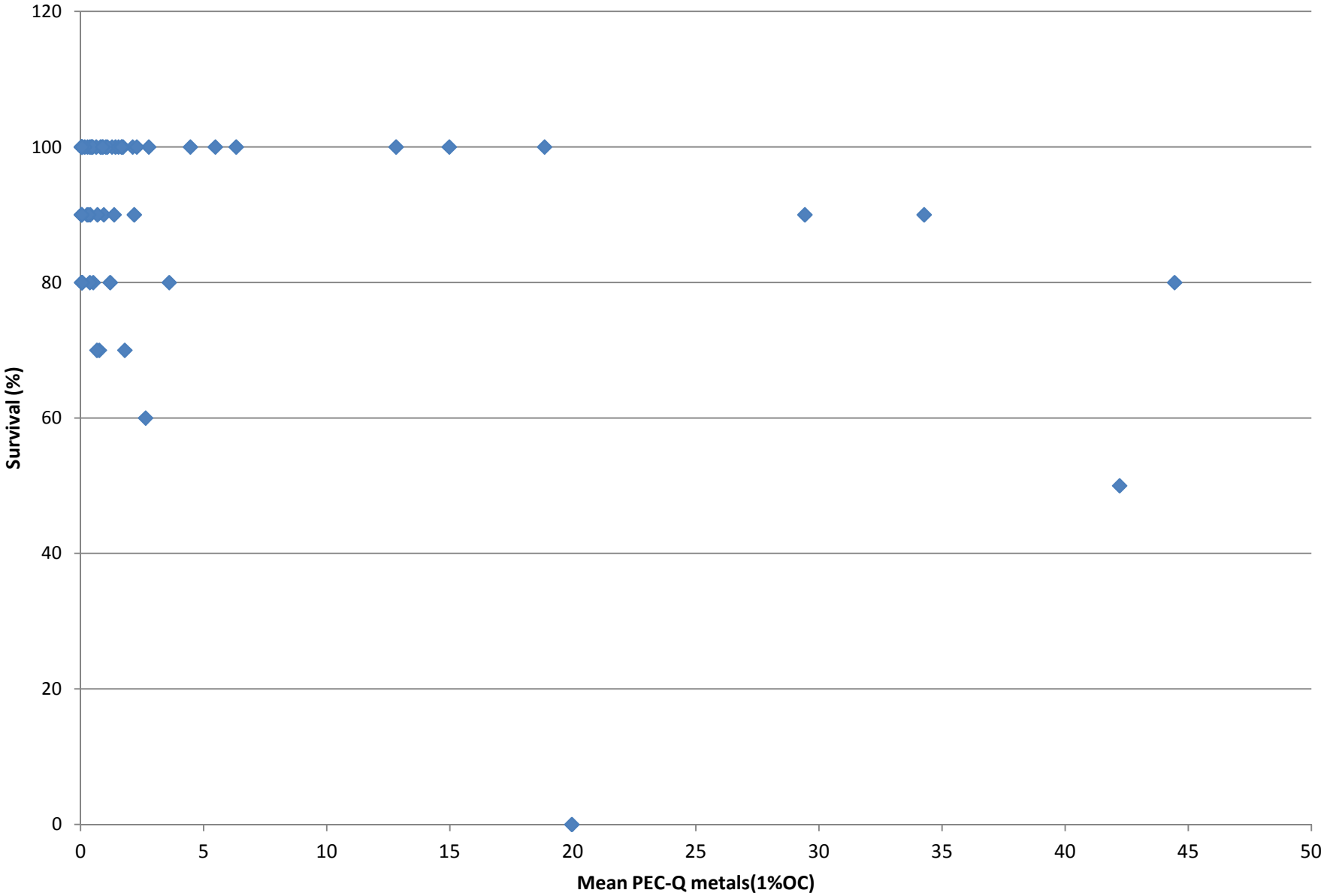


Figure 6-25

Relationship Between *Ceriodaphnia* Survival and Mean PEC-$Q_{metals(1\%\ OC)}$

Upper Columbia River RI/FS

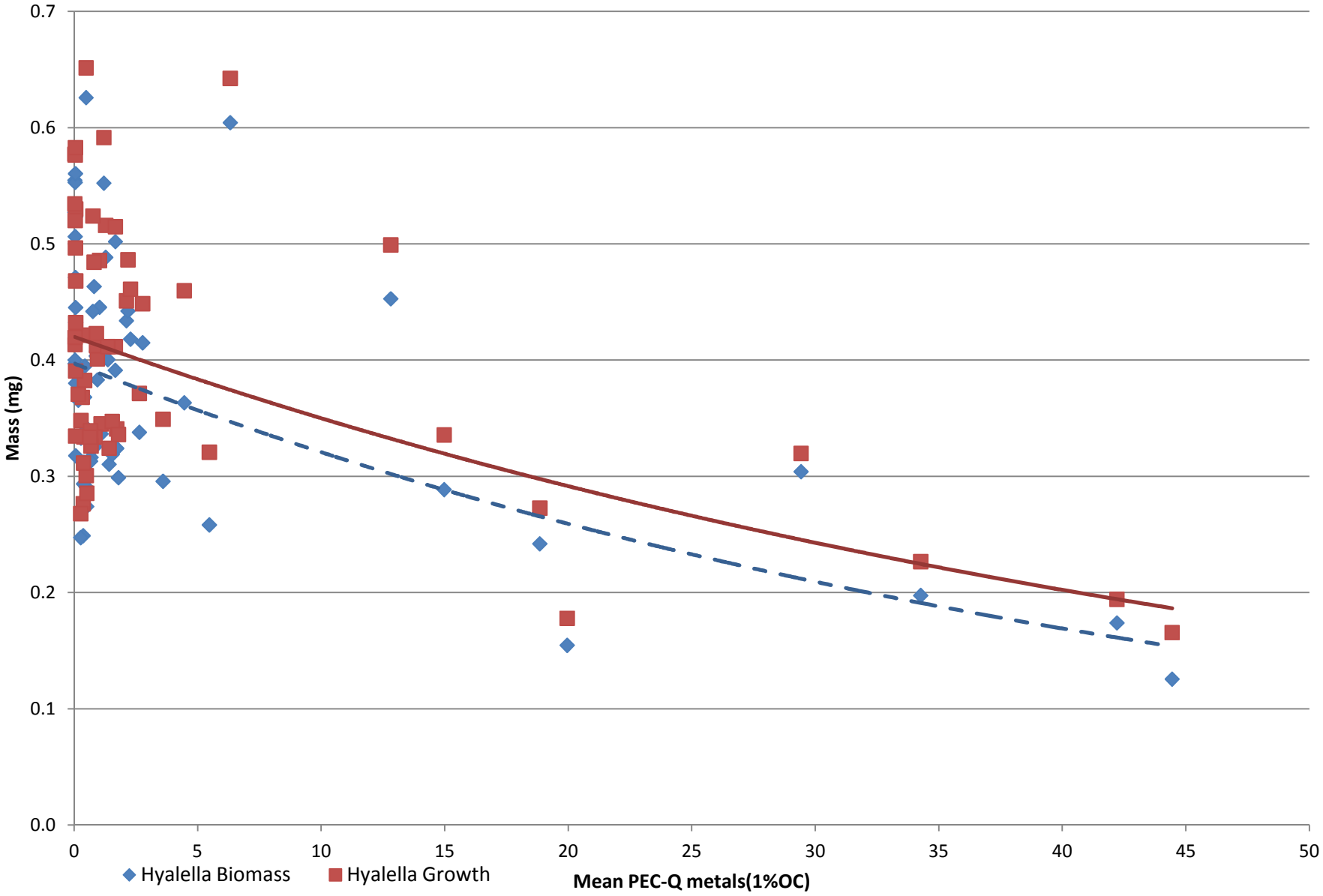


Figure 6-26

Relationship Between *Hyalella* Growth and Mean PEC-$Q_{metals(1\%\ OC)}$

Upper Columbia River RI/FS

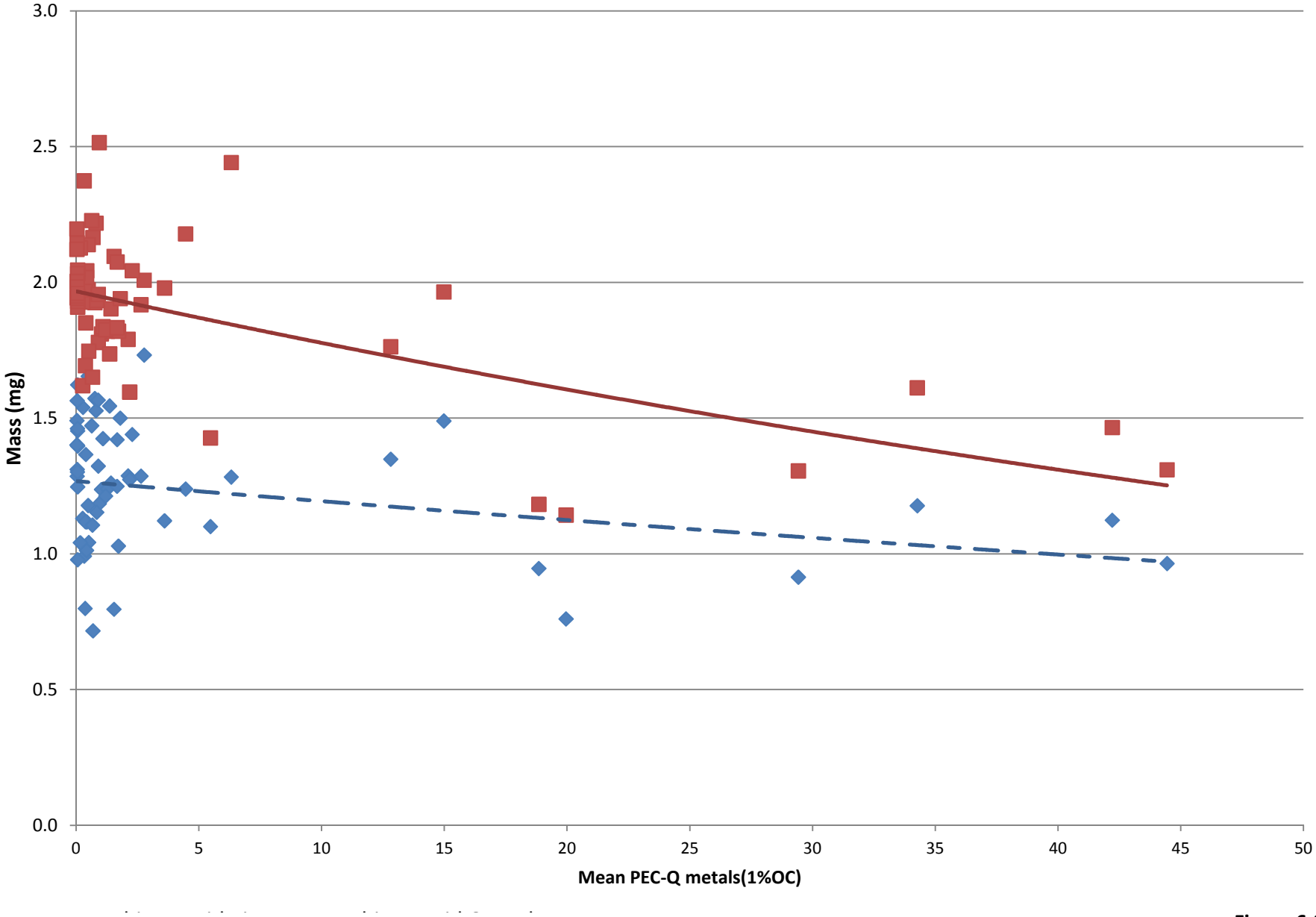


Figure 6-27

Relationship Between *Chironomus* Growth and Mean PEC-$Q_{metals(1\%\ OC)}$

Upper Columbia River RI/FS

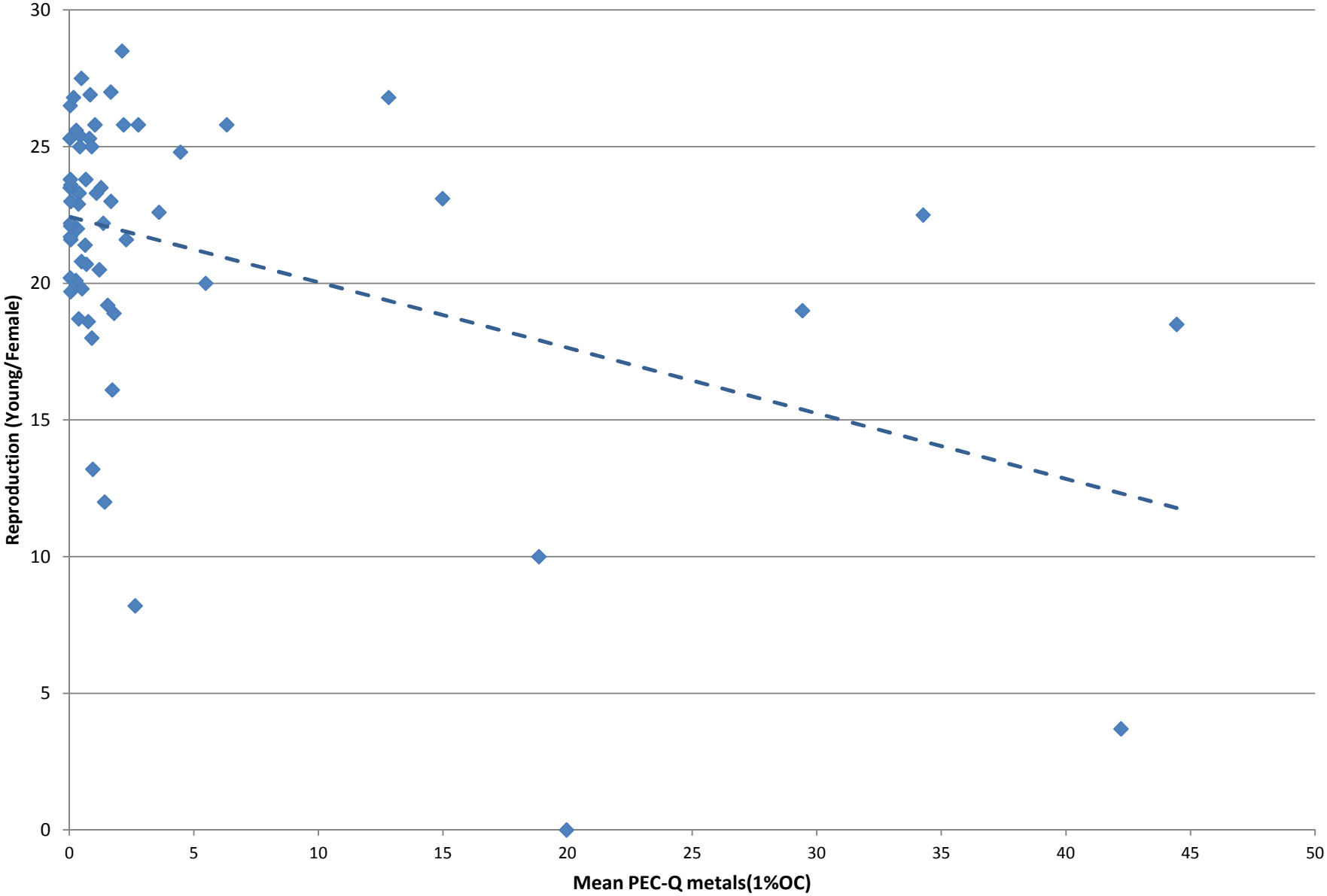


Figure 6-28

Relationship Between *Ceriodaphnia* Reproduction and Mean PEC-$Q_{metals(1\%\ OC)}$

Upper Columbia River RI/FS

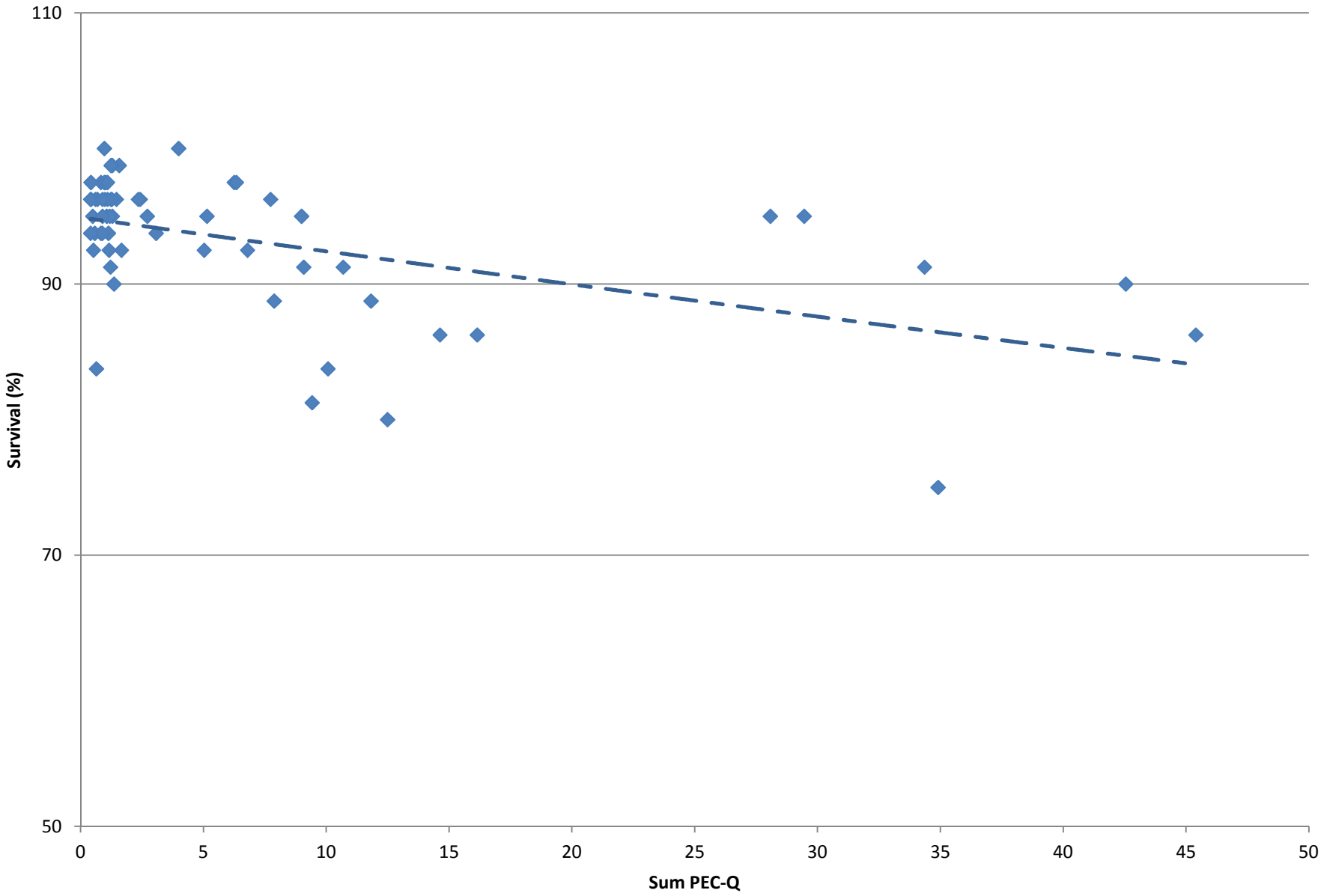


Figure 6-29

Relationship Between *Hyalella* Survival and Sum PEC-Q

Upper Columbia River RI/FS

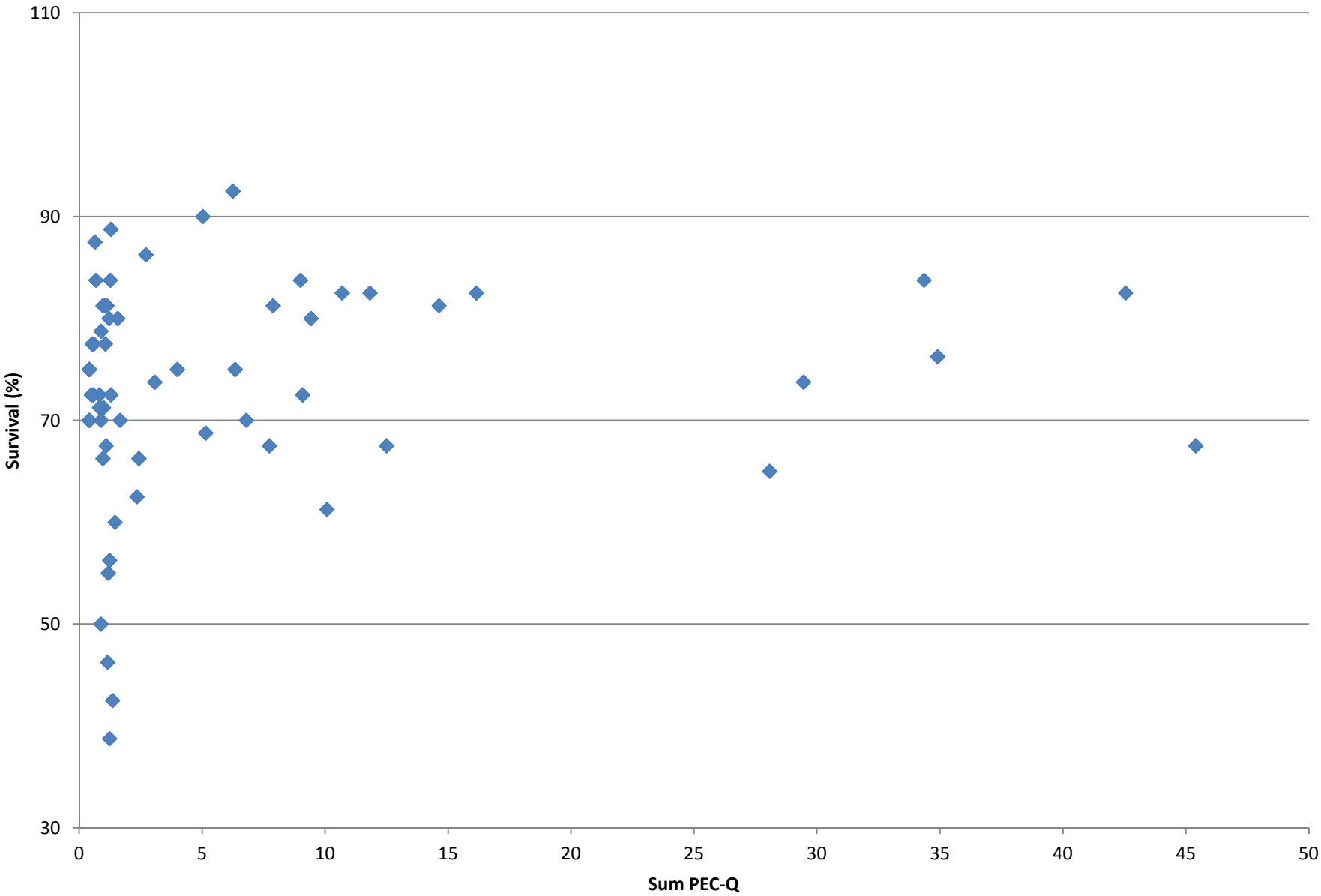


Figure 6-30

Relationship Between *Chironomus* Survival and Sum PEC-Q

Upper Columbia River RI/FS

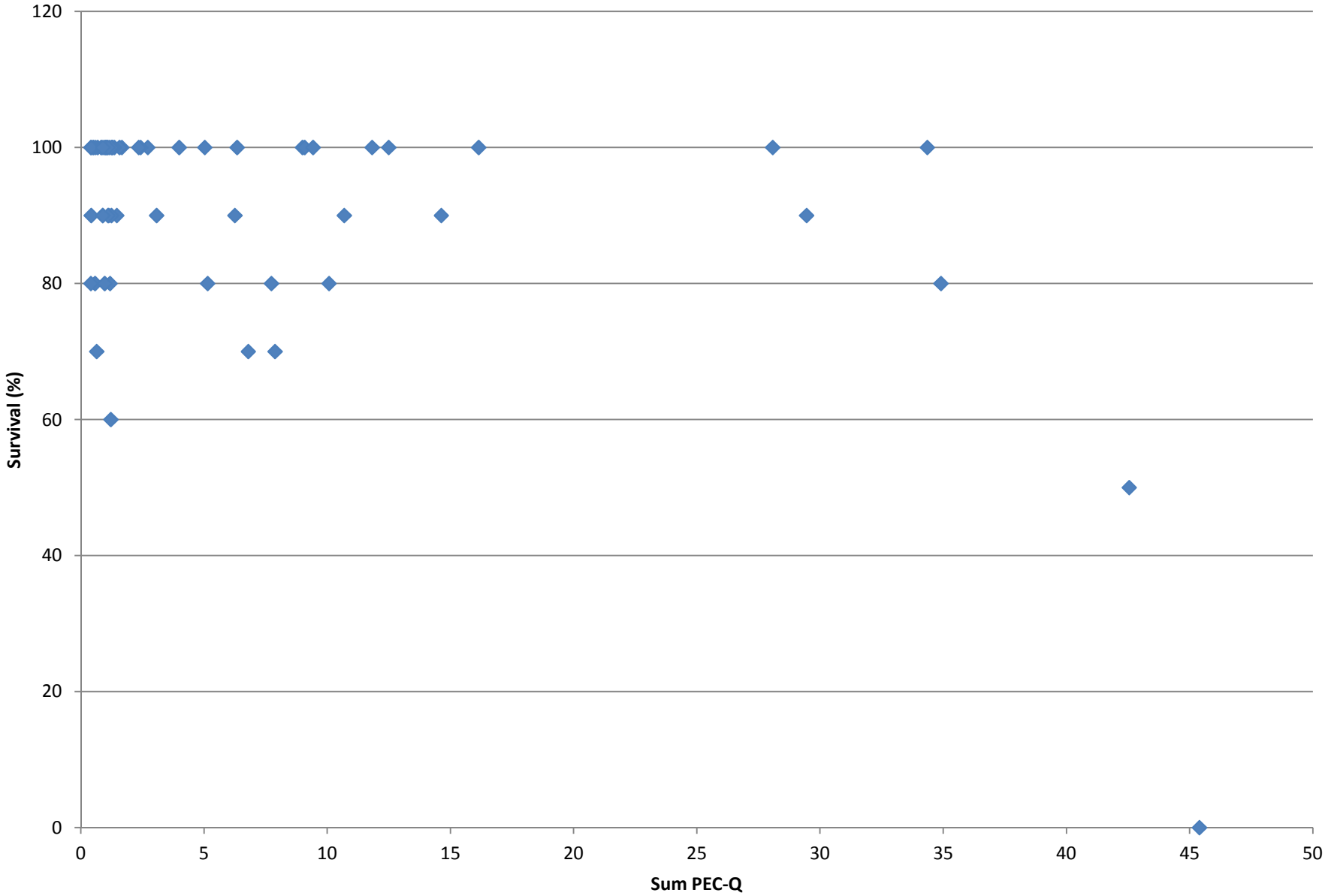


Figure 6-31

Relationship Between *Ceriodaphnia* Survival and Sum PEC-Q

Upper Columbia River RI/FS

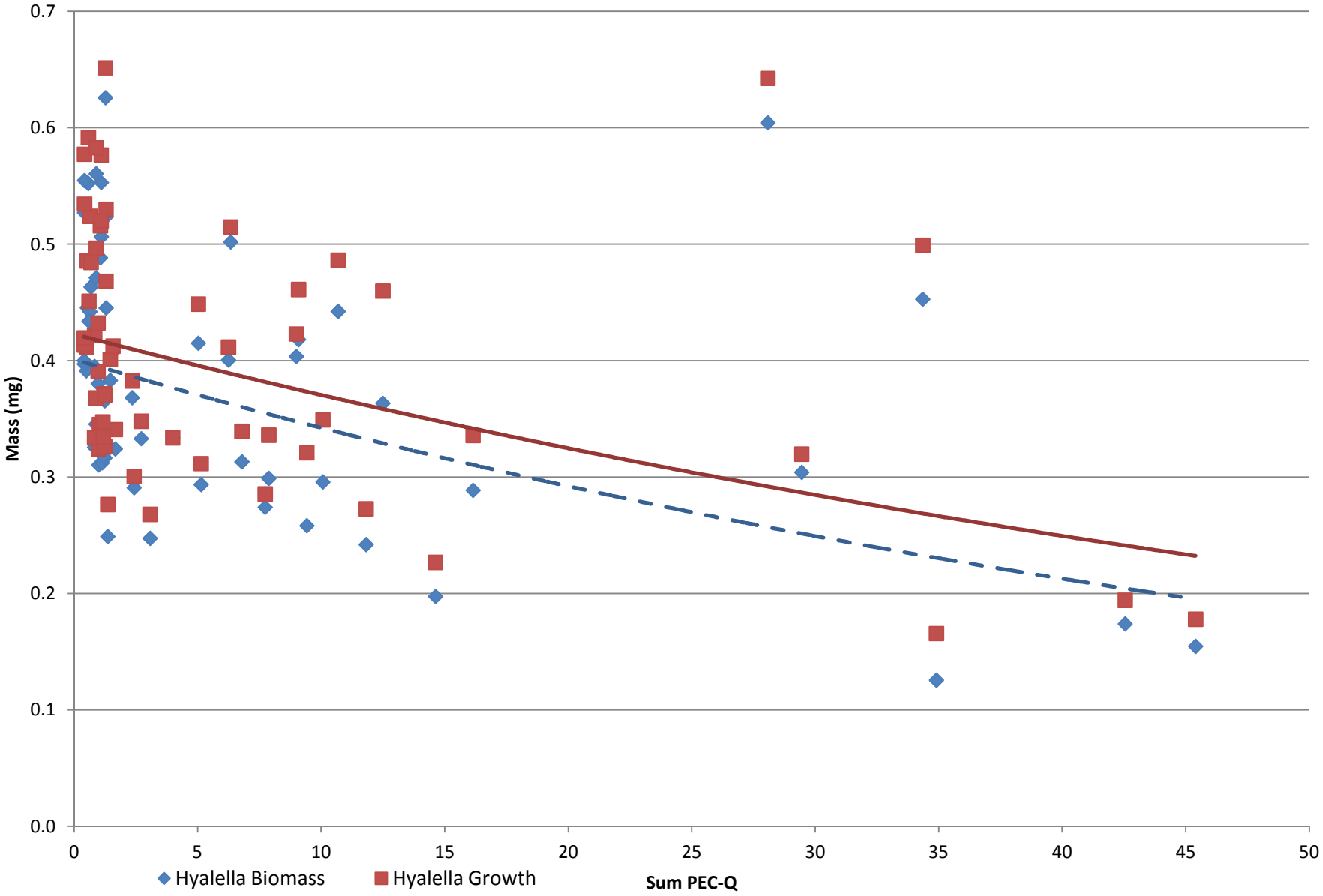


Figure 6-32
Relationship Between *Hyalella* Growth and Sum PEC-Q
Upper Columbia River RI/FS

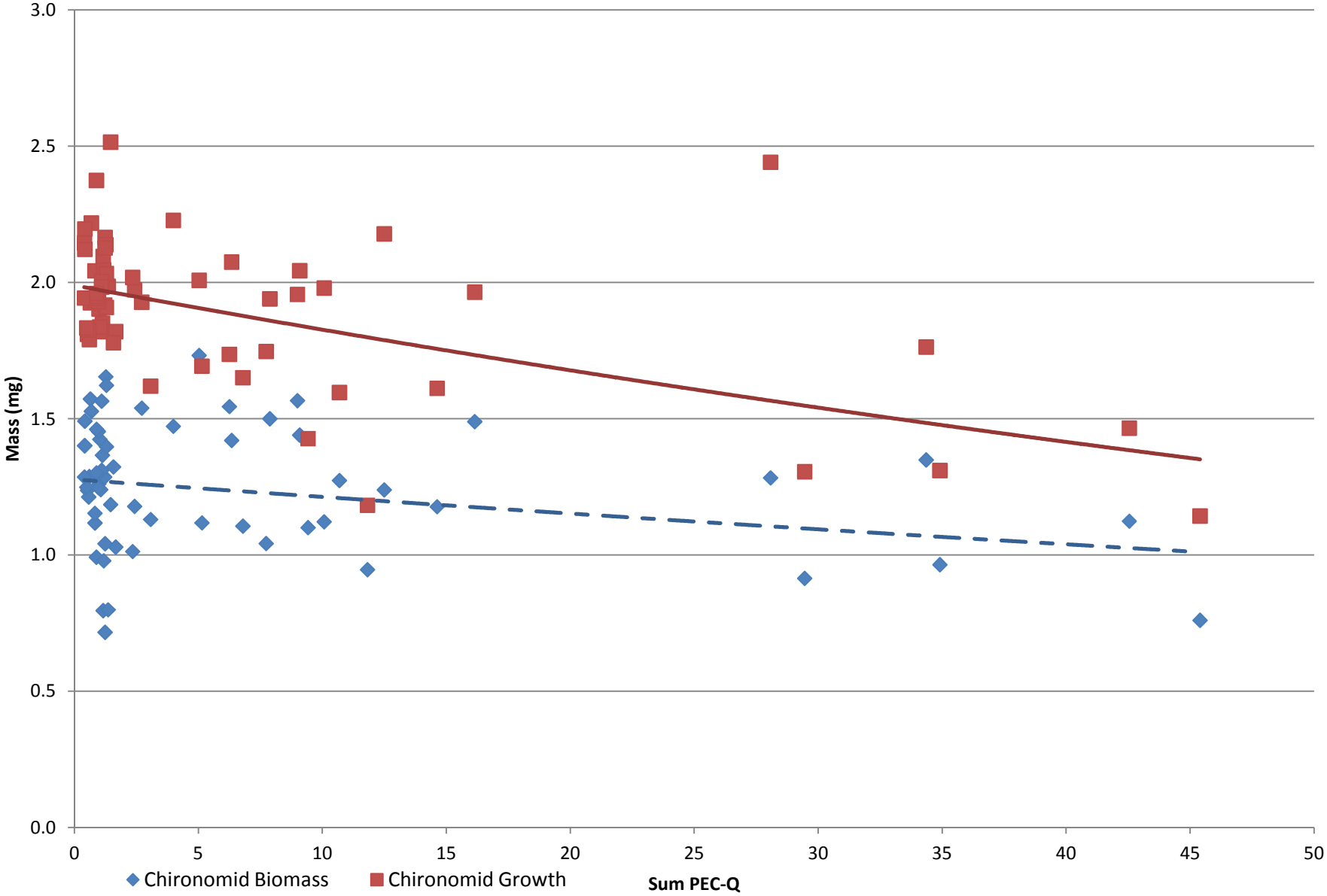


Figure 6-33

Relationship Between *Chironomus* Growth and Sum PEC-Q

Upper Columbia River RI/FS

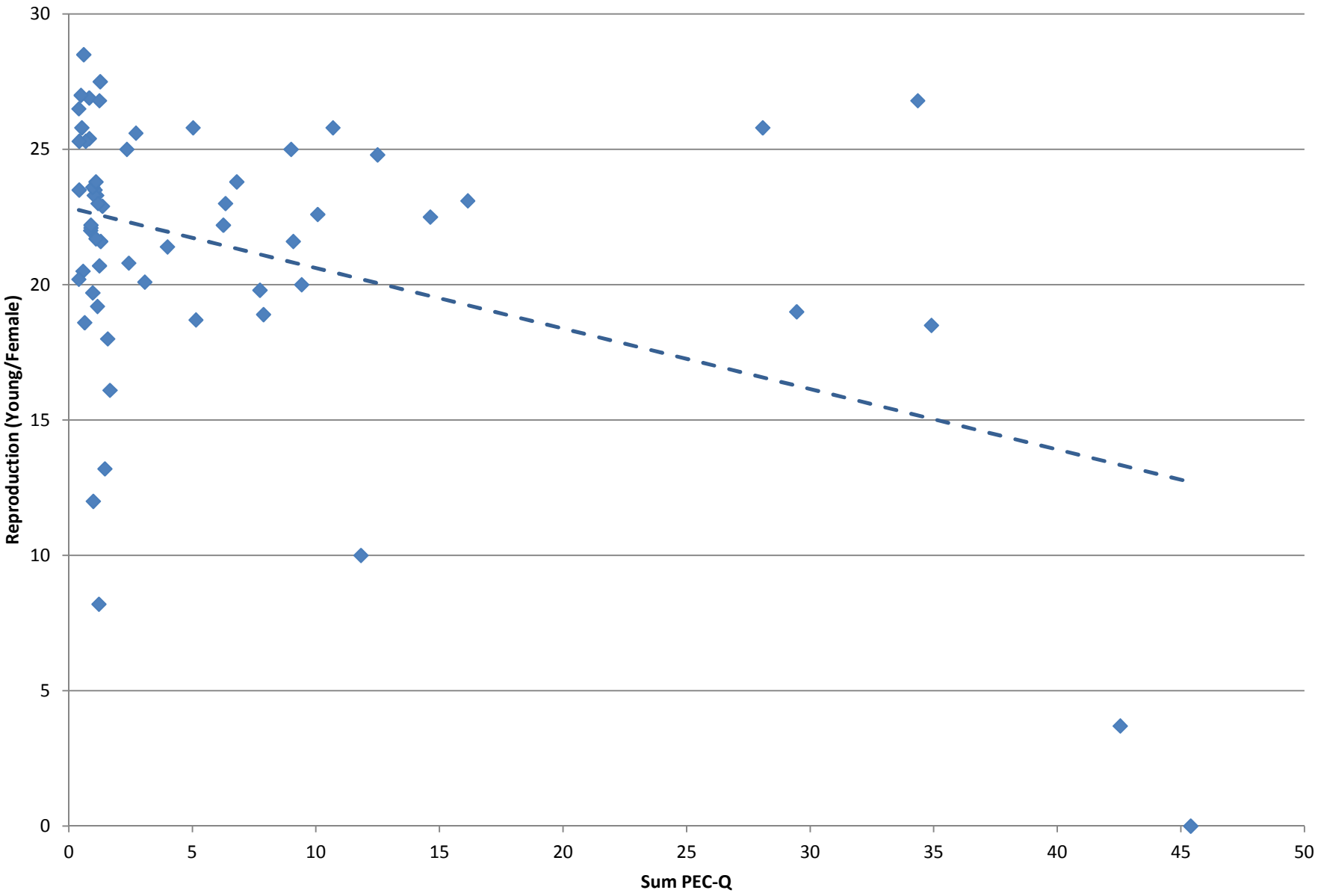


Figure 6-34
Relationship Between *Ceriodaphnia* Reproduction and Sum PEC-Q
Upper Columbia River RI/FS

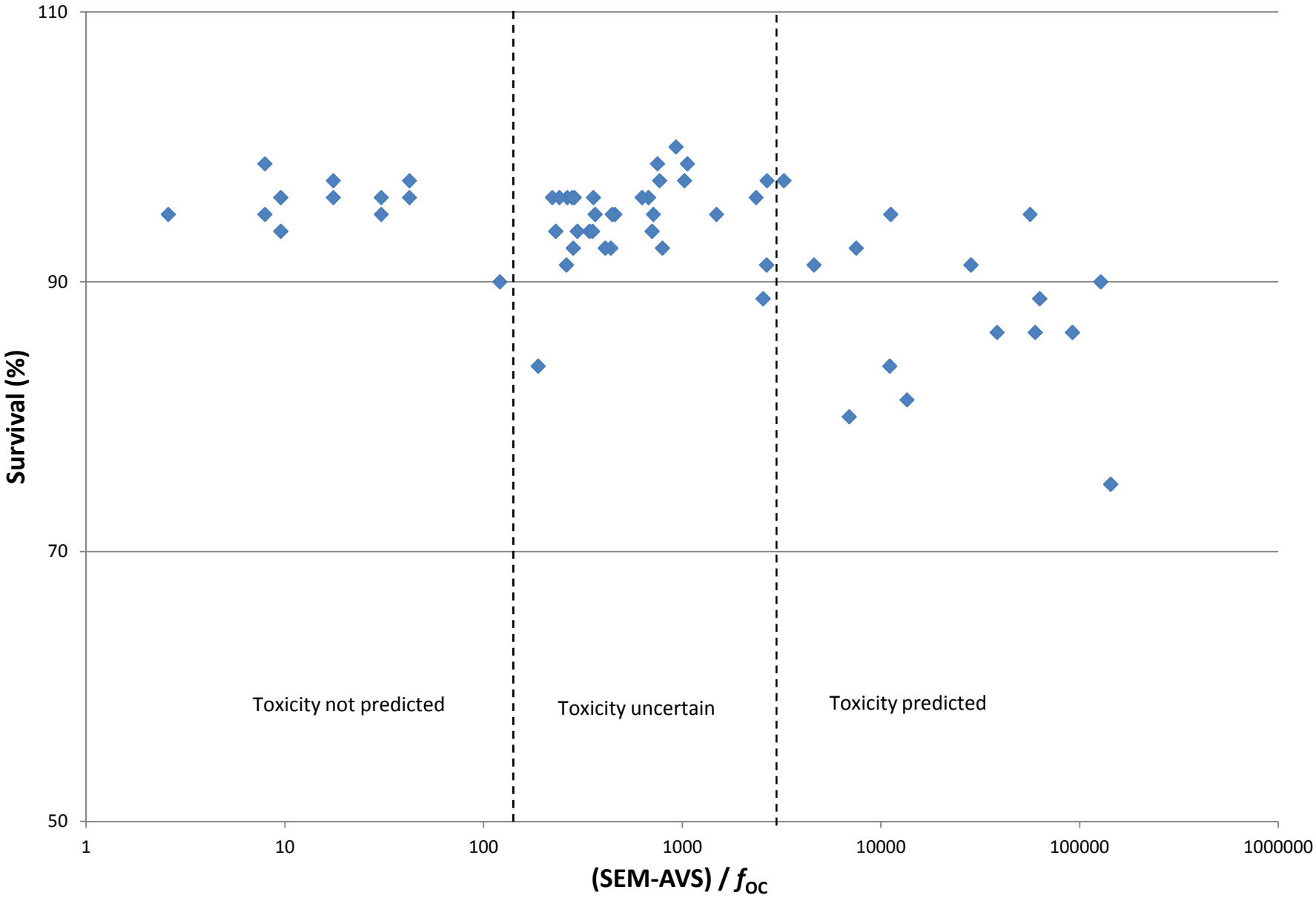


Figure 6-35

Relationship Between *Hyalella* Survival and (SEM-AVS) / f_{OC}

Upper Columbia River RI/FS

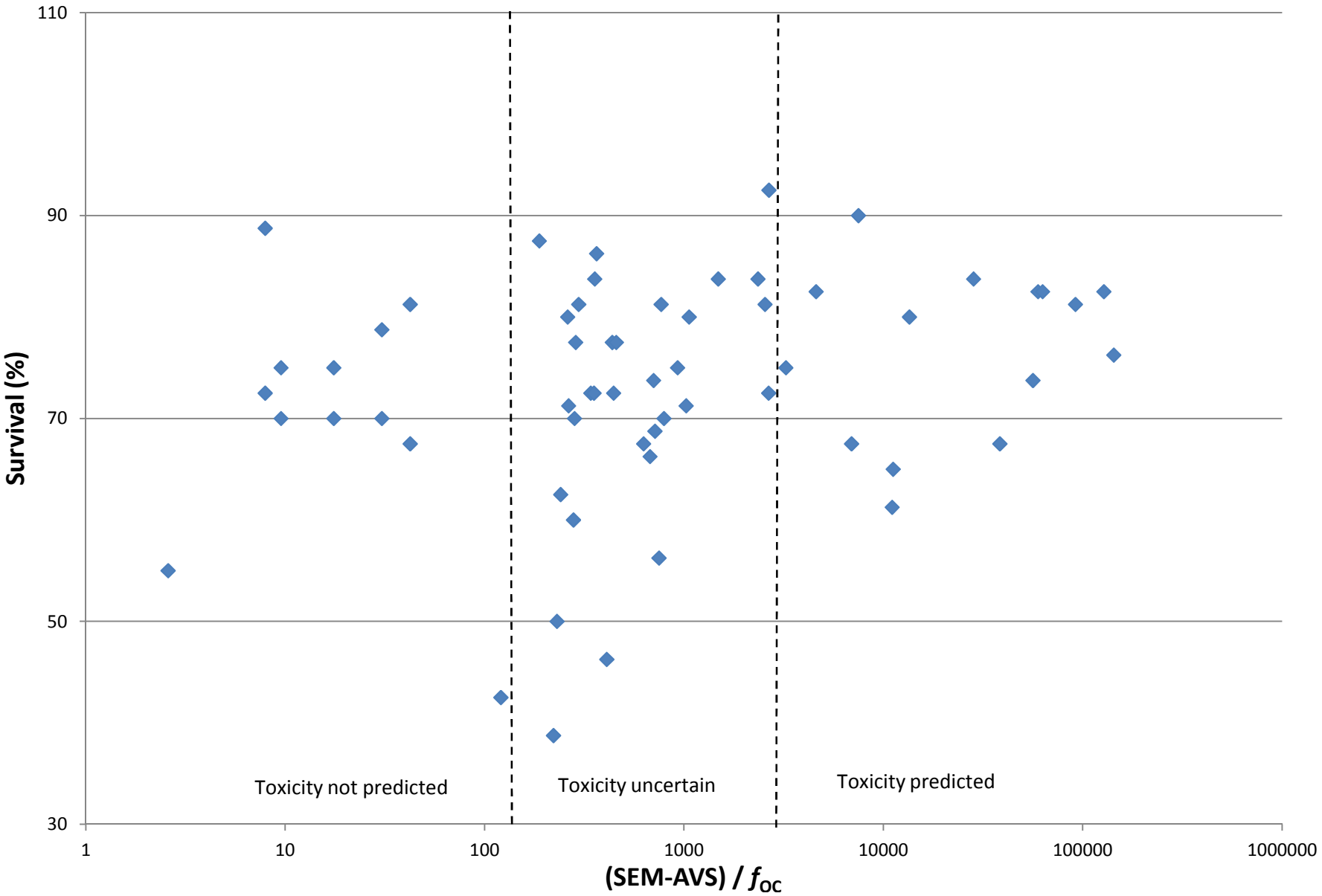


Figure 6-36

Relationship Between *Chironomus* Survival and (SEM-AVS) / f_{OC}

Upper Columbia River RI/FS

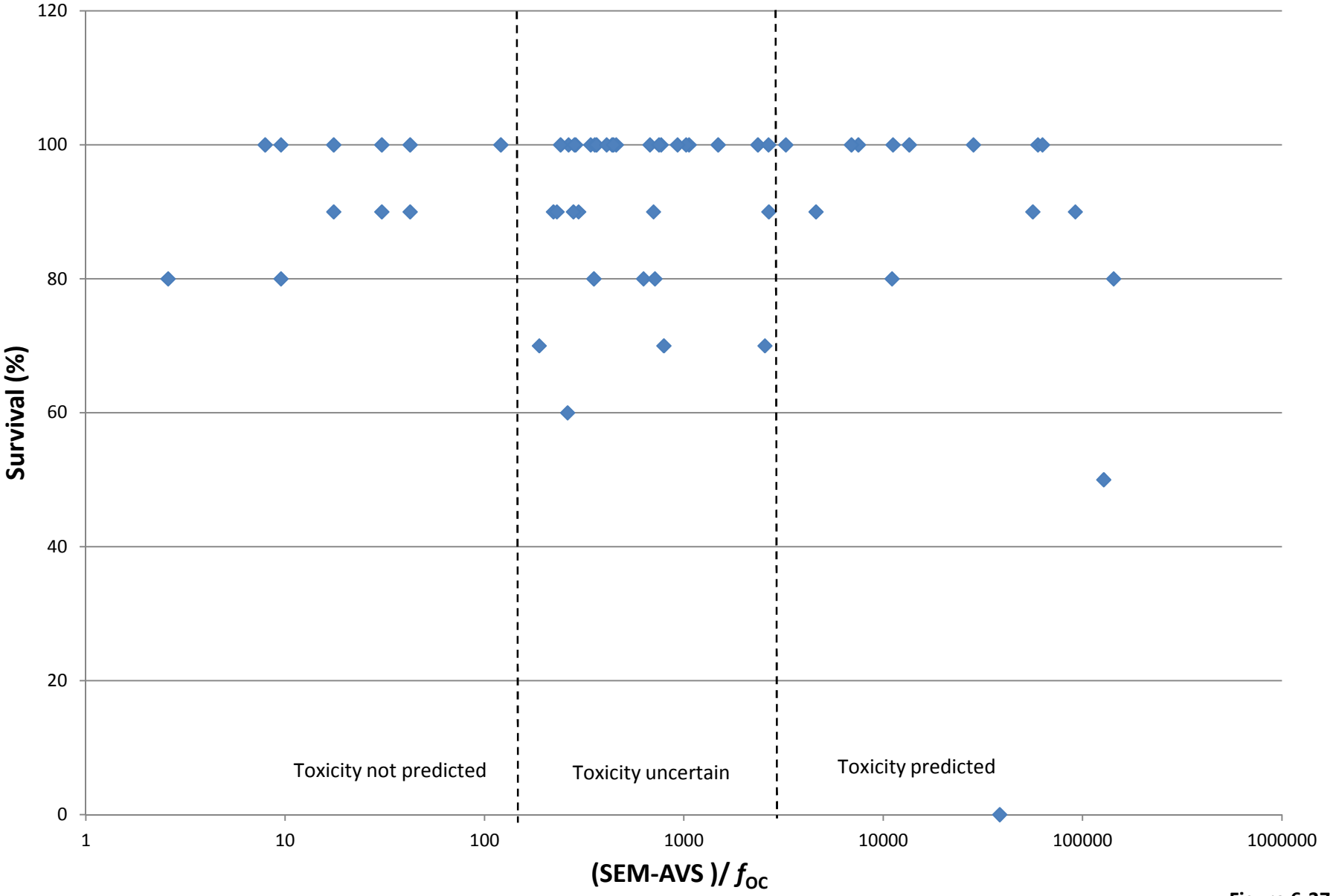


Figure 6-37

Relationship Between *Ceriodaphnia* Survival and (SEM-AVS) / f_{OC}

Upper Columbia River RI/FS

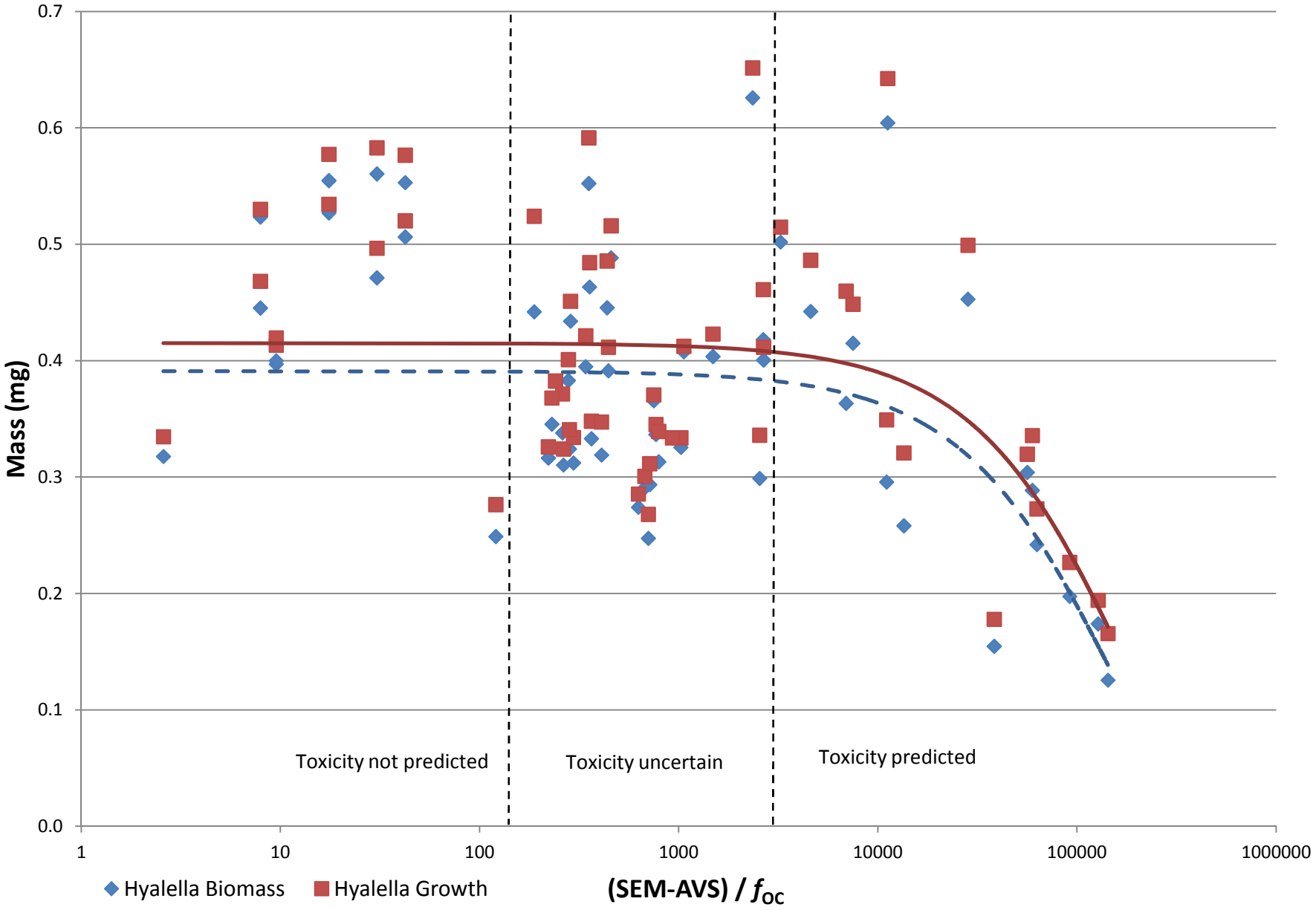


Figure 6-38

Relationship Between *Hyalella* Growth and (SEM-AVS) / f_{OC}

Upper Columbia River RI/FS

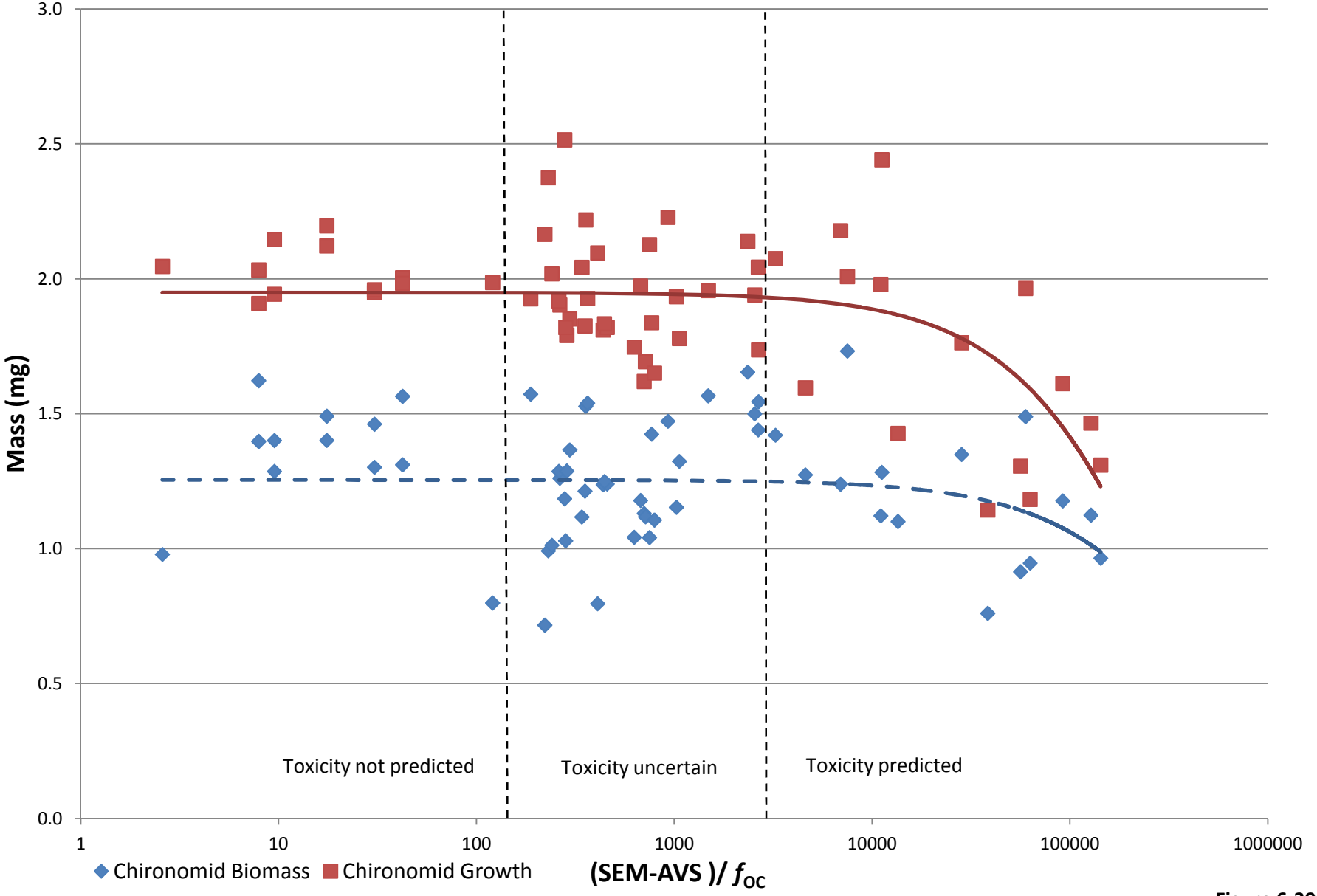


Figure 6-39

Relationship Between *Chironomus* Growth and (SEM-AVS) / f_{OC}

Upper Columbia River RI/FS

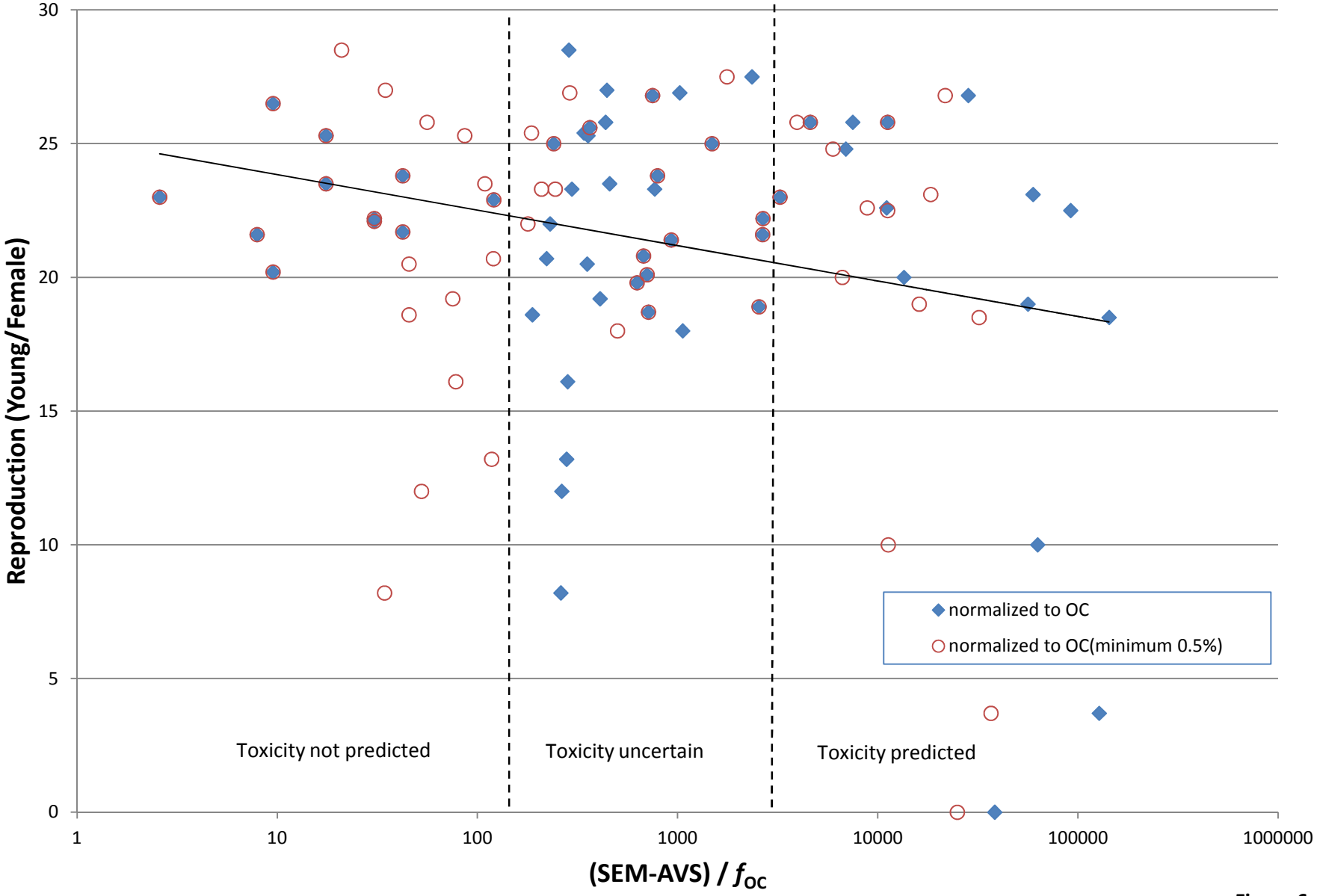


Figure 6-40

Relationship Between *Ceriodaphnia* Reproduction and (SEM-AVS) / f_{OC}

Upper Columbia River RI/FS

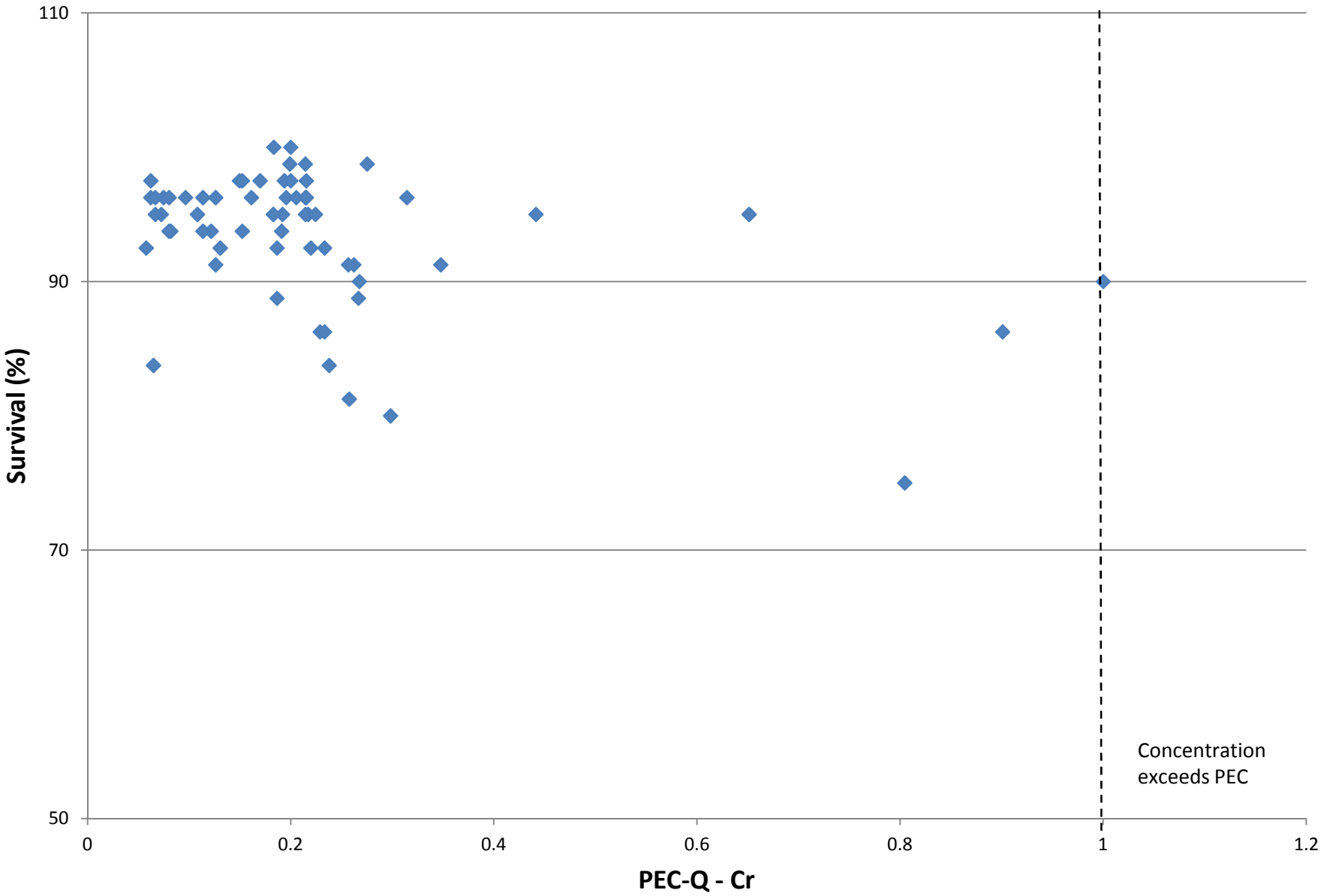


Figure 6-41

Relationship Between *Hyalella* Survival and PEC-Q - Chromium

Upper Columbia River RI/FS

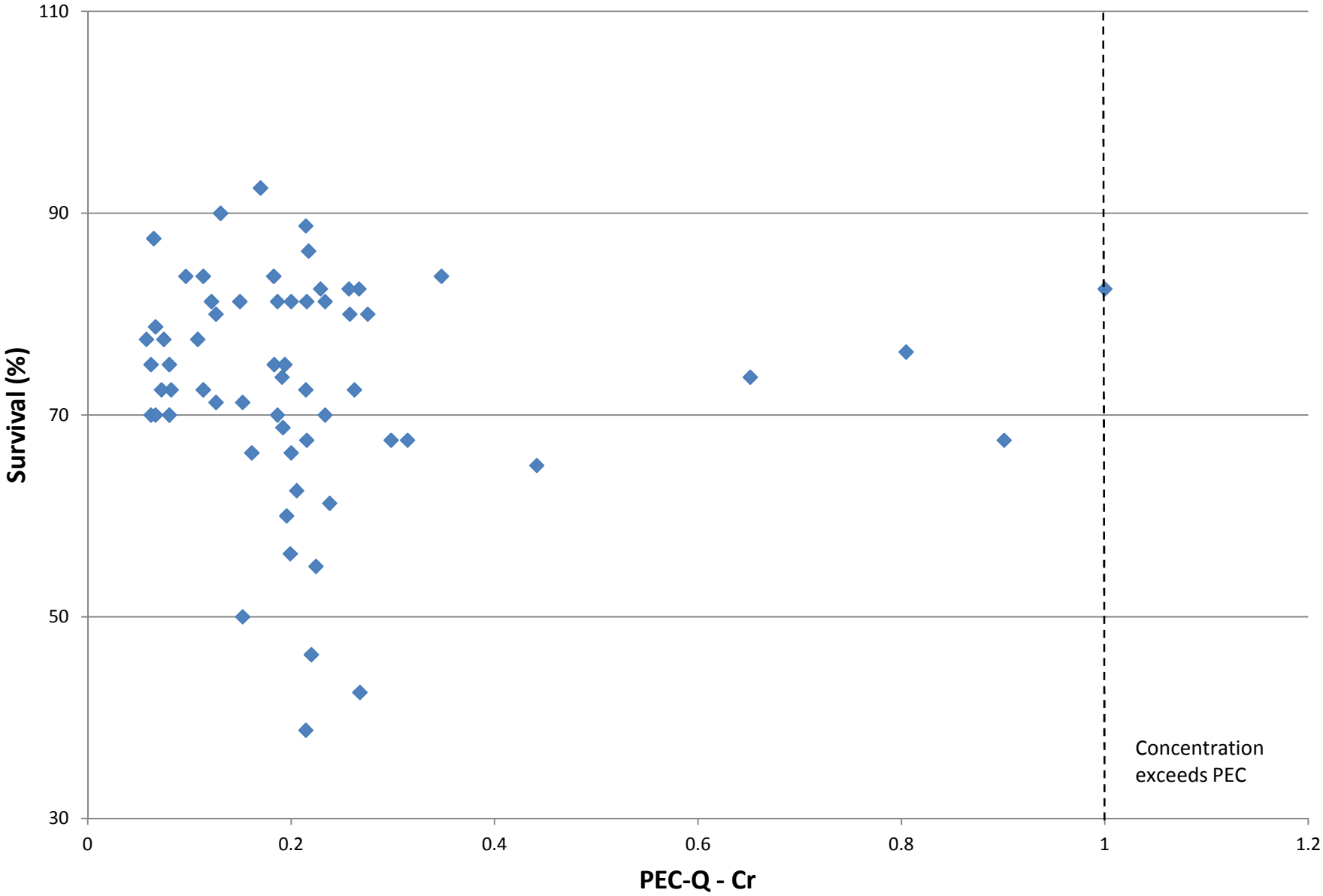


Figure 6-42

Relationship Between *Chironomus* Survival and PEC-Q - Chromium

Upper Columbia River RI/FS

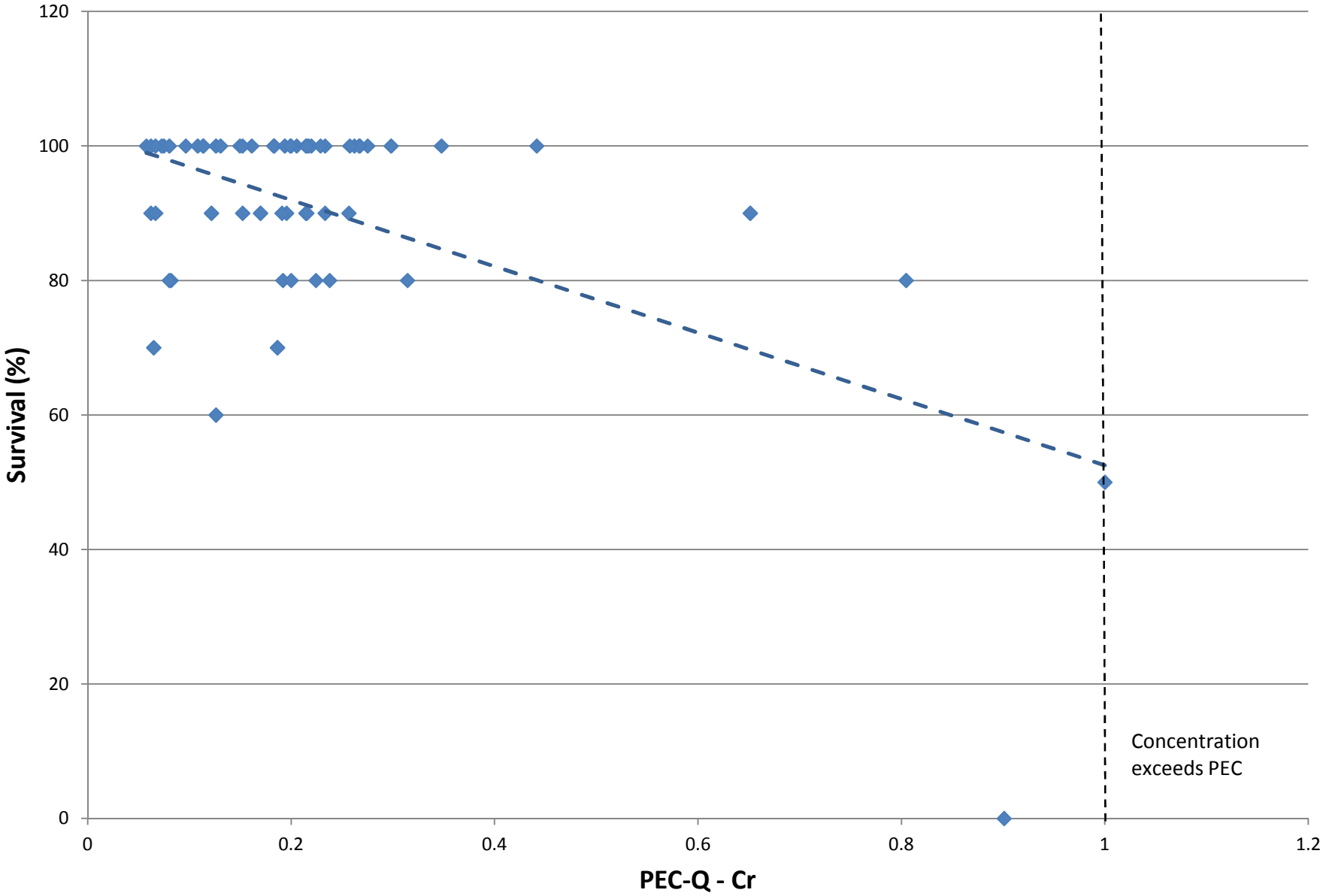


Figure 6-43

Relationship Between *Ceriodaphnia* Survival and PEC-Q - Chromium

Upper Columbia River RI/FS

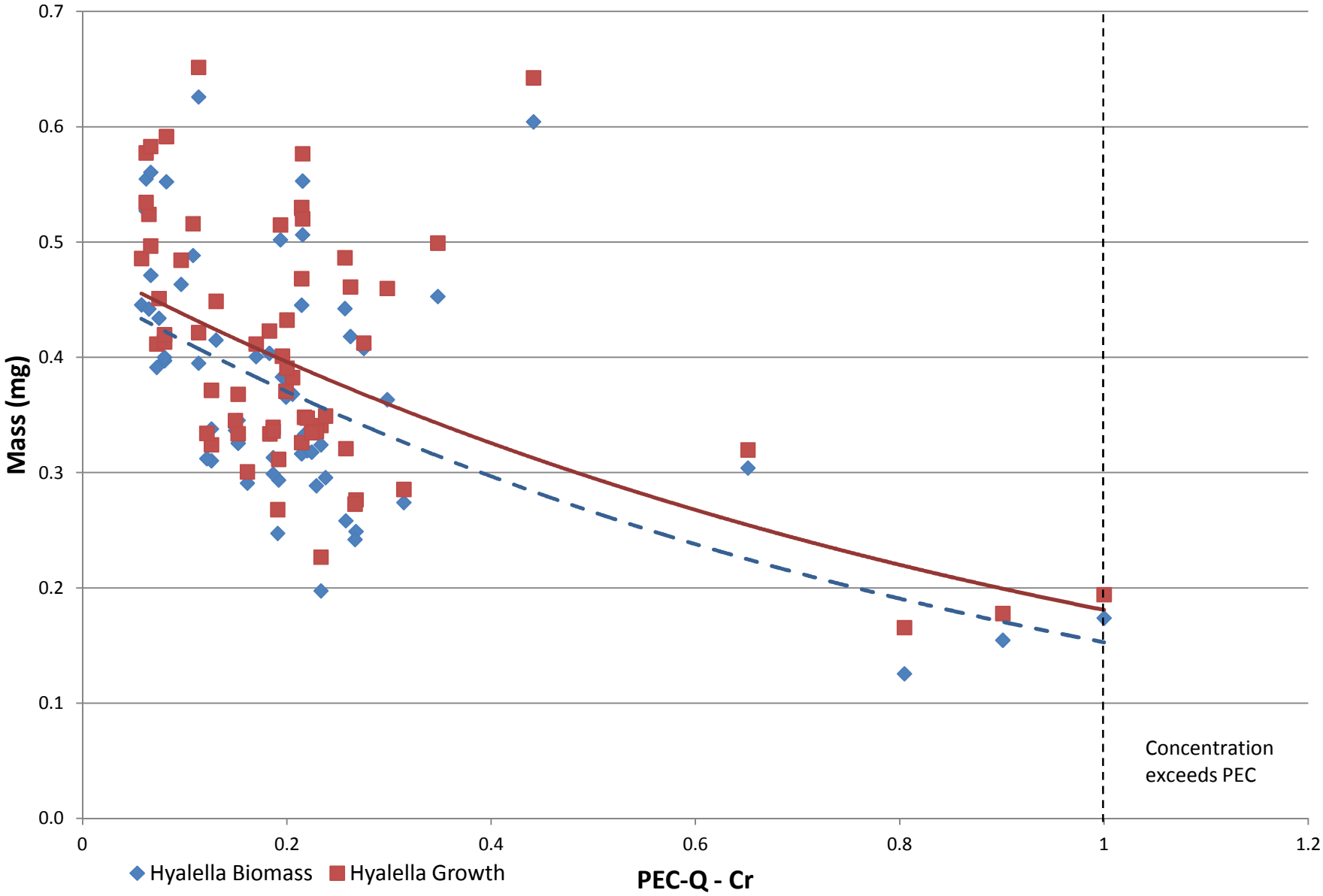


Figure 6-44

Relationship Between *Hyalella* Growth and PEC-Q - Chromium

Upper Columbia River RI/FS

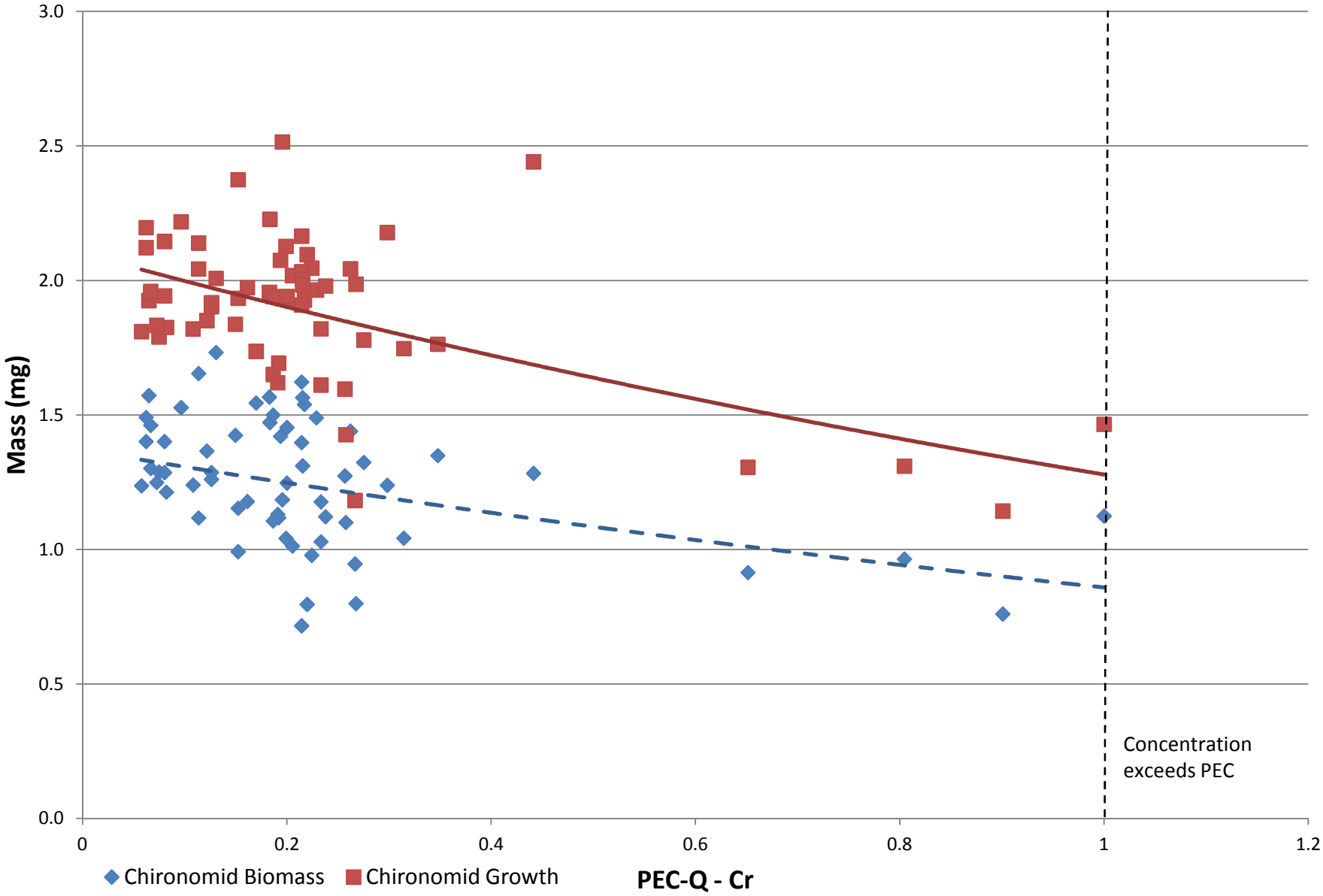


Figure 6-45

Relationship Between *Chironomus* Growth and PEC-Q - Chromium

Upper Columbia River RI/FS

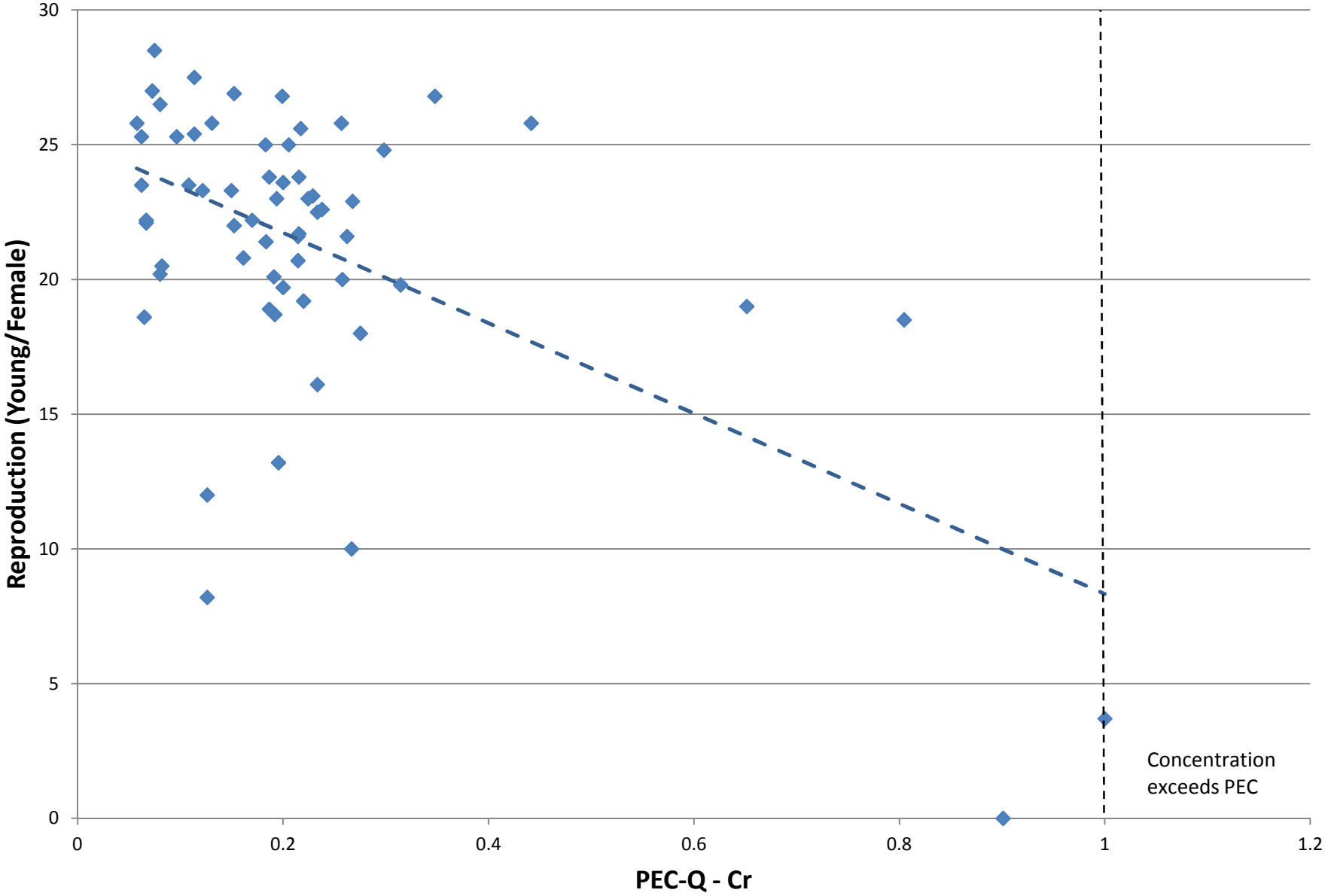


Figure 6-46

Relationship Between *Ceriodaphnia* Reproduction and PEC-Q - Chromium

Upper Columbia River RI/FS

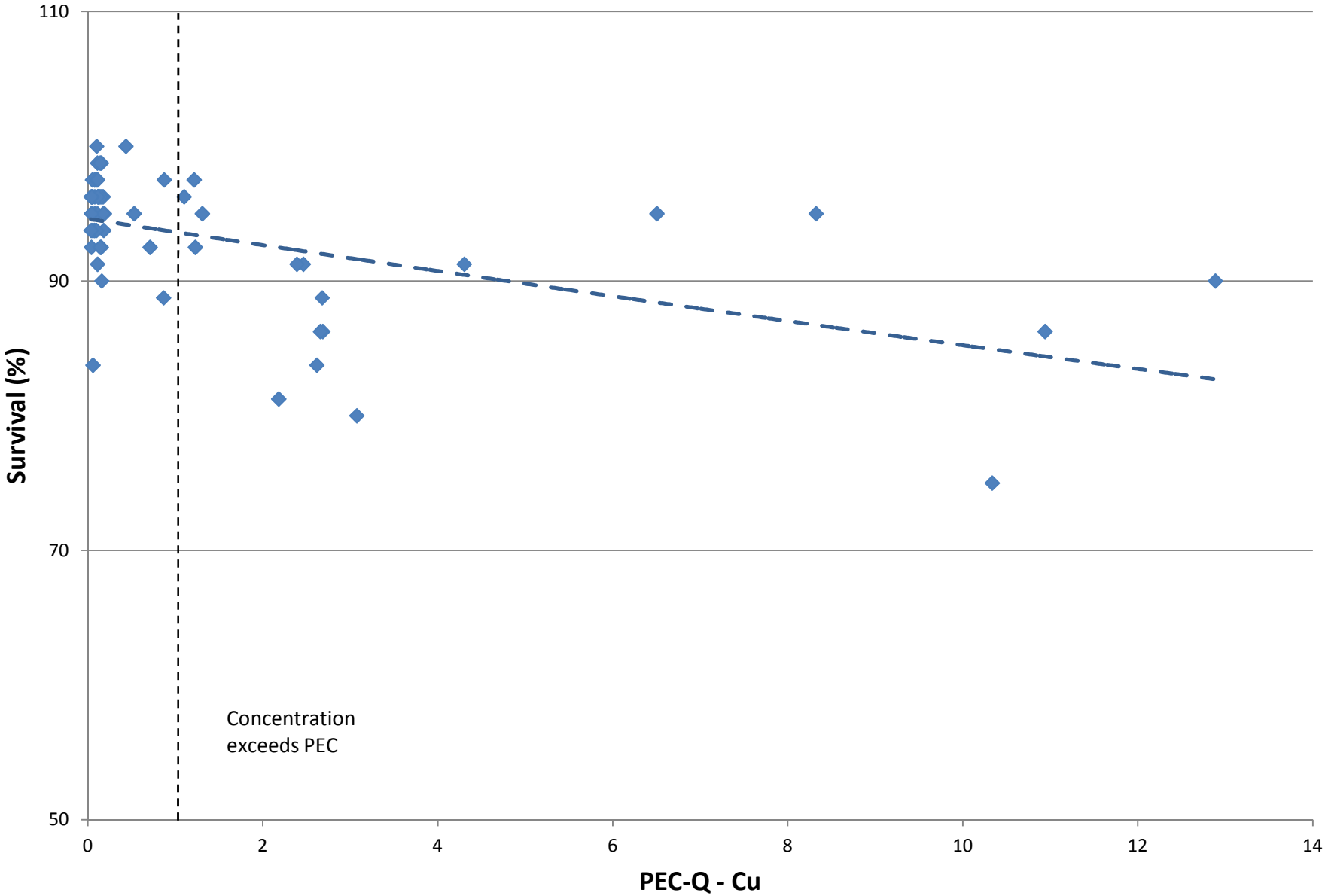


Figure 6-47

Relationship Between *Hyalella* Survival and PEC-Q - Copper

Upper Columbia River RI/FS

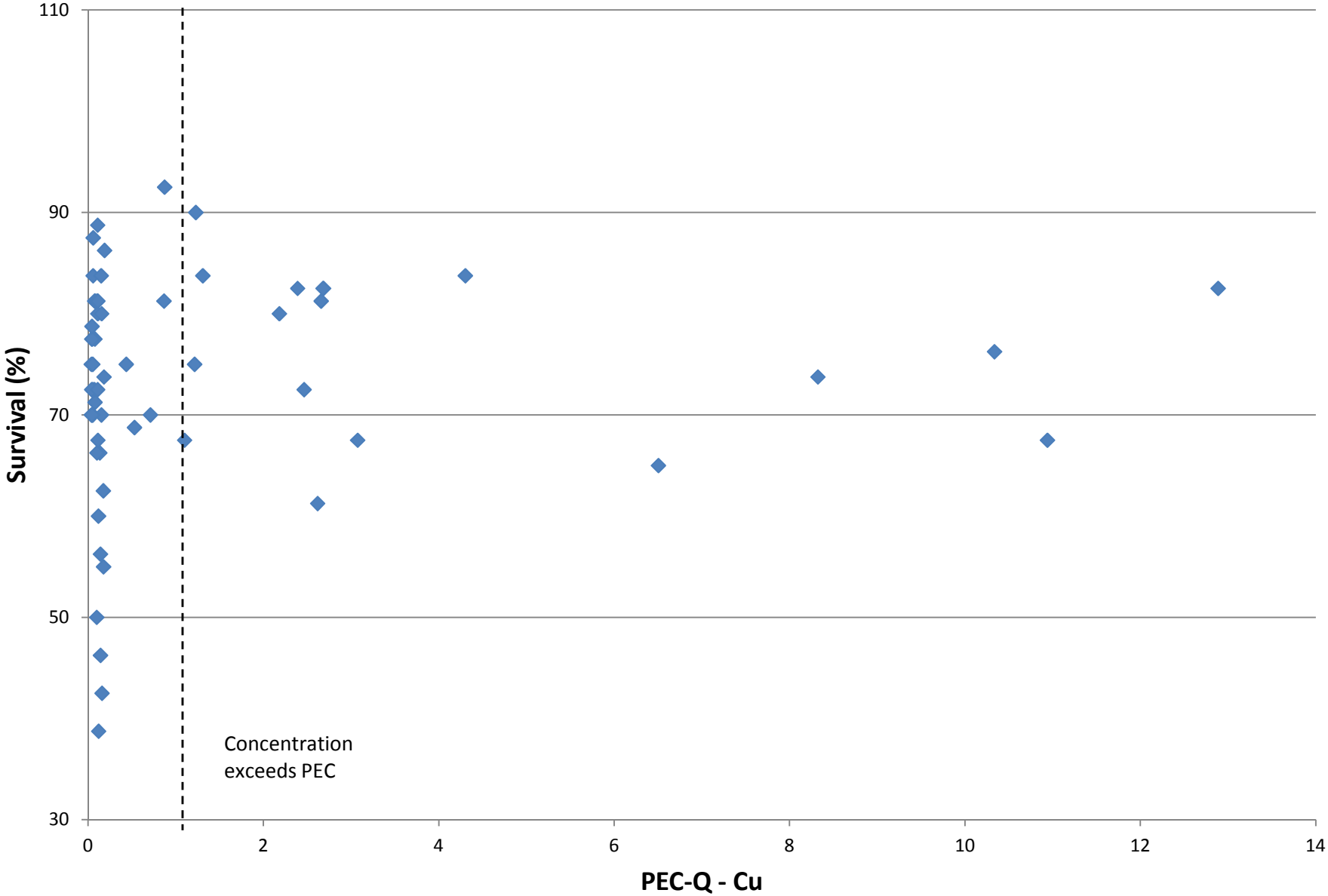


Figure 6-48

Relationship Between *Chironomus* Survival and PEC-Q - Copper

Upper Columbia River RI/FS

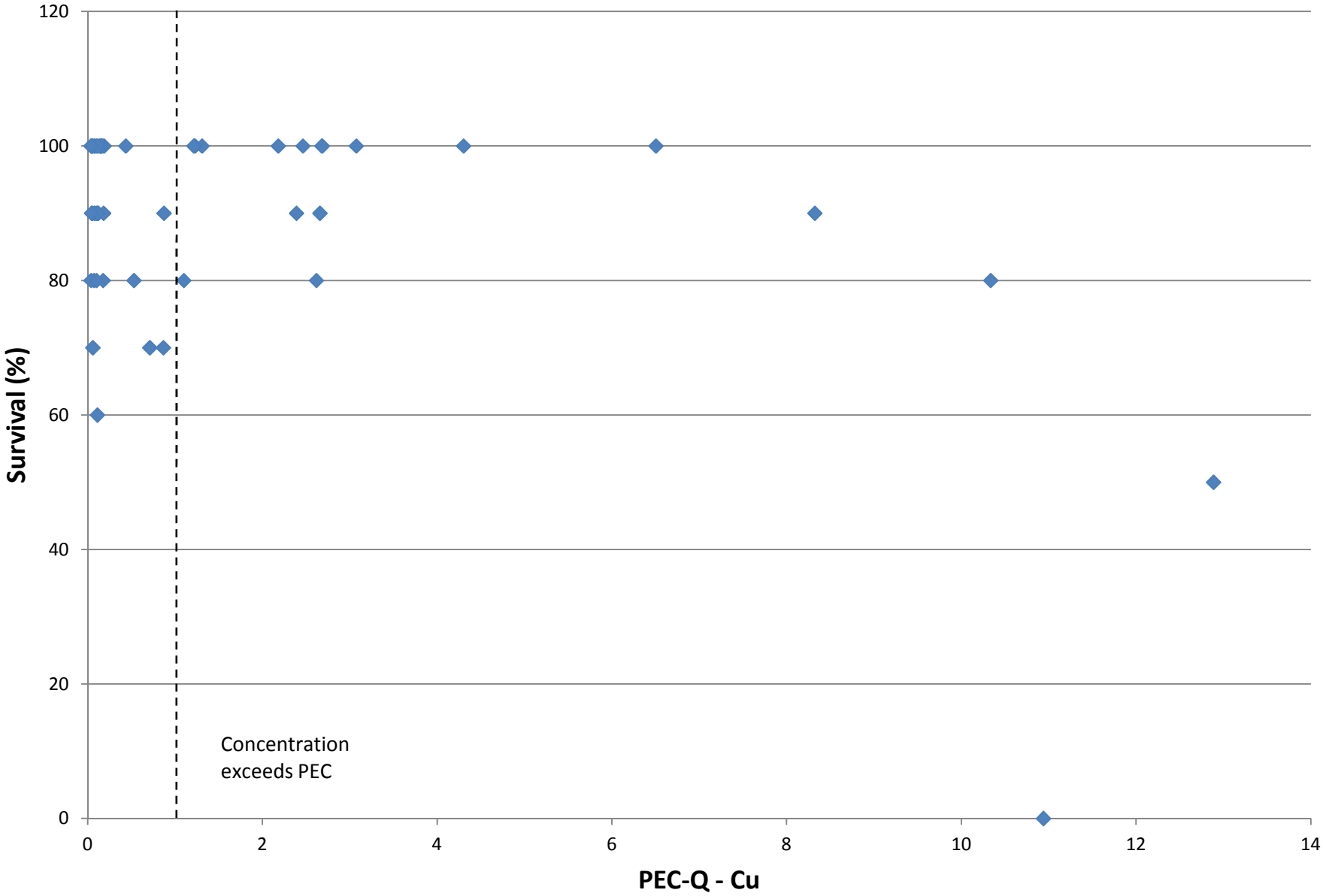


Figure 6-49

Relationship Between *Ceriodaphnia* Survival and PEC-Q - Copper

Upper Columbia River RI/FS

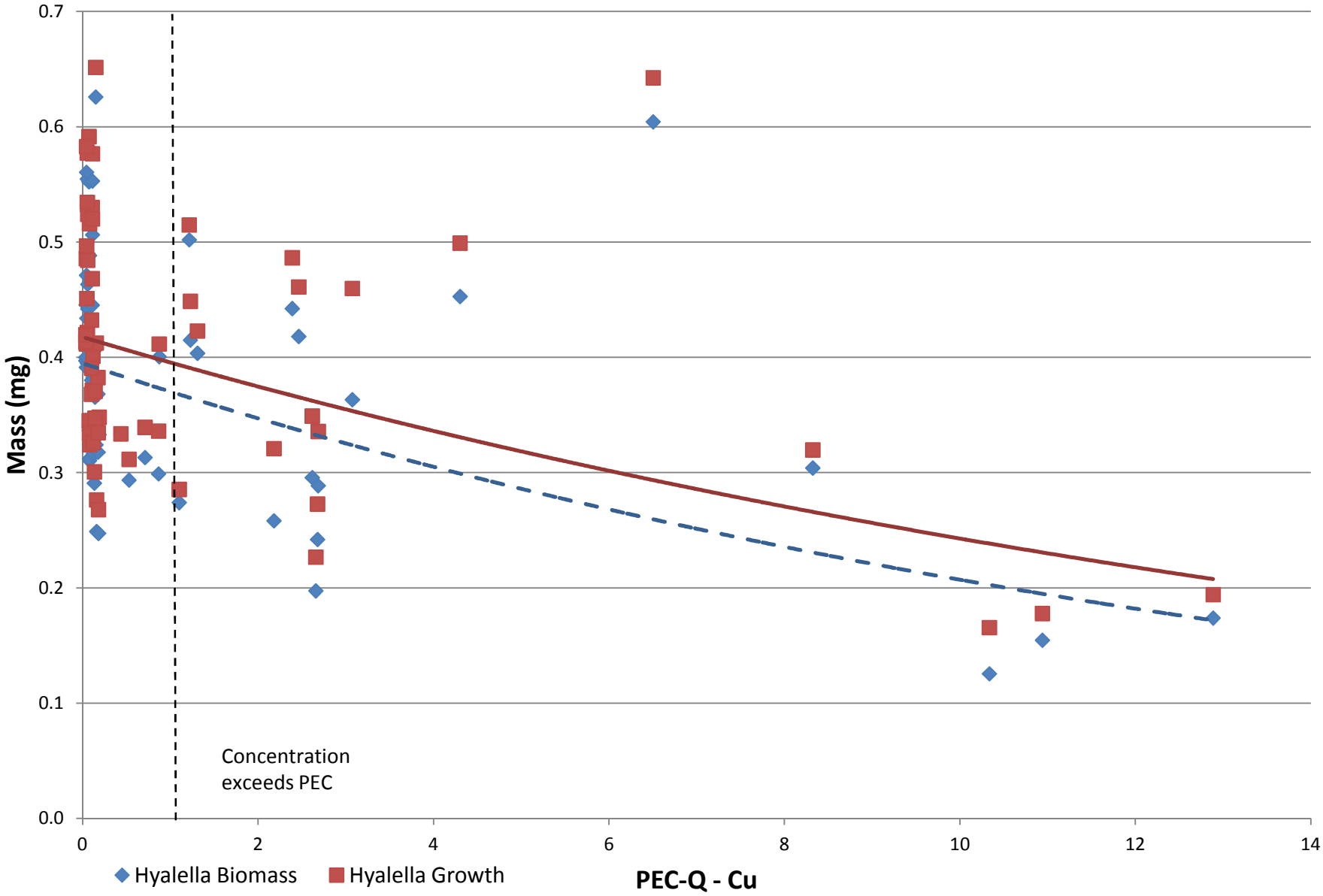


Figure 6-50

Relationship Between *Hyalella* Growth and PEC-Q - Copper

Upper Columbia River RI/FS

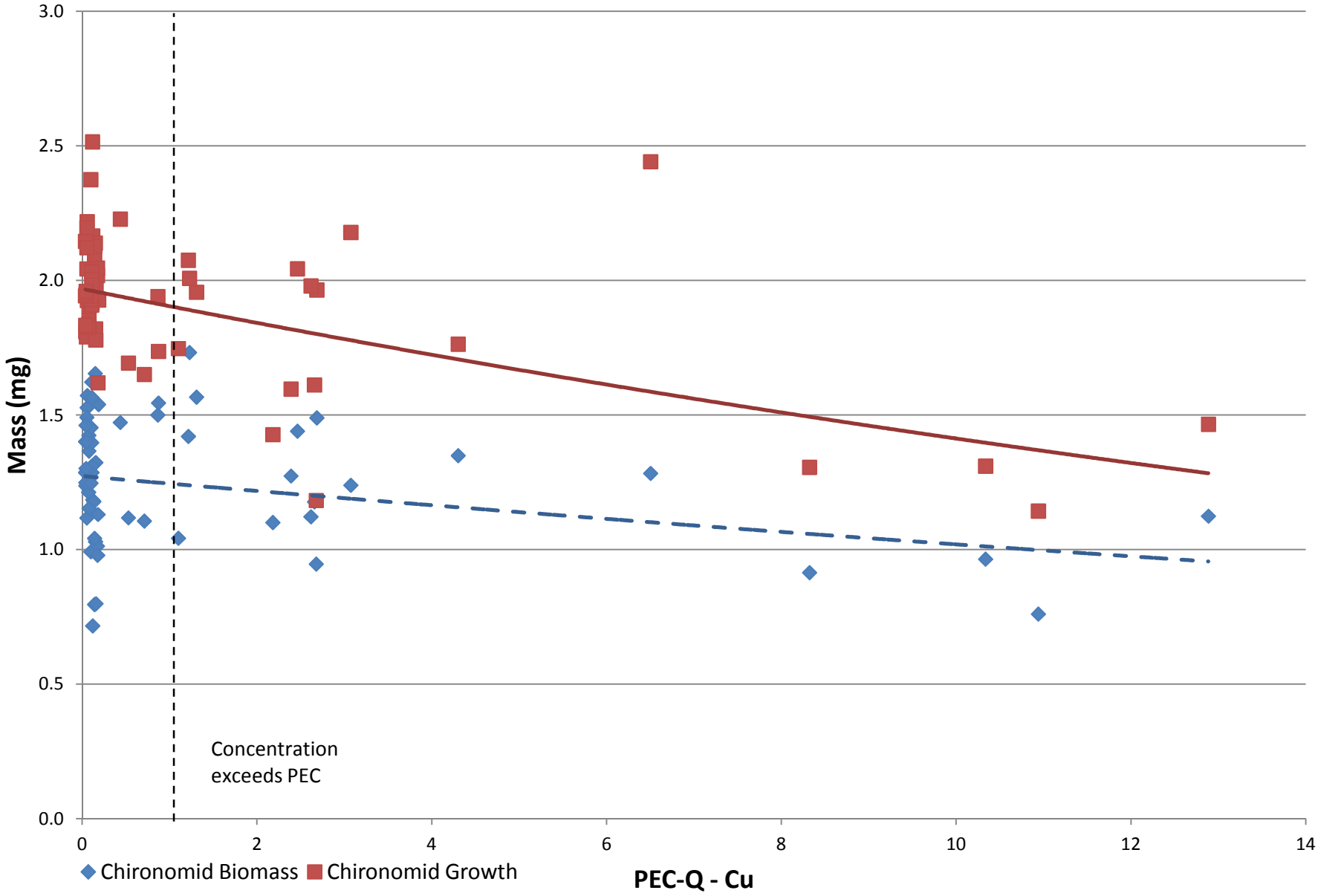


Figure 6-51

Relationship Between *Chironomus* Growth and PEC-Q - Copper

Upper Columbia River RI/FS

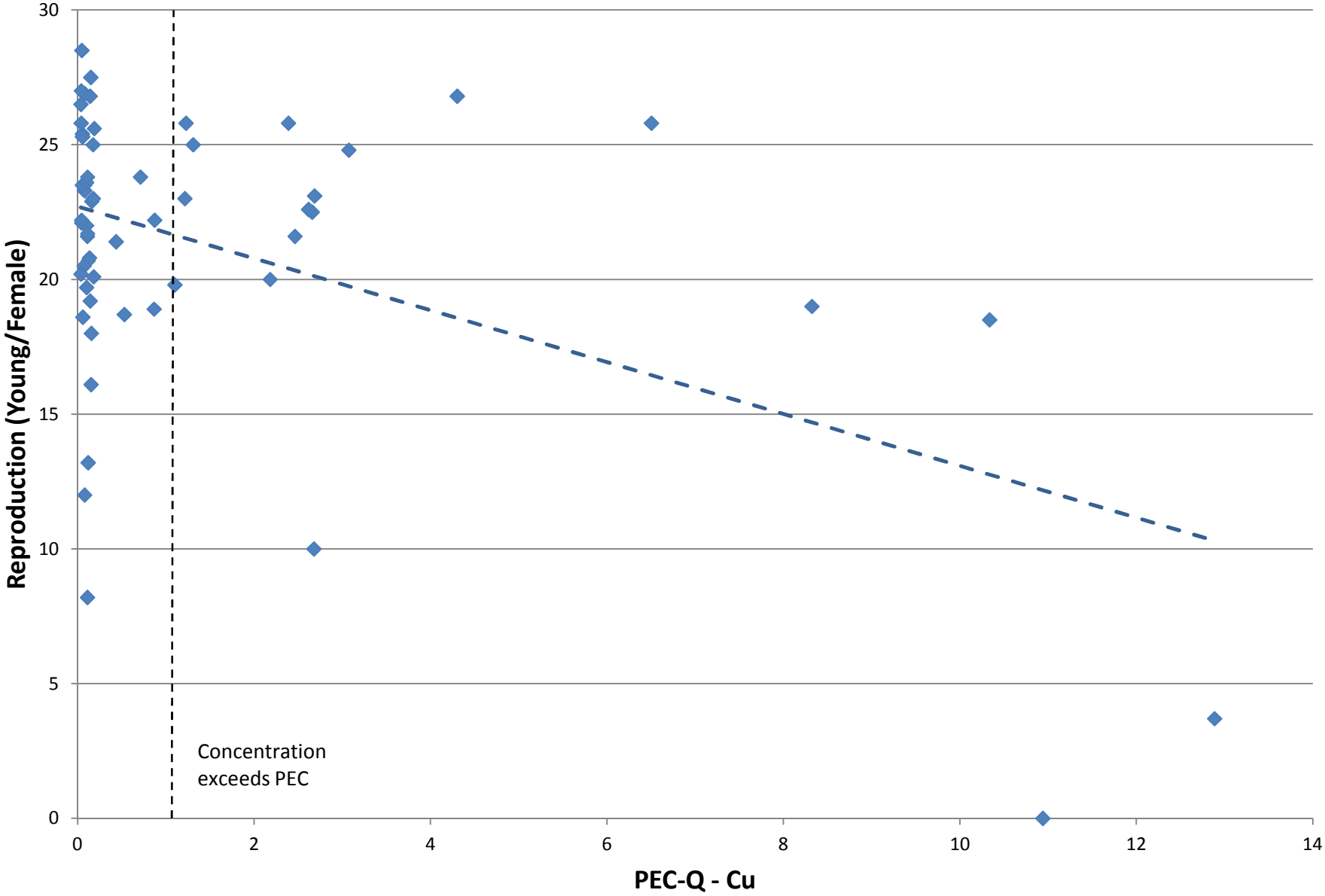


Figure 6-52

Relationship Between *Ceriodaphnia* Reproduction and PEC-Q - Copper

Upper Columbia River RI/FS

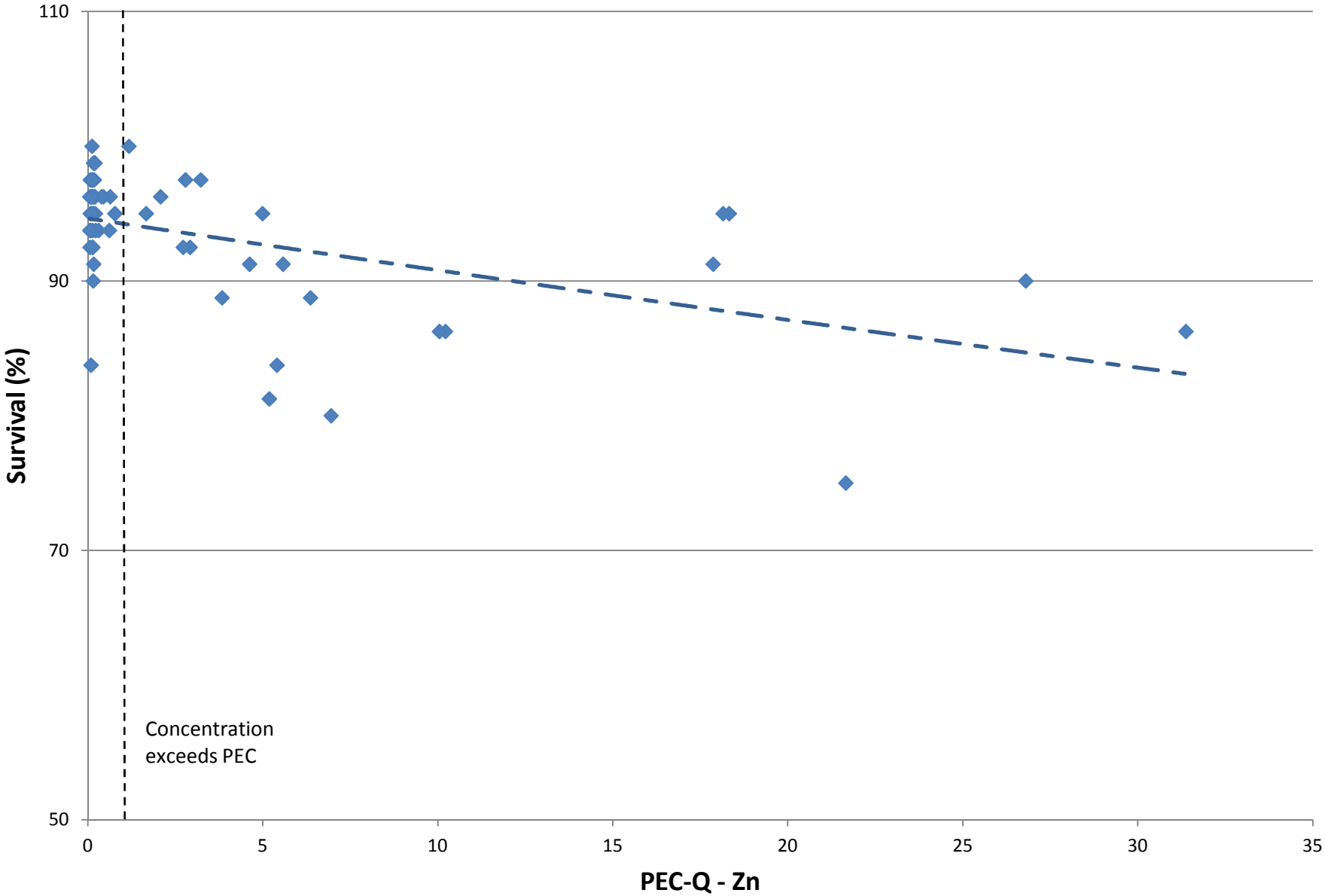


Figure 6-53

Relationship Between *Hyalella* Survival and PEC-Q - Zinc

Upper Columbia River RI/FS

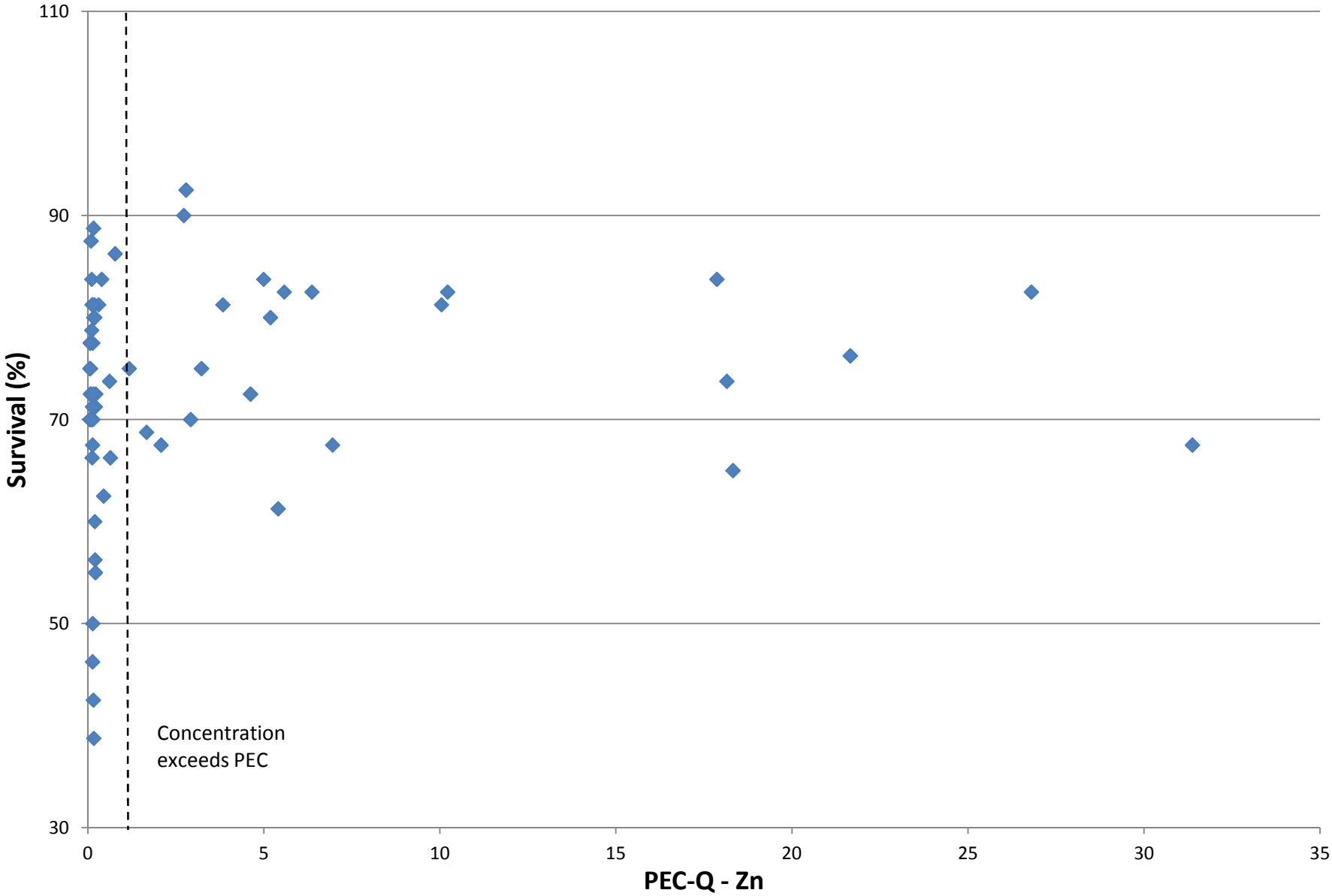


Figure 6-54

Relationship Between *Chironomus* Survival and PEC-Q - Zinc

Upper Columbia River RI/FS

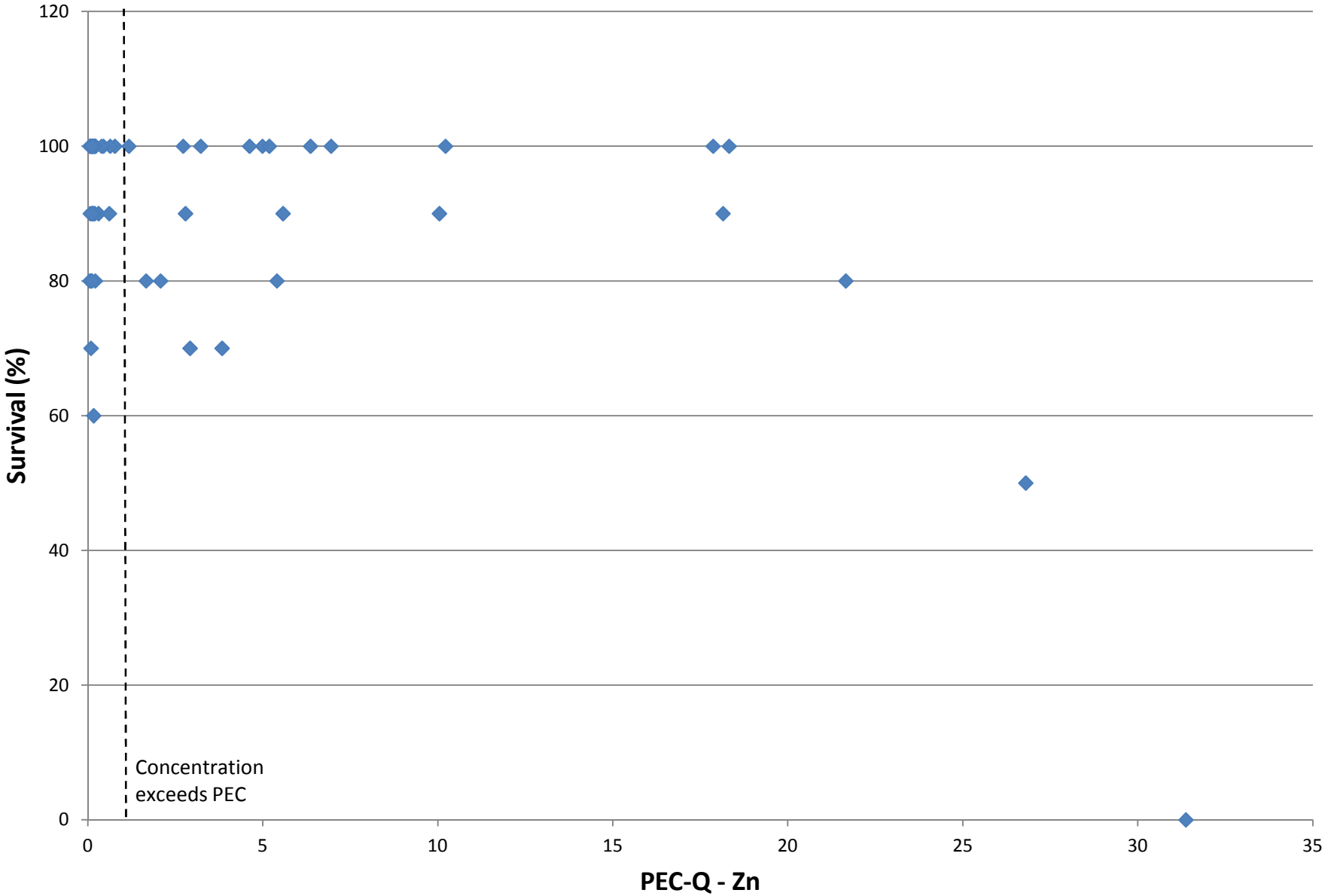


Figure 6-55

Relationship Between *Ceriodaphnia* Survival and PEC-Q - Zinc

Upper Columbia River RI/FS

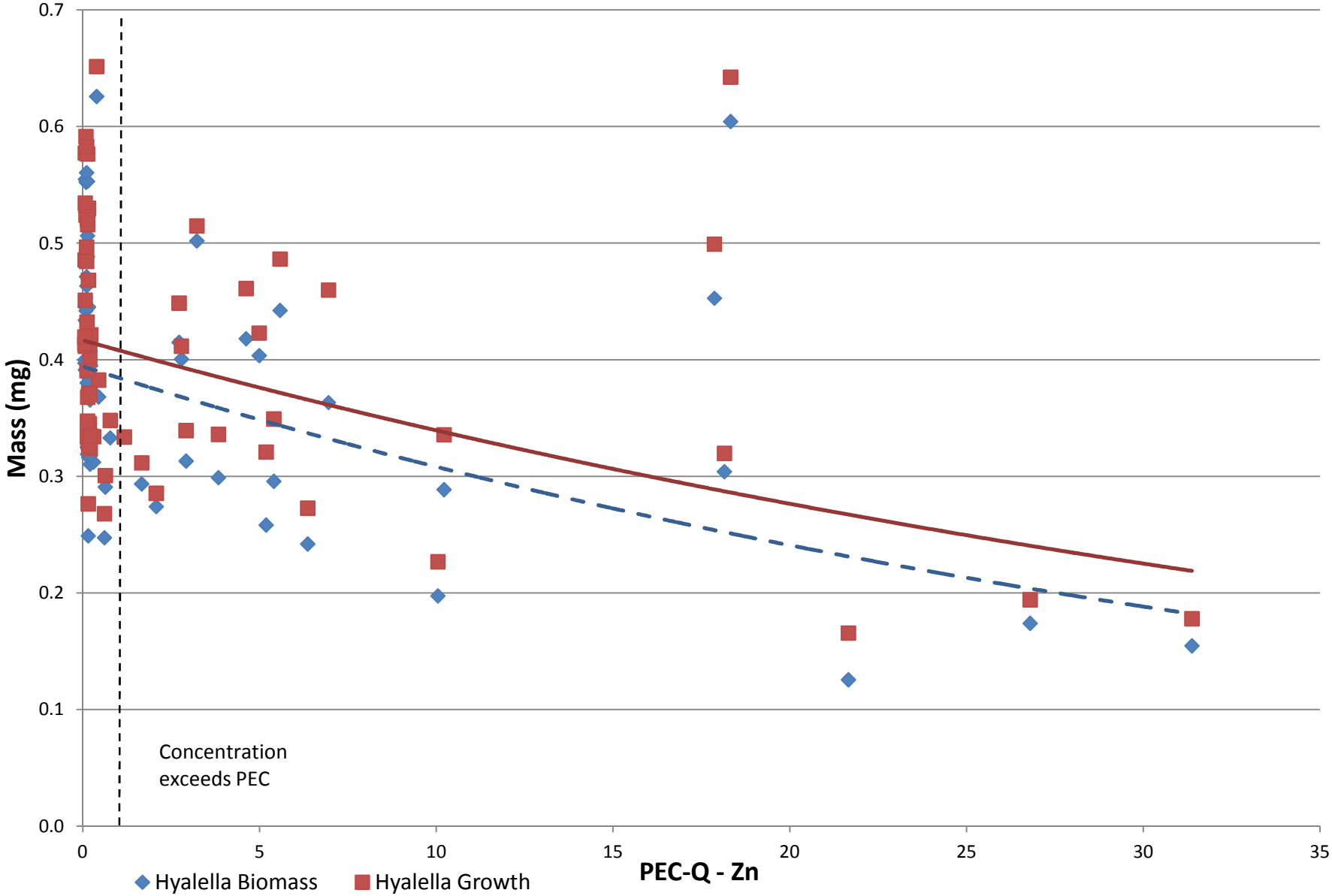


Figure 6-56

Relationship Between *Hyalella* Growth and PEC-Q - Zinc

Upper Columbia River RI/FS

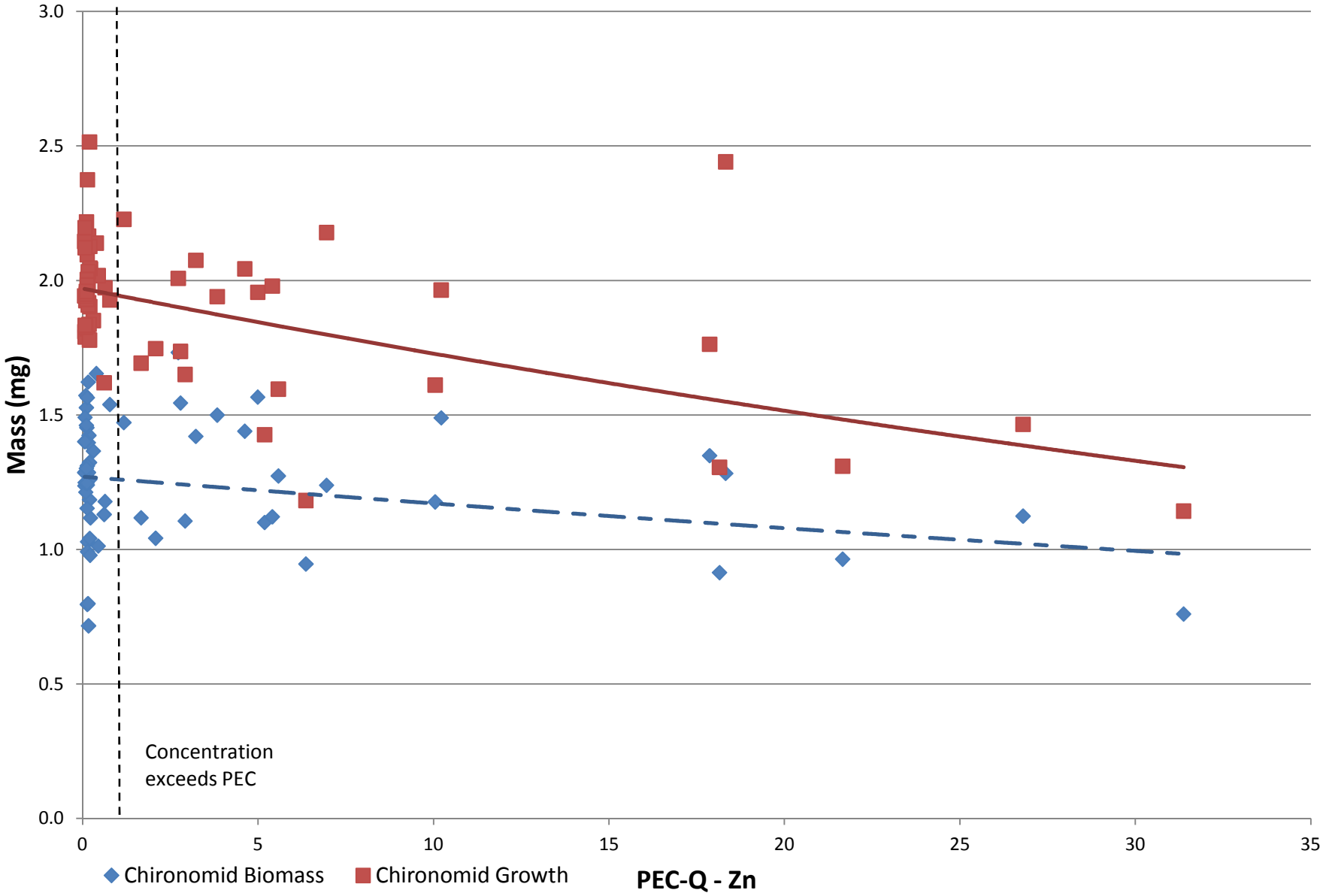


Figure 6-57

Relationship Between *Chironomus* Growth and PEC-Q - Zinc

Upper Columbia River RI/FS

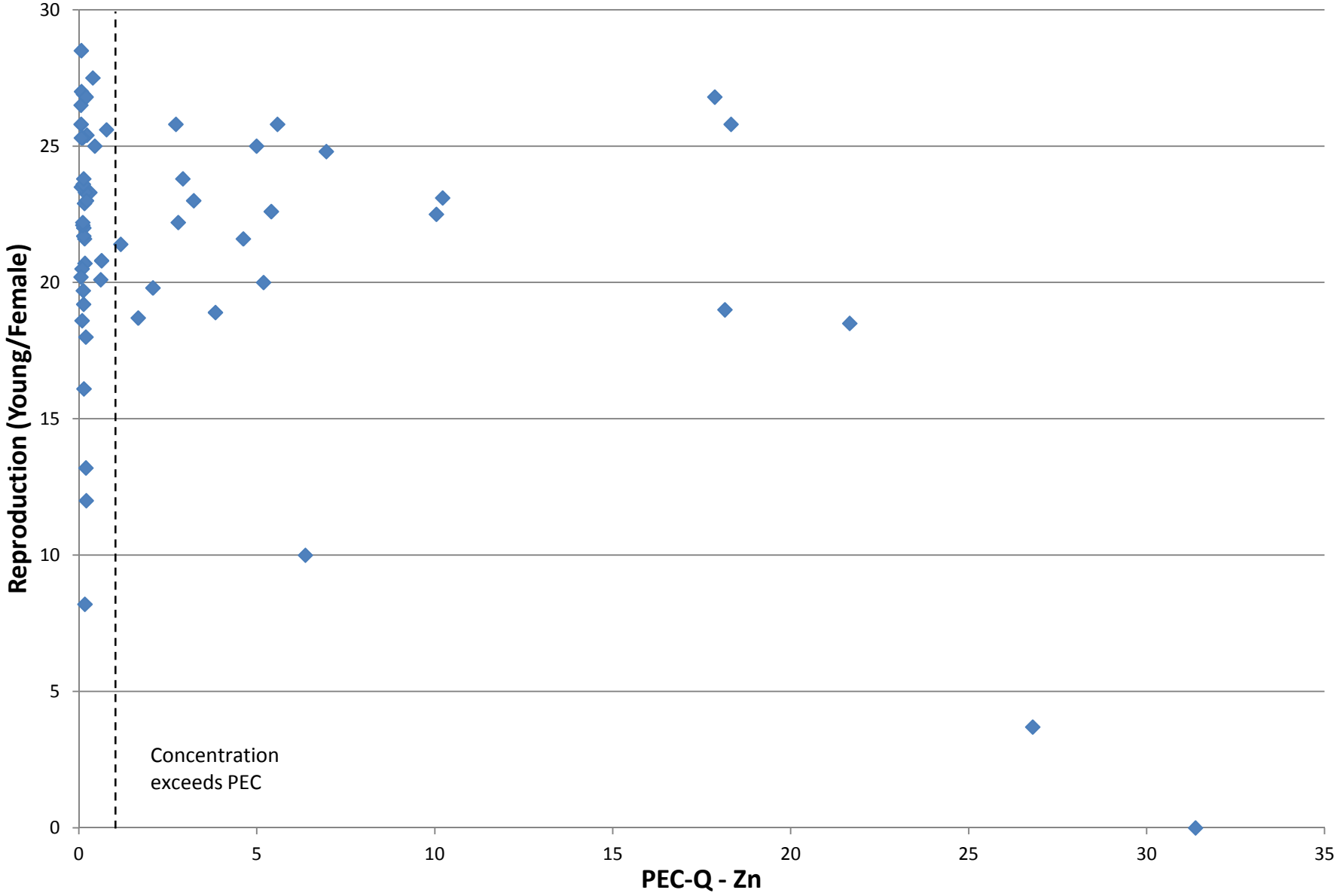


Figure 6-58

Relationship Between *Ceriodaphnia* Reproduction and PEC-Q - Zinc

Upper Columbia River RI/FS

Appendix A

Historical Bioassay Evaluation

Evaluation of Historical Bioassay Test Results and Recommendations for Phase I Bioassay Toxicity Testing — Upper Columbia River Site CERCLA RI/FS

PREPARED FOR: Jim Stefanoff/SPK
Chuck Gruenenfelder/SPK

PREPARED BY: Jeff Schut/CVO
Dennis Shelton/CVO

DATE: January 18, 2005

1.0 Introduction

The purpose of this technical memorandum is to summarize the existing information on sediment and porewater toxicity testing conducted in the Upper Columbia River (UCR) Remedial Investigation (RI), and based on evaluation of those data, provide recommendations for sediment toxicity testing during the Phase I RI.

A sediment sampling program will be conducted by the U.S. Environmental Protection Agency (EPA) in April and May 2005, as part of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Remedial Investigation/Feasibility Study (RI/FS) for the UCR. Sediment samples will be collected along a stretch of the Columbia River between the U.S.-Canadian border and Grand Coulee Dam, an area referred to as the Upper Columbia River. Whole sediment toxicity tests will be conducted on a subset of the RI sediment samples from approximately 50 locations, and the resulting data will be used for characterizing the potential for risk to benthic infaunal communities that exist in the UCR.

The rationale, approach, and sample locations for the initial phase of the sediment sampling program are provided in detail in the *Draft Phase I Sediment Sampling Approach and Rationale* document (CH2MHILL December, 2004). A preliminary conceptual site model (CSM) for contaminated sediment in the UCR was also presented in that document, and a diagrammatic representation of the preliminary CSM for potential ecological exposure to contaminated sediment was provided in Figure 4-41. The preliminary CSM for contaminated sediment includes potential sources of contamination, river/reservoir hydraulic relationships, the nature and extent of chemicals of interest (COIs) in sediment, fate and transport of COIs, and the potential exposure pathways for risk to receptors. The exposure pathway of concern that is relevant to this technical memorandum is the direct exposure of benthic infaunal invertebrates to sediment constituents.

The following sections are organized to present the following information:

- Section 2--Summary and review of existing toxicity studies conducted on sediment and porewater collected in the UCR
- Section 3--Identification of data gaps related to sediment toxicity testing
- Section 4--Selection of bioassay sediment sample locations
- Section 5--Selection of bioassay test species and protocols
- Section 6—Data evaluation approach
- Section 7--References

2.0 Summary and Review of Existing Bioassay Data

Numerous bioassay studies have been conducted over the years to assess various media and contaminants of interest at the UCR site. As described in the *Draft Phase I Sediment Sampling Approach and Rationale* (CH2MHILL December, 2004) report, more than 400 documents presenting information pertaining to the UCR site have been identified, collected, and catalogued from various sources as part of the RI planning process. From these, the most extensive bioassay studies were evaluated to develop a preliminary understanding of the potential for sediment toxicity at the UCR, and to identify potential data gaps for the RI. The studies selected were from investigations conducted from 1986 to 2004, and are summarized in Table A2-1. The findings and conclusions from these studies are summarized in this section, starting from the earliest to the most recent. The studies summarized are as follows:

1) ***An Assessment of Metals Contamination in Lake Roosevelt*** (Ecology, 1989)

Sediment samples were collected by Washington Department of Ecology (Ecology) in 1986 within Lake Roosevelt from four locations, including Deadman's Eddy (RM 738), Marcus Island (RM 708), Gifford (RM 676), and Seven Bays (RM 636). Metals analysis and whole sediment toxicity tests using *Hyalella azteca* (10-day exposure) and *Daphnia pulex* (48-hr exposure) were conducted at each location. A summary of the test results is provided in Table A2-2. Ecology made the following conclusions:

- The lake sediments did not appear to be toxic to *H. azteca*.
- Statistically significant reduction in survival of *D. pulex* was only observed at the Seven Bays sediment sampling location.
- Neither bioassay demonstrated a pattern of response that correlated with metals concentrations or physical characteristics of the sediments.

As a results of these findings, Ecology concluded that "the bioassays suggest an absence of toxicity in the upper reaches of the lake where the sediments are apparently contaminated by slag."

2) ***Survival and Water Quality Results of Bioassays on Five Species of Aquatic Organisms Exposed to Slag from Cominco's Trail Operations*** (Jennifer C. Nener, Department of Fisheries and Oceans, Habitat Division. Eastern B.C., 1992)

Water-granulated fumed slag was collected from Teck Cominco's smelter in Trail, B.C. in March 1992 and tested for toxicity using five species of aquatic organisms of various trophic levels. The slag was acutely toxic to rainbow trout (*Oncorhynchus mykiss,* 24-hr exposure), algae (*Selenastrum capricornutum,* 96-hr exposure), an amphipod (*H. azteca,* 10-day exposure), a midge (*Chironomus dilutus,* 10-day exposure), and a cladoceran (*D. magna,* 48-hr and 96-hr exposures). In some cases, the supernatant prepared from the slag was also acutely toxic. The authors indicated that elevated levels of copper and zinc may have been at least partly responsible for the acute toxicity observed. A summary of the test results is provided in Table A2-3.

3) ***Sediment-Quality Assessment of Franklin Roosevelt Lake and the Upstream Reach of the Columbia River*** (USGS, 1994)

Sixteen sediment samples were collected in 1992 from within the Columbia River and at six major tributaries to the river, respectively, by the United States Geological Survey (USGS). Metals and dioxin/furan analyses and whole sediment toxicity tests using *H. azteca* (7-day exposure), *Ceriodaphnia dubia* (7-day exposure), and *Photobacterium phosphoreum* (Microtox® test; 15-min exposure) were conducted at each location. In addition, porewater was tested using Microtox® at all locations. A summary of the test results is provided in Tables A2-4a and A2-4b. USGS made the following conclusions:

- *H. azteca* and *C. dubia* showed low survival rates when exposed to bed sediment from sites in the Columbia River near the international boundary and downstream 7 miles.
- *C. dubia* reproduction rates declined when the organisms were exposed to bed sediment from sites in the Columbia River near the international boundary and from two of three sites in the lower reach of the reservoir.
- Microtox® showed high toxicity response when exposed to sandy bed sediment from the lower sites in the Northport reach of the Columbia River and when exposed to fine-grained sediment from about one-third of the sites in the mid and lower reaches of Lake Roosevelt.

Generally, *H. azteca* and *C. dubia* were affected greatest near the international boundary and Microtox® was affected further downstream. The sediments causing low survival or reproduction rates for *H. azteca* and *C. dubia* contained slag with highly elevated concentrations of copper and zinc. Adverse effects were observed for at least one or all three test organisms in the upper reaches of Columbia River, from the international border to 15 miles downstream.

4) ***Columbia River Integrated Environmental Monitoring Program (CRIEMP), 1991-1993 Interpretive Report*** (Aquametrix Research Ltd., 1994)

Sediment samples were collected in September 1992 from eight locations on the Columbia River north of the international border and from Arrow Lake as a reference location, where tested for toxicity using *H. azteca* (exposure duration unspecified) and Microtox® tests. A summary of the test results is provided in Table A2-5. *H. azteca* mortality was highest from the samples collected downstream from Celgar (33 percent mortality) and downstream from Teck Cominco (27 percent mortality). Microtox® tests results were more variable with inconclusive results. Aquametrix concluded that sediment toxicity was greatest immediately

downstream from both the Celgar and Teck Cominco discharges, although the data were considered preliminary.

5) ***Lower Columbia River from Birchbank to the International Border: Water Quality Assessment and Recommended Objectives - Technical Report*** (MacDonald Environmental Sciences Ltd., 1997)

This report reviews various toxicity studies. It summarizes a study by Godin and Hagan (1992) where sediment from Beaver Creek (downstream from Teck Cominco) was found to be toxic to *D. magna* (10-day exposure) reproduction and survival (0 percent survival), whereas samples from Genelle Island and a back eddy pool at Genelle were found to be nontoxic (100 percent survival). In another study by NECL (1993) sediment samples collected near Beaver Creek and downstream of Celgar were found to be acutely toxic to *H. azteca* (10-day exposure) while sediment from Birchbank was only slightly toxic, and sediments from the vicinity of Ryan Creek and Waneta were not toxic. None of these sediments were toxic to *D. magna* (48-hr exposure). A summary of these studies is provided in Table A2-6.

6) ***Assessment of Columbia River Receiving Waters - Final Report*** (G3 Consulting, 2001)

The purpose of this study (conducted by G3 Consulting for Teck Cominco) was to assess the changes in the health of the Columbia River following upgrades of the Teck Cominco smelter operations. Results are reported for toxicity tests conducted on water, bottom sediments, and suspended sediments from the Columbia River in 1995, and for bioassays conducted with whole sediment in 1999. The water samples were collected from six sites on the river. The river water samples showed no acute toxicity to *D. magna* (48-hr LC_{50}) or chronic Microtox® (22-hr light loss) at any of the six sites. After comparing the results to a 1994 Environment Canada bioassay, G3 Consulting concluded that the results suggest very rapid dilution of Teck Cominco effluents in the river immediately after effluent discharge, resulting in the absence of acute instream toxicity. As a result, these tests were not repeated in 1999.

The bottom sediments were collected from Birchbank (upstream of Teck Cominco) and Waneta (downstream of Teck Cominco) and suspended sediments from New Bridge (immediately below Teck Cominco). Additional bottom sediments were collected from Birchbank and Waneta in 1999 for comparison. The sediment samples were assessed with the 14-day *C. dilutus* bioassay. A summary of the test results is provided in Table A2-7. The 1995 results showed considerably higher *C. dilutus* mortality for New Bridge (88 percent) than for Birchbank (7 percent) or Waneta (13 percent). Although no significant difference in survival was seen between Birchbank and Waneta in either 1995 or 1999, growth at Waneta was significantly lower than at Birchbank in both years. In 1995, growth was highest at Birchbank, intermediate at Waneta, and lowest at New Bridge. The 1999 sampling results confirmed this trend for Birchbank and Waneta.

Sediment pore water, assessed using Microtox® acute toxicity bioassays (5 and 15 min) showed no toxicity at any site in 1995. Microtox® (22-hr light loss) bioassays in 1999 showed moderate chronic toxicity.

7) ***Reassessment of Toxicity of Lake Roosevelt Sediments*** (Ecology, 2001)

Nine sediment samples were collected by Ecology in May 2001 from between the US/Canada border and the Grand Coulee Dam, as well one sample at a reference station in Lower Arrow Lake. Metals analyses, whole sediment bioassays using *H. azteca* (10-day exposure) and *C. dilutus* (20-day exposure), and sediment porewater bioassays using Microtox® (15-min exposure) were conducted at each location. A summary of the test results is provided in Table A2-8. Statistically significant toxicity, when compared with the laboratory controls, was observed in at least one bioassay test at all locations except the furthest downstream locations (near the Grand Coulee Dam). Statistically significant toxicity, when compared with the reference area, was observed at six of nine sample locations. The highest toxicity to *H. azteca* and *C. dilutus* was observed at Goodeve Creek, just upstream of Northport, followed by the Auxiliary Gage location further upstream. These locations also had the highest metals concentrations measured during the study. Microtox® test results did not correlate well with the invertebrate test results. In general, chironomids were the most sensitive species tested and sediments collected in the Upper Columbia were more toxic than sediments collected downstream in Lake Roosevelt.

8) ***Teck Cominco Aquatic Ecological Risk Assessment Field Summary Report for 2003*** (Golder Associates, 2004)

Whole sediment toxicity tests using *C. dilutus* were conducted on Columbia River sediments collected by Teck Cominco in 2003 at seven locations downstream and three locations upstream of the Teck Cominco facility. Both 10- and 20-day survival and growth bioassays were conducted on the whole sediments, using third instar *C. dilutus* larvae. A summary of the test results is provided in Table A2-9. The following presents the findings from these tests:

- In the 10-day tests, sediments collected from the Maglios and Fort Sheppard locations, both downstream of the Teck Cominco facility, had the highest toxicity, with 50 and 55 percent survival rates, respectively.
- Minimum growth rates during the 10-day tests were observed at the Maglios and Waneta locations. Again, both of these locations are downstream of the Teck Cominco facility.
- In the 20-day tests, sediments collected at the Maglios and Waneta locations, both downstream of the Teck Cominco facility, had the highest toxicity, with 0 and 24 percent survival rates, respectively.
- Minimum growth rates during the 20-day tests were observed at the Maglios and Waneta locations, similar to the 10-day observations.

The 20-day *C. dilutus* tests (summarized above) were conducted using third instars, instead of <24-hr old larvae as prescribed using the ASTM 20-day protocol (Method 1706-00, ASTM 2003). According to ASTM, "the first and second instars of chironomids are more sensitive to contaminants than the third or fourth instars". For example, first instar *C. dilutus* have been reported to be up to 27-fold more sensitive to acute copper exposure than fourth instar larvae, and first-instar *Chironomus riparius* have been reported to be up to 127-fold more sensitive to acute cadmium exposure than second instar larvae (ASTM 2003). Given this, it is possible that the degree of sediment toxicity reported by Golder Associates (2004) for river sediments downstream of Teck Cominco was underestimated during those studies.

9) ***The Effects of Trace Elements on Water Quality and Biological Health in the Lake Roosevelt National Recreational Area: Columbia River, NPS/WRD Water-Quality Cooperative Program*** (USGS, 2004)

In addition to the investigations summarized above, USGS has collected sediment from eight locations along the UCR in 2004, and is conducting bioassay tests on *H. azteca* and *C. dilutus*, as well as a bioaccumulation test using *Lumbriculus variegatus*. The results are pending.

3.0 Identification of Data Gaps

The data needs for all phases of sediment investigations were identified in Table 5-1 of the *Draft Phase I Sediment Sampling Approach and Rationale* document (CH2MHILL December, 2004), and the associated data quality objectives (DQOs) for specific RI tasks were developed. Based on the review of historic investigations of sediment toxicity in the UCR, this section describes the identified data gaps specifically related to bioassay data. These data gaps fall into the following three categories:

1) Lack of temporal representativeness

2) Lack of spatial representativeness

3) Incomplete assessment of chronic toxicity

These categories of data gaps are described in the following subsections.

3.1 Lack of Temporal Representativeness

A significant temporal factor in the assessment of historic UCR investigation data is the documented industrial modernization and process changes that have occurred at both Teck Cominco and Celgar since the early 1990s. At Teck Cominco, the amount of metals entering the UCR is currently much lower than in the past, primarily because of the cessation of direct discharge of slag to the Columbia River in 1995. The amount of current metal loading to the UCR is unknown. At the Celgar Pulp mill, dioxin/furan loading was reduced after 1993 when the use of elemental chlorine was switched to chlorine dioxide, and other waste reduction and treatment processes were implemented. The changes at both of these facilities would be expected to reduce the releases of contamination into the UCR. As discussed in the *Draft Phase I Sediment Sampling Approach and Rationale* document (CH2MHILL December, 2004), review of available data suggests that concentrations of slag-related metals and dioxins/furans in suspended sediment, surface water, and/or biota have decreased during the 1990s. It is uncertain to what degree these changes are reflected in reduced sediment toxicity. The most recent toxicity investigations on UCR sediment (Golder Associates, 2004) upstream of the US/Canadian border indicate that some toxic conditions currently remain.

3.2 Lack of Spatial Representativeness

In addition to the lack of temporal representativeness, existing toxicity data provide information at only a limited number of locations, many of which are above the US/Canadian border. Also, of those investigations south of the international border, very few toxicity tests have been conducted on samples collected from the lower reaches of the

UCR, within Lake Roosevelt. More whole sediment toxicity tests are needed to provide an assessment of the relationship between sediment toxicity and distance from the international border.

3.3 Incomplete Assessment of Chronic Toxicity

As summarized in Table A2-1, most of the historic sediment toxicity studies conducted on UCR sediment have evaluated acute toxicity, with a few considering sublethal endpoints such as growth or reproduction. Only two investigations have evaluated exposure durations greater than 10 days, and none of these have evaluated any species other than *Chironomus dilutus*.

Besides the data gaps related to sublethal endpoints and chronic exposure durations, very little information exists that identifies causative factors associated with sediment toxicity, or that has attempted to identify toxicity threshold concentrations. Although existing bulk sediment concentrations are at levels known to exceed effects-based screening benchmarks for sediment, it is unknown exactly how bioavailable these chemical constituents are.

3.4 Data Gaps Conclusions

Because of the temporal, spatial, and risk-based limitations of the existing data set, additional toxicity testing and synoptic sediment concentration data are needed. These data, along with the previous investigation data, will provide further characterization of sediment contamination within the UCR and provide the basis for assessing data needs in future phases of the sediment investigation. Considering the historical toxicity in sediments collected in the UCR, additional sediment toxicity tests are recommended to establish the relationship between contaminant concentrations and toxicity over the range of potential concentrations. The following sections describe the proposed sediment sample locations, and the bioassay test species and protocols.

4.0 Selection of Sediment Toxicity Sample Locations

As outlined in the *Draft Phase I Sediment Sampling Approach and Rationale* document (CH2MHILL December, 2004), sediment samples for toxicity testing will be collected at 50 locations along the length of the UCR in April and May 2005. These sample locations were identified to provide coverage over the extent of the study area, and to help ensure that the relationship between COI concentrations and toxicity may be established over the range of potential concentrations. Sediment samples for toxicity testing will be collected from the top 10 centimeters (the biologically active zone) at areas that are several feet below the water line at the time of sampling[1]. For the lower reaches (i.e., Lake Roosevelt), this will correspond approximately to the 1,250 foot elevation (assuming a drawdown elevation to a water level of 1,255 feet). If the pre-selected locations are not suitable for the collection of a sample at the time of sampling (e.g., inappropriate substrate type), the specific sample location will be relocated upstream or downstream, as appropriate. Two to three sediment samples for toxicity testing will also be collected from the reference areas for comparison to site sample results. Suitable reference areas have not yet been identified.

[1] Since shallow-water zones are most important for benthic infaunal communities and associated foraging by fish and wildlife, toxicity testing will focus on these areas and will not be conducted on deep-water samples.

To address the need for spatial coverage, toxicity tests will be conducted from sediments collected along the full length of the UCR (from RM 603 to RM 744). However, given the general findings of the historic sediment toxicity testing, the most likely location to encounter toxic conditions is in the upper reach of the UCR. For this reason, additional sediment sample locations are proposed in the upper reach to increase the likelihood that any toxic conditions currently existing in the upper reach will be measured. The expectation that higher toxicity could be observed in the upper reaches is consistent with the observation that bulk sediment chemistry results indicate greater exceedances of sediment screening benchmarks such as TECs and PECs (see below). The spatial distributions of COIs are presented graphically in Figures 4-11 through 4-20 of the *Draft Phase I Sediment Sampling Approach and Rationale* document (CH2MHILL December, 2004).

4.1 Effects-Based Sediment Screening Benchmark Comparison

To help direct the selection of the bioassay sediment sample locations, the available historic sediment chemistry data were evaluated to determine those locations where toxicity, if present, would be most expected. To do this, the available sediment chemistry data were compared to effects-based sediment screening levels. Sediment COI concentration data were compared with probable effects concentrations (PECs) and threshold effects concentrations (TECs), which are numerical sediment quality benchmarks as reported in the *Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems* (MacDonald, Ingersoll, and Berger, 2000). PECs represent levels that are "likely to be toxic to sediment-dwelling organisms", whereas TECs are used to "identify sediments that are unlikely to be adversely affected by sediment-associated contaminants". It should be noted that these sediment quality benchmarks are intended to be used for screening purposes (e.g., to select sampling locations) and exceedances of these values should not at this time be misconstrued as actual risk.

Available sediment data were grouped into three data groups representing Lower (approximately between river miles 600 and 640), Middle (approximately between river miles 641 and 710), and the Upper and Northport (approximately between river miles 711 and 744) Reaches of the UCR. Tables A4-1 through A4-3 provide the benchmark comparisons for the Lower, Middle, Upper and Northport Reaches, respectively. These tables also provide the number of samples exceeding benchmarks, and the factor of exceedance of the maximum detection.

The following surface sediment (i.e., about 0 to 4 inches [10 cm] below the sediment/surface water interface) constituents exceeded their respective PECs in at least one sample locations (maximum factor of exceedance of the PEC is provided in parenthesis):

- Lower UCR Reach: cadmium (2.5), chromium (1.1), lead (2.5), mercury (1.5), and zinc (2.4)
- Middle UCR Reach : cadmium (2.6), chromium (1.2), copper (8.1), lead (6.6), mercury (2.6), and zinc (31.5)
- Upper and Northport UCR Reaches: arsenic (1.6), cadmium (9.3), chromium (2.8), copper (32.7), lead (12.4), mercury (1.3), nickel (1.4), and zinc (58.5)

The results provided in Tables A4-1 through A4-3 indicate that for these metals exceedances of benchmarks have occurred along the entire length of the UCR. However, the greatest

factors of exceedances above the benchmarks have occurred in the Upper and Northport Reaches of the UCR.

Based on the screening benchmark comparisons, the locations with the top-10 highest exceedances of PECs for arsenic, cadmium, copper, lead, mercury, and zinc were identified as target locations for sediment bioassay testing during the RI[2]. Since many of these constituents co-occur, some of the selected locations were found to be redundant between constituents. Once the locations with highest exceedances of PECs were selected, the remaining areas of the UCR were divided to provide relatively even spatial coverage for bioassay sampling, with particular concentration in the six established focus areas. Preliminary sample maps presenting locations where sediment samples will be collected for bioassay testing are provided in Figures 6-2 through 6-11 of the *Draft Phase I Sediment Sampling Approach and Rationale* document (CH2MHILL December, 2004), and summarized in Table 6-3 of the same document.

5.0 Selection of Toxicity Test Species and Protocols

In accordance with the DQO's for surface sediment, the toxicity test results will provide one line of evidence in support of a decision of whether measures are needed to prevent exposure of benthic resources to constituent concentrations in surface sediment in the UCR at levels that pose unacceptable risk. The choice of a test organism can influence the relevance, success, and interpretation of a toxicity test to accomplish this goal.

Test methods for conducting whole sediment toxicity testing are available for several freshwater organisms. The most common test species are *H. azteca* (amphipod), *C. dilutus* (midge), *C. riparius* (midge), *C. dubia* (cladoceran), and *L. variegatus* (worm). Methods do exist for other species (e.g., additional amphipod species, mollusks, etc.), however they are not commonly used for various reasons. Table A5-1 (EPA, 2000 and ASTM, 2003) uses 11 selection criteria for a rating system for selecting potential freshwater sediment test species. Based on these criteria, *H. azteca*, *C. dilutus*, and *L. variegatus* are considered the most reliable freshwater test species.

5.1 Species Sensitivity to COIs

An additional consideration in selection of test species is the existence of information on the relative sensitivity of organisms to COIs in the UCR. A number of studies have evaluated the sensitivity of commonly tested freshwater species. Ankley et al., (1991) conducted a variety of sediment elutriate and pore-water tests and found *H. azteca* to be as, or slightly more sensitive than *C. dubia*, while *L. variegatus* was less sensitive than either the amphipod or water flea. West et al., (1993) ranked the sensitivity of three species to the lethal effects of copper in sediments in the following order from greatest to least; *H. azteca* > *C. dilutus* > *L. variegatus*. Schubauer-Berigan et al., (1993) found that *L. variegatus* were generally less sensitive than *H. azteca*, *C. dubia*, or *Pimephales promelas* in short-term (less than 96-hour) exposures to cadmium, nickel, zinc, copper, and lead.

[2] Although PCBs and dioxin/furans are identified as COIs for the UCR RI, existing sediment data for these constituents are insufficient to provide direction in selection of specific sample locations for bioassay sampling.

ASTM (2003) and EPA (2000) summarize the results from studies of Great Lakes sediment and water-only and made the following conclusions:

- *H. azteca*, *C. dilutus*, and *C. riparius* were among the most sensitive and discriminatory of 24 organisms tested (Burton and Ingersoll, 1994; Burton et al., 1996; Ingersoll et al., 1993).
- The sensitivity of four species to metal-contaminated sediments were ranked (from greatest to least): *H. azteca* > *C. riparius* > *O. mykiss* (rainbow trout) > *D. magna* (Kemble et al., 1994).

In general, *H. azteca* has been shown to be more sensitive to most metals than either *L. variegatus*, daphnids, *C. dilutus*, or *C. riparius*. However, neither *H.* or *C. dilutus* have been consistently more sensitive to all chemicals. This emphasizes the importance of using more than a single test species when conducting sediment assessments (ASTM, 2003).

5.2 Proposed Bioassay Tests

Considering the criteria provided in Table A5-1, the relative species sensitivities, and the need to evaluate multiple endpoints, three test species are recommended for UCR sediment assessment, including *C. dilutus*, *H. azteca*, and *C. dubia*. These tests are described as follows:

5.2.1 28-Day Amphipod (*Hyalella azteca*) Toxicity Test

The toxicity of UCR sediments will be assessed using a 28-day exposure with the amphipod, *Hyalella azteca*, with growth and survival as measured endpoints. This protocol is based on ASTM Method E 1706-00 (ASTM, 2003) and EPA Method 100.4 (EPA, 2000). *H. azteca* most commonly occurs in warm (20 to 30°C for much of the summer) lakes which support aquatic plants, but is also found in ponds, sloughs, marshes, rivers, ditches, streams, and springs, but in lower numbers. It is an epibenthic detritivore that burrows into the sediment surface, selectively ingesting bacteria and algae. *H. azteca* has many desirable characteristics as a sediment toxicity testing organism including: relative sensitivity to contaminants associated with sediment, short generation time, contact with sediment, ease of culture in the laboratory, tolerance to varying physico-chemical characteristics of sediment, and their response has been evaluated in interlaboratory studies and has been confirmed with natural benthos populations (Table A5-1). This species has been used in at least six previous investigations in the UCR (Table A2-1), and new information will allow some comparison with historic toxicity measurements. The test conditions for conducting the 28-day sediment toxicity test with *H. azteca* are summarized in Exhibit A5-1.

5.2.2 10-Day Midge (*Chironomus dilutus*) Toxicity Test

The toxicity of UCR sediments will be assessed using a 10-day exposure with the midge, *C. dilutus*, with growth and survival as measured endpoints. This protocol is based on ASTM Method E 1706-00 (ASTM, 2003) and EPA Method 100.2 (EPA, 2000). Midge larvae are important in the diet of fish and waterfowl. Larvae of *C. dilutus* usually penetrate a few centimeters into sediment. In both lotic and lentic habitats with soft bottoms, about 95 % of the chironomid larvae occur in the upper 10 cm of substrate, very few larvae are found below 40 cm. *C. dilutus* has many desirable characteristics as a sediment toxicity testing organism including: relative sensitivity to contaminants associated with sediment, contact with sediment, ease of culture in the laboratory, tolerance to varying physicochemical characteristics of sediment, short generation time, and their response has been evaluated in

interlaboratory studies and has been confirmed with natural benthos populations (Table A5-1). This species has been used in at least four previous investigations in the UCR (Table A2-1), and new information will allow some comparison with historic toxicity measurements. The test conditions for conducting the 10-day sediment toxicity test with *C. dilutus* are summarized in Exhibit A5-2.

5.2.2 7-Day Cladoceran (*Ceriodaphnia dubia*) Toxicity Test

The toxicity of UCR sediments will be assessed using a 7-day exposure with the cladoceran, *C. dubia*, with reproduction and survival as measured endpoints. This protocol is based on ASTM Method E 1706-00 (ASTM, 2003). One of the most important reasons for using cladocerans as toxicity test organisms is their importance in the food web. In addition, they provide a reproduction endpoint, which is not an endpoint for either of the other two selected species. In whole-sediment toxicity tests, cladocera behave as nonselective epifaunal zooplankton. The organisms are frequently observed on the sediment surface and are likely exposed to both water-soluble and particulate-bound contaminants (through ingestion) in overlying water and surface sediments. The responsiveness of *C. dubia* to UCR sediments has been confirmed, and correspondence with *H. azteca* toxicity has been observed as shown in Table A2-4a (USGS, 1994). The test conditions for conducting the 7-day sediment toxicity test with *C. dubia* are summarized in Exhibit A5-3.

5.2.3 Discussion of Proposed Toxicity Tests

It is believed that use of the 28-day amphipod (*H. azteca*), 10-day midge (*C. dilutus*), and the 7-day *C. dubia* sediment toxicity tests will provide adequate information for supporting the DQOs identified for the UCR Phase I RI. The same amphipod method is also being used for testing sediments collected in 2004 by USGS at eight locations in the UCR (personal communication Pat Moran/USGS), which will allow direct comparability with the RI data. Also, these same amphipod and midge tests are being used for the Portland Harbor Superfund site RI/FS, to support the ecological risk assessment for that site. Therefore, these tests will allow some regional consistency and comparability between the UCR results and other northwest CERCLA sites.

Other test methods, such as the Microtox® bioluminescence test were not chosen because 1) they have shown low correlations with sediment chemistry data or with toxicity seen in other invertebrate tests, 2) have lower relevance to conditions in the UCR (*Photobacterium phosphoreum* is a marine bacterium), and/or 3) may not measure chronic exposure conditions.

6.0 Data Evaluation Approach

For the purposes of the ecological risk assessment to be conducted as part of the RI, and in accordance with standard practices for interpreting sediment bioassay results, three conditions are generally considered when identifying a causal relationship between a site-specific COI and sediment toxicity:

1. A statistically significant difference in effects level between test sediment and control and/or reference sediment ($p<0.05$ for survival, growth, etc.);
2. A biologically significant effect level for the specific test organism and protocol, as outlined in the test acceptability requirements (e.g., minimum mean control survival of 70% for *C. dilutus*); and
3. Evidence of a dose-response relationship. That is, there should be geographic correspondence between measured concentrations and measured toxicity.

The test sediment responses will be compared to the responses observed in the laboratory negative controls and reference area sediments. Determination of the "hit/no hit" designation for each sediment sample will depend on the statistical comparison with the negative control and reference area control, and whether acceptability requirements are also met. To document the sensitivity of the test organisms, reference toxicant tests will also be conducted using a standard toxicant solution (e.g., cadmium chloride [$CdCl_2$] or copper sulfate [$CuSO_4$]). Additional information on the bioassay test methods and associated laboratory QA will be provided in the Phase I Sediment Sampling QAPP.

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Table A2-1
Bioassay Studies Reviewed for the Upper Columbia River
Upper Columbia River RI/FS

Source	Sampling Date	Exposure Medium	Test Organism Type	Test Species	Duration	Endpoint
Ecology, 1989	1986	sediment	Amphipod	*Hyalella azteca*	10-day	survival
Ecology, 1989	1986	sediment	Waterflea	*Daphnia pulex*	48-hr	survival
Nener et.al., 1992	1992	slag samples	Waterflea	*Daphnia magna*	48 and 96-hr	survival
Nener et.al., 1992	1992	slag samples	Amphipod	*Hyalella azteca*	10-day	survival
Nener et.al., 1992	1992	slag samples	Midge	*Chironomus dilutus*	10-day	survival, growth
Nener et.al., 1992	1992	slag samples	Rainbow trout	*Oncorhynchus mykiss*	24-hr	survival
Nener et.al., 1992	1992	slag samples	Algae	*Selenastrum capricornutum*	96-hr	growth
USGS, 1994	1992	sediment	Amphipod	*Hyalella azteca*	7-day	survival
USGS, 1994	1992	sediment	Waterflea	*Ceriodaphnia dubia*	7-day	survival, reproduction
USGS, 1994	1992	sediment	MicrotoxTM	*Photobacterium phosphoreum*	15-min	light reduction
USGS, 1994	1992	porewater	MicrotoxTM	*Photobacterium phosphoreum*	15-min	light reduction
Aquametrix Research Ltd., 1994	1992	sediment	Amphipod	*Hyalella azteca*	unspecified	survival
Aquametrix Research Ltd., 1994	1992	sediment	MicrotoxTM	*Photobacterium phosphoreum*	unspecified	light reduction
Goden and Haden, 1992 (reported in MacDonald Environmental Sciences Ltd., 1997)	1992	sediment	Waterflea	*Daphnia magna*	10-day	survival, reproduction
NECL, 1993 (reported in MacDonald Environmental Sciences Ltd., 1997)	1993	sediment	Amphipod	*Hyalella azteca*	10-day	survival
NECL, 1993 (reported in MacDonald Environmental Sciences Ltd., 1997)	1993	sediment	Waterflea	*Daphnia magna*	48-hr	survival
G3 Consulting, 2001	1995	river water	Waterflea	*Daphnia magna*	48-hr	survival
G3 Consulting, 2001	1995	river water	MicrotoxTM	*Photobacterium phosphoreum*	22-hr	light reduction
G3 Consulting, 2001	1995 and 1999	sediment	Midge	*Chironomus dilutus*	14-day	survival, growth
G3 Consulting, 2001	1995 and 1999	pore water	MicrotoxTM	*Photobacterium phosphoreum*	22-hr	light reduction
Ecology, 2001	2001	sediment	Midge	*Chironomus dilutus*	20-day	survival, growth
Ecology, 2001	2001	sediment	Amphipod	*Hyalella azteca*	10-day	survival
Ecology, 2001	2001	porewater	MicrotoxTM	*Photobacterium phosphoreum*	15-min	light reduction
Golder Associates 2004	2003	sediment	Midge	*Chironomus dilutus*	10 and 20-day	survival, growth

Table A2-2
Sediment Bioassay Results (Ecology, 1989)
Upper Columbia River RI/FS

Sample Location	Survival (%)
Hyalella azteca (10-day)	
Control	92
Lower Arrow Lake	78
Deadman's Eddy	90
Marcus Island	74
Gifford	80
Seven Bays	74
Daphnia pulex (48-hr)	
Control	70
Lower Arrow Lake	45
Deadman's Eddy	55
Marcus Island	75
Gifford	65
Seven Bays	35[a]

Notes:
[a] Statistically significant difference from lab control

Source:
An Assessment of Metals Contamination in Lake Roosevelt (Ecology, 1989)

Table A2-3
Results of Solid-Phase Bioassays on Slag (Nener, 1992)
Upper Columbia River RI/FS

Species Tested	Exposure Duration	Survival (%)			
		Control	Tap 1/2	Tap 2	Tap 3
Daphnia magna	96 hours	92	0[a]	0[a]	96
Chironomus dilutus	10 days	78	40[a]	54[a]	58
Hyalella azteca	10 days	94	0[a]	0[a]	0[a]
Oncorhynchus mykiss	24 hours	100	0[a]	0[a]	0[a]
		Inhibition of Growth at 6.25% Supernatant (%)			
Selenastrum capricornutum	96 hours	na	85.4[a]	96.7[a]	81.9[a]

Notes:
na = not applicable
[a] Statistically significant difference from lab control

Source:
Survival and Water Quality Results of Bioassays on Five Species of Aquatic Organisms Exposed to Slag from Cominco's Trail Operations (Jennifer C. Nener, Department of Fisheries and Oceans, Habitat Division. Eastern B.C., 1992)

Table A2-4a
***Ceriodaphnia dubia* and *Hyalella azteca* Sediment Bioassay Results (USGS, 1994)**
Upper Columbia River RI/FS

Area	Site Name	Matrix	Survival (%)	Young (per female)
Ceriodaphnia dubia (7-day)				
Control/Reference	Control 1	Whole sediment	90	14.8
Control/Reference	Control 2	Whole sediment	90	33.3
Control/Reference	Lower Arrow Lake LB1	Whole sediment	100	31.2
Control/Reference	Lower Arrow Lake LB2	Whole sediment	90	30.8
Northport Reach	Boundary LB	Whole sediment	0[a]	0[a]
Northport Reach	Auxiliary Gage LB	Whole sediment	40[a]	1.8[a]
Northport Reach	Goodeve Creek RB	Whole sediment	80	18.4[a]
Northport Reach	Fivemile Creek LB	Whole sediment	80	29
Northport Reach	Onion Creek LB	Whole sediment	90	33.3
Upper Reach	China Bend RB	Whole sediment	100	38.7
Upper Reach	Bossborg RB	Whole sediment	90	29.2
Upper Reach	Summer Island RB1	Whole sediment	90	33.2
Mid Reach	Marcus Island MS	Whole sediment	70	23.2
Mid Reach	French Point Rocks MS	Whole sediment	70	27.7
Mid Reach	Hunters LB	Whole sediment	100	35.6
Lower Reach	Seven Bays RB	Whole sediment	100	23.6
Lower Reach	Whitestone Creek MS	Whole sediment	100	17.3[a]
Lower Reach	Grand Coulee Dam RB	Whole sediment	80	13.6[a]
Hyalella azteca (7-day)				
Control/Reference	Control 1	Whole sediment	96.7	na
Control/Reference	Control 2	Whole sediment	86.6	na
Control/Reference	Control 3	Whole sediment	95	na
Control/Reference	Lower Arrow Lake LB1	Whole sediment	90	na
Control/Reference	Lower Arrow Lake LB2	Whole sediment	86.7	na
Northport Reach	Boundary LB	Whole sediment	30[a]	na
Northport Reach	Auxiliary Gage LB	Whole sediment	10[a]	na
Northport Reach	Fivemile Creek LB	Whole sediment	73.3	na
Northport Reach	Goodeve Creek RB	Whole sediment	56.7[b]	na
Northport Reach	Onion Creek LB	Whole sediment	86.7	na
Upper Reach	China Bend RB	Whole sediment	86.7	na
Upper Reach	Bossborg RB	Whole sediment	76.7	na
Upper Reach	Summer Island RB1	Whole sediment	73.3	na
Mid Reach	Marcus Island MS	Whole sediment	80	na
Mid Reach	French Point Rocks MS	Whole sediment	96.7	na
Mid Reach	Hunters LB	Whole sediment	90	na
Lower Reach	Seven Bays RB	Whole sediment	93.3	na
Lower Reach	Whitestone Creek MS	Whole sediment	96.7	na
Lower Reach	Grand Coulee Dam RB	Whole sediment	83.3	na

Notes:
[a] Statistically significant difference from lab controls and reference areas
[b] Statistically significant difference from lab controls only
na = not applicable

Source:
Sediment-Quality Assessment of Franklin Roosevelt Lake and the Upstream Reach of the Columbia River (USGS, 1994)

Table A2-4b
***Photobacterium phosphoreum* Sediment Bioassay Results (USGS, 1994)**
Upper Columbia River RI/FS

Photobacterium phosphoreum			Sediment EC50 (%)	Toxicity Response	5 Minute Porewater EC50 (%)	Toxicity Response	15 Minute Porewater EC50 (%)	Toxicity Response
Control/Reference	Lower Arrow Lake LB1	Sandy sediment	10	Low				
Control/Reference	Lower Arrow Lake LB2	Sandy sediment	NT	NT				
Northport Reach	Boundary LB	Sandy sediment	11	Low				
Northport Reach	Boundary RB	Sandy sediment	27	Low				
Northport Reach	Auxiliary Gage LB	Sandy sediment	NT	NT				
Northport Reach	Auxiliary Gage RB	Sandy sediment	NT	NT				
Northport Reach	Goodeve Creek LB	Fine-grained sediment	1.7	Moderate				
Northport Reach	Goodeve Creek LB	Sediment pore water			61	Moderate	55	Moderate
Northport Reach	Goodeve Creek RB	Sandy sediment	NT	NT				
Northport Reach	Fivemile Creek LB	Sandy sediment	4.9	Moderate				
Northport Reach	Onion Creek LB	Sandy sediment	3.6	High				
Northport Reach	Onion Creek LB	Sediment pore water			91	Low	84	Low
Northport Reach	Onion Creek RB	Sandy sediment	5.9	Moderate				
Upper Reach	China Bend RB	Fine-grained sediment	11	Low				
Upper Reach	China Bend RB	Sediment pore water			NT	NT	NT	NT
Upper Reach	Bossborg RB	Fine-grained sediment	2.1	Low				
Upper Reach	Bossborg RB	Sediment pore water			70	Moderate	54	Moderate
Upper Reach	Summer Island RB1	Fine-grained sediment	3.9	Low				
Upper Reach	Summer Island RB1	Sediment pore water			36	High	27	High
Upper Reach	Summer Island RB2	Fine-grained sediment	NT	NT				
Upper Reach	Summer Island RB2	Sediment pore water			NT	NT	NT	NT
Mid Reach	Marcus Island MS	Fine-grained sediment	5.1	Low				
Mid Reach	Marcus Island MS	Sediment pore water			NT	NT	NT	NT
Mid Reach	Cheweka Creek LB	Fine-grained sediment	1.9	Moderate				
Mid Reach	Cheweka Creek LB	Sediment pore water			NT	NT	NT	NT
Mid Reach	Fort Spokane RB	Fine-grained sediment	0.9	Moderate				
Mid Reach	Fort Spokane RB	Sediment pore water			NT	NT	NT	NT
Mid Reach	French Point Rocks MS	Fine-grained sediment	0.81	Moderate				
Mid Reach	French Point Rocks MS	Sediment pore water			59	Moderate	43	Moderate
Mid Reach	Gifford MS	Fine-grained sediment	0.2	High				
Mid Reach	Gifford MS	Sediment pore water			NT	NT	NT	NT
Mid Reach	Haag Cove RB	Fine-grained sediment	5.6	Low				
Mid Reach	Haag Cove RB	Sediment pore water			NT	NT	NT	NT
Mid Reach	Hunters LB	Fine-grained sediment	0.5	High				
Mid Reach	Hunters LB	Sediment pore water			79	Low	NT	NT
Mid Reach	Ninemile Creek RB	Fine-grained sediment	1.2	Moderate				
Mid Reach	Ninemile Creek RB	Sediment pore water			NT	NT	NT	NT
Mid Reach	West Kettle Falls LB	Fine-grained sediment	1.9	Moderate				
Mid Reach	West Kettle Falls LB	Sediment pore water			53	Moderate	32	High
Lower Reach	Seven Bays RB	Fine-grained sediment	0.77	High				
Lower Reach	Seven Bays RB	Sediment pore water			NT	NT	81	Low
Lower Reach	Whitestone Creek MS	Fine-grained sediment	0.18	High				
Lower Reach	Whitestone Creek MS	Sediment pore water			53	Moderate	65	Moderate
Lower Reach	Keller Ferry RB	Fine-grained sediment	1.9	Moderate				
Lower Reach	Keller Ferry RB	Sediment pore water			NT	NT	NT	NT
Lower Reach	Swawilla Basin LB	Fine-grained sediment	0.88	Moderate				
Lower Reach	Swawilla Basin LB	Sediment pore water			NT	NT	NT	NT
Lower Reach	Grand Coulee Dam RB	Fine-grained sediment	0.63	High				
Lower Reach	Grand Coulee Dam RB	Sediment pore water			NT	NT	NT	NT

Notes:
NT = no apparent toxicity observed

Source:
Sediment-Quality Assessment of Franklin Roosevelt Lake and the Upstream Reach of the Columbia River (USGS, 1994)

Table A2-5
***Hyalella azteca* and Microtox Bioassay Results (Aquametrix Research Ltd., 1994)**
Upper Columbia River RI/FS

	Microtox Test		Amphipod
Site Name	EC50 (% by wt.)	Duplicate EC50 (% by wt.)	Survival (%)
Arrow Lake	0.44	1.15	100
Kootenay Lake	0.15	---	93
Downstream Celgar	2.34	---	33
Robson	8.13	5.1	93
China Creek	1.26	---	100
Birchbank	1.28	---	67
Downstream Cominco	0.39	---	27
Downstream Beaver	1.25	0.33	100
Waneta	0.28	---	100

Notes:
--- = not available

Source:
Columbia River Integrated Environmental Monitoring Program (CRIEMP), 1991-1993 Interpretive Report (Aquametrix Research Ltd., 1994).

Table A2-6
10-Day *Hyalella azteca* and *Daphnia magna* Bioassay Results
(MacDonald Environmental Sciences Ltd., 1997)
Upper Columbia River RI/FS

Site Name	% Survival	Young/Adult
Daphnia magna (10-day) [c]		
Control	100	248
Back Eddy Pool	100	264
Genelle Island	100	157
Beaver Creek	0[b]	15[b]
Hyalella azteca (10-day) [d]		
Arrow Lake (reference site)	100	na
Celgar	33[a]	na
Birchbank	67[a]	na
Ryan Creek	100	na
Beaver Creek	27[a]	na
Waneta	100	na

Notes:
na = not applicable
[a] Statistically significant difference when compared with reference site
[b] Statistically significant difference when compared with control
[c] Original study from Godin and Hagan (1992)
[d] Original study from NECL (1993)

Source:
Lower Columbia River from Birchbank to the International Border: Water Quality Assessment and Recommended Objectives - Technical Report (MacDonald Environmental Sciences Ltd., 1997).

Table A2-7
***14-Day Chironomus dilutus* Sediment Bioassay Results (G3 Consulting, 2001)**
Upper Columbia River RI/FS

Area	Date	Site	Survival (%)	% of Control Weight
Chironomus dilutus (14-day)				
Upstream reference	Spring 1995	Birchbank	92.7	116
Upstream reference	Spring 1999	Birchbank	88	64
Downstream reference	Spring 1995	Waneta	86.7	64
Downstream reference	Spring 1999	Waneta	86	26
	Spring 1995	New Bridge	12[a]	44
	Spring 1999	New Bridge	NS	NS

Notes:
[a] Statistically significant difference when compared with both reference sites
NS = not sampled

Source:
Assessment of Columbia River Receiving Waters - Final Report (G3 Consulting, 2001).

Table A2-8

Chironomus dilutus, Hyalella azteca, and MicrotoxTM Sediment Bioassay Results (Ecology, 2001)

Upper Columbia River RI/FS

Site Location	Matrix	Mean Survival (%)	Test Duration (days)	Mean Growth (mg)	5 Minute Porewater EC50 (%)	15 Minute Porewater EC50 (%)
Chironomus dilutus (20-day)						
Auxiliary Gage	Sediment	2.5[a]	20	1.08[a]	na	na
Boundary	Sediment	70	20	1.05	na	na
Castle Rock	Sediment	62.5[a]	20	1.55	na	na
Goodeve Creek	Sediment	0[a]	20	0[a]	na	na
Grand Coulee Dam	Sediment	63.8	20	1.56	na	na
Kettle River	Sediment	51.3	20	2.55	na	na
Lower Arrow Lake	Sediment	76.3	20	1.18	na	na
Sanpoil River	Sediment	53.8[a]	20	1.08	na	na
Swawilla Basin	Sediment	60[a]	20	1.25	na	na
Whitestone Creek	Sediment	55[a]	20	1.36	na	na
Control	Sediment	68.8	20	1.52	na	na
Hyalella azteca (10-day)						
Auxiliary Gage	Sediment	56.3	10	na	na	na
Boundary	Sediment	66.3	10	na	na	na
Castle Rock	Sediment	72.5	10	na	na	na
Goodeve Creek	Sediment	50[a]	10	na	na	na
Grand Coulee Dam	Sediment	71.3	10	na	na	na
Kettle River	Sediment	68.8	10	na	na	na
Lower Arrow Lake	Sediment	71.3	10	na	na	na
Sanpoil River	Sediment	70	10	na	na	na
Swawilla Basin	Sediment	75	10	na	na	na
Whitestone Creek	Sediment	92.5	10	na	na	na
Control	Sediment	90	10	na	na	na
Photobacterium phosphoreum **, Microtox™**						
Auxiliary Gage	Porewater	na	na	na	6	5
Boundary	Porewater	na	na	na	16[a]	21[a]
Castle Rock	Porewater	na	na	na	15[a]	15[a]
Goodeve Creek	Porewater	na	na	na	26[a]	38[a]
Grand Coulee Dam	Porewater	na	na	na	-5	-7
Kettle River	Porewater	na	na	na	67[a]	68[a]
Lower Arrow Lake	Porewater	na	na	na	0	0
Sanpoil River	Porewater	na	na	na	2	-1
Swawilla Basin	Porewater	na	na	na	8	6
Whitestone Creek	Porewater	na	na	na	7	5
Control	Porewater	na	na	na	0	0

Notes:

[a] Values showed significant toxicity compared to reference.

Source:

Reassessment of Toxicity of Lake Roosevelt Sediments (Ecology, 2001)

Table A2-9
10- and 20-Day *Chironomus dilutus* Sediment Bioassay Results
(Golder Associates, 2004)
Upper Columbia River RI/FS

Sample Location	Test Duration (days)	Survival (%)	Mean Growth (mg)
10-day Results			
Control 1	10	72	0.29
Control 2	10	57	0.33
Waneta	10	86	0.26
Casino	10	84	0.77
Korpak	10	88	0.91
Trimac	10	92	0.98
Maglios	10	50	0.16
Fort Sheppard	10	55	1.75
Airport Bar	10	92	1.64
Birchbank	10	94	1.27
Control 3	10	82	0.28
Kootenay Eddy	10	94	0.62
Genelle	10	80	0.27
20-day Results			
Control 1	20	57	1.02
Control 2	20	53	1.22
Waneta	20	24	0.31
Casino	20	86	1.75
Korpak	20	72	1.46
Trimac	20	76	0.85
Maglios	20	0	na
Fort Sheppard	20	58	2.23
Airport Bar	20	86	2.34
Birchbank	20	86	1.66
Kootenay Eddy	20	82	1.94
Genelle	20	60	1.2

Notes:
Statistical differences compared to controls not available.

Source:
Teck Cominco Aquatic Ecological Risk Assessment Field Summary Report for 2003 (Golder Associates, 2004).

Table A4-1

Comparison of Detected Sediment Concentrations in the Lower Reach of the Upper Columbia River (RM 600-640) with Sediment Screening Benchmarks[a]

Upper Columbia River RI/FS

Constituent	Units	Number of Detects	Number of Samples	Frequency of Detection	Minimum Detection Limit	Maximum Detection Limit	Minimum Detected Value	Maximum Detected Value	Arithmetic Mean	Criterion - TEC	Factor of Exceedence of Maximum	Number of Detects > Criterion	Criterion - PEC	Factor of Exceedence of Maximum	Number of Detects > Criterion
Aluminum	mg/kg	3	3	100%	--	--	22500	27000	25333	--	--	--	--	--	--
Antimony	mg/kg	22	22	100%	--	--	0.4	5.6	2.9	--	--	--	--	--	--
Arsenic	mg/kg	14	14	100%	--	--	4.2	15.3	9.77	9.79	1.6	6	33	0.5	--
Arsenic, dissolved	mg/kg	11	11	100%	--	--	6.1	22	16	--	--	--	--	--	--
Barium	mg/kg	20	20	100%	--	--	710	1200	891	--	--	--	--	--	--
Beryllium	mg/kg	4	4	100%	--	--	1.7	2.1	1.9	--	--	--	--	--	--
Cadmium	mg/kg	25	27	93%	0.1	0.5	0.3	12.4	5.0	0.99	12.5	21	4.98	2.5	12
Cadmium, Recoverable	mg/kg	3	3	100%	--	--	5.6	11	8.7	--	--	--	--	--	--
Chromium	mg/kg	21	21	100%	--	--	34	120	76	43.4	2.8	18	111	1.1	1
Cobalt	mg/kg	5	5	100%	--	--	8.2	12	10	--	--	--	--	--	--
Copper	mg/kg	26	26	100%	--	--	10.7	79	46	31.6	2.5	16	149	0.5	--
Copper, Recoverable	mg/kg	3	3	100%	--	--	51	66	58	--	--	--	--	--	--
Gold	mg/kg	4	4	100%	--	--	12	23	17	--	--	--	--	--	--
Iron	mg/kg	3	3	100%	--	--	33480	36680	35593	--	--	--	--	--	--
Lead	mg/kg	30	30	100%	--	--	14	320	138	35.8	8.9	20	128	2.5	14
Lead, Recoverable	mg/kg	3	3	100%	--	--	170	300	250	--	--	--	--	--	--
Lithium	mg/kg	7	7	100%	--	--	21	35	27	--	--	--	--	--	--
Manganese	mg/kg	24	24	100%	--	--	340	2600	1170	--	--	--	--	--	--
Mercury	mg/kg	23	25	92%	0.01	0.05	0.01	1.6	0.61	0.18	8.9	15	1.06	1.5	7
Mercury, Recoverable	mg/kg	2	3	67%	0.5	0.5	0.2	0.4	0.3	--	--	--	--	--	--
Molybdenum	mg/kg	1	2	50%	1	1	1	1	1	--	--	--	--	--	--
Nickel	mg/kg	9	9	100%	--	--	16	28	24	22.7	1.2	6	48.6	0.6	--
Phosphorus	mg/kg	6	6	100%	--	--	760	1500	1143	--	--	--	--	--	--
Selenium	mg/kg	5	5	100%	--	--	0.06	0.4	0.21	--	--	--	--	--	--
Strontium	mg/kg	9	9	100%	--	--	310	430	363	--	--	--	--	--	--
Tin	mg/kg	10	10	100%	--	--	1.3	3	2.2	--	--	--	--	--	--
Vanadium	mg/kg	5	5	100%	--	--	63	130	105	--	--	--	--	--	--
Zinc	mg/kg	26	26	100%	--	--	53	1100	508	121	9.1	22	459	2.4	13
Zinc, Recoverable	mg/kg	3	3	100%	--	--	610	1000	853	--	--	--	--	--	--

[a] The sediment quality benchmarks on this table are intended to be used to select sampling locations and exceedances of these values should not at this time be misconstrued as actual ris

Table A4-2

Comparison of Detected Sediment Concentrations in the Middle Reach of the Upper Columbia River (RM 641-710) with Sediment Screening Benchmarks[a]

Upper Columbia River RI/FS

Constituent	Units	Number of Detects	Number of Samples	Frequency of Detection	Minimum Detection Limit	Maximum Detection Limit	Minimum Detected Value	Maximum Detected Value	Arithmetic Mean	Criterion - TEC	Factor of Exceedence of Maximum	Number of Detects > Criterion	Criterion - PEC	Factor of Exceedence of Maximum	Number of Detects > Criterion
4,4'-DDE	mg/kg	2	23	9%	0.0033	0.013	0.0017	0.0031	0.0024	3.16	0.0010	--	31.3	0.00010	--
4,4'-DDT	mg/kg	1	22	5%	0.0033	0.013	0.01	0.01	0.01	4.16	0.0024	--	62.9	0.00016	--
alpha-Chlordane	mg/kg	1	19	5%	0.0017	0.0068	0.00073	0.00073	0.00073	--	--	--	--	--	--
Aluminum	mg/kg	85	85	100%	--	--	1210	21600	9,068	--	--	--	--	--	--
Antimony	mg/kg	71	105	68%	0.6	3.4	0.6	32	5.21	--	--	--	--	--	--
Aroclor 1254	mg/kg	1	23	4%	0.033	0.13	0.038	0.038	0.038	--	--	--	--	--	--
Aroclor 1260	mg/kg	1	23	4%	0.033	0.13	0.017	0.017	0.017	--	--	--	--	--	--
Arsenic	mg/kg	70	89	79%	1.1	9.5	1.2	30	7.94	9.79	3.1	20	33	0.9	--
Arsenic, dissolved	mg/kg	21	21	100%	--	--	1.4	26	12.0	--	--	--	--	--	--
Barium	mg/kg	96	96	100%	--	--	9.7	1700	331	--	--	--	--	--	--
Beryllium	mg/kg	66	66	100%	--	--	0.07	2.3	0.61	--	--	--	--	--	--
beta-BHC	mg/kg	1	18	0%	0.0017	0.0045	0.0059	0.0059	0.0059	--	--	--	--	--	--
Cadmium	mg/kg	85	97	88%	0.06	0.5	0.08	13.1	3.71	0.99	13	57	4.98	2.6	28
Cadmium, Recoverable	mg/kg	3	3	100%	--	--	3.4	11	7.23	--	--	--	--	--	--
Calcium	mg/kg	82	82	100%	--	--	910	174000	24,093	--	--	--	--	--	--
Chromium	mg/kg	102	102	100%	--	--	1.6	130	38.1	43.4	3.0	30	111	1.2	2
Cobalt	mg/kg	72	72	100%	--	--	0.53	15	6.67	--	--	--	--	--	--
Copper	mg/kg	126	126	100%	--	--	1.7	1200	66.2	31.6	38	60	149	8.1	10
Copper, Recoverable	mg/kg	3	3	100%	--	--	32	200	110	--	--	--	--	--	--
Endrin aldehyde	mg/kg	1	22	5%	0.0033	0.013	0.0015	0.0015	0.0015	--	--	--	--	--	--
Gold	mg/kg	4	5	80%	13	13	12	20	16.25	--	--	--	--	--	--
Iron	mg/kg	87	87	100%	--	--	2040	152890	18,390	--	--	--	--	--	--
Lead	mg/kg	134	135	99%	1.5	1.5	1.2	841	159	35.8	23	74	128	6.6	53
Lead, Recoverable	mg/kg	3	3	100%	--	--	130	580	363	--	--	--	--	--	--
Lithium	mg/kg	12	12	100%	--	--	21	36	29.2	--	--	--	--	--	--
Magnesium	mg/kg	81	81	100%	--	--	569	18100	5,272	--	--	--	--	--	--
Manganese	mg/kg	118	118	100%	--	--	47.4	3190	601	--	--	--	--	--	--
Mercury	mg/kg	57	69	83%	0.05	0.27	0.01	2.8	0.79	0.18	16	42	1.06	2.6	15
Mercury, Recoverable	mg/kg	3	3	100%	--	--	0.2	0.8	0.57	--	--	--	--	--	--
Methoxychlor	mg/kg	2	19	11%	0.017	0.068	0.027	0.052	0.040	--	--	--	--	--	--
Molybdenum	mg/kg	12	13	92%	1	1	1	2.5	1.81	--	--	--	--	--	--
Nickel	mg/kg	88	88	100%	--	--	1.2	45.6	19.8	22.7	2.0	32	48.6	0.9	--
Phosphorus	mg/kg	8	8	100%	--	--	970	1600	1,259	--	--	--	--	--	--
Potassium	mg/kg	82	82	100%	--	--	298	6120	1,773	--	--	--	--	--	--
Selenium	mg/kg	28	61	46%	0.68	2	0.1	4.8	1.38	--	--	--	--	--	--
Silver	mg/kg	57	76	75%	0.17	0.91	0.18	2.9	0.88	--	--	--	--	--	--
Sodium	mg/kg	69	81	85%	178	1010	139	685	315	--	--	--	--	--	--
Strontium	mg/kg	14	14	100%	--	--	290	550	392	--	--	--	--	--	--
Thallium	mg/kg	1	35	3%	0.78	4.4	2.2	2.2	2.20	--	--	--	--	--	--
Tin	mg/kg	17	18	94%	1	1	1.4	6.8	4.01	--	--	--	--	--	--
Total organic carbon	mg/kg	33	34	97%	1000	1000	1420	328000	27,198	--	--	--	--	--	--
Vanadium	mg/kg	88	88	100%	--	--	3.4	120	33.3	--	--	--	--	--	--
Zinc	mg/kg	122	122	100%	--	--	7	14440	538	121	119	61	459	31.5	42
Zinc, Recoverable	mg/kg	3	3	100%	--	--	350	1200	807	--	--	--	--	--	--

[a] The sediment quality benchmarks on this table are intended to be used to select sampling locations and exceedances of these values should not at this time be misconstrued as actual ris

Table A4-3

Comparison of Detected Sediment Concentrations in the Upper Reach of the Upper Columbia River (RM 711-750) with Sediment Screening Benchmarks[a]

Upper Columbia River RI/FS

Constituent	Units	Number of Detects	Number of Samples	Frequency of Detection	Minimum Detection Limit	Maximum Detection Limit	Minimum Detected Value	Maximum Detected Value	Arithmetic Mean	Criterion - TEC	Factor of Exceedence of Maximum	Number of Detects > Criterion	Criterion - PEC	Factor of Exceedence of Maximum	Number of Detects > Criterion
4,4'-DDT	mg/kg	1	13	8%	0.0033	0.0052	0.0059	0.0059	0.0059	4.16	0.0014	--	62.9	0.000094	--
Aluminum	mg/kg	74	74	100%	--	--	924	25900	9,362	--	--	--	--	--	--
Ammonia	mg/kg	1	1	100%	--	--	0.06	0.06	0.060	--	--	--	--	--	--
Antimony	mg/kg	73	90	81%	0.61	9.2	0.63	380	49.0	--	--	--	--	--	--
Arsenic	mg/kg	72	77	94%	1.2	3.1	1.6	54	14.8	9.79	5.5	40	33	1.6	4
Arsenic, dissolved	mg/kg	17	17	100%	--	--	4.5	66	33.1	--	--	--	--	--	--
Barium	mg/kg	85	85	100%	--	--	37.7	3400	762	--	--	--	--	--	--
Beryllium	mg/kg	48	54	89%	0.04	0.2	0.03	77	2.15	--	--	--	--	--	--
Cadmium	mg/kg	71	75	95%	0.06	0.09	0.07	46.2	4.47	0.99	47	52	4.98	9.3	21
Cadmium, Recoverable	mg/kg	3	6	50%	2.4	3.8	4.6	6.4	5.37	--	--	--	--	--	--
Calcium	mg/kg	71	71	100%	--	--	1780	336000	53,292	--	--	--	--	--	--
Chromium	mg/kg	91	91	100%	--	--	1.5	310	60.9	43.4	7.1	34	111	2.8	17
Cobalt	mg/kg	65	66	98%	0.61	0.61	0.44	85.7	14.3	--	--	--	--	--	--
Copper	mg/kg	99	99	100%	--	--	3.6	4870	766	31.6	154	68	149	32.7	52
Copper, Recoverable	mg/kg	5	5	100%	--	--	220	2800	1,312	--	--	--	--	--	--
Endrin	mg/kg	1	14	7%	0.0033	0.0052	0.0063	0.0063	0.0063	2.22	0.002837838	--	207	0.000030	--
Gold	mg/kg	5	5	100%	--	--	22	72	53.8	--	--	--	--	--	--
Iron	mg/kg	76	76	100%	--	--	1030	326200	63,616	--	--	--	--	--	--
Lead	mg/kg	99	99	100%	--	--	5.2	1590	271	35.8	44	78	128	12.4	63
Lead, Recoverable	mg/kg	6	6	100%	--	--	260	460	318	--	--	--	--	--	--
Lithium	mg/kg	6	6	100%	--	--	21	30	24.8	--	--	--	--	--	--
Magnesium	mg/kg	71	71	100%	--	--	1290	26600	6,911	--	--	--	--	--	--
Manganese	mg/kg	100	100	100%	--	--	41.4	5900	1,437	--	--	--	--	--	--
Mercury	mg/kg	44	57	77%	0.05	0.26	0.01	1.4	0.36	0.18	7.8	24	1.06	1.3	2
Mercury, Recoverable	mg/kg	5	5	100%	--	--	0.05	0.6	0.24	--	--	--	--	--	--
Methoxychlor	mg/kg	1	11	9%	0.017	0.027	0.036	0.036	0.036	--	--	--	--	--	--
Molybdenum	mg/kg	4	4	100%	--	--	1.8	2.7	2.20	--	--	--	--	--	--
Nickel	mg/kg	71	71	100%	--	--	2.9	66.7	16.7	22.7	2.9	13	48.6	1.4	1
Nitrogen, nitrite	mg/kg	1	1	100%	--	--	0.1	0.1	0.10	--	--	--	--	--	--
Orthophosphate	mg/kg	1	1	100%	--	--	0.004	0.004	0.0040	--	--	--	--	--	--
Phosphorus	mg/kg	2	2	100%	--	--	1450	1500	1,475	--	--	--	--	--	--
Potassium	mg/kg	66	66	100%	--	--	265	4330	1,804	--	--	--	--	--	--
Selenium	mg/kg	29	54	54%	0.1	1.9	0.81	28.4	3.10	--	--	--	--	--	--
Silver	mg/kg	54	73	74%	0.15	0.86	0.25	12.6	2.91	--	--	--	--	--	--
Sodium	mg/kg	60	68	88%	237	562	83.6	2630	644	--	--	--	--	--	--
Strontium	mg/kg	5	5	100%	--	--	365	420	391	--	--	--	--	--	--
Thallium	mg/kg	8	44	18%	0.1	5.3	0.81	4.6	2.25	--	--	--	--	--	--
Tin	mg/kg	6	6	100%	--	--	6.8	22	11.9	--	--	--	--	--	--
Total organic carbon	mg/kg	30	31	97%	1000	1000	1210	96600	15,532	--	--	--	--	--	--
Total Phosphorus	mg/kg	1	1	100%	--	--	0.006	0.006	0.0060	--	--	--	--	--	--
Vanadium	mg/kg	73	73	100%	--	--	2.7	92	29.0	--	--	--	--	--	--
Zinc	mg/kg	98	98	100%	--	--	16.2	26840	5,446	121	222	78	459	58.5	61
Zinc, Recoverable	mg/kg	6	6	100%	--	--	1300	16000	8,233	--	--	--	--	--	--

[a] The sediment quality benchmarks on this table are intended to be used to select sampling locations and exceedances of these values should not at this time be misconstrued as actual ris

Table A5-1

Rating of Selection Criteria for Freshwater Sediment Toxicity Testing Organisms [1]

Upper Columbia River RI/FS

Criterion	*Hyalella azteca*	*Diporeia spp.*	*Chironomus dilutus*	*Chironomus riparius*	*Lumbriculus variegatus*	*Tubifex tubifex*	*Hexagenia spp.*	*Mollusks*	*Daphnia spp. and Ceriodaphnia spp.*
Relative sensitivity toxicity database	+	-	+	-	+	-	-	-	-
Round-robin studies conducted	+	-	+	-	-	-	-	-	-
Contact with sediment	+	+	+	+	+	+	+	+	-
Laboratory culture	+	-	+	+	+	+	-	-	+
Taxonomic identification	+/-	+/-	+/-	+/-	+	+	+	+	+
Ecological importance	+	+	+	+	+	+	+	+	+
Geographical distribution	+	+/-	+	+	+	+	+	+	+/-
Sediment physico-chemical tolerance	+	+	+/-	+	+	+	-	+	NA
Response confirmed with benthic populations	+	+	+	+	+	+	+	-	+
Peer reviewed	+	+	+	+	+	+	+	-	+/-
Endpoints monitored[2]	S, G, M, R	S, B, A	S, G, E, R	S, G, E	B, S, R	S, R	S, G	B	S, G, R

[1] A "+" or "-" rating indicates a positive or negative attribute

[2] S - Survival, G = Growth, B = Bioaccumulation, A = Avoidance, R = Reproduction, M = Maturation, E = Emergence, NA = not applicable

spp = species

Exhibit A5-1

Test Conditions for Conducting a 28-day Sediment Toxicity Test with *Hyalella azteca*

Parameter Conditions

1. Test type: Whole-sediment toxicity test with renewal of overlying water

2. Temperature: 23 ±1°C

3. Light quality: Wide-spectrum fluorescent lights

4. Illuminance: About 100 to 1000 lux

5. Photoperiod: 16L:8D

6. Test chamber: 300-mL high-form lipless beaker

7. Sediment volume: 100 mL

8. Overlying water volume: 175 mL in the sediment exposure from Day 0 to Day 28

9. Renewal of overlying water: 2 volume additions/d; continuous or intermittent (e.g., one volume addition every 12 h)

10. Age of organisms: 7- to 8-d old at the start of the test

11. Number of organisms/chamber: 10

12. Number of replicate chambers/treatment: 4 (minimum) to 8 for 28-day survival and growth

13. Feeding: YCT food, fed 1.0 mL (1,800 mg/L stock) daily to each test chamber

14. Aeration: None, unless dissolved oxygen in overlying water drops below 2.5 mg/L.

15. Overlying water: Culture water, well water, or surface water

16. Overlying water quality: Hardness, alkalinity, conductivity, and ammonia at the beginning and end of a sediment exposure (Day 0 and 28). Temperature daily. Conductivity weekly. Dissolved oxygen (DO) and pH three times/week. Concentrations of DO should be measured more often if DO drops more than 1 mg/L since the previous measurement.

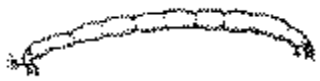
17. Test duration: 28 days

18. Endpoints: 28-day survival and growth

19. Test acceptability: Minimum mean control survival of 80% on Day 28. Additional performance-based criteria specifications are outlined in outlined in ASTM E1706–00

Exhibit A5-2

Recommended Test Conditions for Conducting a 10-day Sediment Toxicity Test with *Chironomus dilutus*



Parameter Conditions

1. Test type: Whole-sediment toxicity test with renewal of overlying water

2. Temperature: 23 ± 1°C

3. Light quality: Wide-spectrum fluorescent lights

4. Illuminance: About 100 to 1000 lux

5. Photoperiod: 16L:8D

6. Test chamber: 300-mL high-form lipless beaker

7. Sediment volume: 100 mL

8. Overlying water volume: 175 mL

9. Renewal of overlying water: 2 volume additions/d; continuous or intermittent (e.g., one volume addition every 12 h)

10. Age of organisms: Second- to third-instar larvae (about 10-day-old larvae)

11. Number of organisms/chamber: 10

12. Number of replicate chambers/treatment: Eight replicates are recommended for routine testing

13. Feeding: TetrafinT goldfish food, fed 1.5 mL daily to each test chamber (1.5 mL contains 6.0 mg of dry solids)

14. Aeration: None, unless dissolved oxygen in overlying water drops below 2.5 mg/L.

15. Overlying water: Reconstituted water

16. Overlying water quality: Hardness, alkalinity, conductivity, pH, and ammonia at the beginning and end of a test on day 10. Temperature and dissolved oxygen daily

17. Test duration: 10 day

18. Endpoints: Survival, growth (ash-free dry weight; AFDW)

19. Test acceptability: Minimum mean control survival of 70% with minimum mean weight per surviving control organism of 0.48 mg AFDW, and performance-based criteria specifications outlined in ASTM E1706–00.

Exhibit A5-3

Test Conditions for Conducting 7-Day Sediment Toxicity Tests with *Daphnia magna* or *Ceriodaphnia dubia*

Parameter Conditions

1. Test Type: Whole-sediment toxicity test with renewal of overlying water.

2. Temperature: 25°C ±1°C

3. Light quality: Wide-spectrum fluorescent lights

4. Illuminance: About 100 to 1000 lux

5. Photoperiod: 16L:8D

6. Test chamber: 30-mL beaker

7. Sediment volume: 5 mL

8. Overlying water volume: 20 mL

9. Renewal of overlying water: 15 mL daily

10. Age of organisms: *Daphnia magna* 5-day old at start of test or *Ceriodaphnia dubia* <24-h old at the start of the test

11. Number of organisms/chamber: 1

12. Number of replicate chambers/treatment: Ten replicates are recommended for routine testing.

13. Feeding: Culture food (e.g., algae, YCT)

14. Aeration: None, unless dissolved oxygen in overlying water drops below 2.5 mg/L

15. Overlying water: Culture water, well water, surface water, site water, or reconstituted water.

16. Test chamber cleaning: None during a test

17. Overlying water quality: Hardness, alkalinity, conductivity, and ammonia at the beginning and end of a test. Temperature, pH, and dissolved oxygen daily

18. Test duration: 7 day or when at least 60% of the controls have produced their third brood

19. End points: Survival, reproduction

20. Test acceptability: Minimum mean control survival of ≥ 80%, average brood size per surviving females in control must be ≥ 15 for tests with *C. dubia* or ≥ 20 for tests with *D. magna*, and performance-based criteria specifications outlined in ASTM E1706–00

Appendix B

Detailed Bioassay Laboratory Reports

DMR

Dinnel Marine Resources
1519 13th St.
Anacortes, WA 98221
360-299-8468

25 April 2005

Mr. Michael Stanaway
Applied Sciences Laboratories
CH2M Hill
2300 Walnut Blvd.
Corvallis, OR 97330

Dear Mike:

Thank you for your time and patience during my pre-test visit to your laboratory last Friday. I found your facilities and testing protocols to be in excellent shape and your personnel to be well experienced in the types of sediment tests to be run for the upcoming Upper Columbia River Project.

I take this opportunity to reconfirm several items in ASL's *Chironomus* and *Ceriodaphnia* test protocols that were not specifically defined for the Upper Columbia River (UCR) Testing program.

For the *Chironomus* test, your protocol for the UCR test should note that you will use 8 replicates for each sample and that the reference toxicant for this test will be KCl. At the discretion of the project lead, you might also wish to consider at least Time zero measurements of interstitial sulfide in the test sediments since significant amounts of sulfide can produce false positives in sediment tests (if sulfide concentrations in Upper Columbia River sediments are known to be consistently low, then this is not an issue). It would also be helpful if you can compare your extraction method for DO with measurements of DO in the water quality beakers themselves (especially when DO concentrations are low).

For the *Ceriodaphnia* test, your protocol for the UCR program should note that the test will use the Washington State test termination method (end the reproduction portion of the test when 60% of the surviving control organisms produce their third brood, but continue test [if necessary] with adults until day 7 for the survival endpoint). Additionally, I note that you will use 5 g (vs. 5 ml) of sediment in each test container and that the reference toxicant will be NaCl.

One other item that should be clarified with the project lead is the selection of the water harness to be used during testing. The water hardness should be reasonably close to the

ASTM/EPA recommended levels but may be adjusted to match the levels typically observed in the areas from which the sediment samples were collected.

As noted during my visit, I will make at least one unannounced test-in-progress audit of both of the sediment tests. I look forward to receiving a copy of your test schedule once it has been finalized.

Once again thank you and Brett Muckey for finding time in your busy schedules to meet with me.

Sincerely,

Paul Dinnel
Project QA Auditor

DMR

Dinnel Marine Resources
1519 13th St.
Anacortes, WA 98221
360-299-8468

28 April 2005

Ms. Artemis Antipas
CH2M Hill
1100 112th Ave. NE
Bellevue, WA 98004-5404

Dear Ms. Antipas:

As per my Bioassay QA Scope of Work approved by CH2M Hill, I have reviewed all bioassay test protocols and conducted a pre-test visit of CH2M Hill's Applied Sciences Laboratories (ASL) in Corvallis, Oregon. Similar reviews of Northwestern Aquatic Sciences Laboratory in Newport (NAS), OR was deemed unnecessary since DMR has been conducting routine audits of NAS associated with several other recent sediment bioassay projects.

Following my reviews of both NAS and ASL bioassay SOPs, I found that all three SOPs were in agreement with ASTM Standard Guide E 1706, Test Method for Measuring the Toxicity of Sediment-Associated Contaminants with Freshwater Invertebrates, and further in general agreement with parallel U.S. EPA guidelines for conducting these same tests.

Although I found both laboratory SOPs in agreement with ASTM and EPA guidelines, I did have some project-specific suggestions for each laboratory (communicated by letter to Mike Stanaway, ASL on 25 April 2005 [see separate letter] and to NAS via phone call). These included:

1. Measurement of sulfide in the interstitial sediments prior to testing if sulfide concentrations in the Upper Columbia River sediments are anticipated to be significant.

2. Specification of the number of replicates to be used for each test (8 for *Hyalella* and *Chironomus* and 10 for *Ceriodaphnia*).

3. Use of the Washington State termination method for the *Ceriodaphnia* test.

4. Selection of a project-specific water hardness (the harness selected is 70 ± 5 mg/liter) for all three tests.

5. Specification of reference toxicants to be tested in parallel with the sediment tests (KCl for the *Chironomus* test, NaCl for the *Ceriodaphnia* test and cadmium for the *Hyalella* test).

I also conducted a pre-test audit of ASL laboratories and personnel on 22 April 2005. I found ASL's facilities to be in excellent shape and their test personnel to be well qualified and experienced in running the *Chironomus* and *Ceriodaphnia* sediment tests. I am satisfied that both NAS and ASL will be using test methods that are consistent with ASTM/EPA guidelines and that their documentation of all testing conditions and parameters will be satisfactory. Once testing is initiated, I will make one (or more, if necessary) test-in-progress audits of the sediment bioassays.

Should you have any questions, please contact me via phone at 360-299-8468 or via e-mail at padinnel@aol.com.

Sincerely,

Paul A. Dinnel, PhD
Upper Columbia River Bioassay QA Monitor

CC: Jim Stesanoff, CH2M Hill

DMR

Dinnel Marine Resources
1519 13th St.
Anacortes, WA 98221
360-299-8468

23 October 2005

Mr. Gerald Irissarri
Upper Columbia River Bioassay Project Manager
Northwestern Aquatic Sciences
PO Box 1437
Newport, OR 97365

Dear Gerald:

I have finished my audits of your two draft data reports for the testing of Upper Columbia River test sediments. Your data reports were in excellent condition and reflect your usual high degree of attention to detail. There are only a few minor "housekeeping" items that need some attention and a couple of transcription errors that need to be corrected for your final drafts. My audit findings are noted below. Please provide me with copies of any corrections made to your draft data reports.

Both Draft Reports

1. You might want to take this occasion to update your references to the ASTM and EPA protocols noted on the top of page 1 of your "Toxicity Test Report." Your NAS protocol references ASTM 2001 and EPA 2000. The most recent ASTM Standard is 2005 (E 1706-05). I'm not sure what the most recent EPA reference is.

2. In a number of places in your reports you use the term "biomass." In this case you are actually measuring the "dry weights" or "growth" of *Hyalella* and not biomass. Biomass as defined by ASTM Designation E 1705-95 (reapproved in 2002) is "total weight of living matter in a given volume." I suggest changing "biomass" to "dry weight" or "growth" as appropriate. Places where I noted the term "biomass" in your reports include: bottom of page 2, top of page 3 (twice), top of page 4, Table 2 and in formula in the header for the "Endpoints Data Entry and Calculations File."

3. On page 4 of both reports you note that mean control growth of ≥0.15 mg is required. This requirement is neither in your protocol nor in any of the ASTM or EPA protocol editions that I have. Is this a project-specific requirement? (Note: ASTM and EPA protocols state that there should be "measurable growth of test organisms in control sediment.")

4. Tables 3 and 4: You note that the "+"s in the table indicate responses that are *significantly different from* the reference sediments. My review suggests that in each of these cases the +s denote responses that are significantly *higher* (mortality) or *lower* (growth). If this is the case, it would probably help the project sponsor and the subsequent reviewers to realize that you mean one-tailed responses instead of two-tailed responses.

5. Under "Miscellaneous Notes" (bottom of page following "Sediment Descriptions" page), the value to convert ft-candles to lux (0.0929) is crossed out and a corrected value of 0.929 is inserted. Actually, the original value (0.0929) is the correct value.

6. I note that on one Chain of Custody sheet the "cooler temperature" and "custody seal intact?" information is missing. Do you have any information in any other logs to add this information to these sheets?

Report for Test No. 727-1

1. Endpoints Data Entry and Calculations File: It appears from my photocopy that the tare weight for beaker 108 (index 235) should be 29.268 instead of 29.265. This is a very minor difference, but a correction should be made, if necessary, and the sample means, etc. recalculated.

Report for Test No. 727-2

1. Endpoints Data Entry and Calculations File: Dry weight for beaker 23 (index 51) should be 33.687 instead of 33.678. Please correct and recalculate sample means, etc.

2. At the end of your Excel WQ sheet, you record a mean and SD for ammonia. There actually are no means or SDs since many of the values are < values.

3. ToxCalc sheet, page 5 of 7: The sample type in the upper right corner is copper sulfate, whereas it should be cadmium chloride.

Once again, the corrections suggested above are all relatively minor. Both your sediment testing and draft reports appear to be in excellent shape.

Sincerely,

Paul A. Dinnel
Quality Assurance Auditor

CC: Frank Dillon, CH2M Hill

BIOASSAY REPORT

***CHIRONOMID TENTANS* 10-DAY**
FRESHWATER SEDIMENT BIOASSAYS
***CERIODAPHNIA DUBIA* 7-DAY**
FRESHWATER SEDIMENT BIOASSAYS
Conducted April 28 through May 16, 2005

Prepared for

UPPER COLUMBIA RIVER SEDIMENT PROJECT
EPA REGION 10
SEATTLE, WASHINGTON

Prepared by

CH2M HILL
2300 NW Walnut Boulevard
Corvallis, Oregon 97330

June 14, 2005
Lab I.D. No. B1390
CH2M HILL Project No. 315904.SN.70

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Section

INTRODUCTION

CH2M HILL conducted 7 day and 10 day freshwater sediment bioassays from April 28 through May 16, 2005, on 50 field samples and 6 reference samples provided by CH2M HILL for the Upper Columbia River Project. The organisms tested were the water flea (*Ceriodaphnia dubia*) and the midge (*Chironomid tentans*).

METHODS AND MATERIALS

TEST METHODS

The sediment tests were performed according to the following guidance documents:

- ASTM E1706-00^{E2}. *Standard Test Method for Measuring the Toxicity of Sediment-Associated Contaminants with Freshwater Invertebrates.* (originally adopted 2000, editorially revised February, and editorially updated May 2003)

- *Short-Term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to Freshwater Organisms,* EPA Method 1002.0 "*Ceriodaphnia* Survival and Reproduction Test," EPA-821-R-02-013 (2002).

A summary of the recommended test conditions and test acceptability criteria are provided on pages 6 and 7 for the *C. tentans* and *C. dubia* tests, respectively.

TEST DEVIATIONS

No adult test organisms were found during the Day 2 renewal of the *C. dubia* test conducted on the RM685R1 reference area sample that was initiated on April 28, 2005. The second *C. dubia* test conducted on the RM685R1 reference sample that was initiated on May 4, 2005, showed survival and reproduction rates similar to the other reference sites. Due to the likely laboratory error in the maintenance of the test, no statistical comparisons were made to the RM685R1 data from the April 28, 2005, test.

During the *C. Tentans* test, the dissolved oxygen levels in five samples (the RM685R1 and RM739A1(X1) samples during the testing initiated on April 29, 2005, and the RM734A1(X1), Beaver Creek, and RM736A1(X1) samples during the testing initiated on May 6, 2005) fell below the ASTM (2000) recommended level of 2.5 mg/L. However, the dissolved oxygen deviation did not appear to affect the test results. See discussion in Monitoring of Bioassays section on page 4.

TEST ORGANISMS

The *C. tentans* were obtained from Aquatic Bio Systems, Inc., Fort Collins, Colorado. The chironomids were second to third instar at test initiation. The *C. dubia* were obtained from CH2M HILL's in-house cultures and were less than 24 hours old and within an 8-hour age range at test initiation. All organisms tested were fed and maintained during culturing, acclimation, and testing as prescribed by ASTM (2000) and EPA (2002). All test organisms appeared vigorous and in good condition prior to testing.

CONTROL SEDIMENT

The sediment used as a laboratory control (negative control) during the *C. tentans* testing was Beaver Creek sediment (sample ID: B1395-01) collected from an area approximately 1 mile east of highway 101 bridge, approximately 0.8 miles south of Newport, Oregon. The sediment was collected on April 22, 2005. The negative control sediment was stored at 4°C in the dark until used.

The sediment used as a laboratory control (negative control) during the *C. dubia* testing was 20 mesh washed silica sand. An additional laboratory control was conducted with overlying water only and no sediment.

Laboratory control sediments were used to assess test acceptability criteria only. (see Data Analysis section below)

OVERLYING WATER

The waters used for acclimation and overlying water throughout the testing for the *C. tentans* and *C. dubia* were reconstituted synthetic waters with a total hardnesses of 72, 72, and 74 mg/L as $CaCO_3$, alkalinities of 68, 58 and 60 mg/L as $CaCO_3$, and pH's of 7.5, 7.5, and 7.6.

SAMPLE PREPARATION

For the *C. tentans* bioassays, the entire sediment sample (100 percent) was homoginized with stainless steel implements, 100 ml placed in a 300 ml high-form borosilicate glass beaker, 175 ml of overlying water was then added (Day -1), and allowed to stand overnight at 23°±1°C. The overlying water was renewed the following morning and the tests were initiated by the addition of organisms to the test chambers (Day 0).

For the *C. dubia* tests, the entire sediment sample was homogenized with stainless steel implements and then 5 g of each test sediment sample (100 percent) was weighed into the test chamber for each replicate. Twenty (20) milliliters of overlying water was then gently added to each chamber. The test chambers were then placed into an incubator or water bath,

elevating the solution temperature to 25°±1°C, and allowed to settle for 1 to 2 hours prior to test organism addition.

TEST CONCENTRATIONS

The concentration tested was 100 percent sample sediment with reference sediments for the control. For the *C. tentans* test, the concentration (100 percent) was performed in 8 replicates with 10 organisms per replicate. For the *C. dubia*, the concentration (100 percent) was performed in 10 replicates with 1 organism per replicate.

For both species, test chamber placement was randomly assigned to avoid spatial bias (e.g. temperature, feeding, and light intensity), bias during the assignment of organisms to testing chambers, or analyst observation bias. Additionally, *C. dubia* culturing and test chamber assignments were tracked to ensure separate parentage for each replicate of a test concentration and to allow any necessary evaluation of test organism performance.

SAMPLE DESCRIPTION

The summary tables 1 through 4 list all samples by Lab ID (CH2M HILL's internal ID number), Sample Number (from Chain of Custody forms), and Station Location (references specific sampling point and river mile, also from chain of Custody form).

For example: Sample Number: 5164433 from Station Location: RM704A1(X1) was assigned Lab ID number: B1390-01 on arrival to CH2M HILL's Applied Sciences laboratory.

SAMPLE COLLECTION AND SHIPPING

The samples were collected from April 20 through 28, 2005, by CH2M HILL personnel and delivered to CH2M HILL's bioassay laboratory by Federal Express from April 22 through 30, 2005. See Chain of Custody forms in Appendix C for sample identification and collection dates. The samples were stored in the dark at 4°C in sealed containers until test initiation. Sample containers that arrived at the laboratory with headspace were filled with nitrogen gas and the chain of custody forms marked with a "N". The tests were initiated within 14 days of sample collection, as recommended by ASTM (2000).

MONITORING OF BIOASSAYS

For the *C. tentans*, approximately 150 ml of the overlying water in the testing chambers was renewed twice daily at approximately 12 hour intervals. Pre-renewal test solutions were monitored at initiation (Day 0) for dissolved oxygen, pH, conductivity, ammonia, alkalinity, and hardness, and every 24 hours thereafter for dissolved oxygen and temperature. Dissolved oxygen, pH, conductivity, ammonia, alkalinity, and hardness were monitored at test termination. Mortality and ash-free dry weight were determined at test termination. Temperature was monitored in pre-renewal solutions daily and in the waterbath continuously throughout the testing period.

For the *C. dubia*, approximately 15 ml of the overlying water in the testing chambers was renewed daily. Pre- and post-renewal solutions were monitored at initiation (Day 0) for dissolved oxygen, pH, conductivity, ammonia, alkalinity, and hardness, and every 24 hours thereafter for dissolved oxygen, temperature, and pH. Dissolved oxygen, pH, conductivity, ammonia, alkalinity, and hardness were monitored at test termination. *C. dubia* survival and neonate production was measured daily. According to ASTM (2000) and EPA (2002), tests should be terminated when 60 percent or more of the surviving female *C. dubia* in the controls have produced their third brood or at day 7. Regardless of control reproductive performance, all test chambers were maintained to day 7. *C.* adult survival was measured through day 7, with reproduction data consisting of the total of the first 3 broods produced by each adult. Temperature was monitored in pre-renewal solutions daily and in the incubator continuously throughout the testing period.

The dissolved oxygen levels in the tests remained above the ASTM (2000) recommended minimum 2.5 mg/L throughout the test period, with the exception of samples RM685R1, RM739A1(X1), RM734A1(X1), Beaver Creek, and RM736A1(X1) (measurement beakers 108, 258, 478, 542, and 544 respectively) in the *C. tentans* tests. However, the dissolved oxygen levels were below 2.5 mg/L for not more than 1 day and no dissolved oxygen levels fell below 1.5 mg/L. ASTM cites dissolved oxygen levels as low as 1.5 mg/L can be tolerated by *C. tentans* (ASTM (2000), p. 40). The dissolved oxygen deviation did not appear to affect the test results.

Daily mean test temperatures remained at 23±1°C, and instantaneous temperatures remained at 23±3°C, for the *C. tentans* tests. Daily mean test temperatures remained at 25±1°C, and instantaneous temperatures remained at 25±3°C, for the *C. dubia* tests. Except as noted, the tests proceeded without interruption or incidents that could have affected test results.

DATA ANALYSIS

The statistical analyses performed were those outlined in ASTM (2000) and EPA (2002) using CETIS version 1.025B.

For the *C. tentans*, the endpoints measured were survival [total number of organisms (larvae, pupae, and emerged adults) surviving at termination divided by number of larvae added at initiation] and weight [ash-free dry weight (dry weight minus ash weight) of surviving larvae divided by the number of surviving larvae]. Survival data were transformed using arcsine square root transformation. Weight data were not transformed unless the data set was not normally distributed in which case the data were converted to normalized ranks (rankits) as per ASTM (2000) section 15.2.4.8.

For the *C. dubia*, the endpoints measured were survival (total number of adults surviving at day 7 divided by the number added at initiation) and reproduction (total number of neonates produced through the first 3 broods from each adult). Survival data were not transformed. Reproduction data were not transformed unless the data set was not normally distributed in which case the data were converted to normalized ranks (rankits) as per ASTM (2000) section 15.2.4.8.

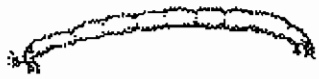
Shapiro-Wilk W test was used to formally test the assumption of normality. Variance Ratio was used to determine homogeneity (equal) or heterogeneous (unequal) variance. When the assumption of normality was met, the Equal variance t-Test or Unequal variance t-Test was used to compare test data to each reference site. When the assumption of normality could not be met using any of the data transformations described above, the non-parametric Mann-Whitney U test was used. Fisher's Exact test was used to analyze all *C. dubia* survival data.

Alpha (α) represents the probability of making a Type I (false positive) statistical error. All initial statistical analysis used an alpha level of 0.05 (5%). In cases where a statistically significant result occurred and the end-point specific reduction observed in the test sample was less than 20 percent[a] from the reference site data, the alpha level was reduced to 0.01 and the statistics recalculated. In such cases, both the $\alpha = 0.05$ and 0.01 test results are reported in the summary of test results (see Tables 1 through 4).

[a] Used as a measure of a biologically significant difference in effects level. An effect of less than a 20 percent reduction from reference data was used as an indicator of a potential statistical error.

TEST CONDITIONS

Recommended Test Conditions for Conducting a 10-day Sediment Toxicity Test with *Chironomus tentans*



Parameter Conditions

1. Test type: Whole-sediment toxicity test with renewal of overlying water

2. Temperature: Instantaneous: 23 ± 3°C, Daily mean: 23 ± 1°C

3. Light quality: Wide-spectrum fluorescent lights

4. Illuminance: About 100 to 1000 lux

5. Photoperiod: 16L:8D

6. Test chamber: 300-mL high-form lip less beaker

7. Sediment volume: 100 mL

8. Overlying water volume: 175 mL

9. Renewal of overlying water: 2 volume additions/d; continuous or intermittent (e.g., one volume addition approximately every 12 h)

10. Age of organisms: Second- to third-instar larvae (about 10-day-old larvae)

11. Number of organisms/chamber: 10

12. Number of replicate chambers/treatment: Eight replicates are recommended for routine testing

13. Feeding: TetrafinT goldfish food, fed 1.5 mL of a 4g/L solution (contains 6.0 mg of dry solids) daily to each test chamber

14. Aeration: None, unless dissolved oxygen in overlying water drops below 2.5 mg/L.

15. Overlying water: Reconstituted water

16. Overlying water quality: Hardness, alkalinity, conductivity, pH, and ammonia at the beginning and end of a test on day 10. Temperature and dissolved oxygen daily

17. Test duration: 10 day

18. Endpoints: Survival, growth (ash-free dry weight; AFDW)

19. Test acceptability: Minimum mean negative control survival of 70% with minimum mean weight per surviving control organism of 0.48 mg AFDW, and performance-based criteria specifications outlined in ASTM E1706–00.

Recommended Test Conditions for Conducting 7-Day Sediment Toxicity Tests with *Ceriodaphnia dubia*

Parameter Conditions

1. Test Type: Whole-sediment toxicity test with renewal of overlying water.

2. Temperature: Instantaneous: 25 ± 3°C, Daily mean: 25 ± 1°C

3. Light quality: Wide-spectrum fluorescent lights

4. Illuminance: About 100 to 1000 lux

5. Photoperiod: 16L:8D

6. Test chamber: 30-mL beaker

7. Sediment volume: 5 mL

8. Overlying water volume: 20 mL

9. Renewal of overlying water: 15 mL daily

10. Age of organisms: *C. dubia* <24-h old, all within an 8 hour span, at the start of the test

11. Number of organisms/chamber: 1

12. Number of replicate chambers/treatment: Ten replicates are recommended for routine testing.

13. Feeding: Culture food (e.g., algae, YCT)

14. Aeration: None, unless dissolved oxygen in overlying water drops below 2.5 mg/L

15. Overlying water: Culture water, well water, surface water, site water, or reconstituted water.

16. Test chamber cleaning: None during a test

17. Overlying water quality: Hardness, alkalinity, conductivity, and ammonia at the beginning and end of a test. Temperature, pH, and dissolved oxygen daily

18. Test duration: 7 day or when at least 60% of the controls have produced their third brood

19. End points: Survival, reproduction

20. Test acceptability: Minimum mean negative control survival of ≥ 80%, average mean total 3 brood size in the negative control must be ≥ 15 per surviving female, and performance-based criteria specifications outlined in ASTM E1706–00

RESULTS AND DISCUSSION

SEDIMENT BIOASSAYS

The raw data sheets are presented in Appendix A and the results are summarized in the following tables:

- Table 1 – "Summary of *C. dubia* test results for tests initiated on April 28, 2005"
- Table 2 – "Summary of *C. dubia* test results for tests initiated on May 4, 2005"
- Table 3 – "Summary of *C. tentans* test results for tests initiated on April 29, 2005"
- Table 4 – "Summary of *C. tentans* test results for tests initiated on May 6, 2005"

Table 1: Summary of *Ceriodaphnia dubia* test results for tests initiated on April 28, 2005.

Ceriodaphnia dubia					Statistical comparisons of Survival compared to:								Statistical comparisons of Reproduction compared to:					
Lab ID:	Sample Number:	Station Location:	Average Percent Survival (%)	Standard Deviation	RM685R1	RM686R1	RM705R1	RM721R1	RM726R1	RM732RI	Average Young per female	Standard Deviation	RM665R1	RM686R1	RM705R1	RM721R1	RM726R1	RM732RI
Negative Laboratory Control and Reference Sites																		
B1390-42	5164496	RM685R1	na	na	--	ns	ns	ns	ns	ns	na	na	--	ns	ns	ns	ns	ns
B1390-38	5164489	RM668R1	60	42	--	--	ns	ns	ns	ns	20.2	11.3	--	--	ns	ns	ns	ns
B1390-36	5164486	RM705R1	100	0	--	ns	--	ns	ns	ns	23.5	5.5	--	ns	--	ns	ns	ns
B1390-31	5164476	RM721R1	100	0	--	ns	ns	--	ns	ns	23.6	8.2	--	ns	ns	--	ns	ns
B1390-32	5164478	RM726R1	100	0	--	ns	ns	ns	--	ns	23.8	5.5	--	ns	ns	ns	--	ns
B1390-25	5164470	RM732R1	100	0	--	ns	ns	ns	ns	--	22.1	6.4	--	ns	ns	ns	ns	--
Sediment Control		Silica Sand	80	42	--	--	--	--	--	--	22.8	11.5	--	--	--	--	--	--
Sample Sites																		
B1390-01	5164433	RM704A1(X1)	100	0	--	ns	ns	ns	ns	ns	25.0	2.8	--	ns	ns	ns	ns	ns
B1390-02	5164434	RM698A1(X1)	80	42	--	ns	ns	ns	ns	ns	19.6	10.6	--	ns	ns	ns	ns	ns
B1390-03	5164435	RM744A1(X1)	80	42	--	ns	ns	ns	ns	ns	22.6	8.2	--	ns	ns	ns	ns	ns
B1390-04	5164436	RM744A2(X3)	60	42	--	ns	ns	ns	ns	ns	18.5	10.7	--	ns	ns	ns	ns	ns
B1390-05	5164437	RM692A1(X1)	100	0	--	ns	ns	ns	ns	ns	27.0	2.2	--	ns	ns	ns	ns	ns
B1390-06	5164440	RM687A1	90	32	--	ns	ns	ns	ns	ns	20.1	7.5	--	ns	ns	ns	ns	ns
B1390-07	5164441	RM689A1(X3)	90	32	--	ns	ns	ns	ns	ns	22.0	8.5	--	ns	ns	ns	ns	ns
B1390-08	5164442	RM706A1(X1)	80	42	--	ns	ns	ns	ns	ns	16.7	8.8	--	ns	MW ^{5,1ns}	ns	ns	ns
B1390-09	5164443	RM743A2(X3)	100	0	--	ns	ns	ns	ns	ns	20.0	4.4	--	ns	ns	ns	ns	ns
B1390-10	5164449	RM708A2(X7)	60	42	--	ns	ns	ns	ns	ns	23.0	5.6	--	ns	ns	ns	ns	ns
B1390-11	5164457	RM676A1(X3)	100	0	--	ns	ns	ns	ns	ns	19.2	5.1	--	ns	E ^{5,1ns}	ns	E ^{5,1ns}	ns
B1390-12	5164459	RM741A1(X3)	100	0	--	ns	ns	ns	ns	ns	24.8	2.8	--	ns	ns	ns	ns	ns
B1390-13	5164460	RM740A1(X1)	100	0	--	ns	ns	ns	ns	ns	23.0	5.7	--	ns	ns	ns	ns	ns
B1390-14	5164481	RM724A1(X1)	100	0	--	ns	ns	ns	ns	ns	28.8	2.7	--	ns	ns	ns	ns	ns
B1390-15	5164439	RM686A1(X3)	80	42	--	ns	ns	ns	ns	ns	20.5	11.7	--	ns	ns	ns	ns	ns
B1390-16	5164450	RM708A1(X3)	70	48	--	ns	ns	ns	ns	ns	23.8	9.3	--	ns	ns	ns	ns	ns
B1390-17	5164451	RM680A1(X1)	90	32	--	ns	ns	ns	ns	ns	20.7	6.4	--	ns	E ^{5,1ns}	ns	ns	ns
B1390-18	5164452	RM742A1(X1)	100	0	--	ns	ns	ns	ns	ns	10.0	6.9	--	E ^{5,1}	E ^{5,1}	E ^{5,1}	E ^{5,1}	E ^{5,1}
B1390-19	5164453	RM743A1(X1)	90	32	--	ns	ns	ns	ns	ns	25.8	3.8	--	ns	ns	ns	ns	ns
B1390-20	5164454	RM678A1(X1)	100	0	--	ns	ns	ns	ns	ns	28.9	4.6	--	ns	ns	ns	ns	ns
B1390-21	5164455	RM742A2(X5)	90	32	--	ns	ns	ns	ns	ns	19.0	9.1	--	ns	ns	ns	ns	ns
B1390-22	5164456	RM677A1(X3)	100	0	--	ns	ns	ns	ns	ns	22.9	4.4	--	ns	ns	ns	ns	ns
B1390-23	5164468	RM738A1(X3)	0	0	--	F ^{5,1}	F ^{5,1}	F ^{5,1}	F ^{5,1}	F ^{5,1}	0.0	0.0	--	MW ^{5,1}	MW ^{5,1}	MW ^{5,1}	MW ^{5,1}	MW ^{5,1}
B1390-24	5164469	RM739A1(X3)	100	0	--	ns	ns	ns	ns	ns	21.6	4.3	--	ns	ns	ns	ns	ns
B1390-26	5164471	RM724A2(X3)	100	0	--	ns	ns	ns	ns	ns	25.8	3.4	--	ns	ns	ns	ns	ns
B1390-27	5164472	RM737A1(X3)	50	53	--	ns	F ^{5,1ns}	F ^{5,1ns}	F ^{5,1ns}	F ^{5,1ns}	3.7	7.6	--	E ^{5,1}	E ^{5,1}	E ^{5,1}	E ^{5,1}	E ^{5,1}
B1390-28	5164473	RM723A1(X1)	100	0	--	ns	ns	ns	ns	ns	27.5	5.4	--	ns	ns	ns	ns	ns
B1390-29	5164474	RM736A1(X1)	70	48	--	ns	ns	ns	ns	ns	18.9	11.1	--	ns	ns	ns	ns	ns

[E indicates a statistically significant reduction from reference sites by use of Equal variance T-test; UE, statistically significant reduction from reference sites by use of UnEqual variance test;

MW, statistically significant reduction from reference sites by use of Mann-Whitney U-test; F, statistically significant reduction from reference sites by use of Fisher's Exact test;

^{5}, indicates significant at alpha (p) = 0.05; ^{1}, indicates significant at alpha = 0.01; ^{1ns}, indicates not significant et alpha = 0.01; ns indicates a non significant result; --, indicates no stat. test performed.

Data analysis at the alpha = 0.01 level was only performed when a siginifcant result at the 0.05 level was less than a 20% reduction from reference site values.]

na , indicates not available (reference sample RM685R1 test organisms missing on Day 2 renewal, no statistical analysis performed)

Table 2: Summary of *Ceriodaphnia dubia* test results for tests initiated on May 4, 2005.

Ceriodaphnia dubia					Statistical comparisons of Survival compared to:								Statistical comparisons of Reproduction compared to:					
Lab ID:	Sample Number:	Station Location:	Average Percent Survival (%)	Standard Deviation	RM685R1	RM686R1	RM705R1	RM721R1	RM726R1	RM732RI	Young per female	Standard Deviation	RM685R1	RM686R1	RM705R1	RM721R1	RM726R1	RM732RI
Negative Laboratory Control and Reference Sites																		
B1390-42	5164496	RM685R1	100	na	–	ns	ns	ns	ns	ns	21.6	3.9	–	E ^{5,1}	E ^{5,1ns}	ns	ns	ns
B1390-38	5164489	RM666R1	100	0	ns	–	ns	ns	ns	ns	26.5	2.5	ns	–	ns	ns	ns	ns
B1390-36	5164486	RM705R1	90	32	ns	ns	–	ns	ns	ns	25.3	9.6	ns	ns	–	ns	ns	ns
B1390-31	5164476	RM721R1	60	42	ns	ns	ns	–	ns	ns	19.7	8.5	ns	UE ^{5,1ns}	ns	–	ns	ns
B1390-32	5164478	RM726R1	90	32	ns	ns	ns	ns	–	ns	21.7	10.1	ns	ns	ns	ns	–	ns
B1390-25	5164470	RM732R1	90	32	ns	ns	ns	ns	ns	–	22.2	7.6	ns	ns	ns	ns	ns	--
Sediment Control		Silica sand	90	32	–	–	–	–	–	–	24.0	11.5	–	–	–	–	–	--
Sample Sites																		
B1390-30	5164475	RM723A2(X3)	100	0	ns	ns	ns	ns	ns	ns	25.0	4.7	ns	ns	ns	ns	ns	ns
B1390-33	5164479	RM734A1(X3)	90	32	ns	ns	ns	ns	ns	ns	22.5	8.4	ns	ns	ns	ns	ns	ns
B1390-34	5164463	RM661A1(X1)	100	0	ns	ns	ns	ns	ns	ns	23.3	4.9	ns	E ^{5,1ns}	ns	ns	ns	ns
B1390-35	5164485	RM656A1(X3)	100	0	ns	ns	ns	ns	ns	ns	18.0	4.7	E ^{5,1ns}	E ^{5,1}	E ^{5,1}	ns	ns	ns
B1390-37	5164487	RM713A1(X3)	100	0	ns	ns	ns	ns	ns	ns	21.4	6.1	ns	E ^{5,1ns}	ns	ns	ns	ns
B1390-39	5164491	RM730A1(X1)	100	0	ns	ns	ns	ns	ns	ns	23.1	6.1	ns	ns	ns	ns	ns	ns
B1390-40	5164493	RM733A1(X1)	100	0	ns	ns	ns	ns	ns	ns	26.6	4.4	ns	ns	ns	ns	ns	ns
B1390-41	5164494	RM729A1(X1)	100	0	ns	ns	ns	ns	ns	ns	25.8	5.1	ns	ns	ns	ns	ns	ns
B1390-43	5164507	RM727A1(X1)	90	32	ns	ns	ns	ns	ns	ns	22.2	8.4	ns	ns	ns	ns	ns	ns
B1390-44	5174405	RM644A1(X3)	100	0	ns	ns	ns	ns	ns	ns	16.1	3.2	E ^{5,1}	E ^{5,1}	MW ^{5,1}	ns	ns	E ^{5,1ns}
B1390-45	5174406	RM637A1(X1)	100	0	ns	ns	ns	ns	ns	ns	28.5	3.3	ns	ns	ns	ns	ns	ns
B1390-46	5174407	RM634A1(X1)	60	52	F ^{5,1ns}	F ^{5,1ns}	ns	ns	ns	ns	8.2	8.2	E ^{5,1}	UE ^{5,1}	E ^{5,1}	E ^{5,1}	E ^{5,1}	E ^{5,1}
B1390-47	5174408	RM642A1(X1)	100	0	ns	ns	ns	ns	ns	ns	20.8	8.2	ns	UE ^{5,1ns}	ns	ns	ns	ns
B1390-48	5174409	RM605A1(X1)	100	0	ns	ns	ns	ns	ns	ns	25.8	3.6	ns	ns	ns	ns	ns	ns
B1390-49	5174410	RM606A1(X3)	100	0	ns	ns	ns	ns	ns	ns	25.4	3.6	ns	ns	ns	ns	ns	ns
B1390-50	5174411	RM616A1(X3)	100	0	ns	ns	ns	ns	ns	ns	25.3	3.5	ns	ns	ns	ns	ns	ns
B1390-51	5174412	RM641A1(X1)	100	0	ns	ns	ns	ns	ns	ns	25.6	5.0	ns	ns	ns	ns	ns	ns
B1390-52	5174413	RM640A1(X3)	90	32	ns	ns	ns	ns	ns	ns	13.2	5.3	E ^{5,1}	MW ^{5,1}	MW ^{5,1}	E ^{5,1ns}	E ^{5,1ns}	E ^{5,1}
B1390-53	5174415	RM626A1(X1)	70	48	ns	ns	ns	ns	ns	ns	18.6	11.2	ns	MW ^{5,1ns}	MW ^{5,1ns}	ns	ns	ns
B1390-54	5174423	RM603A1(X1)	100	0	ns	ns	ns	ns	ns	ns	12.0	3.0	E ^{5,1}	E ^{5,1}	MW ^{5,1}	UE ^{5,1ns}	UE ^{5,1}	E ^{5,1}
B1390-55	5174424	RM605A2(X8)	90	32	ns	ns	ns	ns	ns	ns	23.3	9.3	ns	ns	ns	ns	ns	ns
B1390-56	5174427	RM622A1(X3)	100	0	ns	ns	ns	ns	ns	ns	23.5	3.4	ns	E ^{5,1ns}	ns	ns	ns	ns

[E indicates a statistically significant reduction from reference sites by use of Equal variance T-test; UE, statistically significant reduction from reference sites by use of UnEqual variance test;

MW, statistically significant reduction from reference sites by use of Mann-Whitney U-test; F, statistically significant reduction from reference sites by use of Fisher's Exact test;

^{5}, indicates significant at alpha (p) = 0.05; ^{1}, indicates significant at alpha = 0.01; ^{1ns}, indicates not significant at alpha = 0.01; ns indicates a non significant result; –, indicates no stat. test performed.

Data analysis at the alpha = 0.01 level was only performed when a siginifcant result at the 0.05 level was less than a 20% reduction from reference site values.]

Table 3: Summary of *Chironomus tentans* test results for tests initiated on April 29, 2005.

Chironomus tentans					Statistical comparisons of Survival compared to:								Statistical comparisons of AFDW Weight compared to:					
Lab ID:	Sample Number:	Station Location:	Average Percent Survival (%)	Standard Deviation	RM685R1	RM686R1	RM705R1	RM721R1	RM726R1	RM732RI	Average weight per surviving larvae (mg)	Standard Deviation	RM685R1	RM686R1	RM705R1	RM721R1	RM726R1	RM732RI
Negative Laboratory Control and Reference Sites																		
B1390-42	5164498	RM685R1	72.5	12.8	--	ns	ns	ns	ns	ns	2.03	0.31	--	ns	ns	ns	ns	ns
B1390-38	5164469	RM688R1	70.0	16.9	ns	--	ns	ns	ns	ns	1.94	0.41	ns	--	ns	ns	ns	ns
B1390-36	5164486	RM705R1	70.0	16.9	ns	ns	--	ns	ns	ns	2.12	0.39	ns	ns	--	ns	ns	ns
B1390-31	5164476	RM721R1	66.3	11.9	ns	ns	ns	--	ns	ns	1.93	0.20	ns	ns	ns	--	ns	ns
B1390-32	5164476	RM726R1	67.5	11.7	ns	ns	ns	ns	--	ns	2.00	0.32	ns	ns	ns	ns	--	ns
B1390-25	5164470	RM732R1	70.0	7.6	ns	ns	ns	ns	ns	--	1.95	0.25	ns	ns	ns	ns	ns	--
Sediment Control		Beaver Creek	83.8	15.1	--	--	--	--	--	--	1.51	0.40	--	--	--	--	--	--
Sample Sites																		
B1390-01	5164433	RM704A1(X1)	62.5	26.6	ns	ns	ns	ns	ns	ns	2.02	1.01	ns	ns	ns	ns	ns	ns
B1390-02	5164434	RM698A1(X1)	67.5	24.3	ns	ns	ns	ns	ns	ns	1.75	0.58	ns	ns	E $^{5, 1ns}$	ns	E $^{5, 1ns}$	E $^{5, 1ns}$
B1390-03	5164435	RM744A1(X1)	61.3	13.8	ns	ns	ns	ns	ns	ns	1.98	0.35	ns	ns	ns	ns	ns	ns
B1390-04	5164436	RM744A2(X3)	78.3	11.9	ns	ns	ns	ns	ns	ns	1.31	0.31	E $^{5, 1}$	E $^{5, 1}$	E $^{5, 1}$	E $^{5, 1}$	E $^{5, 1}$	E $^{5, 1ns}$
B1390-05	5164437	RM892A1(X1)	72.5	18.7	ns	ns	ns	ns	ns	ns	1.83	0.26	ns	ns	ns	ns	ns	ns
B1390-06	5164440	RM687A1	73.8	17.7	ns	ns	ns	ns	ns	ns	1.62	0.38	ns	ns	E $^{5, 1ns}$	E $^{5, 1ns}$	E $^{5, 1ns}$	E $^{5, 1ns}$
B1390-07	5164441	RM889A1(X3)	50.0	26.7	E $^{5, 1ns}$	ns	ns	ns	ns	UE $^{5, 1ns}$	2.37	0.79	ns	ns	ns	ns	ns	ns
B1390-08	5164442	RM706A1(X1)	66.8	22.3	ns	ns	ns	ns	ns	ns	1.69	0.24	E $^{5, 1ns}$	ns	E $^{5, 1ns}$	E $^{5, 1ns}$	E $^{5, 1ns}$	E $^{5, 1ns}$
B1390-09	5164443	RM743A2(X3)	80.0	17.7	ns	ns	ns	ns	ns	ns	1.43	0.29	E $^{5, 1ns}$	E $^{5, 1ns}$	E $^{5, 1ns}$	E $^{5, 1ns}$	E $^{5, 1}$	E $^{5, 1ns}$
B1390-10	5164449	RM706A2(X7)	55.0	25.8	ns	ns	ns	ns	ns	ns	2.05	0.53	ns	ns	ns	ns	ns	ns
B1390-11	5164457	RM678A1(X3)	46.3	27.2	E $^{5, 1ns}$	E $^{5, 1ns}$	E $^{5, 1ns}$	E $^{5, 1ns}$	E $^{5, 1ns}$	E $^{5, 1ns}$	2.10	0.82	ns	ns	ns	ns	ns	ns
B1390-12	5164459	RM741A1(X3)	67.5	26.0	ns	ns	ns	ns	ns	ns	2.18	0.82	ns	ns	ns	ns	ns	ns
B1390-13	5164460	RM740A1(X1)	75.0	10.7	ns	ns	ns	ns	ns	ns	2.08	0.35	ns	ns	ns	ns	ns	ns
B1390-14	5164461	RM724A1(X1)	58.3	19.2	E $^{5, 1ns}$	ns	ns	ns	ns	E $^{5, 1ns}$	2.13	0.79	ns	ns	ns	ns	ns	ns
B1390-15	5164439	RM688A1(X3)	72.5	19.8	ns	ns	ns	ns	ns	ns	1.83	0.29	ns	ns	E $^{5, 1ns}$	ns	ns	ns
B1390-16	5164450	RM708A1(X3)	70.0	22.7	ns	ns	ns	ns	ns	ns	1.65	0.33	ns	ns	ns	ns	E $^{5, 1ns}$	E $^{5, 1ns}$
B1390-17	5164451	RM680A1(X1)	38.8	25.9	E $^{5, 1}$	E $^{5, 1}$	E $^{5, 1}$	E $^{5, 1ns}$	E $^{5, 1}$	UE $^{5, 1}$	2.17	0.52	ns	ns	ns	ns	ns	ns
B1390-18	5164452	RM742A1(X1)	82.5	15.8	ns	ns	ns	ns	ns	ns	1.18	0.28	E $^{5, 1}$	E $^{5, 1}$	E $^{5, 1}$	E $^{5, 1}$	E $^{5, 1}$	E $^{5, 1}$
B1390-19	5164453	RM743A1(X1)	62.5	14.9	ns	ns	ns	ns	ns	ns	1.80	0.32	E $^{5, 1ns}$	E $^{5, 1ns}$	E $^{5, 1ns}$	E $^{5, 1ns}$	E $^{5, 1ns}$	E $^{5, 1ns}$
B1390-20	5164454	RM678A1(X1)	71.3	16.9	ns	ns	ns	ns	ns	ns	1.93	0.57	ns	ns	ns	ns	ns	ns
B1390-21	5164455	RM742A2(X5)	73.8	20.0	ns	ns	ns	ns	ns	ns	1.31	0.37	E $^{5, 1}$	E $^{5, 1}$	E $^{5, 1}$	E $^{5, 1}$	E $^{5, 1}$	E $^{5, 1ns}$
B1390-22	5164456	RM677A1(X3)	42.5	24.3	E $^{5, 1}$	E $^{5, 1ns}$	E $^{5, 1ns}$	E $^{5, 1ns}$	E $^{5, 1ns}$	UE $^{5, 1ns}$	1.99	0.35	ns	ns	ns	ns	ns	ns
B1390-23	5164466	RM738A1(X3)	67.5	14.9	ns	ns	ns	ns	ns	ns	1.14	0.27	E $^{5, 1}$	E $^{5, 1}$	E $^{5, 1}$	E $^{5, 1}$	E $^{5, 1}$	E $^{5, 1}$
B1390-24	5164469	RM739A1(X3)	72.5	12.6	ns	ns	ns	ns	ns	ns	2.04	0.22	ns	ns	ns	ns	ns	ns
B1390-26	5164471	RM724A2(X3)	65.0	22.7	ns	ns	ns	ns	ns	ns	2.44	0.69	ns	ns	ns	ns	ns	ns

[E indicates a statistically significant reduction from reference sites by use of Equal variance T-test; UE, statistically significant reduction from reference sites by use of UnEqual variance test;
MW, statistically significant reduction from reference sites by use of Mann-Whitney U-test; F, statistically significant reduction from reference sites by use of Fisher's Exact test;
^{5}, indicates significant at alpha (p) = 0.05; ^{1}, indicates significant at alpha = 0.01; ^{1ns}, indicates not significant at alpha = 0.01; ns indicates a non significant result; --, indicates no stat. test performed.
Data analysis at the alpha = 0.01 level was only performed when a siginifcant result at the 0.05 level was less than a 20% reduction from reference site values.]

Table 4: Summary of *Chironomus tentens* test results for tests initiated on May 6, 2005.

Chironomus tentans					Statistical comparisons of Survival compared to:										Statistical comparisons of AFDW Weight compared to:					
Lab ID:	Sample Number:	Station Location:	Average Percent Survival (%)	Standard Deviation	RM685R1	RM686R1	RM705R1	RM721R1	RM726R1	RM732RI		Average weight per surviving larvae (mg)	CV%	Standard Deviation	RM685R1	RM686R1	RM705R1	RM721R1	RM726R1	RM732RI
Negative Laboratory Control and Reference Sites																				
B1390-42	5164496	RM685R1	88.75	12.5	–	ns	ns	ns	ns	ns		1.91	11.3%	0.22	–	ns	E [5, 1]	ns	ns	ns
B1390-38	5164489	RM686R1	75.0	15.1	E [5, 1ns]	–	ns	ns	ns	ns		2.15	21.7%	0.47	ns	–	ns	ns	ns	ns
B1390-36	5164486	RM705R1	75.0	14.1	E [5, 1ns]	ns	–	ns	ns	ns		2.20	8.6%	0.19	ns	ns	–	ns	ns	ns
B1390-31	5164476	RM721R1	81.3	15.5	ns	ns	ns	–	ns	ns		1.94	17.2%	0.33	ns	ns	E [5, 1ns]	–	ns	ns
B1390-32	5164478	RM726R1	81.3	12.5	ns	ns	ns	ns	–	ns		1.98	13.2%	0.26	ns	ns	E [5, 1ns]	ns	–	ns
B1390-25	5164470	RM732R1	78.8	17.3	ns	ns	ns	ns	ns	–		1.96	12.2%	0.24	ns	ns	E [5, 1ns]	ns	ns	–
Sediment Control		Beaver Creek	88.8	13.6	–	–	–	–	–	–		1.97	9.0%	0.18	–	–	–	–	–	–
Sample Sites																				
B1390-27	5164472	RM737A1(X3)	82.5	17.5	ns	ns	ns	ns	ns	ns		1.47	18.0%	0.26	E [5, 1]	E [5, 1ns]	E [5, 1ns]	E [5, 1ns]	E [5, 1]	E [5, 1ns]
B1390-28	5164473	RM723A1(X1)	83.8	11.9	ns	ns	ns	ns	ns	ns		2.14	17.0%	0.36	ns	ns	ns	ns	ns	ns
B1390-29	5164474	RM736A1(X1)	81.3	11.3	ns	ns	ns	ns	ns	ns		1.94	14.8%	0.29	ns	ns	E [5, 1ns]	ns	ns	ns
B1390-30	5164475	RM723A2(X3)	83.8	10.6	ns	ns	ns	ns	ns	ns		1.96	20.8%	0.41	ns	ns	ns	ns	ns	ns
B1390-33	5164479	RM734A1(X3)	81.3	8.3	ns	ns	ns	ns	ns	ns		1.61	18.2%	0.29	E [5, 1ns]	E [5, 1ns]	E [5, 1ns]	E [5, 1ns]	E [5, 1]	E [5, 1ns]
B1390-34	5164483	RM661A1(X1)	81.3	8.3	ns	ns	ns	ns	ns	ns		1.84	12.6%	0.23	ns	ns	E [5, 1]	ns	ns	ns
B1390-35	5164485	RM658A1(X3)	80.0	14.1	ns	ns	ns	ns	ns	ns		1.78	24.1%	0.43	ns	ns	E [5, 1ns]	ns	ns	ns
B1390-37	5164487	RM713A1(X3)	75.0	20.7	ns	ns	ns	ns	ns	ns		2.23	31.2%	0.70	ns	ns	ns	ns	ns	ns
B1390-39	5164491	RM730A1(X1)	82.5	14.9	ns	ns	ns	ns	ns	ns		1.96	12.2%	0.24	ns	ns	E [5, 1ns]	ns	ns	ns
B1390-40	5164493	RM733A1(X1)	83.8	13.0	ns	ns	ns	ns	ns	ns		1.76	13.8%	0.24	ns	E [5, 1ns]	E [5, 1]	ns	ns	ns
B1390-41	5164494	RM729A1(X1)	90.0	7.6	ns	ns	ns	ns	ns	ns		2.01	13.7%	0.27	ns	ns	ns	ns	ns	ns
B1390-43	5164507	RM727A1(X1)	92.5	11.7	ns	ns	ns	ns	ns	ns		1.74	11.5%	0.20	ns	E [5, 1ns]	E [5, 1ns]	ns	E [5, 1ns]	E [5, 1ns]
B1390-44	5174405	RM644A1(X3)	70.0	23.9	E [5, 1ns]	ns	ns	ns	ns	ns		1.82	31.5%	0.57	ns	ns	ns	ns	ns	ns
B1390-45	5174406	RM637A1(X1)	77.5	10.4	E [5, 1ns]	ns	ns	ns	ns	ns		1.79	21.0%	0.38	ns	ns	E [5, 1]	ns	ns	ns
B1390-46	5174407	RM634A1(X1)	80.0	15.1	ns	ns	ns	ns	ns	ns		1.92	32.1%	0.62	ns	ns	ns	ns	ns	ns
B1390-47	5174408	RM642A1(X1)	66.3	30.2	E [5, 1ns]	ns	ns	ns	ns	ns		1.97	14.2%	0.28	ns	ns	E [5, 1ns]	ns	ns	ns
B1390-48	5174409	RM605A1(X1)	77.5	17.5	ns	ns	ns	ns	ns	ns		1.81	38.8%	0.70	ns	ns	ns	ns	ns	ns
B1390-49	5174410	RM606A1(X3)	72.5	27.6	ns	ns	ns	ns	ns	ns		2.04	46.0%	0.94	ns	ns	ns	ns	ns	ns
B1390-50	5174411	RM616A1(X3)	83.8	9.2	ns	ns	ns	ns	ns	ns		2.22	36.2%	0.80	ns	ns	ns	ns	ns	ns
B1390-51	5174412	RM641A1(X1)	86.3	15.1	ns	ns	ns	ns	ns	ns		1.93	15.5%	0.30	ns	ns	E [5, 1ns]	ns	ns	ns
B1390-52	5174413	RM640A1(X3)	60.0	23.9	E [5, 1]	ns	ns	E [5, 1ns]	E [5, 1ns]	E [5, 1ns]		2.52	21.4%	0.54	ns	ns	ns	ns	ns	ns
B1390-53	5174415	RM628A1(X1)	87.5	11.7	ns	ns	ns	ns	ns	ns		1.93	22.7%	0.44	ns	ns	ns	ns	ns	ns
B1390-54	5174423	RM603A1(X1)	71.3	9.9	E [5, 1]	ns	ns	ns	E [5, 1ns]	ns		1.90	13.0%	0.25	ns	ns	E [5, 1]	ns	ns	ns
B1390-55	5174424	RM605A2(X8)	81.3	9.9	ns	ns	ns	ns	ns	ns		1.85	13.2%	0.25	ns	ns	E [5, 1]	ns	ns	ns
B1390-56	5174427	RM622A1(X3)	77.5	13.9	E [5, 1ns]	ns	ns	ns	ns	ns		1.82	15.4%	0.28	ns	ns	E [5, 1]	ns	ns	ns

[E Indicates a statistically significant reduction from reference sites by use of Equal variance T-test; UE, statistically significant reduction from reference sites by use of UnEqual variance test; MW, statistically significant reduction from reference sites by use of Mann-Whitney U-test; F, statistically significant reduction from reference sites by use of Fisher's Exact test; [5], indicates significant at alpha (p) = 0.05; [1], indicates significant at alpha = 0.01; [1ns], indicates not significant at alpha = 0.01; ns indicates a non significant result; –, indicates no stat. test performed. Data analysis at the alpha = 0.01 level was only performed when a significant result at the 0.05 level was less than a 20% reduction from reference site values.]

REFERENCE TOXICANT TESTS

The 48-hour LC_{50} values, 7 day IC_{25} values, and control chart limits for the reference toxicant tests (sodium chloride for the *C. dubia* and potassium chloride for *C. tentans*) conducted in April and May are listed below. The results indicate that the organisms were within their expected sensitivity range.

Table
Reference Toxicant Tests

Species	LC_{50}	95% C.I.
Chironomus tentans (Chi 13)	6.6 g/L	0.7 to 7.4 g/L
Chironomus tentans (Chi 14)	5.1 g/L	1.6 to 7.4 µg/l

Table
Chronic Reference Toxicant Tests (g/L)

Species	IC_{25}	Control Chart Limits
Ceriodaphnia dubia (survival)	1.42	1.03 to 2.00
Ceriodaphnia dubia (reproduction)	0.42	0.21 to 0.90

APPENDIX A
RAW DATA SHEETS

CH2M HILL *TOXICITY TEST ORGANISM AND WATER QUALITY DATA*

Client Upper Columbia Test Initiation: Date 4-28-05 Time _____ Test Termination: Date 5-5-05 Time _____

Contact _____ Technician _____

Test Species/ID *Ceriodaphnia dubia* / Cd 1782 _____ / _____

Sample Information												Test Species Information	ID# Cd 1782	ID#	ID#
Sample ID Number	Field ID	Collected Date	Collected Time	Total Residual Chlorine (mg/l) As Received / As Dechlor.	Ammonia mg/l NH_3-N Pre	Ammonia mg/l NH_3-N Post	Hardness mg/l CaCO Pre	Hardness mg/l CaCO Post	Alkalinity mg/l CaCO Pre	Alkalinity mg/l CaCO Post					
B1390-01	RM704A1(X1)	04/20/2005	8:50	- / -	0.13	0.07	102	90	74	64		Age or Size	< 24 hours within an 8 hour span		
B1390-02	RM698A1(X1)	04/20/2005	10:10	- / -	0.22	0.10	88	92	50	56		Test Container Size	30 ml		
B1390-03	RM744A1(X1)	04/20/2005	10:45	- / -	0.61	0.01	112	100	74	71		Test Volume	5 g sample, 20 ml overlying water		
B1390-04	RM744A2(X3)	04/20/2005	11:45	- / -	0.09	0.04	100	90	72	58		Feeding: Type	0.1 ml Algae &		
B1390-05	RM692A1(X1)	04/20/2005	11:15	- / -	0.23	0.05	90	86	60	56		Amount	YCT daily		
B1390-06	RM687A1	04/20/2005	14:00	- / -	0.35	0.06	80	86	48	60			-		
B1390-07	RM689A1(X3)	04/20/2005	12:55	- / -	0.27	0.04	108	104	80	74		Aeration: Began	none		
B1390-08	RM706A1(X1)	04/20/2005	13:30	- / -	0.62	0.05	78	95	50	60		Amount	-		
B1390-09	RM743A2(X3)	04/20/2005	13:15	- / -	0.14	0.03	102	92	71	64		Dilution Water ID#	2499		
B1390-10	RM706A2(X7)	04/20/2005	16:25	- / -	1.07	0.13	76	76	50	56		Acclimation Period	< 24 hours		
B1390-11	RM676A1(X3)	04/21/2005	14:05	- / -	0.41	0.06	102	104	76	78		Test Location	# 11		
B1390-12	RM741A1(X3)	04/21/2005	13:30	- / -	0.31	0.01	110	98	84	72		Condition of Survivors			
B1390-13	RM740A1(X1)	04/21/2005	14:30	- / -	0.14	0.06	116	105	86	74					
B1390-14	RM724A1(X1)	04/21/2005	13:20	- / -	0.52	0.05	118	106	78	67		Comments	* NH_3, Hard & Alk are from overlying waters.		

Dilution Water Source	ID#	Ammonia mg/l NH_3-N	Hardness mg/l CaCO	Alkalinity mg/l CaCO
Reconstitued water	2499	-	74	60

Water Quality Meters Used/ID#

Dissolved Oxygen _____ pH _____ Temperature _____

Conductivity _____ Refractometer _____ Other _____

CH2M HILL *TOXICITY TEST ORGANISM AND WATER QUALITY DATA*

Client Upper Columbia Test Initiation: Date 4-28-05 Time _____ Test Termination: Date 5-5-05 Time _____

Contact _____ Technician _____

Test Species/ID *Ceriodaphnia dubia* / Cd 1782 /

Sample Information												Test Species Information	ID# Cd 1782	ID#	ID#
Sample ID Number	Field ID	Collected Date	Collected Time	Total Residual Chlorine (mg/l) As Received / As Dechlor.	Ammonia mg/l NH_3-N Pre	Ammonia mg/l NH_3-N Post	Hardness mg/l CaCO Pre	Hardness mg/l CaCO Post	Alkalinity mg/l CaCO Pre	Alkalinity mg/l CaCO Post					
B1390-15	RM686A1(X3)	04/21/2005	9:30	- / -	0.16	0.04	88	96	58	60	Age or Size	< 24 hours within an 8 hour span			
B1390-16	RM708A1(X3)	04/21/2005	9:43	- / -	0.52	0.09	124	104	72	64	Test Container Size	30 ml			
B1390-17	RM680A1(X1)	04/21/2005	10:40	- / -	0.24	0.06	112	98	83	72	Test Volume	5 g sample, 20 ml overlying water			
B1390-18	RM742A1(X1)	04/21/2005	11:00	- / -	0.26	0.06	104	89	76	70	Feeding: Type	0.1 ml Algae &			
B1390-19	RM743A1(X1)	04/21/2005	10:15	- / -	0.19	0.08	100	93	68	62	Amount	YCT daily			
B1390-20	RM678A1(X1)	04/21/2005	12:35	- / -	0.21	0.04	100	93	80	66		-			
B1390-21	RM742A2(X5)	04/21/2005	12:20	- / -	0.13	0.05	92	92	66	60	Aeration: Began	none			
B1390-22	RM677A1(X3)	04/21/2005	13:20	- / -	0.35	0.04	116	112	84	86	Amount	-			
B1390-23	RM738A1(X3)	04/22/2005	11:00	- / -	0.21	NA ~~0.44~~ BL	90	NA ~~100~~ BL	64	NA ~~76~~ BL	Dilution Water ID#	2499			
B1390-24	RM739A1(X3)	04/22/2005	10:00	- / -	0.53	0.41 ~~0.53~~	126	96	100	67	Acclimation Period	< 24 hours			
B1390-25	RM732R1	04/22/2005	11:35	- / -	0.59	0.05 ~~0.13~~ BL	168	130	128	108	Test Location	# 11			
B1390-26	RM724A2(X3)	04/22/2005	11:27	- / -	0.48	0.10 ~~0.06~~ BL	130	100	100	76	Condition of Survivors				
B1390-27	RM737A1(X3)	04/22/2005	12:15	- / -	0.15	0.06 ~~0.14~~ BL	120	85	58	65					
B1390-28	RM723A1(X1)	04/22/2005	12:55	- / -	0.17	0.04 ~~0.15~~ BL	110	98	74	68	Comments				

Dilution Water Source	ID#	Ammonia mg/l NH_3-N	Hardness mg/l CaCO	Alkalinity mg/l CaCO
Reconstitued water	2499	-	74	60

Water Quality Meters Used/ID#

Dissolved Oxygen _____ pH _____ Temperature _____

Conductivity _____ Refractometer _____ Other _____

CH2M HILL *TOXICITY TEST ORGANISM AND WATER QUALITY DATA*

Client Upper Columbia Test Initiation: Date 4-28-05 Time _____ Test Termination: Date 5-5-05 Time _____

Contact _____ Technician _____

Test Species/ID *Ceriodaphnia dubia* / Cd 1782 _____ / _____

Sample Information												Test Species Information	ID# Cd 1782	ID#	ID#
Sample ID Number	Field ID	Collected Date	Collected Time	Total Residual Chlorine (mg/l) As Received / As Dechlor.	Ammonia mg/l NH_3-N Pre	Ammonia mg/l NH_3-N Post	Hardness mg/l CaCO Pre	Hardness mg/l CaCO Post	Alkalinity mg/l CaCO Pre	Alkalinity mg/l CaCO Post					
B1390-29	RM736A1(X1)	04/22/2005	13:45	- / -	0.19	0.15	124	116	46	84		Age or Size	< 24 hours within an 8 hour span		
B1390-31	RM721R1	04/22/2005	14:39	- / -	0.38	0.12	154	124	104	90		Test Container Size	30 ml		
B1390-32	RM726R1	04/22/2005	13:20	- / -	0.49	0.14	166	134	114	108		Test Volume	5 g sample, 20 ml overlying water		
B1390-36	RM705R1	04/23/2005	9:25	- / -	0.29	0.05	90	86	56	54		Feeding: Type	0.1 ml Algae &		
B1390-38	RM686R1	04/23/2005	11:20	- / -	0.38	2.23	84	84	54	53		Amount	YCT daily		
B1390-42	RM685R1	04/23/2005	13:50	- / -	0.43	NA	148	NA	124	NA			-		
Sediment Cont.	20 grade, washed, silica sand	4/22/05	6640	- / -	0.15	0.14	76	88	54	60		Aeration: Began	none		
				/								Amount	-		
				/								Dilution Water ID#	2499		
				/								Acclimation Period	< 24 hours		
				/								Test Location	# 11		
				/								Condition of Survivors			
				/											
				/								Comments			

Dilution Water Source	ID#	Ammonia mg/l NH_3-N	Hardness mg/l CaCO	Alkalinity mg/l CaCO
Reconstituted water	2499	-	74	60

Water Quality Meters Used/ID#

Dissolved Oxygen _____ pH _____ Temperature _____

Conductivity _____ Refractometer _____ Other _____

Randomization chart for *Ceriodaphnia* tests initiated on 4/28/2005

Lab ID:	Field Sample Number	Station Location	Random number	Random position	Board ID	Postion on Board	Sample Number
B1390-13	5164460	RM740A1(X1)	0.991001693	1	I	#1	I #1
Sediment Control	0	silica sand	0.962650344	2	I	#2	I #2
B1390-28	5164473	RM723A1(X1)	0.955004644	3	I	#3	I #3
B1390-26	5164471	RM724A2(X3)	0.928375592	4	I	#4	I #4
B1390-16	5164450	RM708A1(X3)	0.916498082	5	I	#5	I #5
B1390-08	5164442	RM706A1(X1)	0.856860652	6	I	#6	I #6
B1390-14	5164461	RM724A1(X1)	0.838952286	7	II	#1	II #1
B1390-25	5164470	RM732R1	0.820457901	8	II	#2	II #2
B1390-06	5164440	RM687A1	0.812732995	9	II	#3	II #3
B1390-21	5164455	RM742A2(X5)	0.788955166	10	II	#4	II #4
B1390-27	5164472	RM737A1(X3)	0.788020487	11	II	#5	II #5
B1390-04	5164436	RM744A2(X3)	0.747708793	12	II	#6	II #6
B1390-02	5164434	RM698A1(X1)	0.718082784	13	III	#1	III #1
B1390-11	5164457	RM676A1(X3)	0.710700744	14	III	#2	III #2
B1390-20	5164454	RM678A1(X1)	0.702125815	15	III	#3	III #3
B1390-32	5164478	RM726R1	0.695169187	16	III	#4	III #4
B1390-23	5164468	RM738A1(X3)	0.663267376	17	III	#5	III #5
B1390-38	5164489	RM686R1	0.625312212	18	III	#6	III #6
B1390-15	5164439	RM686A1(X3)	0.561725402	19	IV	#1	IV #1
B1390-22	5164456	RM677A1(X3)	0.540011398	20	IV	#2	IV #2
B1390-03	5164435	RM744A1(X1)	0.502345625	21	IV	#3	IV #3
B1390-36	5164486	RM705R1	0.467917115	22	IV	#4	IV #4
B1390-05	5164437	RM692A1(X1)	0.459383098	23	IV	#5	IV #5
B1390-09	5164443	RM743A2(X3)	0.439793898	24	IV	#6	IV #6
B1390-10	5164449	RM706A2(X7)	0.427196759	25	V	#1	V #1
B1390-42	5164496	RM685R1	0.402559728	26	V	#2	V #2
B1390-19	5164453	RM743A1(X1)	0.400925649	27	V	#3	V #3
B1390-29	5164474	RM736A1(X1)	0.400354183	28	V	#4	V #4
Lab Control	ReconMH only	no sediment	0.360528594	29	V	#5	V #5
B1390-01	5164433	RM704A1(X1)	0.3119343	30	V	#6	V #6
B1390-18	5164452	RM742A1(X1)	0.253761287	31	VI	#1	VI #1
B1390-24	5164469	RM739A1(X3)	0.160229012	32	VI	#2	VI #2
B1390-17	5164451	RM680A1(X1)	0.138992204	33	VI	#3	VI #3
B1390-31	5164476	RM721R1	0.089754999	34	VI	#4	VI #4
B1390-07	5164441	RM689A1(X3)	0.062075709	35	VI	#5	VI #5
B1390-12	5164459	RM741A1(X3)	0.003337713	36	VI	#6	VI #6

Ceriodaphnia cubica

Neonate distribution

Test Initiation Date: April 28, 2005

Neonate source:

Culture board ID:	Spot #:	Test Board ID & Slot Number											
H3	3	I 1	I 11	III 1	III 11	V 1	V 11	IV 1	IV 11	II 1	II 11	VI 1	VI 11
H5	5	I 2	I 12	III 2	III 12	V 2	V 12	IV 2	IV 12	II 2	II 12	VI 2	VI 12
H	13	I 3	I 13	III 3	III 13	V 3	V 13	IV 3	IV 13	II 3	II 13	VI 3	VI 13
H	51	I 4	I 14	III 4	III 14	V 4	V 14	IV 4	IV 14	II 4	II 14	VI 4	VI 14
H	58	I 5	I 15	III 5	III 15	V 5	V 15	IV 5	IV 15	II 5	II 15	VI 5	VI 15
H	10	I 6	I 16	III 6	III 16	V 6	V 16	IV 6	IV 16	II 6	II 16	VI 6	VI 16
H	4	I 7	I 17	III 7	III 17	V 7	V 17	IV 7	IV 17	II 7	II 17	VI 7	VI 17
H	12	I 8	I 18	III 8	III 18	V 8	V 18	IV 8	IV 18	II 8	II 18	VI 8	VI 18
H	19	I 9	I 19	III 9	III 19	V 9	V 19	IV 9	IV 19	II 9	II 19	VI 9	VI 19
H	17	I 10	I 20	III 10	III 20	V 10	V 20	IV 10	IV 20	II 10	II 20	VI 10	VI 20
HH	55	III 21	III 31	V 21	V 31	I 21	I 31	IV 21	IV 31	VI 21	VI 31	II 21	II 31
HH	18	III 22	III 32	V 22	V 32	I 22	I 32	IV 22	IV 32	VI 22	VI 32	II 22	II 32
HH	38	III 23	III 33	V 23	V 33	I 23	I 33	IV 23	IV 33	VI 23	VI 33	II 23	II 33
HH	59	III 24	III 34	V 24	V 34	I 24	I 34	IV 24	IV 34	VI 24	VI 34	II 24	II 34
HH	60	III 25	III 35	V 25	V 35	I 25	I 35	IV 25	IV 35	VI 25	VI 35	II 25	II 35
HH	42	III 26	III 36	V 26	V 36	I 26	I 36	IV 26	IV 36	VI 26	VI 36	II 26	II 36
HH	4	III 27	III 37	V 27	V 37	I 27	I 37	IV 27	IV 37	VI 27	VI 37	II 27	II 37
HH	54	III 28	III 38	V 28	V 38	I 28	I 38	IV 28	IV 38	VI 28	VI 38	II 28	II 38
HH	9	III 29	III 39	V 29	V 39	I 29	I 39	IV 29	IV 39	VI 29	VI 39	II 29	II 39
HH	11	III 30	III 40	V 30	V 40	I 30	I 40	IV 30	IV 40	VI 30	VI 40	II 30	II 40
H	24	III 41	III 51	VI 41	VI 51	II 41	II 51	V 41	V 51	IV 41	IV 51	I 41	I 51
H	6	III 42	III 52	VI 42	VI 52	II 42	II 52	V 42	V 52	IV 42	IV 52	I 42	I 52
H	26	III 43	III 53	VI 43	VI 53	II 43	II 53	V 43	V 53	IV 43	IV 53	I 43	I 53
H	2	III 44	III 54	VI 44	VI 54	II 44	II 54	V 44	V 54	IV 44	IV 54	I 44	I 54
H	20	III 45	III 55	VI 45	VI 55	II 45	II 55	V 45	V 55	IV 45	IV 55	I 45	I 55
H	60	III 46	III 56	VI 46	VI 56	II 46	II 56	V 46	V 56	IV 46	IV 56	I 46	I 56
H	11	III 47	III 57	VI 47	VI 57	II 47	II 57	V 47	V 57	IV 47	IV 57	I 47	I 57
H	49	III 48	III 58	VI 48	VI 58	II 48	II 58	V 48	V 58	IV 48	IV 58	I 48	I 58
H	8	III 49	III 59	VI 49	VI 59	II 49	II 59	V 49	V 59	IV 49	IV 59	I 49	I 59
H	39	III 50	III 60	VI 50	VI 60	II 50	II 60	V 50	V 60	IV 50	IV 60	I 50	I 60

1st set of neonates:

board ID:	Random #	Random Order
I	0.926674	1
III	0.612989	2
V	0.46073	3
IV	0.3765655	4
II	0.0764079	5
VI	0.0403402	6

2nd set of neonates:

board ID:	Random #	Random Order
III	0.9488999	1
V	0.5971845	2
I	0.4942352	3
IV	0.3576403	4
VI	0.1599817	5
II	0.0956865	6

3rd set of neonates:

board ID:	Random #	Random Order
III	0.5998317	1
VI	0.5044984	2
II	0.2722564	3
V	0.2143665	4
IV	0.15864	5
I	0.0415832	6

Test Board Slot Location Information

Board ID: I

	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #
rep A	1	I # 4	11	I # 2	21	I # 6	31	I # 1	41	I # 5	51	I # 3
rep B	2	I # 1	12	I # 3	22	I # 5	32	I # 2	42	I # 4	52	I # 6
rep C	3	I # 2	13	I # 3	23	I # 4	33	I # 1	43	I # 5	53	I # 6
rep D	4	I # 3	14	I # 5	24	I # 4	34	I # 2	44	I # 1	54	I # 6
rep E	5	I # 6	15	I # 2	25	I # 5	35	I # 4	45	I # 3	55	I # 1
rep F	6	I # 4	16	I # 5	26	I # 1	36	I # 3	46	I # 6	56	I # 2
rep G	7	I # 4	17	I # 2	27	I # 5	37	I # 3	47	I # 1	57	I # 6
rep H	8	I # 1	18	I # 6	28	I # 4	38	I # 5	48	I # 2	58	I # 3
rep I	9	I # 3	19	I # 5	29	I # 2	39	I # 6	49	I # 1	59	I # 4
rep J	10	I # 2	20	I # 6	30	I # 3	40	I # 5	50	I # 4	60	I # 1

Board ID: II

	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #
rep A	1	II # 2	11	II # 6	21	II # 5	31	II # 3	41	II # 1	51	II # 4
rep B	2	II # 5	12	II # 3	22	II # 1	32	II # 2	42	II # 6	52	II # 4
rep C	3	II # 4	13	II # 2	23	II # 6	33	II # 1	43	II # 5	53	II # 3
rep D	4	II # 4	14	II # 6	24	II # 3	34	II # 5	44	II # 2	54	II # 1
rep E	5	II # 4	15	II # 2	25	II # 5	35	II # 6	45	II # 3	55	II # 1
rep F	6	II # 1	16	II # 6	26	II # 4	36	II # 2	46	II # 5	56	II # 3
rep G	7	II # 3	17	II # 4	27	II # 6	37	II # 1	47	II # 2	57	II # 5
rep H	8	II # 3	18	II # 1	28	II # 5	38	II # 6	48	II # 2	58	II # 4
rep I	9	II # 4	19	II # 1	29	II # 2	39	II # 5	49	II # 3	59	II # 6
rep J	10	II # 3	20	II # 5	30	II # 1	40	II # 2	50	II # 6	60	II # 4

Board ID: III

	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #
rep A	1	III # 5	11	III # 4	21	III # 3	31	III # 6	41	III # 2	51	III # 1
rep B	2	III # 6	12	III # 4	22	III # 1	32	III # 5	42	III # 3	52	III # 2
rep C	3	III # 4	13	III # 3	23	III # 2	33	III # 1	43	III # 6	53	III # 5
rep D	4	III # 1	14	III # 5	24	III # 4	34	III # 2	44	III # 6	54	III # 3
rep E	5	III # 4	15	III # 5	25	III # 6	35	III # 1	45	III # 2	55	III # 3
rep F	6	III # 5	16	III # 6	26	III # 2	36	III # 1	46	III # 3	56	III # 4
rep G	7	III # 2	17	III # 3	27	III # 4	37	III # 5	47	III # 6	57	III # 1
rep H	8	III # 5	18	III # 4	28	III # 2	38	III # 6	48	III # 1	58	III # 3
rep I	9	III # 5	19	III # 4	29	III # 1	39	III # 6	49	III # 2	59	III # 3
rep J	10	III # 2	20	III # 3	30	III # 6	40	III # 5	50	III # 1	60	III # 4

Test Board Slot Location Information

Board ID: IV

	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #
rep A	1	IV # 6	11	IV # 1	21	IV # 4	31	IV # 3	41	IV # 2	51	IV # 5
rep B	2	IV # 2	12	IV # 5	22	IV # 3	32	IV # 4	42	IV # 6	52	IV # 1
rep C	3	IV # 4	13	IV # 1	23	IV # 2	33	IV # 6	43	IV # 5	53	IV # 3
rep D	4	IV # 2	14	IV # 5	24	IV # 1	34	IV # 3	44	IV # 6	54	IV # 4
rep E	5	IV # 6	15	IV # 3	25	IV # 2	35	IV # 1	45	IV # 5	55	IV # 4
rep F	6	IV # 2	16	IV # 3	26	IV # 4	36	IV # 6	46	IV # 5	56	IV # 1
rep G	7	IV # 1	17	IV # 4	27	IV # 6	37	IV # 3	47	IV # 5	57	IV # 2
rep H	8	IV # 5	18	IV # 6	28	IV # 1	38	IV # 4	48	IV # 2	58	IV # 3
rep I	9	IV # 1	19	IV # 3	29	IV # 2	39	IV # 5	49	IV # 6	59	IV # 4
rep J	10	IV # 6	20	IV # 5	30	IV # 3	40	IV # 2	50	IV # 1	60	IV # 4

Board ID: V

	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #
rep A	1	V # 5	11	V # 4	21	V # 2	31	V # 1	41	V # 3	51	V # 6
rep B	2	V # 2	12	V # 5	22	V # 6	32	V # 3	42	V # 4	52	V # 1
rep C	3	V # 5	13	V # 1	23	V # 4	33	V # 3	43	V # 6	53	V # 2
rep D	4	V # 4	14	V # 6	24	V # 1	34	V # 5	44	V # 2	54	V # 3
rep E	5	V # 2	15	V # 1	25	V # 3	35	V # 5	45	V # 6	55	V # 4
rep F	6	V # 5	16	V # 3	26	V # 1	36	V # 6	46	V # 4	56	V # 2
rep G	7	V # 5	17	V # 6	27	V # 1	37	V # 3	47	V # 4	57	V # 2
rep H	8	V # 4	18	V # 6	28	V # 2	38	V # 1	48	V # 5	58	V # 3
rep I	9	V # 6	19	V # 5	29	V # 3	39	V # 2	49	V # 4	59	V # 1
rep J	10	V # 1	20	V # 4	30	V # 6	40	V # 2	50	V # 5	60	V # 3

Board ID: VI

	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #
rep A	1	VI # 2	11	VI # 5	21	VI # 1	31	VI # 4	41	VI # 6	51	VI # 3
rep B	2	VI # 5	12	VI # 4	22	VI # 6	32	VI # 1	42	VI # 3	52	VI # 2
rep C	3	VI # 4	13	VI # 3	23	VI # 1	33	VI # 6	43	VI # 5	53	VI # 2
rep D	4	VI # 2	14	VI # 6	24	VI # 4	34	VI # 1	44	VI # 5	54	VI # 3
rep E	5	VI # 6	15	VI # 2	25	VI # 5	35	VI # 3	45	VI # 1	55	VI # 4
rep F	6	VI # 1	16	VI # 1	26	VI # 3	36	VI # 4	46	VI # 5	56	VI # 2
rep G	7	VI # 3	17	VI # 1	27	VI # 4	37	VI # 2	47	VI # 5	57	VI # 6
rep H	8	VI # 3	18	VI # 1	28	VI # 2	38	VI # 5	48	VI # 6	58	VI # 4
rep I	9	VI # 2	19	VI # 1	29	VI # 4	39	VI # 5	49	VI # 6	59	VI # 3
rep J	10	VI # 2	20	VI # 4	30	VI # 1	40	VI # 6	50	VI # 5	60	VI # 3

CH2M HILL

Ceriodaphnia dubia
Survival and Reproduction
Test Data Summary

Client: Upper Columbia Project — Test Start Date: 4-28-2005
Sample Description: I — Sample ID#: see cross reference sheet
Ceriodaphnia Lot#: Cd 1782 — Statistician: [illegible]

Percent or Concentration	Total Young Per Replicate										# Alive Adults	Total Live Young
	A	B	C	D	E	F	G	H	I	J		
I #1	29	19	29	24	27	27	12	22	16	25	10	230
I #2	30	26	28	31	4/AD	23	27	35	0/AD	24	8	228
I #3	36	28	28	28	28	28	27	29	14	29	10	275
I #4	20	31	27	29	23	25	24	27	23	29	10	258
I #5	36	27	27	26	23/AD	24	0/AD	23	30	22/AD	7	238
I #6	22	26	24	9/AD	25	24	11	0/AD	23	23	8	187

Footnote: *Ceriodaphnia dubia* test should be terminated when 60% of the control organisms have produced their third brood, or at the end of eight days, whichever occurs first.

* SURVIVAL THROUGH DAY 7 DATA.
REPRODUCTIVE THRU 1ST 3 BROODS.

CH2M HILL

CERIODAPHNIA 7-DAY SURVIVAL AND REPRODUCTION DATA

Client Upper Columbia Project Test Beginning : Date 4-28-05 Time 1310

Sample Description Board ID: 1 Test Ending : Date 5-5-05 Time 0910

Ceriodaphnia Lot# Cd 1782 Dilution Water Recon MH (FHM) ID# 2499

Technician: Day 0 3m/DW, Day 1 DW, Day 2 3m, Day 3 DW, Day 4 3m, Day 5 DW, Day 6 DW, Day 7 MS

Time: Day 0 1310, Day 1 0900, Day 2 0915, Day 3 0835, Day 4 1055, Day 5 0915 Day 6 0840 Day 7 0910

✓= Fed: Day 0 ✓, Day 1 ✓, Day 2 ✓, Day 3 ✓, Day 4 ✓, Day 5 ✓, Day 6 ✓, Day 7 ___

Sample Number	Day	Replicate A	B	C	D	E	F	G	H	I	J	No. Live Adults	Total Live Young
I #1	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	3	0	0	4	0	0	0	0	0	0	10	7
	4	0	0	4	8	6	4	0	4	0	4	10	30
	5	12	7	12	0	8	11	4	8	5	9	10	76
	6	14	12	13	12	0	12	3	0	0	0	10	66
	7	0	0	0	10	13	0	5	10	11	12	10	61
I #2	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	3	0	4	4	0	0	0	0	0	10	11
	4	5	13	4	0	0 M*	5	3	6	0 M*	3	8	39
	5	11	0	10	11	|	0	11	14	|	9	8	66
	6	13	10	14	16	|	7	13	15	|	0	8	88
	7	10	11	0	17	|	11	0	0	|	12	8	52
I #3	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	4	4	5	0	0	0	0	0	0	10	13
	4	7	0	0	0	5	3	5	2	3	6	10	31
	5	15	11	10	11	12	13	13	12	4	15	10	116
	6	0	13	14	12	11	12	9	15	0	0	10	86
	7	14	0	15	0	0	0	0	0	7	8	10	44
I #4	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	4	4	4	4	4	3	0	0	0	10	23
	4	3	0	0	0	5	0	0	6	3	3	10	20
	5	7	12	11	11	0	9	8	10	9	12	10	89
	6	0	15	12	14	14	12	13	11	0	0	10	91
	7	10	9	13	15	0	0	0	0	11	14	10	72
I #5	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	3	4	4	3	4	0	0 M*	0	0	10	18
	4	6	0	0	0	0	0	AD 0	dead	5	4	9	15
	5	12	8	9	9	10	9	|	5	12	10	9	84
	6	0	16	14	13	M/AD	11	|	7	0	M/AD	8 7	79
	7	18	11	15	10	↓	12	↓	all	13	↓	7	90
I #6	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	2	2	3	0	2	0	0	0	0	0	10	9
	4	0	1/0	0	1	0	2	2	0 M/D	2	2	9	10
	5	9	10	9	8/AD	9	8	9	|	10	11	8	83
	6	11	13	12	|	14	0	0	|	0	0	8	50
	7	0	0	0	↓	0	14	0	1	11	10	8	35

CH2M HILL

CERIODAPHNIA WATER QUALITY DATA

Client: Upper Columbia Project
Initiated Date: 4-28-05 Time: 1310
Adults Isolated Date: 4-27-05 Time: 1600
Sample Description: Board ID: I
Terminated Date: 5-5-05 Time: 0800
Neo's Collected Date: 4-27-05 Time: 2230

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Technician	DW/BM	MS	MS	DW	DW	DW	DW	DW
Time	1310	0820	0830	1330	1330	0745	1045	0800

Sample Number	Dissolved Oxygen (mg/l) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	pH Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Temperature (C) / Conductivity (µmhos/cm) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
I #1	7.0	6.9 / 7.9	7.2 / 7.7	7.1 / 7.5	6.9 / 7.9	7.2 / 7.8	7.1 / 7.8	6.9	7.2	7.1 / 7.7	7.4 / 7.5	7.4 / 7.4	7.2 / 7.5	7.1 / 7.4	7.0 / 7.4	6.9	24.1 / 311	26.3	25.1	24.7	25.5	25.1	25.4	24.4
I #2	7.9	6.12 / 7.9	6.7 / 7.7	7.4 / 7.5	7.2 / 7.9	7.4 / 7.8	7.3 / 7.8	7.2	7.4	7.3 / 7.7	7.4 / 7.5	7.4 / 7.4	7.3 / 7.5	7.2 / 7.4	7.0 / 7.4	7.0	23.7 / 285	26.0	25.4	24.4	26.0	24.9	25.5	24.9
I #3	7.0	6.0 / 7.9	6.6 / 7.7	7.1 / 7.5	7.0 / 7.9	7.1 / 7.8	7.1 / 7.8	7.0	7.2	7.2 / 7.7	7.3 / 7.5	7.4 / 7.4	7.3 / 7.5	7.1 / 7.4	6.9 / 7.4	7.0	23.5 / 310	26.1	24.8	24.2	24.9	25.1	25.3	24.5
I #4	6.1	6.9 / 7.9	6.4 / 7.7	6.9 / 7.5	7.1 / 7.9	6.6 / 7.8	7.0 / 7.8	7.0	7.2	7.2 / 7.7	7.3 / 7.5	7.4 / 7.4	7.2 / 7.5	7.1 / 7.4	7.0 / 7.4	7.1	23.9 / 318	25.7	25.9	24.5	25.6	24.6	25.3	24.6
I #5	3.2	4.9 / 7.9	6.3 / 7.7	7.1 / 7.5	7.0 / 7.9	6.9 / 7.8	6.8 / 7.8	6.9	6.8	7.2 / 7.7	7.2 / 7.5	7.4 / 7.4	7.3 / 7.5	7.1 / 7.4	7.0 / 7.4	7.0	24.0 / 311	25.8	25.4	24.6	25.2	25.1	25.5	24.9
I #6	4.1	6.0 / 7.9	6.7 / 7.7	7.2 / 7.5	7.1 / 7.9	7.0 / 7.8	7.1 / 7.8	7.0	6.7	7.0 / 7.7	7.1 / 7.5	7.3 / 7.4	7.3 / 7.5	7.0 / 7.4	7.0 / 7.4	7.0	23.9 / 271	26.1	25.6	24.7	24.3	24.5	25.2	24.7

COMMENTS:

CH2M HILL

Ceriodaphnia dubia
Survival and Reproduction
Test Data Summary

Client: Upper Columbia Project
Test Start Date: 4-28-2005
Sample Description: II
Sample ID#: See cross reference
Ceriodaphnia Lot#: Cd 1782
Statistician: Bm

Percent or Concentration	Total Young Per Replicate										# Alive Adults	Total Live Young
	A	B	C	D	E	F	G	H	I	J		
II #1	20	29	26	26	26	28	28	28	30	27	10	268 ✓
II #2	25	24	25	16	25	16	23	30	28	9	10	221 ✓
II #3	23	24	~~22~~ 25 (37)	21	0/(AD)	26	23	20	22	17	9	201 ~~198~~ ✓
II #4	26	25	20	7/(AD)	26	23	0	23	26	14	9	190 ✓
II #5	0	0/(AD)	0/(AD)	17	19	0/(AD)	0/(AD)	1	0/(AD)	0	5	37 ✓
II #6	25	28	28	0/(AD)	27	15	0/(AD)	18	24	20	8	185 ✓

Footnote: *Ceriodaphnia dubia* test should be terminated when 60% of the control organisms have produced their third brood, or at the end of eight days, whichever occurs first.

× SURVIVAL THRU DAY 7, REPRODUCTION THRU 3 BROODS.

CH2M HILL

CERIODAPHNIA 7-DAY SURVIVAL AND REPRODUCTION DATA

Client Upper Columbia Project Test Beginning : Date 4-28-05 Time 1315

Sample Description Board ID: II Test Ending : Date 5-5-05 Time 0930

Ceriodaphnia Lot# Cd 1782 Dilution Water Recon MH (FHM) ID# 2479

Technician: Day 0 BW, Day 1 BW, Day 2 DW, Day 3 DW, Day 4 DW, Day 5 DW, Day 6 BW, Day 7 BW

Time: Day 0 1315, Day 1 0900, Day 2 0900, Day 3 1100, Day 4 1130, Day 5 1100, Day 6 0930, Day 7 0930

✓= Fed: Day 0 ✓, Day 1 ✓, Day 2 ✓, Day 3 ✓, Day 4 ✓, Day 5 ✓, Day 6 ✓, Day 7 ___

Sample Number	Day	Replicate A	B	C	D	E	F	G	H	I	J	No. Live Adults	Total Live Young
II #1	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	4	4	0	0	4	3	0	0	0	10	15
	4	4	0	0	3	4	0	0	5	4	3	10	23
	5	7	11	11	9	11	11	13	10	10	11	10	104
	6	0	12	6	1/0	0	13	12	0	3/0	3/0	10	50
	7	9	2/0	5/0	13	11	0	3	13	13	10	10	79
II #2	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	3	2	0	3	0	0	0	0	0	10	8
	4	5	0	0	0	0	4	3	5	5	4	10	26
	5	11	8	10	6	12	7	10	14	11	0	10	89
	6	0	13	13	0	10	0	9	11	0	0	10	56
	7	9	0	13	10	8	5	1/0	0	12	5	10	63
II #3	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	3	4	4	4	0	4	3	3	3	3	10	31
	5	9	9	10	8	%AD	10	8	0	7	5	9	66
	6	0	0	8	0	↓	0	0	5	1/0	0	9	14
	7	11	11	3/0	9	↓	12	12	12	11	9	9	90
II #4	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	2	3	0	0	0	0	0	10	5
	4	5	4	0	0	0	4	0	4	5	0	10	22
	5	8	11	12	5	11	8	0	9	9	5	10	78
	6	1/0	0	8	0/AD	12	1/0	0*	0	0	0	9	22
	7	12	10	0	↓	0	10	0 Fem	10	12	9	9	63
II #5	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	%AD	0	0	0	0	0	%AD	0	8	0
	3	0	0	↓	0	0	%AD	%AD	0	↓	0	6	0
	4	0	%AD	↓	2	2	↓	↓	0	↓	0	5	4
	5	0	↓	↓	8	7	↓	↓	0	↓	0	5	15
	6	0	↓	↓	7	10	↓	↓	1	↓	0	5	18
	7	0F	↓	↓	0	0	↓	↓	0	↓	0F	5	0
II #6	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	3	%AD	0	3	%AD	0	0	0	8	6
	4	5	5	0	↓	0	6	↓	4	4	4	8	28
	5	7	10	11	↓	6	6	↓	8	9	7	8	64
	6	0	13	14	↓	10	0	↓	6	0	0	8	43
	7	13	0	14	↓	11	4	↓	0	11	9	8	62

CH2M HILL

CERIODAPHNIA WATER QUALITY DATA

Client: Upper Columbia Project
Sample Description: Board ID: II
Technician: Day 0 DW/BM; Day 1 MS; Day 2 MS; Day 3 ~~DW~~ ~~3~~; Day 4 DW; Day 5 DW; Day 6 DW; Day 7 DW
Time: Day 0 1315; Day 1 0845; Day 2 0900; Day 3 1330; Day 4 1130; Day 5 0800; Day 6 1050; Day 7 0800

Initiated: Date 4-28-05 Time 1315
Terminated: Date 5-5-05 Time 0800
Adults Isolated: Date 4-27-05 Time 1600
Neo's Collected: Date 4-27-05 Time 2230

Sample Number	Dissolved Oxygen (mg/l) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
II #1	5.4	6.5 / 7.9	6.4 / 7.7	6.8 / 7.5	7.4 / 7.9	7.3 / 7.8	7.2 / 7.8	6.6
II #2	6.4	6.8 / 7.9	6.3 / 7.7	6.9 / 7.5	7.4 / 7.9	7.2 / 7.8	7.1 / 7.8	6.9
II #3	6.5	7.0 / 7.9	6.7 / 7.7	7.1 / 7.5	7.5 / 7.9	6.9 / 7.8	7.0 / 7.8	6.8
II #4	7.8	7.6 / 7.9	7.0 / 7.7	7.2 / 7.5	7.5 / 7.9	7.3 / 7.8	7.1 / 7.8	6.8
II #5	8.1	7.4 / 7.9	7.3 / 7.7	7.4 / 7.5	7.4 / 7.9	7.5 / 7.8	7.3 / 7.8	7.1
II #6	7.6	7.5 / 7.9	7.3 / 7.7	7.4 / 7.5	7.4 / 7.9	7.3 / 7.8	7.1 / 7.8	7.0

Sample Number	pH Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
II #1	7.4	7.2 / 7.7	7.3 / 7.5	7.4 / 7.4	7.5 / 7.5	7.4 / 7.4	7.3 / 7.4	7.2
II #2	7.6	7.5 / 7.7	7.6 / 7.5	7.5 / 7.4	7.8 / 7.5	7.7 / 7.4	7.6 / 7.4	7.4
II #3	7.0	7.1 / 7.7	7.3 / 7.5	7.6 / 7.4	7.7 / 7.5	7.3 / 7.4	7.2 / 7.4	7.3
II #4	7.3	7.5 / 7.7	7.4 / 7.5	7.5 / 7.4	7.5 / 7.5	7.4 / 7.4	7.3 / 7.4	7.2
II #5	7.5	7.5 / 7.7	7.5 / 7.5	7.5 / 7.4	7.6 / 7.5	7.5 / 7.4	7.4 / 7.4	7.3
II #6	7.4	7.5 / 7.7	7.5 / 7.5	7.5 / 7.4	7.4 / 7.5	7.5 / 7.4	7.4 / 7.4	7.3

Sample Number	Temperature (C) / Conductivity (µmhos/cm) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
II #1	26.0 / 304	24.8 / -	24.3 / -	25.2 / -	26.1 / -	24.5 / -	24.2 / -	24.9 / -
II #2	25.7 / 335	25.0 / -	24.2 / -	24.9 / -	26.0 / -	24.4 / -	24.6 / -	24.8 / -
II #3	25.4 / 261	25.1 / -	24.0 / -	24.8 / -	25.7 / -	24.6 / -	24.2 / -	25.1 / -
II #4	26.0 / 274	25.2 / -	23.9 / -	25.1 / -	25.9 / -	24.5 / -	24.6 / -	24.7 / -
II #5	25.4 / 274	25.0 / -	24.2 / -	25.3 / -	25.6 / -	24.5 / -	24.4 / -	24.8 / -
II #6	25.7 / 286	25.1 / -	24.3 / -	25.0 / -	25.9 / -	24.7 / -	24.6 / -	24.5 / -

COMMENTS:

CH2M HILL

Ceriodaphnia dubia
Survival and Reproduction
Test Data Summary

Client Upper Columbia Project
Test Start Date 4-28-2005
Sample Description III
Sample ID# See cross reference
Ceriodaphnia Lot# Cd 1782
Statistician [illegible]

Percent or Concentration	Total Young Per Replicate										# Alive Adults	Total Live Young
	A	B	C	D	E	F	G	H	I	J		
III #1	%(AD)	29	26	28	25	20	23	25	22	%(AD)	8	198 ✓
III #2	13	18	26	17	19	18	28	12	23	18	10	192 ✓
III #3	32	18	27	28	29	26	33	26	29	21	10	269 ✓
III #4	17	31	30	25	29	24	23	26	16	17	10	238 ✓
III #5	%(AD)	%(AD)	%(AD)	%(AD)	%(AD)	%(AD)	%(AD)	%(AD)	%(AD)	%(AD)	0	0 ✓
III #6	26	27	%(AD)	25	28	25	27	29	%(AD)	15	8	202 ✓

Footnote: *Ceriodaphnia dubia* test should be terminated when 60% of the control organisms have produced their third brood, or at the end of eight days, whichever occurs first.

* SURVIVAL THRU DAY 7. REPRODUCTION THRU 3 BROODS.

CH2M HILL

CERIODAPHNIA 7-DAY SURVIVAL AND REPRODUCTION DATA

Client Upper Columbia Project Test Beginning : Date 4-28-05 Time 1320

Sample Description Board ID: III Test Ending : Date 5-5-05 Time 0915

Ceriodaphnia Lot# Cd 1782 Dilution Water Recon MH (FHM) ID# 2499

Technician: Day 0 8-4/ay, Day 1 DW, Day 2 DW, Day 3 Bm, Day 4 Bm, Day 5 MS, Day 6 DW, Day 7 JS

Time: Day 0 1320, Day 1 0930, Day 2 0925, Day 3 1145, Day 4 1145, Day 5 1030, Day 6 0930, Day 7 0915

✓= Fed: Day 0 ✓, Day 1 ✓, Day 2 ✓, Day 3 ✓, Day 4 ✓, Day 5 ✓, Day 6 ✓, Day 7 —

Sample Number	Day	Replicate A	B	C	D	E	F	G	H	I	J	No. Live Adults	Total Live Young
III #1	1	0/AD	0	0	0	0	0	0	0	0	0	9	0
	2		0	0	0	0	0	0	0	0	0	9	0
	3		3	0	0	2	0	0	0	0	0	9	5
	4		0	3	5	0	2	1	2	3	0 AD	8	16
	5		10	11	10	11	13	9	11	9		8	84
	6		15	12	13	12	5	0	0	0		8	57
	7		1/6	0	0	0	0	13	12	10		8	36
III #2	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	0	0	4	3	3	3	5	5	2	3	10	28
	5	5	6	10	5	6	7	9	0	9	10	10	57
	6	0	0	12	9	0	0	0	0	0	7	10	28
	7	8	12	0	0	10	8	14	7	12	8	10	79
III #3	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	2	0	0	0	5	0	0	0	10	7
	4	3	4	2/0	3	4	3	1/0	4	4	2	10	30
	5	1/14	6	10	12	12	11	16	11	11	10	10	114
	6	14	0	13	13	0	12	11	0	0	0	10	63
	7	3/0	4/4x	0	0	13	0	0	11	14	9	10	55
III #4	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	3	5	4	0	3	0	0	0	0	10	15
	4	2	3/0	0	0	3	0	4	7	3	2	10	24
	5	6	10	12	10	1/13	8	11	11	7	8	10	~~98~~97
	6	0	15	13	11	12	13	0	0	0	0	10	64
	7	9	0	0	0	2	0	8	8	6	7	10	40
III #5	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0/AD	0	0	0/AD	0/AD	0/AD	0	0/AD	0	0/AD	4	0
	3		0	0				0		0 AD		3	0
	4		0 AD	0 AD				0 AD				0	0
	5												
	6												
	7												
III #6	1	0	0	0	0	0	0	0	0	0/AD	0	9	0
	2	0	0	0	0	0	0	0	0		0	9	0
	3	0	0	0 AD	0	5	0	0	0		0	5	5
	4	5	4		3	0	3	5	2		2	8	24
	5	1/9	8		9	12	10	4	14		10	8	81
	6	11	15		13	11	12	14	13		0	8	89
	7	0	0		0	0	0	0	0		3	3	3

CH2M HILL

CERIODAPHNIA WATER QUALITY DATA

Client: Upper Columbia Project
Sample Description: Board ID: III
Technician: Day 0 DW/BM | Day 1 MS | Day 2 MS | Day 3 BM | Day 4 DW | Day 5 DW | Day 6 DW | Day 7 DW
Time: Day 0 1320 | Day 1 0917 | Day 2 0850 | Day 3 1330 | Day 4 1510 | Day 5 0815 | Day 6 1050 | Day 7 0805

Initiated: Date 4-28-05 Time 1320
Terminated: Date 5-5-05 Time 0805
Adults Isolated: Date 4-27-05 Time 1600
Neo's Collected: Date 4-27-05 Time 2230

Sample Number	Dissolved Oxygen (mg/l) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
III #1	3.2	6.1 / 7.9	6.4 / 7.7	6.9 / 7.5	7.9 / 7.9	7.5 / 7.8	7.3 / 7.8	7.1
III #2	7.4	7.0 / 7.9	7.0 / 7.7	7.1 / 7.5	7.9 / 7.9	7.5 / 7.8	7.3 / 7.8	7.0
III #3	7.4	7.0 / 7.9	7.0 / 7.7	7.2 / 7.5	7.9 / 7.9	7.5 / 7.8	7.4 / 7.8	7.2
III #4	5.8	6.0 / 7.9	7.0 / 7.7	6.9 / 7.5	7.6 / 7.9	7.2 / 7.8	7.1 / 7.8	6.9
III #5	8.0	7.3 / 7.9	7.0 / 7.7	7.3 / 7.5	7.8 / 7.9	~~7.4~~ DW / ~~7.8~~	~~7.2~~ / ~~7.8~~	~~7.0~~ DW
III #6	5.3	6.3 / 7.9	6.8 / 7.7	7.0 / 7.5	7.9 / 7.9	7.2 / 7.8	7.0 / 7.8	6.7

Sample Number	pH Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
III #1	6.8	6.7 / 7.7	7.2 / 7.5	7.4 / 7.4	7.4 / 7.5	7.3 / 7.4	7.2 / 7.4	7.2
III #2	7.4	7.4 / 7.7	7.5 / 7.5	7.6 / 7.4	7.7 / 7.5	7.6 / 7.4	7.4 / 7.4	7.3
III #3	7.3	7.4 / 7.7	7.5 / 7.5	7.6 / 7.4	7.6 / 7.5	7.5 / 7.4	7.3 / 7.4	7.3
III #4	7.3	7.4 / 7.7	7.5 / 7.5	7.6 / 7.4	7.7 / 7.5	7.6 / 7.4	7.5 / 7.4	7.3
III #5	7.5	7.5 / 7.7	7.6 / 7.5	7.6 / 7.4	7.7 / 7.5	~~7.6~~ DW / ~~7.4~~	~~7.5~~ / ~~7.4~~	7.4 DW
III #6	6.8	7.1 / 7.7	7.2 / 7.5	7.3 / 7.4	7.4 / 7.5	7.4 / 7.4	7.2 / 7.4	7.2

Sample Number	Temperature (C) / Conductivity (µmhos/cm) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
III #1	24.4 / 274	24.6 / ~~24.6~~	26.1 /	24.7 /	24.1 /	24.7 /	25.3 /	24.4 /
III #2	24.8 / 283	24.4 / -	25.6 / -	25.8 / -	24.0 / -	24.7 / -	26.1 / -	24.6 / -
III #3	24.5 / 269	24.3 / -	25.3 / -	25.9 / -	24.0 / -	24.9 / -	26.0 / -	24.3 / -
III #4	24.3 / 305	24.4 / -	25.8 / -	25.9 / -	24.1 / -	24.1 / -	24.8 / -	24.8 / -
III #5	24.1 / 260	24.3 / -	25.5 / -	25.7 / -	24.0 / -	24.3 / -	— / -	— / -
III #6	24.4 / 257	24.5 /	25.3 /	25.0 /	24.0 /	24.4 /	25.2 /	25.0 /

COMMENTS: DO | all measurements (+ conductivity) taken in surrogate chamber. Temp taken in a randomly selected test chamber 3m

CH2M HILL

Ceriodaphnia dubia
Survival and Reproduction
Test Data Summary

Client: Upper Columbia Project — Test Start Date: 4-28-2005
Sample Description: IV — Sample ID#: See cross reference
Ceriodaphnia Lot#: Cd 1782 — Statistician: BR

Percent or Concentration	Total Young Per Replicate										# Alive Adults	Total Live Young
	A	B	C	D	E	F	G	H	I	J		
IV #1	26	0/AD	27	15	22	0/AD	27	29	31	28	8	205 ✓
IV #2	29	25	19	23	22	22	22	15	22	30	10	229 ✓
IV #3	21	25	14/AD	3/AD	27	26	26	30	25	29	8	226 ✓
IV #4	27	22	30	26	26	24	25	27	16	12	10	235 ✓
IV #5	26	27	24	27	28	32	26	27	28	25	10	270 ✓
IV #6	26	14	22	25	25	16	18	21	18	15	10	200 ✓

Footnote: *Ceriodaphnia dubia* test should be terminated when 60% of the control organisms have produced their third brood, or at the end of eight days, whichever occurs first.

* SURVIVAL THRU DAY 7, REPRODUCTION THRU 3 BROODS

CH2M HILL

CERIODAPHNIA 7-DAY SURVIVAL AND REPRODUCTION DATA

Client: Upper Columbia Project Test Beginning: Date 4-28-05 Time 1325

Sample Description: Board ID: IV Test Ending: Date 5-5-05 Time 1030

Ceriodaphnia Lot#: Cd 1782 Dilution Water: Recon MH (FHM) ID# 2459

Technician: Day 0 B~/DW, Day 1 B~, Day 2 MS, Day 3 DW, Day 4 B~, Day 5 DW, Day 6 B~, Day 7 B~

Time: Day 0 1325, Day 1 0950, Day 2 0930, Day 3 1145, Day 4 1415, Day 5 1200, Day 6 1030, Day 7 1030

✓= Fed: Day 0 ✓, Day 1 ✓, Day 2 ✓, Day 3 ✓, Day 4 ✓, Day 5 ✓, Day 6 ✓, Day 7 ____

Sample Number	Day	A	B	C	D	E	F	G	H	I	J	No. Live Adults	Total Live Young
		Replicate											
IV #1	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0/AD	4	0	3	0/AD	4	0	0	0	8	11
	4	6	↓	1/0	0	3/0	↓	2/0	6	6	4	8	28
	5	9		10	6	7		9	11	12	13	8	77
	6	0		12	9	9		9	12	1/0	0	8	52
	7	11		12	0	14		3/0	0	12	11	8	63
IV #2	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	DW ~~0~~ 3	0	0	2	2	0	0	0	0	10	7
	4	3	0	0	4	0	0	3	0	5	6	10	21
	5	12	10	8	9	11	8	11	6	9	12	10	96
	6	0	12	11	10	9	12	0	0	0	0	10	54
	7	14	0	0	0	10	0	8	9	8	12	10	61
IV #3	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	3	4	3	4	4	3	0	0	0	10	21
	4	0	0	1/0	0AD	7	0	0	4	3	5	9	20
	5	10	12	9	↓	2/0	12	11	12	11	12	9	91
	6	11	8	0AD		12	10	12	0	0	0	8	53
	7	0	2/0	↓		2/9	14	0	14	11	12	8	64
IV #4	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	3	4	3	0	0	0	3	0	0	0	10	13
	4	0	9	1/0	6	5	5	0	2	0	0	10	28
	5	11	1/0	11	10	7	6	11	11	7	6	10	81
	6	13	8	14	10	12	13	11	12	0	0	10	93
	7	0	16	1/14	0	2/0	0	0	2/0	9	6	10	50
IV #5	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	4	0	4	5	3	0	0	0	0	10	16
	4	3	0	0	0	0	0	4	4	4	3	10	18
	5	12	11	10	9	10	13	10	12	13	12	10	112
	6	11	12	12	13	13	16	12	11	11	0	10	111
	7	0	15	2	1/12	0	0	0	0	0	10	10	40
IV #6	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	2	0	0	0	0	0	10	2
	4	2	0	2	3	0	0	0	4	2	2	10	15
	5	11	7	10	13	12	7	9	8	7	3	10	87
	6	0	7	10	9	11	6	9	0	0	1/0	10	53
	7	13	0	0	4	14	3	0	9	9	9	10	61

IV#1, rep A: aquatic spider looking organism in chamber, removed on Day 1 renewal. Cd ok. B~

CH2M HILL

CERIODAPHNIA WATER QUALITY DATA

Client: Upper Columbia Project
Sample Description: Board ID: IV
Technician: Day 0 DW/BM Day 1 MS Day 2 MS Day 3 3- Day 4 DW Day 5 DW Day 6 DW Day 7 DW
Time: Day 0 1325 Day 1 0800 Day 2 0840 Day 3 1330 Day 4 1515 Day 5 0750 Day 6 1055 Day 7 0810

Initiated Date 4-28-05 Time 1325
Terminated Date 5-5-05 Time 0810
Adults Isolated Date 4-27-05 Time 1600
Neo's Collected Date 4-27-05 Time 2230

Sample Number	Dissolved Oxygen (mg/l) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
IV #1	7.8	7.5 / 7.9	7.2 / 7.7	7.4 / 7.5	7.4 / 7.9	7.5 / 7.8	7.4 / 7.8	7.1
IV #2	6.4	6.5 / 7.9	6.7 / 7.7	7.2 / 7.5	7.3 / 7.9	7.2 / 7.8	7.1 / 7.8	7.0
IV #3	7.3	7.5 / 7.9	6.5 / 7.7	7.2 / 7.5	7.2 / 7.9	7.0 / 7.8	7.1 / 7.8	7.0
IV #4	6.3	6.7 / 7.9	6.1 / 7.7	7.2 / 7.5	7.0 / 7.9	6.9 / 7.8	7.0 / 7.8	6.7
IV #5	8.0	6.5 / 7.9	6.3 / 7.7	7.4 / 7.5	7.5 / 7.9	7.3 / 7.8	7.2 / 7.8	6.9
IV #6	7.4	7.0 / 7.9	6.7 / 7.7	7.3 / 7.5	7.3 / 7.9	7.6 / 7.8	7.4 / 7.8	7.1

Sample Number	pH Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
IV #1	7.2	7.0 / 7.7	7.4 / 7.5	7.5 / 7.4	7.4 / 7.5	7.3 / 7.4	7.2 / 7.7	7.2
IV #2	7.3	7.0 / 7.7	7.5 / 7.5	7.5 / 7.4	7.6 / 7.5	7.4 / 7.4	7.4 / 7.4	7.3
IV #3	7.3	7.1 / 7.7	7.5 / 7.5	7.5 / 7.4	7.5 / 7.5	7.4 / 7.4	7.4 / 7.4	7.3
IV #4	7.0	7.0 / 7.7	7.5 / 7.5	7.4 / 7.4	7.4 / 7.5	7.1 / 7.4	7.2 / 7.4	7.2
IV #5	7.4	7.2 / 7.7	7.5 / 7.5	7.5 / 7.4	7.5 / 7.5	7.2 / 7.4	7.2 / 7.4	7.2
IV #6	7.2	7.2 / 7.7	7.5 / 7.5	7.5 / 7.4	7.4 / 7.5	7.5 / 7.4	7.2 / 7.4	7.3

Sample Number	Temperature (C) / Conductivity (µmhos/cm) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
IV #1	25.4 / 270	24.9 / -	25.2 / -	24.3 / -	24.1 / -	25.3 / -	24.1 / -	24.2 / -
IV #2	25.1 / 286	25.2 / -	25.3 / -	24.5 / -	24.1 / -	25.5 / -	24.0 / -	24.3 / -
IV #3	25.3 / 292	24.8 / -	25.7 / -	24.4 / -	24.2 / -	24.9 / -	24.0 / -	24.6 / -
IV #4	25.2 / 269	25.3 / -	25.4 / -	24.6 / -	24.1 / -	25.5 / -	24.1 / -	24.8 / -
IV #5	24.8 / 270	24.3 / -	25.5 / -	24.2 / -	24.1 / -	25.3 / -	24.0 / -	24.5 / -
IV #6	24.4 / 282	24.4 / -	25.6 / -	24.5 / -	24.1 / -	25.8 / -	24.0 / -	24.7 / -

COMMENTS:

CH2M HILL

Ceriodaphnia dubia
Survival and Reproduction
Test Data Summary

Client: Upper Columbia Project
Test Start Date: 4-28-2005
Sample Description: V
Sample ID#: see cross reference
Ceriodaphnia Lot#: cd 1782
Statistician: Jm

Percent or Concentration	Total Young Per Replicate										# Alive Adults	Total Live Young
	A	B	C	D	E	F	G	H	I	J		
V #1	27	23	27	25	27/AD	22/AD	27	26	15	11	8	230 ✓
V #2	*	—	—	—	—	—	—	—	—	—	—	→
V #3	27	27	31	23	30	25	23	25	28	19/AD	9	258 ✓
V #4	12/AD	0/AD	21	30	28	26	26	22	24	0/AD	7	189 ✓
V #5	5	27	28	28	28	0	29	31	31	34	10	241 ✓
V #6	26	28	28	25	25	27	26	19	22	24	10	250 ✓

Footnote: *Ceriodaphnia dubia* test should be terminated when 60% of the control organisms have produced their third brood, or at the end of eight days, whichever occurs first.

* Adults Could not be found on day 2; they were probably accidentally discarded!

SURVIVE THRU DAY 7, Reproduction thru 3 broods

CH2M HILL

CERIODAPHNIA 7-DAY SURVIVAL AND REPRODUCTION DATA

Client: Upper Columbia Project   Test Beginning: Date 4-28-05 Time 1330

Sample Description: Board ID: V   Test Ending: Date 5-5-05 Time 10/15

Ceriodaphnia Lot# Cd 1782   Dilution Water Recon MH (FHM) ID# 2499

Technician: Day 0 SMW, Day 1 BW, Day 2 DW, Day 3 BW, Day 4 DW, Day 5 DW, Day 6 DW, Day 7 JS

Time: Day 0 1330, Day 1 1030, Day 2 1000, Day 3 1205, Day 4 1430, Day 5 1400, Day 6 1015, Day 7 1015

✓= Fed: Day 0 ✓, Day 1 ✓, Day 2 ✓, Day 3 ✓, Day 4 ✓, Day 5 ✓, Day 6 ✓, Day 7 —

Sample Number	Day	A	B	C	D	E	F	G	H	I	J	No. Live Adults	Total Live Young
V #1	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	4	0	3	4	5	0	0	0	0	0	10	16
	4	0	4	1/0	1/0	7	5	4	4	5	4	10	35
	5	11	8	9	8	0	8	10	9	10	7	10	80
	6	12	11	14	12	15	9/AD	11	13	0	0	9	97
	7	0	0	0	0	AD/0	↓	2/0	0	0	0	8	2
* V #2	1	0	0	0	0	0	0	0	0	0	0	10	0
	2 *	0/AD	0/AD	0/AD	0/AD	0/AD	0/AD	0/AD	0/AD	0/AD	0/AD	0	0
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4												
	5												
	6												
	7	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
V #3	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	2	4	0	5	4	0	0	0	0	10	15
	4	4	2/0	2/0	4	9	2/0	4	4	3	4	10	38
	5	9	11	12	9	1/0	8	10	11	12	11	10	94
	6	14	12	13	0	15	11	7	0	0	4/AD	9	76
	7	0	0	0	10	0	0	2/0	10	13	↓	9	35
V #4	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0/AD	0	0	0	0	0	0	0	0	9	0
	3	0	↓	4	5	0	0	0	0	0	0 AD	8	9
	4	3		1/0	0	4	4	4	3	0	↓	8	19
	5	9		4	11	10	9	9	9	13		8	74
	6	0/AD		12	14	14	2/0	13	2/0	0		7	57
	7	↓	↓	0	0	0	11	0	8	11	↓	7	30
V #5	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	5	5	4	5	0	5	5	0	0	10	29
	4	5	0	10	0	10	0	0	0	8	5	10	38
	5	0	10	0	10	0	0	10	11	11	14	10	66
	6	0	12	13	14	13	0	14	15	12	0	10	93
	7	0	0	0	0	17	0	0	0	0	15	10	32
V #6	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	5	3	0	0	0	0	0	0	0	10	8
	4	0	0	0	3	4	3	3	0	2	3	10	18
	5	13	11	11	10	10	11	9	9	7	8	10	99
	6	0	12	14	0	0	0	2/0	0	0	0	10	28
	7	13	0	0	12	11	13	12	10	13	13	10	97

* On 4-30-05 [illegible] there were no adults in the 10 reps (dead or alive).

CH2MHILL

CERIODAPHNIA WATER QUALITY DATA

Client: Upper Columbia Project
Sample Description: Board ID: V
Technician: Day 0 DW/BM Day 1 MS Day 2 MS Day 3 JM Day 4 DW Day 5 DW Day 6 DW Day 7 DW
Time: Day 0 1330 Day 1 0835 Day 2 0850 Day 3 1330 Day 4 1520 Day 5 0805 Day 6 1100 Day 7 0810

Initiated: Date 4-28-05 Time 1330
Terminated: Date 5-5-05 Time 0810
Adults Isolated: Date 4-27-05 Time 1600
Neo's Collected: Date 4-27-05 Time 2230

Sample Number	Dissolved Oxygen (mg/l) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
V #1	4.2	6.2 / 7.9	6.7 / 7.7	7.2 / 7.5	7.9 / 7.9	7.8 / 7.8	7.6 / 7.8	7.1
V #2	6.9	5.9 / 7.9	6.4 / 7.7	7.1 / 7.5	7.8 / 7.9	7.6 / 7.8	7.4 / 7.8	6.9
V #3	7.6	6.5 / 7.9	6.7 / 7.7	7.1 / 7.5	7.8 / 7.9	7.2 / 7.8	7.1 / 7.8	6.7
V #4	6.6	6.5 / 7.9	6.0 / 7.7	7.2 / 7.5	7.5 / 7.9	7.0 / 7.8	7.1 / 7.8	6.6
V #5	8.1	7.6 / 7.9	7.5 / 7.7	7.5 / 7.5	7.7 / 7.9	7.5 / 7.8	7.3 / 7.8	7.5
V #6	6.4	5.5 / 7.9	6.7 / 7.7	7.6 / 7.5	7.6 / 7.9	7.6 / 7.8	7.4 / 7.8	7.2

Sample Number	pH Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
V #1	6.4	6.7 / 7.7	6.4 / 7.5	7.4 / 7.4	7.4 / 7.5	7.2 / 7.4	6.9 / 7.4	7.0
V #2	7.4	7.4 / 7.7	7.1 / 7.5	7.7 / 7.4	7.7 / 7.5	7.7 / 7.4	7.6 / 7.4	7.4
V #3	7.3	7.4 / 7.7	7.2 / 7.5	7.6 / 7.4	7.6 / 7.5	7.4 / 7.4	7.3 / 7.4	7.3
V #4	7.0	7.2 / 7.7	7.4 / 7.5	7.6 / 7.4	7.6 / 7.5	7.4 / 7.4	7.2 / 7.4	7.3
V #5	7.5	7.5 / 7.7	7.4 / 7.5	7.6 / 7.4	7.7 / 7.5	7.6 / 7.4	7.3 / 7.4	7.4
V #6	7.2	7.2 / 7.7	7.4 / 7.5	7.6 / 7.4	7.5 / 7.5	7.6 / 7.4	7.3 / 7.4	7.3

Sample Number	Temperature (C) / Conductivity (µmhos/cm) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
V #1	24.2 / 255	24.4 / -	24.2 / -	24.1 / -	26.7 / -	25.1 / -	25.7 / -	24.7 / -
V #2	24.4 / 293	25.0 / -	24.5 / -	— / -	— / -	— / -	— / -	— / -
V #3	24.3 / 272	24.4 / -	24.5 / -	24.7 / -	26.0 / -	25.3 / -	25.4 / -	24.9 / -
V #4	24.1 / 281	24.4 / -	24.6 / -	24.8 / -	25.4 / -	24.9 / -	24.8 / -	24.6 / -
V #5	24.5 / 275	24.6 / -	24.7 / -	25.2 / -	26.2 / -	25.4 / -	25.4 / -	24.3 / -
V #6	24.4 / 284	24.7 / -	24.4 / -	24.5 / -	25.9 / -	24.7 / -	25.2 / -	24.8 / -

COMMENTS:

CH2M HILL

Ceriodaphnia dubia
Survival and Reproduction
Test Data Summary

Client: Upper Columbia Project
Test Start Date: 4-28-2005
Sample Description: VI
Sample ID#: see cross reference
Ceriodaphnia Lot#: Cd 1782
Statistician: BM

Percent or Concentration	Total Young Per Replicate										# Alive Adults	Total Live Young
	A	B	C	D	E	F	G	H	I	J		
VI #1	21	18	0	22	4	8	2	18	7	0	10	100 ✓
VI #2	16	19	26	25	21	25	25	17	26	16	10	216 ✓
VI #3	23	22	20	3/(AD)	23	25	23	21	23	24	9	207 ✓
VI #4	27	30	25	30	33	16	18	20	20	17	10	236 ✓
VI #5	26	18	25	32	24	23	0/(AD)	22	25	25	9	220 ✓
VI #6	26	22	23	29	24	24	21	23	27	29	10	248 ✓

Footnote: *Ceriodaphnia dubia* test should be terminated when 60% of the control organisms have produced their third brood, or at the end of eight days, whichever occurs first.

SURVIVAL THRU DAY 7. REPRODUCTION THRU 3 BROODS.

CH2M HILL

CERIODAPHNIA 7-DAY SURVIVAL AND REPRODUCTION DATA

Client Upper Columbia Project Test Beginning : Date 4-28-05 Time 1335

Sample Description Board ID: VI Test Ending : Date 5-5-05 Time 1000

Ceriodaphnia Lot# Cd 1782 Dilution Water Recon MH (FHM) ID# 2499

Technician: Day 0 ~~BT~~, Day 1 DN, Day 2 MS, Day 3 BT, Day 4 ~~BT~~ BT, Day 5 MS, Day 6 BT, Day 7 DN

Time: Day 0 1335, Day 1 1030, Day 2 1035, Day 3 1330, Day 4 1440, Day 5 1320, Day 6 1130, Day 7 1000

✓= Fed: Day 0 ✓, Day 1 ✓, Day 2 ✓, Day 3 ✓, Day 4 ✓, Day 5 ✓, Day 6 ✓, Day 7 ___

Sample Number	Day	Replicate A	B	C	D	E	F	G	H	I	J	No. Live Adults	Total Live Young
VI #1	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	5	2	0	2	0	0	0	0	0	0	10	9
	4	0	0	0	2/0	0	0	0	3	1	0	10	6
	5	10	6	0 6	8	0	0	0	7	0	0	10	31
	6	6	10	0 6	10	0	6	B~~2~~	7	0	0	10	41
	7	0	0	0	1	4	2	0	1/0	6	0	10	14
VI #2	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	3	4	0	0	0	0	0	0	10	7
	4	6	4	3/0	0	0	4	4	3	4	5	10	33
	5	4	8	10	9	9	10	11	8	10	0	10	79
	6	0	0	10	2/10	1/9	0	10	6	0	0	10	48
	7	6	7	0	0	2	11	0	0	12	11	10	49
VI #3	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	4	3	0	4	4	4	0	0	0	10	19
	4	2	0	0	3	0	0	0	3	3	4	10	15
	5	7	7	9	AD	11	9	10	7	8	9	9	77
	6	1/0	9	8	)	8	9	9	0	0	0	9	44
	7	13	2/0	0	)	0	3/0	0	11	12	11	9	52
VI #4	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	4	5	4	6	0	0	0	0	0	0	10	19
	4	0	1/11	2/0	0	5	0	0	3	3	6	10	31
	5	8	0	9	11	12	9	10	9	8	0	10	76
	6	1/11	13	10	13	0	7	8	0	0	1	10	64
	7	3/0	11	0	12	16	0	0	8	9	10	10	69
VI #5	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	3	7	3	0	OAD	0	0	0	9	13
	4	3	2	2/0	0	1/0	4	|	2	4	3	9	21
	5	11	3/0	9	12	11	12	|	11	MD ~~4~~ 0/0	11	9	90
	6	0	13	1/10	12	9	0	|	0	10	0	9	55
	7	12	0	0	1/0	13	7	┘	9	1/0	11	9	57
VI #6	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	4	5	3	4	4	0	0	0	0	10	20
	4	5	7	0	2/0	0	0	2	3	4	3	10	26
	5	10	0	8	13	11	7	7	9	13	11	10	89
	6	0	11	1/9	11	2/7	10	0	0	0	3/0	10	54
	7	11	12	1	0	10	3/0	12	11	10	12	10	82

CH2M HILL

CERIODAPHNIA WATER QUALITY DATA

Client: Upper Columbia Project
Sample Description: Board ID: VI

Initiated Date 4-28-05 Time 1335
Terminated Date 5-5-05 Time 0815

Adults Isolated Date 4-27-05 Time 1600
Neo's Collected Date 4-27-05 Time 2230

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Technician	DW/BM	MS	MS	BW	DW	DW	DW	DW
Time	1335	0900	0845	1330	1530	0820	1105	0815

Sample Number	Dissolved Oxygen (mg/l) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
VI #1	7.9	7.7 / 7.9 (7.3)	7.4 / 7.7	7.4 / 7.5	7.7 / 7.9	7.3 / 7.8	7.4 / 7.8	6.8
VI #2	6.4	7.0 / 7.9 (7.1)	6.7 / 7.7	6.8 / 7.5	7.6 / 7.9	7.0 / 7.8	7.1 / 7.8	6.8
VI #3	7.6	6.9 / 7.9	6.6 / 7.7	7.1 / 7.5	7.4 / 7.9	7.2 / 7.8	7.1 / 7.8	6.7
VI #4	6.7	6.5 / 7.9	6.3 / 7.7	7.2 / 7.5	7.4 / 7.9	7.2 / 7.8	7.2 / 7.8	7.0
VI #5	7.2	5.4 / 7.9	6.5 / 7.7	7.2 / 7.5	7.6 / 7.9	7.3 / 7.8	7.1 / 7.8	7.1
VI #6	7.3	6.2 / 7.9	6.4 / 7.7	6.8 / 7.5	7.4 / 7.9	6.9 / 7.8	7.0 / 7.8	7.0

Sample Number	pH Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
VI #1	7.4	7.3 / 7.7	7.4 / 7.5	7.7 / 7.4	7.6 / 7.5	7.5 / 7.4	7.5 / 7.4	7.4
VI #2	7.1	7.2 / 7.7	7.3 / 7.5	7.5 / 7.4	7.4 / 7.5	7.3 / 7.4	7.3 / 7.4	7.2
VI #3	7.4	7.4 / 7.7	7.4 / 7.5	7.6 / 7.4	7.6 / 7.5	7.5 / 7.4	7.4 / 7.4	7.3
VI #4	7.3	7.4 / 7.7	7.4 / 7.5	7.6 / 7.4	7.6 / 7.5	7.6 / 7.4	7.6 / 7.4	7.4
VI #5	7.4	7.5 / 7.7	7.4 / 7.5	7.7 / 7.4	7.6 / 7.5	7.6 / 7.4	7.5 / 7.4	7.4
VI #6	7.3	7.4 / 7.7	7.3 / 7.5	7.5 / 7.4	7.5 / 7.5	7.4 / 7.4	7.3 / 7.4	7.3

Sample Number	Temperature (C) / Conductivity (µmhos/cm) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
VI #1	23.8 / 273	24.3 / -	24.4 / -	25.6 / -	24.1 / -	25.7 / -	25.0 / -	24.7 / -
VI #2	24.1 / 292	24.5 / -	25.1 / -	25.1 / -	23.0 / -	24.9 / -	24.1 / -	24.9 / -
VI #3	23.9 / 279	24.2 / -	24.4 / -	25.3 / -	23.9 / -	24.7 / -	24.6 / -	24.5 / -
VI #4	24.2 / 288	24.6 / -	24.1 / -	25.8 / -	24.0 / -	24.1 / -	24.2 / -	24.6 / -
VI #5	24.4 / 216	24.3 / -	24.4 / -	25.8 / -	24.2 / -	23.9 / -	24.6 / -	24.8 / -
VI #6	23.9 / 290	24.1 /	23.9 /	25.1 /	24.3 /	24.0 /	24.5 /	24.8 /

COMMENTS:

CH2M HILL *TOXICITY TEST ORGANISM AND WATER QUALITY DATA*

Client Upper Columbia Test Initiation: Date 5-4-05 Time _____ Test Termination: Date 5-11-05 Time _____

Contact _____ Technician _____

Test Species/ID *Ceriodaphnia dubia* / Cd 1783 _____ / _____

Sample Information												Test Species Information	ID# Cd 1783	ID#	ID#
Sample ID Number	Field ID	Collected Date	Collected Time	Total Residual Chlorine (mg/l) As Received / As Dechlor.	Ammonia mg/l NH_3-N Pre	Ammonia mg/l NH_3-N Post	Hardness mg/l CaCO Pre	Hardness mg/l CaCO Post	Alkalinity mg/l CaCO Pre	Alkalinity mg/l CaCO Post					
B1390-25	RM732R1	04/22/2005	11:35	- / -	2.45	0.04	168	126	146	114		Age or Size	< 24 hours within an 8 hour span		
B1390-30	RM723A2(X3)	04/22/2005	15:16	- / -	0.19	0.07	138	102	96	72		Test Container Size	30 ml		
B1390-31	RM721R1	04/22/2005	14:39	- / -	0.23	0.05	160	128	110	116		Test Volume	5 g sample, 20 ml overlying water		
B1390-32	RM726R1	04/22/2005	13:20	- / -	0.65	0.04	159	132	120	110		Feeding: Type	0.1 ml Algae &		
B1390-33	RM734A1(X3)	04/22/2005	15:00	- / -	0.47	0.14	92	94	64	76		Amount	YCT daily		
B1390-34	RM661A1(X1)	04/22/2005	10:15	- / -	0.14	0.03	90	84	61	62			-		
B1390-35	RM658A1(X3)	04/22/2005	11:30	- / -	0.18	0.15	118	104	82	68		Aeration: Began	none		
B1390-36	RM705R1	04/23/2005	9:25	- / -	0.27	0.09	82	86	60	60		Amount	-		
B1390-37	RM713A1(X3)	04/23/2005	9:30	- / -	2.31	0.03	80	98	48	56		Dilution Water ID#	2499		
B1390-38	RM686R1	04/23/2005	11:20	- / -	0.32	0.11	82	84	50	60		Acclimation Period	< 24 hours		
B1390-39	RM730A1(X1)	04/23/2005	11:15	- / -	0.30	0.01	105	106	72	78		Test Location	# 11		
B1390-40	RM733A1(X1)	04/23/2005	9:45	- / -	0.21	0.05	100	96	76	72		Condition of Survivors			
B1390-41	RM729A1(X1)	04/23/2005	12:30	- / -	0.14	0.15	104	92	74	68					
B1390-42	RM685R1	04/23/2005	13:50	- / -	0.42	0.06	158	136	140	110		Comments			

Dilution Water Source	ID#	Ammonia mg/l NH_3-N	Hardness mg/l CaCO	Alkalinity mg/l CaCO
Reconstitued water	2499	-	74	60

Water Quality Meters Used/ID#

Dissolved Oxygen _____ pH _____ Temperature _____

Conductivity _____ Refractometer _____ Other _____

CH2M HILL *TOXICITY TEST ORGANISM AND WATER QUALITY DATA*

Client Upper Columbia Test Initiation: Date 5-4-05 Time _____ Test Termination: Date 5-11-05 Time _____

Contact _____ Technician _____

Test Species/ID *Ceriodaphnia dubia* / Cd 1783 _____ / _____

Sample Information												Test Species Information	ID# Cd 1783	ID#	ID#
Sample ID Number	Field ID	Collected Date	Collected Time	Total Residual Chlorine (mg/l) As Received / As Dechlor.	Ammonia mg/l NH_3-N Pre	Ammonia mg/l NH_3-N Post	Hardness mg/l CaCO Pre	Hardness mg/l CaCO Post	Alkalinity mg/l CaCO Pre	Alkalinity mg/l CaCO Post					
B1390-43	RM727A1(X1)	04/23/2005	14:15	- / -	0.25	0.02	104	100	72	70		Age or Size	< 24 hours within an 8 hour span		
B1390-44	RM644A1(X3)	04/26/2005	10:15	- / -	0.13	0.04	100	108	76	78		Test Container Size	30 ml		
B1390-45	RM637A1(X1)	04/26/2005	11:26	- / -	0.15	0.26	90	94	60	66		Test Volume	5 g sample, 20 ml overlying water		
B1390-46	RM634A1(X1)	04/26/2005	14:02	- / -	0.39	0.09	102	104	74	87		Feeding: Type	0.1 ml Algae &		
B1390-47	RM642A1(X1)	04/26/2005	11:50	- / -	0.35	0.07	60	100	76	58		Feeding: Amount	YCT daily		
B1390-48	RM605A1(X1)	04/26/2005	14:17	- / -	0.14	0.17	88	90	64	74			-		
B1390-49	RM606A1(X3)	04/26/2005	13:01	- / -	0.33	0.10	66	84	42	60		Aeration: Began	none		
B1390-50	RM616A1(X3)	04/26/2005	10:16	- / -	0.20	0.01	110	104	90	72		Aeration: Amount	-		
B1390-51	RM641A1(X1)	04/26/2005	13:54	- / -	0.27	0.07	72	72	48	50		Dilution Water ID#	2499		
B1390-52	RM640A1(X3)	04/26/2005	15:20	- / -	0.04	0.04	126	102	76	80		Acclimation Period	< 24 hours		
B1390-53	RM628A1(X1)	04/26/2005	15:42	- / -	0.08	0.02	104	106	76	88		Test Location	# 11		
B1390-54	RM603A1(X1)	04/28/2005	10:45	- / -	0.04	0.02	100	104	76	80		Condition of Survivors			
B1390-55	RM605A2(X8)	04/28/2005	9:47	- / -	0.29	0.25	74	86	72	72					
B1390-56	RM622A1(X3)	04/28/2005	9:58	- / -	0.09	0.10	114	110	90	86		Comments			

Dilution Water Source	ID#	Ammonia mg/l NH_3-N	Hardness mg/l CaCO	Alkalinity mg/l CaCO
Reconstitued water	2499	-	74	60

Water Quality Meters Used/ID#

Dissolved Oxygen _____ pH _____ Temperature _____

Conductivity _____ Refractometer _____ Other _____

CH2M HILL *TOXICITY TEST ORGANISM AND WATER QUALITY DATA*

Client Upper Columbia Test Initiation: Date 5-4-05 Time _____ Test Termination: Date 5-11-05 Time _____

Contact _____ Technician _____

Test Species/ID *Ceriodaphnia dubia* / Cd 1783 _____ / _____

Sample Information												Test Species Information	ID# Cd 1783	ID#	ID#
Sample ID Number	Field ID	Collected Date	Collected Time	Total Residual Chlorine (mg/l) As Received / As Dechlor.	Ammonia mg/l NH_3-N Pre	Ammonia mg/l NH_3-N Post	Hardness mg/l CaCO Pre	Hardness mg/l CaCO Post	Alkalinity mg/l CaCO Pre	Alkalinity mg/l CaCO Post					
Sediment Cont.	20 grade, washed, silica sand	04/22/05 -	0640 -	- / -	0.22	0.01	76	76	54	64		Age or Size	< 24 hours within an 8 hour span		
				- / -								Test Container Size	30 ml		
				- / -								Test Volume	5 g sample, 20 ml overlying water		
				- / -								Feeding: Type	0.1 ml Algae &		
				- / -								Amount	YCT daily		
				- / -									-		
				- / -								Aeration: Began	none		
				- / -								Amount	-		
				- / -								Dilution Water ID#	2499		
				- / -								Acclimation Period	< 24 hours		
				- / -								Test Location	# 11		
				- / -								Condition of Survivors			
				- / -											
				- / -								Comments			

Dilution Water Source	ID#	Ammonia mg/l NH_3-N	Hardness mg/l CaCO	Alkalinity mg/l CaCO
Reconstitued water	2499	-	74	60

Water Quality Meters Used/ID#

Dissolved Oxygen _____ pH _____ Temperature _____

Conductivity _____ Refractometer _____ Other _____

Randomization chart for *Ceriodaphnia* tests initiated on 5/4/2005

Lab ID:	Field Sample Number	Station Location	Random number	Random position	Board ID	Postion on Board	Sample Number
B1390-37	5164487	RM713A1(X3)	0.986726623	1	VII	#1	VII #1
B1390-25	5164470	RM732R1	0.979141647	2	VII	#2	VII #2
B1390-31	5164476	RM721R1	0.937428735	3	VII	#3	VII #3
B1390-49	5174410	RM606A1(X3)	0.931632714	4	VII	#4	VII #4
B1390-44	5174405	RM644A1(X3)	0.921199549	5	VII	#5	VII #5
B1390-48	5174409	RM605A1(X1)	0.888781214	6	VII	#6	VII #6
B1390-38	5164489	RM686R1	0.85348772	7	VIII	#1	VIII #1
B1390-52	5174413	RM640A1(X3)	0.841240213	8	VIII	#2	VIII #2
B1390-55	5174424	RM605A2(X8)	0.793850703	9	VIII	#3	VIII #3
B1390-50	5174411	RM616A1(X3)	0.77621157	10	VIII	#4	VIII #4
B1390-33	5164479	RM734A1(X3)	0.698936349	11	VIII	#5	VIII #5
B1390-56	5174427	RM622A1(X3)	0.619084903	12	VIII	#6	VIII #6
B1390-41	5164494	RM729A1(X1)	0.588316669	13	IX	#1	IX #1
B1390-36	5164486	RM705R1	0.492085877	14	IX	#2	IX #2
B1390-34	5164483	RM661A1(X1)	0.465214757	15	IX	#3	IX #3
B1390-32	5164478	RM726R1	0.387818737	16	IX	#4	IX #4
B1390-51	5174412	RM641A1(X1)	0.385157307	17	IX	#5	IX #5
B1390-30	5164475	RM723A2(X3)	0.36144243	18	IX	#6	IX #6
B1390-46	5174407	RM634A1(X1)	0.320833887	19	X	#1	X #1
B1390-39	5164491	RM730A1(X1)	0.314220639	20	X	#2	X #2
B1390-45	5174406	RM637A1(X1)	0.312097496	21	X	#3	X #3
Lab Control	ReconMH only	no sediment	0.244158659	22	X	#4	X #4
B1390-54	5174423	RM603A1(X1)	0.208795695	23	X	#5	X #5
B1390-40	5164493	RM733A1(X1)	0.172220445	24	X	#6	X #6
B1390-47	5174408	RM642A1(X1)	0.120932436	25	XI	#1	XI #1
B1390-43	5164507	RM727A1(X1)	0.099552986	26	XI	#2	XI #2
Sediment Control		Silica Sand	0.093517905	27	XI	#3	XI #3
B1390-35	5164485	RM658A1(X3)	0.08545777	28	XI	#4	XI #4
B1390-42	5164496	RM685R1	0.069329826	29	XI	#5	XI #5
B1390-53	5174415	RM628A1(X1)	0.031462933	30	XI	#6	XI #6

Test Board Slot Location Information

May 4, 2005

Board ID: VII

	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #
rep A	1	VII # 1	11	VII # 2	21	VII # 5	31	VII # 3	41	VII # 6	51	VII # 4
rep B	2	VII # 3	12	VII # 5	22	VII # 2	32	VII # 6	42	VII # 1	52	VII # 4
rep C	3	VII # 4	13	VII # 6	23	VII # 2	33	VII # 3	43	VII # 5	53	VII # 1
rep D	4	VII # 3	14	VII # 5	24	VII # 4	34	VII # 2	44	VII # 6	54	VII # 1
rep E	5	VII # 1	15	VII # 5	25	VII # 6	35	VII # 4	45	VII # 2	55	VII # 3
rep F	6	VII # 3	16	VII # 2	26	VII # 4	36	VII # 1	46	VII # 6	56	VII # 5
rep G	7	VII # 4	17	VII # 3	27	VII # 2	37	VII # 5	47	VII # 6	57	VII # 1
rep H	8	VII # 6	18	VII # 2	28	VII # 3	38	VII # 5	48	VII # 1	58	VII # 4
rep I	9	VII # 2	19	VII # 4	29	VII # 5	39	VII # 6	49	VII # 3	59	VII # 1
rep J	10	VII # 5	20	VII # 2	30	VII # 1	40	VII # 3	50	VII # 4	60	VII # 6

Board ID: VIII

	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #
rep A	1	VIII # 4	11	VIII # 5	21	VIII # 2	31	VIII # 1	41	VIII # 3	51	VIII # 6
rep B	2	VIII # 6	12	VIII # 2	22	VIII # 4	32	VIII # 3	42	VIII # 1	52	VIII # 5
rep C	3	VIII # 1	13	VIII # 3	23	VIII # 4	33	VIII # 6	43	VIII # 5	53	VIII # 2
rep D	4	VIII # 2	14	VIII # 4	24	VIII # 3	34	VIII # 1	44	VIII # 6	54	VIII # 5
rep E	5	VIII # 5	15	VIII # 1	25	VIII # 6	35	VIII # 2	45	VIII # 4	55	VIII # 3
rep F	6	VIII # 1	16	VIII # 4	26	VIII # 3	36	VIII # 6	46	VIII # 2	56	VIII # 5
rep G	7	VIII # 5	17	VIII # 6	27	VIII # 4	37	VIII # 3	47	VIII # 2	57	VIII # 1
rep H	8	VIII # 4	18	VIII # 2	28	VIII # 5	38	VIII # 3	48	VIII # 6	58	VIII # 1
rep I	9	VIII # 6	19	VIII # 4	29	VIII # 5	39	VIII # 1	49	VIII # 3	59	VIII # 2
rep J	10	VIII # 3	20	VIII # 5	30	VIII # 1	40	VIII # 2	50	VIII # 4	60	VIII # 6

Board ID: IX

	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #
rep A	1	IX # 2	11	IX # 4	21	IX # 3	31	IX # 5	41	IX # 1	51	IX # 6
rep B	2	IX # 2	12	IX # 4	22	IX # 5	32	IX # 3	42	IX # 6	52	IX # 1
rep C	3	IX # 1	13	IX # 3	23	IX # 5	33	IX # 2	43	IX # 4	53	IX # 6
rep D	4	IX # 5	14	IX # 2	24	IX # 1	34	IX # 6	44	IX # 3	54	IX # 4
rep E	5	IX # 5	15	IX # 4	25	IX # 3	35	IX # 6	45	IX # 1	55	IX # 2
rep F	6	IX # 3	16	IX # 6	26	IX # 4	36	IX # 5	46	IX # 2	56	IX # 1
rep G	7	IX # 4	17	IX # 3	27	IX # 5	37	IX # 2	47	IX # 1	57	IX # 6
rep H	8	IX # 1	18	IX # 6	28	IX # 5	38	IX # 2	48	IX # 4	58	IX # 3
rep I	9	IX # 5	19	IX # 3	29	IX # 1	39	IX # 2	49	IX # 4	59	IX # 6
rep J	10	IX # 4	20	IX # 1	30	IX # 6	40	IX # 3	50	IX # 2	60	IX # 5

Test Board Slot Location Information

Board ID: X

	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #
rep A	1	X # 1	11	X # 5	21	X # 4	31	X # 6	41	X # 2	51	X # 3
rep B	2	X # 3	12	X # 5	22	X # 2	32	X # 1	42	X # 4	52	X # 6
rep C	3	X # 4	13	X # 1	23	X # 3	33	X # 6	43	X # 2	53	X # 5
rep D	4	X # 3	14	X # 6	24	X # 5	34	X # 1	44	X # 2	54	X # 4
rep E	5	X # 2	15	X # 5	25	X # 4	35	X # 3	45	X # 6	55	X # 1
rep F	6	X # 5	16	X # 4	26	X # 3	36	X # 1	46	X # 6	56	X # 2
rep G	7	X # 5	17	X # 6	27	X # 4	37	X # 1	47	X # 3	57	X # 2
rep H	8	X # 6	18	X # 4	28	X # 3	38	X # 2	48	X # 1	58	X # 5
rep I	9	X # 1	19	X # 3	29	X # 2	39	X # 5	49	X # 6	59	X # 4
rep J	10	X # 6	20	X # 1	30	X # 2	40	X # 4	50	X # 3	60	X # 5

Board ID: XI

	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #	Slot #	Sample #
rep A	1	XI # 3	11	XI # 1	21	XI # 2	31	XI # 5	41	XI # 4	51	XI # 6
rep B	2	XI # 1	12	XI # 6	22	XI # 3	32	XI # 2	42	XI # 5	52	XI # 4
rep C	3	XI # 6	13	XI # 5	23	XI # 3	33	XI # 1	43	XI # 4	53	XI # 2
rep D	4	XI # 4	14	XI # 3	24	XI # 2	34	XI # 6	44	XI # 1	54	XI # 5
rep E	5	XI # 5	15	XI # 1	25	XI # 2	35	XI # 3	45	XI # 4	55	XI # 6
rep F	6	XI # 6	16	XI # 3	26	XI # 1	36	XI # 4	46	XI # 5	56	XI # 2
rep G	7	XI # 2	17	XI # 6	27	XI # 1	37	XI # 3	47	XI # 4	57	XI # 5
rep H	8	XI # 6	18	XI # 4	28	XI # 1	38	XI # 5	48	XI # 3	58	XI # 2
rep I	9	XI # 2	19	XI # 3	29	XI # 1	39	XI # 6	49	XI # 5	59	XI # 4
rep J	10	XI # 1	20	XI # 3	30	XI # 6	40	XI # 4	50	XI # 1	60	XI # 2

Neonate distribution

Test Initiation Date: 5-4-05 BM / DW

Neonate source:

Culture board ID:	Spot #:	Test Board ID & Slot Number									
K	3	XI 1	XI 11	VIII 1	VIII 11	IX 1	IX 11	VII 1	VII 11	X 1	X 11
K	7	XI 2	XI 12	VIII 2	VIII 12	IX 2	IX 12	VII 2	VII 12	X 2	X 12
K	8	XI 3	XI 13	VIII 3	VIII 13	IX 3	IX 13	VII 3	VII 13	X 3	X 13
K	12	XI 4	XI 14	VIII 4	VIII 14	IX 4	IX 14	VII 4	VII 14	X 4	X 14
K	17	XI 5	XI 15	VIII 5	VIII 15	IX 5	IX 15	VII 5	VII 15	X 5	X 15
K	18	XI 6	XI 16	VIII 6	VIII 16	IX 6	IX 16	VII 6	VII 16	X 6	X 16
K	23	XI 7	XI 17	VIII 7	VIII 17	IX 7	IX 17	VII 7	VII 17	X 7	X 17
K	28	XI 8	XI 18	VIII 8	VIII 18	IX 8	IX 18	VII 8	VII 18	X 8	X 18
K	33	XI 9	XI 19	VIII 9	VIII 19	IX 9	IX 19	VII 9	VII 19	X 9	X 19
K	42	XI 10	XI 20	VIII 10	VIII 20	IX 10	IX 20	VII 10	VII 20	X 10	X 20
L	1	VIII 21	VIII 31	VII 21	VII 31	IX 21	IX 31	X 21	X 31	XI 21	XI 31
L	34	VIII 22	VIII 32	VII 22	VII 32	IX 22	IX 32	X 22	X 32	XI 22	XI 32
L	3	VIII 23	VIII 33	VII 23	VII 33	IX 23	IX 33	X 23	X 33	XI 23	XI 33
L	8	VIII 24	VIII 34	VII 24	VII 34	IX 24	IX 34	X 24	X 34	XI 24	XI 34
L	17	VIII 25	VIII 35	VII 25	VII 35	IX 25	IX 35	X 25	X 35	XI 25	XI 35
L	23	VIII 26	VIII 36	VII 26	VII 36	IX 26	IX 36	X 26	X 36	XI 26	XI 36
L	26	VIII 27	VIII 37	VII 27	VII 37	IX 27	IX 37	X 27	X 37	XI 27	XI 37
L	28	VIII 28	VIII 38	VII 28	VII 38	IX 28	IX 38	X 28	X 38	XI 28	XI 38
L	30	VIII 29	VIII 39	VII 29	VII 39	IX 29	IX 39	X 29	X 39	XI 29	XI 39
L	32	VIII 30	VIII 40	VII 30	VII 40	IX 30	IX 40	X 30	X 40	XI 30	XI 40
J	18	IX 41	IX 51	VIII 41	VIII 51	X 41	X 51	VII 41	VII 51	XI 41	XI 51
J	26	IX 42	IX 52	VIII 42	VIII 52	X 42	X 52	VII 42	VII 52	XI 42	XI 52
J	27	IX 43	IX 53	VIII 43	VIII 53	X 43	X 53	VII 43	VII 53	XI 43	XI 53
J	40	IX 44	IX 54	VIII 44	VIII 54	X 44	X 54	VII 44	VII 54	XI 44	XI 54
J	48	IX 45	IX 55	VIII 45	VIII 55	X 45	X 55	VII 45	VII 55	XI 45	XI 55
J	57	IX 46	IX 56	VIII 46	VIII 56	X 46	X 56	VII 46	VII 56	XI 46	XI 56
L	36	IX 47	IX 57	VIII 47	VIII 57	X 47	X 57	VII 47	VII 57	XI 47	XI 57
L	48	IX 48	IX 58	VIII 48	VIII 58	X 48	X 58	VII 48	VII 58	XI 48	XI 58
L	58	IX 49	IX 59	VIII 49	VIII 59	X 49	X 59	VII 49	VII 59	XI 49	XI 59
L	2	IX 50	IX 60	VIII 50	VIII 60	X 50	X 60	VII 50	VII 60	XI 50	XI 60

1st set of neonates:

board ID:	Random #	Random Order
XI	0.8538525	1
VIII	0.7027165	2
IX	0.5902532	3
VII	0.420272	4
X	0.0878365	5

2nd set of neonates:

board ID:	Random #	Random Order
VIII	0.8405631	1
VII	0.7703522	2
IX	0.4515585	3
X	0.3818756	4
XI	0.3795498	5

3rd set of neonates:

board ID:	Random #	Random Order
IX	0.4002495	1
VIII	0.3454805	2
X	0.1750142	3
VII	0.1520404	4
XI	0.0616163	5

CH2M HILL

Ceriodaphnia dubia
Survival and Reproduction
Test Data Summary

Client: Upper Columbia Project
Test Start Date: 5-4-2005
Sample Description: VII
Sample ID#: See cross reference
Ceriodaphnia Lot#: Cd 1783
Statistician: Bm

Percent or Concentration	Total Young Per Replicate										# Alive Adults	Total Live Young
	A	B	C	D	E	F	G	H	I	J		
VII #1	24	24	20	12	24	21	17	13	28	31	10	214 ✓
VII #2	30	23	30	21	21	17	5/AD	28	28	19	9	222 ✓
VII #3	27	25	3/AD	24	23	12/AD	16	14	29	25	8	197 ✓
VII #4	24	30	25 4 3M	21	26	31	28	22	27	21	10	254 ✓
VII #5	20	17	16	9 8 14	10	18	17	12	20	17	10	~~156~~ 161 ✓
VII #6	23	26	25	27	27	26	20	31	31	22	10	258 ✓

Footnote: *Ceriodaphnia dubia* test should be terminated when 60% of the control organisms have produced their third brood, or at the end of eight days, whichever occurs first.

SURVIVAL THRU DAY 7, REPRODUCTION THRU 3 BROODS.

CH2M HILL

CERIODAPHNIA 7-DAY SURVIVAL AND REPRODUCTION DATA

Client Upper Columbia Project Test Beginning : Date 5-4-05 Time 1545

Sample Description Board ID: VII Test Ending : Date 5-11-05 Time 0945

Ceriodaphnia Lot# Cd 1783 Dilution Water Recon MH (FHM) ID# 2499

Technician Day 1 DW Day 2 DW Day 3 DW Day 4 DW Day 5 BW Day 6 BW Day 7 BW

Time Day 1 0845 Day 2 0710 Day 3 0730 Day 4 0825 Day 5 0900 Day 6 0945 Day 7 0945

✓ = Fed Day 1 ✓ Day 2 ✓ Day 3 ✓ Day 4 ✓ Day 5 ✓ Day 6 ✓ Day 7 ____

Sample Number	Day	Replicate										No. Live Adults	Total Live Young
		A	B	C	D	E	F	G	H	I	J		
VII #1	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	4	3	3	3	4	3	4	3	3	3	10	33
	5	7	9	7	4	7	6	5	5	12	11	10	73
	6	0	0	0	0	1/12	2/0	2/0	0	0	0	10	17
	7	13	12	10	5	4	10	6	5	13	17	10	95
VII #2	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	4	3	0	4	5	3	3	4	3	2	10	31
	5	10	10	8	1/6	6	2	2/0	9	11	7	9	72
	6	2/0	0	8	10	0	0	1	2/0	2/0	0	9	24
	7	14	10	14	0	10	12	1	13	12	10	9	95
VII #3	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	4	5	3/AD	3	4	4	2	0	3	4	9	31
	5	10	9	|	7	7	8	7	3	11	10	9	72
	6	0	0	|	3/0	2/0	0M	7	11	0	11	8	34
	7	13	11	↓	11	10	1	0	0	15	0	8	60
VII #4	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	4	5	5	3	5	5	4	4	5	3	10	43
	5	8	12	11	9	9	12	10	8	8	9	10	96
	6	0	0	8	8	11	14	0	0	0	0	10	41
	7	12	13	0	1/0	1/0	0	14	10	14	9	10	74
VII #5	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	3	3	0	2	2	2	2	2	1	2	10	19
	5	0	7	2	2/0	0	1/0	7	3	5/0	0	10	27
	6	10	0	1/0	5	3	3	0	0	5	5	10	37
	7	7	7	8	5	5	12	8	7	9	10	10	78
VII #6 ~~#REP! BW~~	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	4	5	5	4	4	5	4	4	5	5	10	45
	5	7	11	10	9	9	12	10	9	11	6	10	94
	6	0	10	10	0	11	9	6	3/0	2/10	1/0	10	62
	7	12	0	0	14	3/0	0	0	15	3/0	10	10	57

CH2M HILL

CERIODAPHNIA WATER QUALITY DATA

Client: Upper Columbia Project
Sample Description: Board ID: VII
Initiated Date: 5-4-05 Time: 1545
Terminated Date: 5-11-05 Time:
Adults Isolated Date: 5-3-05 Time: 1915
Neo's Collected Date: 5-3-05 Time: 2340

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Technician	DW	DW	DW	DW	DW	DW	SW	MS
Time	1500	0800	0900	0700	0730	0750	0815	0845

Sample Number	Dissolved Oxygen (mg/l) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	pH Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Temperature (C) / Conductivity (µmhos/cm) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
VII #1	6.8	6.6 / 7.9	7.2 / 7.7	7.5 / 8.6	7.5 / 8.1	7.8 / 8.0	7.3 / 7.8	7.1	7.2	7.1 / 7.5	7.2 / 7.6	6.8 / 7.5	7.1 / 7.5	7.2 / 7.6	7.2 / 7.6	7.2	24.1 / 234	25.6	25.3	24.7	25.3	24.1	24.3	25.4 / 330
VII #2	6.2	6.4 / 7.9	7.0 / 7.7	7.3 / 8.6	7.3 / 8.1	7.5 / 8.0	7.3 / 7.8	6.7	7.4	7.2 / 7.5	7.7 / 7.6	7.5 / 7.5	7.6 / 7.5	7.7 / 7.6	7.7 / 7.6	7.3	24.1 / 276	25.5	24.9	24.7	25.5	24.0	24.1	25.4 / 356
VII #3	5.8	6.3 / 7.9	7.1 / 7.7	7.4 / 8.6	7.3 / 8.1	7.5 / 8.0	7.2 / 7.8	6.8	7.3	7.3 / 7.5	7.6 / 7.6	7.3 / 7.5	7.5 / 7.5	7.6 / 7.6	7.6 / 7.6	7.4	24.0 / 314	25.3	24.6	24.3	25.1	24.1	24.0	25.7 / 357
VII #4	6.7	6.6 / 7.9	7.2 / 7.7	7.4 / 8.6	7.6 / 8.1	7.5 / 8.0	7.1 / 7.8	6.5	7.2	7.2 / 7.5	7.2 / 7.6	6.8 / 7.5	7.1 / 7.5	7.2 / 7.6	7.1 / 7.6	7.4	24.6 / 226	25.4	24.2	24.5	25.5	24.0	24.2	25.2 / 263
VII #5	7.6	6.9 / 7.9	7.2 / 7.7	7.6 / 8.6	7.8 / 8.1	7.3 / 8.0	7.4 / 7.8	6.5	7.5	7.6 / 7.5	7.7 / 7.6	7.4 / 7.5	7.5 / 7.5	7.5 / 7.6	7.5 / 7.6	7.4	24.0 / 242	25.4	25.9	24.4	25.4	24.3	24.1	25.6 / 311
VII #6	7.4	6.9 / 7.9	7.5 / 7.7	7.8 / 8.6	7.8 / 8.1	7.7 / 8.0	7.7 / 7.8	6.4	7.5	7.6 / 7.5	7.6 / 7.6	7.3 / 7.5	7.5 / 7.5	7.5 / 7.6	7.5 / 7.6	7.4	24.5 / 245	25.2	24.7	24.2	25.3	24.1	24.0	25.4 / 290

COMMENTS:

CH2M HILL

Ceriodaphnia dubia
Survival and Reproduction
Test Data Summary

Client Upper Columbia Project Test Start Date 5-4-2005

Sample Description VIII Sample ID# See cross reference

Ceriodaphnia Lot# Cd 1783 Statistician BM

Percent or Concentration	Total Young Per Replicate										# Alive Adults	Total Live Young
	A	B	C	D	E	F	G	H	I	J		
VIII #1	27	29	25	30	24	27	25	28	22	28	10	265 ✓
VIII #2	15	14	15	15	15	19	13	9	% (AD)	17	9	132 ✓
VIII #3	23	26	31	25	26	30	31*	16	25	% (AD)	9	233 ✓
VIII #4	29	26	17	28	27	22	25	25	27	27	10	253 ✓
VIII #5	28	30	24	28	28	2	27	16	20 (B)	22	9	225 ✓
VIII #6	17	26	28	20	23	23	22	27	26	23	10	235 ✓

Footnote: *Ceriodaphnia dubia* test should be terminated when 60% of the control organisms have produced their third brood, or at the end of eight days, whichever occurs first.

* total young per rep was based on combining the five values in the "survival & reproduction" sheet into three broods!

SURVIVAL THRU DAY 7, REPRODUCTION THRU 3 BROODS

CH2M HILL

CERIODAPHNIA 7-DAY SURVIVAL AND REPRODUCTION DATA

Client Upper Columbia Project Test Beginning : Date 5-4-05 Time 1545

Sample Description Board ID: VIII Test Ending : Date 5-12-05 Time 1020

Ceriodaphnia Lot# Cd 1783 Dilution Water Recon MH (FHM) 3rd ID# 2499

Technician Day 1 DW Day 2 DW Day 3 DW Day 4 Bm Day 5 DW Day 6 Bm Day 7 Bm

Time Day 1 1050 Day 2 0550 Day 3 0845 Day 4 0910 Day 5 0835 Day 6 1040 Day 7 1020

✓ = Fed Day 1 ✓ Day 2 ✓ Day 3 ✓ Day 4 ✓ Day 5 ✓ Day 6 ✓ Day 7 ____

Sample Number	Day	Replicate A	B	C	D	E	F	G	H	I	J	No. Live Adults	Total Live Young
VIII #1	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	3	4	4	4	2	4	3	5	3	4	10	36
	5	12	10	10	8	9	10	9	11	9	11	10	99
	6	12	15	0	14	13	2/11	13	3/20	10	12	10	102
	7	0	0	11	4/0	0	0	0	12	0	1/0	10	28
VIII #2	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	3	2	3	3	2	2	3	2	°/10	3	9	23
	5	3	4	3	5	4	8	6	0	|	4	9	37
	6	0	0	0	0	0	3/0	0	2	|	0	9	2
	7	9	8	9	7	9	9	4	5	↓	10	9	70
VIII #3	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	4	0	0	0	4	3	0	0	°/10	9	11
	4	2	0	4	3	3	0	3/0	0	3	|	9	18
	5	11	12	12	10	11	12	8	4	10	|	9	90
	6	10	10	12	12	10	14	2/15	12	10	|	9	107
	7	0	0	3/0	0	2/0	0	0	0	2/0	↓	9	7
VIII #4	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	4	4	3	3	5	3	5	4	5	3	10	39
	5	13	12	0	11	10	9	10	9	10	11	10	95
	6	0	10	0	13	10	10	10	12	12	2/0	10	79
	7	12	0	14	1/0	2/0	0	0	0	0	11	10	40
VIII #5	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	4	4	3	5	4	0	5	2	7	3	10	37
	5	12	11	10	9	11	0	9	6	11	7	10	86
	6	0	12	11	14	11	~~2/11~~	2/0	0	2/0	9	9	72
	7	12	3/0	0	0	2/0	2	0	8	L	3/0	9	30
~~#REF!~~ VIII #6	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	5	0	0	4	0	0	0	0	10	9
	4	2	5	0	3	2	0	2	4	5	3	10	26
	5	6 ~~Dead~~	8	11	8	9	10	8	11	10	8	10	89
	6	0	13	12	9	11	8	12	10	11	0	10	86
	7	4	0	10	0	1/0	1/0	0	2/0	0	12	10	35

4 adults appear smaller than others. Bm

CH2M HILL

CERIODAPHNIA WATER QUALITY DATA

Client: Upper Columbia Project | Initiated Date: 5-4-05 Time: 1545 | Adults Isolated Date: 5-3-05 Time: 1915

Sample Description: Board ID: VIII | Terminated Date: _____ Time: _____ | Neo's Collected Date: 5-3-05 Time: 2340

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Technician	DW	DW	DW	DW	DW	DW	BM	CP MS
Time	1500	0805	0905	0705	0735	0755	0815	0905

Sample Number	Dissolved Oxygen (mg/l) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
VIII #1	6.1	6.2 / 7.9	7.2 / 7.7	7.6 / 8.6	7.7 / 8.1	7.8 / 8.0	7.0 / 7.3	6.2
VIII #2	6.6	7.0 / 7.9	7.1 / 7.7	7.7 / 8.6	7.2 / 8.1	7.3 / 8.0	6.7 / 7.8	6.7
VIII #3	6.2	6.6 / 7.9	7.2 / 7.7	7.5 / 8.6	7.6 / 8.1	7.5 / 8.0	7.1 / 7.8	6.8
VIII #4	6.9	7.0 / 7.9	7.2 / 7.7	7.8 / 8.6	7.3 / 8.1	7.4 / 8.0	7.1 / 7.8	6.9
VIII #5	6.5	7.2 / 7.9	7.4 / 7.7	7.5 / 8.6	7.7 / 8.1	7.8 / 8.0	7.6 / 7.8	7.0
VIII #6	6.6	6.9 / 7.9	7.5 / 7.7	7.5 / 8.6	7.7 / 8.1	7.8 / 8.0	7.7 / 7.8	7.5

Sample Number	pH Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
VIII #1	6.9 / 7.3 D.W.	7.0 / 7.5	7.1 / 7.6	6.8 / 7.5	7.1 / 7.5	7.3 / 7.6	7.2 / 7.6	7.2
VIII #2	7.2	7.6 / 7.5	7.6 / 7.6	7.1 / 7.5	7.3 / 7.5	7.3 / 7.6	7.3 / 7.6	7.4
VIII #3	7.0	7.1 / 7.5	7.2 / 7.6	6.8 / 7.5	7.1 / 7.5	7.2 / 7.6	7.2 / 7.6	7.4
VIII #4	7.3	7.6 / 7.5	7.6 / 7.6	7.3 / 7.5	7.4 / 7.5	7.5 / 7.6	7.4 / 7.6	7.4
VIII #5	7.5	7.6 / 7.5	7.6 / 7.6	7.3 / 7.5	7.5 / 7.5	7.6 / 7.6	7.5 / 7.6	7.5
VIII #6	7.3	7.7 / 7.5	7.6 / 7.6	7.4 / 7.5	7.6 / 7.5	7.7 / 7.6	7.6 / 7.6	7.5

Sample Number	Temperature (C) / Conductivity (µmhos/cm) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
VIII #1	24.5 DW → 24.0 / 245	24.7 / -	23.9 / -	24.7 / -	24.2 / -	25.2 / -	25.2 / -	24.1 / 260
VIII #2	24.0 / 277	24.6 / -	24.5 / -	25.1 / -	24.0 / -	25.9 / -	25.4 / -	24.1 / 284
VIII #3	24.1 / 247	24.7 / -	24.3 / -	24.6 / -	24.2 / -	25.3 / -	24.8 / -	24.4 / 283
VIII #4	24.3 / 248	24.5 / -	24.7 / -	24.9 / -	24.2 / -	25.5 / -	24.6 / -	24.5 / 313
VIII #5	24.2 / 256	24.7 / -	24.4 / -	24.8 / -	24.3 / -	25.4 / -	24.7 / -	24.2 / 305
VIII #6	24.1 / 275	24.8 / -	24.5 / -	25.0 / -	24.1 / -	25.0 / -	24.6 / -	24.2 / 330

COMMENTS:

CH2M HILL

Ceriodaphnia dubia
Survival and Reproduction
Test Data Summary

Client Upper Columbia Project
Test Start Date 5-4-2005
Sample Description IX
Sample ID# see cross reference
Ceriodaphnia Lot# Cd 1783
Statistician BM

Percent or Concentration	Total Young Per Replicate										# Alive Adults	Total Live Young
	A	B	C	D	E	F	G	H	I	J		
IX #1	24	14	29	28	26	29	27	26	33	22	10	258 ✓
IX #2	21	28	23	32	33	30	24	0/(AD)	29	33	9	253 ✓
IX #3	27	23	23	14	18	19	26	28	27	28	10	233 ✓
IX #4	~~24~~ 14	0/(AD)	32	25	25	19	12	31	32	17	9	~~207~~ BM 217
IX #5	27	22	26	28	28	18	22	20	33	32	10	256 ✓
IX #6	28	22	23	27	29	20	24	25	34	18	10	250 ✓

Footnote: *Ceriodaphnia dubia* test should be terminated when 60% of the control organisms have produced their third brood, or at the end of eight days, whichever occurs first.

SURVIVAL TURN DAY 7, REPRODUCTIVE TURN 3 BROODS

CH2M HILL

CERIODAPHNIA 7-DAY SURVIVAL AND REPRODUCTION DATA

Client: Upper Columbia Project — Test Beginning: Date 5-4-05 Time 1545

Sample Description: Board ID: IX — Test Ending: Date 5-11-05 Time 0910

Ceriodaphnia Lot#: Cd 1783 — Dilution Water: Recon MH (FHM) ID# 2499

Technician: Day 1 Bm Day 2 DW Day 3 MS Day 4 MS Day 5 ~~DW~~ Bm Day 6 MS Day 7 MS

Time: Day 1 1140 Day 2 0630 Day 3 0900 Day 4 0840 Day 5 1020 Day 6 1030 Day 7 0910

✓ = Fed: Day 1 ✓ Day 2 ✓ Day 3 ✓ Day 4 ✓ Day 5 ✓ Day 6 ✓ Day 7 ____

Sample Number	Day	A	B	C	D	E	F	G	H	I	J	No. Live Adults	Total Live Young
IX #1	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	6	4	5	4	5	5	0	4	6	3	10	42
	5	5	10	1/10	8	6	8	10	7	9	3	10	77
	6	2/10	0	13	2/14	2/13	3/13	2/15	13	2/16	2/0	10	122
	7	1/0	0	0	0	0	0	0	2/0	0	14	10	17
IX #2	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0/AD	0	0	9	0
	3	0	0	0	0	0	0	0	↓	0	0	9	0
	4	3	3	5	5	5	6	4		5	3	9	39
	5	2	11	8	11	10	10	9		7	13	9	81
	6	1/15	12	8	16	2/16	14	1/10		2/14	17	9	128
	7	0	2/0	2/0	0	0	0	0		1/0	0	9	5
* Small chironomids found in sample, Day 4 MS IX #3	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	6	3	6	4	3	4	4	4	4	5	10	43
	5	4	2	6	4	4	7	8	8	8	6	10	57
	6	17	18	1/10	2/0	11	2/0	14	16	2/0	17	10	110
	7	0	0	0	4	0	6	0	0	13	0	10	23
IX #4	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	AD	0	0	0	2	0	0	0	0	9	2
	4	0	↓	0	3	3	1/0	0	5	5	4	9	21
	5	8		5	4	9	6	8	7	11	5	9	63
(MS)	6	0 ~~6~~ /60		~~4~~ 8/10	4/14	13	10	4	19	15	7	9	~~89~~ ~~99~~ DW 99 Bm
	7	16		14	0	0	0	0	0	1/0	1/0	9	32
IX #5	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	4 ~~0~~ MS	0	0	0	0	0	0	0	10	MS ~~0~~ 4
	4	4 MS ~~0~~	MS ~~0~~ 4	~~4~~ 0	5 MS ~~0~~	4 ~~0~~ MS	4 ~~0~~ MS	4 ~~0~~	MS 4 ~~0~~	5 ~~0~~ MS	5 ~~0~~ MS	10	MS ~~4~~ 39
	5	9	8	9	9	8	7	5	0	8	8	10	71
	6	14	10	13	14	16	1/6	12	2	20	5	10	113
	7	0	0	13	0	0	0	1/0	14	0	14/8	10	42
IX *6 ~~#REF!~~	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	3	0	0	4	10	7
	4	6	4	6	5	5	4	0	4	7	8	10	49
	5	7	7	8	11	11	7	10	7	10	6	10	84
	6	15	11	9	11	13	9	10	14	17	16	10	125
	7	0	0	0	0	0	0	1/0	0	0	0	10	1

* [illegible] split brood

CH2M HILL

CERIODAPHNIA WATER QUALITY DATA

Client: Upper Columbia Project

Initiated Date: 5-4-05 Time: 1545

Adults Isolated Date: 5-3-05 Time: 1915

Sample Description: Board ID: IX

Terminated Date: 5-11-05 Time: 0850

Neo's Collected Date: 5-3-05 Time: 2340

Technician: Day 0 DW Day 1 DW Day 2 DW Day 3 DW Day 4 DW Day 5 DW Day 6 JM Day 7 MS

Time: Day 0 1445 Day 1 0805 Day 2 0905 Day 3 0710 Day 4 0740 Day 5 0800 Day 6 0315 Day 7 0850

Sample Number	Dissolved Oxygen (mg/l) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
IX #1	7.1	6.9 / 7.9	7.4 / 7.7	7.7 / 8.6	7.7 / 8.1	7.7 / 8.0	7.5 / 7.8	6.9
IX #2	6.5	6.5 / 7.9	7.3 / 7.7	7.9 / 8.6	7.6 / 8.1	7.6 / 8.0	7.4 / 7.8	6.7
IX #3	6.6	7.0 / 7.9	7.3 / 7.7	7.6 / 8.6	7.8 / 8.1	7.8 / 8.0	7.4 / 7.8	7.1
IX #4	6.8	6.6 / 7.9	7.3 / 7.7	7.6 / 8.6	7.7 / 8.1	7.7 / 8.0	7.3 / 7.8	6.7
IX #5	6.9	6.7 / 7.9	7.1 / 7.7	7.7 / 8.6	7.7 / 8.1	7.8 / 8.0	7.1 / 7.8	6.5
IX #6	5.7	6.9 / 7.9	7.1 / 7.7	7.8 / 8.6	7.5 / 8.1	7.6 / 8.0	7.1 / 7.8	6.7

Sample Number	pH Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
IX #1	7.3	7.3 / 7.5	7.5 / 7.6	7.3 / 7.5	7.5 / 7.5	7.5 / 7.6	7.5 / 7.6	7.4
IX #2	7.0	7.2 / 7.5	7.2 / 7.6	7.0 / 7.5	7.2 / 7.5	7.2 / 7.6	7.2 / 7.6	7.3
IX #3	7.1	7.4 / 7.5	7.4 / 7.6	7.1 / 7.5	7.4 / 7.5	7.4 / 7.6	7.3 / 7.6	7.3
IX #4	7.4	7.6 / 7.5	7.7 / 7.6	7.4 / 7.5	7.6 / 7.5	7.6 / 7.6	7.7 / 7.6	7.3
IX #5	6.6	7.2 / 7.5	7.2 / 7.6	6.9 / 7.5	7.0 / 7.5	7.1 / 7.6	7.1 / 7.6	7.4
IX #6	7.2	7.6 / 7.5	7.6 / 7.6	7.2 / 7.5	7.4 / 7.5	7.5 / 7.6	7.4 / 7.6	7.3

Sample Number	Temperature (C) / Conductivity (µmhos/cm) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
IX #1	24.1 / 252	24.4 / -	24.3 / -	23.9 / -	24.5 / -	24.5 / -	24.4 / -	24.1 / 300
IX #2	24.1 / 254	24.6 / -	24.7 / -	24.1 / -	24.6 / -	24.9 / -	25.4 / -	24.4 / 279
IX #3	24.0 / 251	24.5 / -	24.6 / -	24.9 / -	24.9 / -	24.6 / -	24.4 / -	24.3 / 270
IX #4	24.2 / 287	24.4 / -	24.8 / -	23.5 / -	25.0 / -	25.3 / -	24.4 / -	24.7 / 351
IX #5	24.4 / 240	24.4 / -	24.4 / -	24.2 / -	24.9 / -	24.4 / -	24.4 / -	24.4 / 250
IX #6	24.0 / 293	24.6 / -	24.7 / -	24.1 / -	24.4 / -	24.1 / -	25.7 / -	24.3 / 300

COMMENTS:

CH2M HILL

Ceriodaphnia dubia
Survival and Reproduction
Test Data Summary

Client Upper Columbia Project Test Start Date 5-4-2005

Sample Description X Sample ID# see cross reference

Ceriodaphnia Lot# Cd 1783 Statistician [illegible]

Percent or Concentration	Total Young Per Replicate										# Alive Adults	Total Live Young
	A	B	C	D	E	F	G	H	I	J		
X #1	16	10	10	0	0/(AD)	0/(AD)	17	0/(AD)	22	7/(AD)	6	82 ✓
X #2	24	27	20	23	20	27	32	9	~~32~~ DW 25	24	10	231 ✓
X #3	24	25	~~27~~ DW 35	29	32	28	27	30	29	26	10	285 ✓
X #4	18	23	24	27	24	22	26	27	23	24	10	238 ✓
X #5	8	12	8	11	15	13	17	9	13	14	10	120 ✓
X #6	28	26	23	22	21	32	24	34	28	30	10	268 ✓

Footnote: *Ceriodaphnia dubia* test should be terminated when 60% of the control organisms have produced their third brood, or at the end of eight days, whichever occurs first.

SURVIVAL THRU DAY 7, REPRODUCTION THRU 3 BROODS

CH2M HILL

CERIODAPHNIA 7-DAY SURVIVAL AND REPRODUCTION DATA

Client Upper Columbia Project Test Beginning : Date 5-4-05 Time 1545

Sample Description Board ID: X Test Ending : Date 5-11-05 Time 0950

Ceriodaphnia Lot# Cd 1783 Dilution Water Recon MH (FHM) ID# 2499

Technician Day 1 BW Day 2 DW Day 3 BW Day 4 DW Day 5 BW Day 6 DW Day 7 MS

Time Day 1 1220 Day 2 0830 Day 3 1125 Day 4 0915 Day 5 1050 Day 6 1145 Day 7 0950

✓ = Fed Day 1 ✓ Day 2 ✓ Day 3 ✓ Day 4 ✓ Day 5 ✓ Day 6 ✓ Day 7 ____

Sample Number	Day	Replicate										No. Live Adults	Total Live Young
		A	B	C	D	E	F	G	H	I	J		
X #1	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	0	3	2	0	0	0/ND	2	0/ND	2	1	8	10
	5	0	0	3	0	ONP	1	7	1	8	1	7	19
	6	7	0	0	0	1	↓	8	↓	0	5 ND	6	20
	7	9	7	5	OG	↓	↓	0	↓	12	1	6	33
X #2	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	4	0	0	0	0	5	0	0	0	10	9
	4	4	0	4	4	5	4	1/0	0	4	4	10	30
	5	9	9	8	12	6	11	11	1	8	10	10	85
	6	10	1/10	8	7	9	10	13	7	12	9	10	96
	7	1/0	3/0	0	0	0	2/0	2/0	1/0	1/0	1/0	10	11
X #3	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	6	4	4	0	0	4	3	0	0	0	10	15
	4	5	0	1/0	5	5	2/0	0	4	5	5	10	32
	5	7	10	1	10	12	9	9	12	12	1/9	10	92
	6	9	10	15/0	12	15	12	1/14	13	12	0	10	113
	7	3/0	1/0	14	2/0	0	1/0	0	1/0	0	11	10	33
X #4	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	4	0	6	0	0	0	10	10
	4	4	5	5	0	0	5	0	4	4	4	10	31
	5	6	6	12	6	8	7	8	11	11	9	10	84
	6	8	12	7	11	12	10	12	12	8	11	10	103
	7	0	0	0	10	0	0	13	0	0	0	10	23
X #5	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	1	0	0	2	0	0	1	1	1	2	10	8
	5	0	6	5	6	5	5	1	6	6	8	10	48
	6	5	0	0	0	0	0	7	2	0	0	10	14
	7	2	6	3	3	10	8	8	0	6	4	10	50
X*6 ~~#REF!~~ 3	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	3	0	0	0	0	0	0	0	10	3
	4	4	3	0	3	4	6	4	5	5	4	10	38
	5	13	1/9	10	8	10	12	9	10	1/10	1/9	10	102
	6	11	12	10	9	7	13	10	2/0	12	0	10	86
	7	0	1/0	14	2/0	0	1/0	1/0	17	0	17	10	53

Adults smaller

CH2M HILL

CERIODAPHNIA WATER QUALITY DATA

Client: Upper Columbia Project
Sample Description: Board ID: X
Technician: Day 0 DW | Day 1 DW | Day 2 DW | Day 3 DW | Day 4 DW | Day 5 DW | Day 6 JW | Day 7 MS
Time: Day 0 1455 | Day 1 0810 | Day 2 0910 | Day 3 0715 | Day 4 0745 | Day 5 0805 | Day 6 0815 | Day 7 0858

Initiated Date 5-4-05 Time 1545
Terminated Date 5-11-05 Time 0858
Adults Isolated Date 5-3-05 Time 1915
Neo's Collected Date 5-3-05 Time 2340

Sample Number	Dissolved Oxygen (mg/l) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	pH Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Temperature (C) / Conductivity (µmhos/cm) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
X #1	7.4	7.0 / 7.9	7.3 / 7.7	7.6 / 8.6	7.8 / 8.1	7.7 / 8.0	7.6 / 7.8	7.2	7.4	7.3 / 7.5	7.7 / 7.6	7.5 / 7.5	7.6 / 7.5	7.7 / 7.6	7.7 / 7.6	7.6	24.5 / 260	24.7	24.7	24.4	25.2	24.0	24.0	25.7 / 245
X #2	7.3	7.1 / 7.9	7.4 / 7.7	7.8 / 8.6	7.8 / 8.1	7.7 / 8.0	7.4 / 7.8	7.0	7.4	7.3 / 7.5	7.6 / 7.6	7.4 / 7.5	7.6 / 7.5	7.6 / 7.6	7.6 / 7.6	7.6	24.1 / 251	24.6 / -	24.5 / -	24.3 / -	25.1 / -	24.1 / -	24.1 / -	25.5 / 302
X #3	7.6	7.1 / 7.9	7.5 / 7.7	7.8 / 8.6	7.8 / 8.1	7.7 / 8.0	7.5 / 7.8	7.2	7.4	7.4 / 7.5	7.7 / 7.6	7.4 / 7.5	7.6 / 7.5	7.6 / 7.6	7.6 / 7.6	7.6	24.2 / 252	24.8 / -	24.9 / -	24.1 / -	25.4 / -	24.0 / -	24.2 / -	25.7 / 320
X #4	7.4	6.8 / 7.9	7.6 / 7.7	7.7 / 8.6	7.9 / 8.1	7.8 / 8.0	7.6 / 7.8	7.2	7.5	7.3 / 7.5	7.6 / 7.6	7.4 / 7.5	7.5 / 7.5	7.6 / 7.6	7.5 / 7.6	7.6	24.3 / 252	24.5 / -	25.1 / -	24.0 / -	25.0 / -	24.4 / -	23.9 / -	25.5 / 305
X #5	7.6	7.0 / 7.9	7.6 / 7.7	7.8 / 8.6	7.9 / 8.1	7.8 / 8.0	7.6 / 7.8	7.2	7.5	7.3 / 7.5	7.6 / 7.6	7.5 / 7.5	7.7 / 7.5	7.6 / 7.6	7.7 / 7.6	7.6	24.0 / 252	24.6 / -	24.8 / -	24.0 / -	25.2 / -	24.3 / -	24.0 / -	25.3 / 326
X #6	7.1	7.0 / 7.9	7.3 / 7.7	7.6 / 8.6	7.7 / 8.1	7.6 / 8.0	7.5 / 7.8	6.9	7.3	7.1 / 7.5	7.7 / 7.6	7.2 / 7.5	7.4 / 7.5	7.4 / 7.6	7.4 / 7.6	7.5	24.0 / 265	24.7	24.4	24.3	25.3	24.2	24.2	25.7 / 317

COMMENTS:

CH2M HILL

Ceriodaphnia dubia
Survival and Reproduction
Test Data Summary

Client: Upper Columbia Project
Test Start Date: 5-4-2005
Sample Description: XI
Sample ID#: see cross reference sheet
Ceriodaphnia Lot#: Cd 1783
Statistician: BW

Percent or Concentration	Total Young Per Replicate										# Alive Adults	Total Live Young
	A	B	C	D	E	F	G	H	I	J		
XI #1	6	22	36	26	21	25	14	18	25	15	10	208 ✓
XI #2	20	26	21	% (AD)	24	31	25	25	26	24	9	222 ✓
XI #3	22	14/(AD)	16	30	29	7	27	31	35	29	9	240 ✓
XI #4	12	23	18	18	9 ~~25~~	17	19	18	24	22	10	~~194~~ 180
XI #5	20	25	14	27	25	24	23	20	19	19	10	216 ✓
XI #6	27	27	% (AD)	% (AD)	28	22	9/(AD)	25	25	23	7	186 ✓

Footnote: *Ceriodaphnia dubia* test should be terminated when 60% of the control organisms have produced their third brood, or at the end of eight days, whichever occurs first.

SURVIVAL THRU DAY 7. REPRODUCTION THRU 3 BROODS

CH2M HILL

CERIODAPHNIA 7-DAY SURVIVAL AND REPRODUCTION DATA

Client Upper Columbia Project Test Beginning : Date 5-4-05 Time 1545

Sample Description Board ID: XI Test Ending : Date 5-11-05 Time 1000

Ceriodaphnia Lot# Cd 1783 Dilution Water Recon MH (FHM) ID# 2499

Technician Day 1 DW Day 2 DW Day 3 DW Day 4 [illegible] Day 5 DW Day 6 [illegible] Day 7 DW

Time Day 1 1145 Day 2 0740 Day 3 0945 Day 4 0955 Day 5 0940 Day 6 1300 Day 7 1000

✓ = Fed Day 1 ✓ Day 2 ✓ Day 3 ✓ Day 4 ✓ Day 5 ✓ Day 6 ✓ Day 7 ____

Sample Number	Day	Replicate A	B	C	D	E	F	G	H	I	J	No. Live Adults	Total Live Young
XI #1	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	0	2	0	3	2	4	4	2	4	4	10	25
	5	0	9	12	9	5	9	1	5	6	9	10	65
	6	0	9	12	14	1/11	10	2/7	9	11	0	10	86
	7	6	2/0	12	0	2/0	2/0	0	2/0	4/0	2/11	10	43
XI #2	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0/AD	0	0	0	0	0	0	9	0
	3	0	0	0	|	0	0	0	0	0	0	9	0
	4	3	3	3	|	4	5	2	5	5	4	9	34
	5	6	7	5	|	9	10	10	7	7	7	9	68
	6	11	1/14	0	|	11	1/13	13	1/9	14	0	9	88
	7	0	1/0	13	↓	0	2/0	0	3/0	0	13	9	32
XI #3	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	3	0	0	0	0	0	0	0	0	10	03 DW
	4	2	0	3	4	3	2	2	4	3	3	10	26
	5	6	11	1	11	9	0	10	14	16	10	10	88
	6	0	0 AD	0	15	17	5	15	13	15	0	9	80
	7	14	1	12	0	17	0	0	0	1/0	16	9	60
XI #4	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	2	2	3	3	2	4	2	2	2	2	10	24
	5	7	6	4	7	5	5	5	4	6	7	10	56
	6	0	0	0	8	0	7	8	0	2/0	0	10	25
	7	3	15	11	12	2/14	1/0	4/0	12	14	13	10	101
XI #5	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	4	0	0	0	10	4
	4	2	3	2	3	3	4	0	3	3	2	10	25
	5	5	9	2	11	9	7	7	5	7	4	10	66
	6	10	13	9	12	8	13	9	8	7	0	10	89
	7	3/0	0	1/0	1/0	5/0	0	3/0	4/0	2/0	13	10	32
XI *6 #REF!	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0/AD	0	0	0	0	0	0	0	9	0
	4	4	3	|	0 AD	3	2	2	4	3	5	~~9~~ 8	26
	5	10	12	|	|	9	9	7	10	8	7	~~9~~ 8	72
	6	0	12	|	|	12	10	0 AD	10	13	10	7	67
	7	13	0	↓	↓	4/0	1/0	1	1/0	1/0	1/0	7	21

CH2M HILL

CERIODAPHNIA WATER QUALITY DATA

Client: Upper Columbia Project | Initiated Date: 5-4-05 Time: 1545 | Adults Isolated Date: 5-3-05 Time: 1915

Sample Description: Board ID: XI | Terminated Date: 5-11-05 Time: 0840 | Neo's Collected Date: 5-3-05 Time: 2340

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Technician	DW	DW	DW	DW	DW	DW	BC	MS
Time	1450	0810	0910	0720	0745	0805	0825	0840

Sample Number	Dissolved Oxygen (mg/l) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
XI #1	6.1	7.2 / 7.9	7.3 / 7.7	7.6 / 8.6	7.8 / 8.1	7.8 / 8.0	7.2 / 7.8	6.6
XI #2	6.3	6.8 / 7.9	7.1 / 7.7	7.7 / 8.6	7.8 / 8.1	7.6 / 8.0	7.3 / 7.8	6.9
XI #3	7.4	7.4 / 7.9	7.3 / 7.7	7.5 / 8.6	7.8 / 8.1	7.8 / 8.0	7.6 / 7.8	6.7
XI #4	6.8	7.5 / 7.9	7.2 / 7.7	7.7 / 8.6	7.6 / 8.1	7.3 / 8.0	6.9 / 7.8	7.1
XI #5	5.3	7.3 / 7.9	6.8 / 7.7	7.2 / 8.6	7.2 / 8.1	7.1 / 8.0	6.9 / 7.8	7.0
XI #6	6.8	6.7 / 7.9	7.2 / 7.7	7.6 / 8.6	7.7 / 8.1	7.6 / 8.0	7.5 / 7.8	7.3

Sample Number	pH Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
XI #1	6.6	7.7 / 7.5	7.2 / 7.6	6.9 / 7.5	7.0 / 7.5	7.3 / 7.6	7.1 / 7.6	7.4
XI #2	6.9	7.6 / 7.5	7.4 / 7.6	7.2 / 7.5	7.4 / 7.5	7.4 / 7.6	7.5 / 7.6	7.4
XI #3	7.3	7.7 / 7.5	7.6 / 7.6	7.4 / 7.5	7.5 / 7.5	7.5 / 7.6	7.5 / 7.6	7.4
XI #4	7.3	7.7 / 7.5	7.6 / 7.6	7.3 / 7.5	7.4 / 7.5	7.4 / 7.6	7.4 / 7.6	7.4
XI #5	7.5	7.7 / 7.5	7.6 / 7.6	7.4 / 7.5	7.5 / 7.5	7.6 / 7.6	7.6 / 7.6	7.4
XI #6	7.5	7.5 / 7.5	7.7 / 7.6	7.5 / 7.5	7.7 / 7.5	7.7 / 7.6	7.6 / 7.6	7.3

Sample Number	Temperature (C) / Conductivity (µmhos/cm) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
XI #1	24.0 / 233	24.6 / -	24.5 / -	25.3 / -	24.3 / -	25.2 / -	24.7 / -	24.4 / 278
XI #2	24.1 / 266	24.7 / -	24.8 / -	25.1 / -	24.2 / -	25.0 / -	24.4 / -	24.7 / 344
XI #3	24.2 / 249	24.4 / -	24.4 / -	25.4 / -	24.8 / -	25.5 / -	25.0 / -	24.8 / 30 -
XI #4	24.1 / 261	24.5 / -	24.4 / -	25.5 / -	24.5 / -	25.1 / -	24.8 / -	24.5 / 274 -
XI #5	24.8 / 301	24.6 / -	24.7 / -	25.1 / -	24.2 / -	25.4 / -	24.1 / -	24.3 / 285 -
XI #6	24.2 / 257	24.4 / -	24.9 / -	25.3 / -	24.4 / -	24.7 / -	24.4 / -	24.2 / 254

COMMENTS:

CH2M HILL *TOXICITY TEST ORGANISM AND WATER QUALITY DATA*

Client Upper Columbia Test Initiation: Date 5-6-05 Time _____ Test Termination: Date 5-16-05 Time _____

Contact _____ Technician _____

Test Species/ID *Chironomus tentans* / CHI 14 _____ /

Sample Information												Test Species Information	ID# CHI 14	ID#	ID#
Sample ID Number	Field ID	Collected Date	Collected Time	Total Residual Chlorine (mg/l) As Received / As Dechlor.	Ammonia mg/l NH_3-N Pre	Ammonia mg/l NH_3-N Post	Hardness mg/l CaCO Pre	Hardness mg/l CaCO Post	Alkalinity mg/l CaCO Pre	Alkalinity mg/l CaCO Post					
B1390-25	RM732R1	04/22/2005	11:35	- / -	0.52	0.26	120	112	115	103		Age or Size	2nd to 3rd Instar		
B1390-27	RM737A1(X3)	04/22/2005	12:15	- / -	0.34	0.28	90	84	84	75			-		
B1390-28	RM723A1(X1)	04/22/2005	12:55	- / -	0.33	0.36	106	86	102	80		Test Container Size	300 ml		
B1390-29	RM736A1(X1)	04/22/2005	13:45	- / -	0.59	1.01	118	96	110	98		Test Volume	100 ml sample, 175 ml overlying water		
B1390-30	RM723A2(X3)	04/22/2005	15:16	- / -	0.33	0.24	116	96	100	88		Feeding: Type	1.5 ml of 6g/L		
B1390-31	RM721R1	04/22/2005	14:39	- / -	0.37	0.17	120	110	104	104		Amount	Tetrafin slurry		
B1390-32	RM726R1	04/22/2005	13:20	- / -	0.28	0.51	110	114	102	111			daily		
B1390-33	RM734A1(X3)	04/22/2005	15:00	- / -	0.42	0.17	94	92	86	80		Aeration: Began	none		
B1390-34	RM661A1(X1)	04/22/2005	10:15	- / -	0.32	0.16	104	92	94	72		Amount	-		
B1390-35	RM658A1(X3)	04/22/2005	11:30	- / -	0.13	0.10	104	84	92	76		Dilution Water ID#	2498, 2503		
B1390-36	RM705R1	04/23/2005	9:25	- / -	0.35	0.57	106	86	98	83		Acclimation Period	24 hours		
B1390-37	RM713A1(X3)	04/23/2005	9:30	- / -	0.47	0.31	102	80	93	72		Test Location	# 12		
B1390-38	RM686R1	04/23/2005	11:20	- / -	0.35	0.49	98	86	88	80		Condition of Survivors			
B1390-39	RM730A1(X1)	04/23/2005	11:15	- / -	0.35	0.9	98	96	89	88					

Dilution Water Source	ID#	Ammonia mg/l NH_3-N	Hardness mg/l CaCO	Alkalinity mg/l CaCO
Reconstitued water	2498	-	72	68
Reconstitued water	2503	-	72	58

Comments _____

Water Quality Meters Used/ID#

Dissolved Oxygen _____ pH _____ Temperature _____

Conductivity _____ Refractometer _____ Other _____

CH2M HILL *TOXICITY TEST ORGANISM AND WATER QUALITY DATA*

Client Upper Columbia Test Initiation: Date 5-6-05 Time _____ Test Termination: Date 5-16-05 Time ____

Contact _____ Technician _____

Test Species/ID *Chironomus tentans* / CHI 14 _____ /

Sample Information												Test Species Information	ID# CHI 14	ID#	ID#
Sample ID Number	Field ID	Collected Date	Collected Time	Total Residual Chlorine (mg/l) As Received / As Dechlor.	Ammonia mg/l NH_3-N Pre	Ammonia mg/l NH_3-N Post	Hardness mg/l CaCO Pre	Hardness mg/l CaCO Post	Alkalinity mg/l CaCO Pre	Alkalinity mg/l CaCO Post					
B1390-40	RM733A1(X1)	04/23/2005	9:45	- / -	0.51	0.22	110	94	102	86		Age or Size	2nd to 3rd Instar		
B1390-41	RM729A1(X1)	04/23/2005	12:30	- / -	0.45	0.23	100	86	94	82			-		
B1390-42	RM685R1	04/23/2005	13:50	- / -	0.52	0.75	115	116	113	120		Test Container Size	300 ml		
B1390-43	RM727A1(X1)	04/23/2005	14:15	- / -	0.28	0.21	93	94	90	86		Test Volume	100 ml sample, 175 ml overlying water		
B1390-44	RM644A1(X3)	04/26/2005	10:15	- / -	0.14	0.06	102	64	88	84		Feeding: Type	1.5 ml of 6g/L		
B1390-45	RM637A1(X1)	04/26/2005	11:26	- / -	0.28	0.26	93	90	89	80		Amount	Tetrafin slurry		
B1390-46	RM634A1(X1)	04/26/2005	14:02	- / -	0.20	0.05	98	98	90	88			daily		
B1390-47	RM642A1(X1)	04/26/2005	11:50	- / -	0.25	0.18	86	72	79	63		Aeration: Began	none		
B1390-48	RM605A1(X1)	04/26/2005	14:17	- / -	0.24	0.11	98	35	88	78		Amount	-		
B1390-49	RM606A1(X3)	04/26/2005	13:01	- / -	0.39	0.32	94	86	90	80		Dilution Water ID#	2498, 2503		
B1390-50	RM616A1(X3)	04/26/2005	10:16	- / -	0.15	0.28	102	90	94	82		Acclimation Period	24 hours		
B1390-51	RM641A1(X1)	04/26/2005	13:54	- / -	0.51	0.19	103	90	92	74		Test Location	# 12		
B1390-52	RM640A1(X3)	04/26/2005	15:20	- / -	0.20	0.22	94	92	92	80		Condition of Survivors			
B1390-53	RM628A1(X1)	04/26/2005	15:42	- / -	0.21	0.23	102	94	92	84					

Dilution Water Source	ID#	Ammonia mg/l NH_3-N	Hardness mg/l CaCO	Alkalinity mg/l CaCO
Reconstitued water	2498	-	72	68
Reconstitued water	2503	-	72	58

Comments

Water Quality Meters Used/ID#

Dissolved Oxygen _____ pH _____ Temperature _____

Conductivity _____ Refractometer _____ Other _____

CH2M HILL *TOXICITY TEST ORGANISM AND WATER QUALITY DATA*

Client Upper Columbia Test Initiation: Date 5-6-05 Time _____ Test Termination: Date 5-16-05 Time _____

Contact _____ Technician _____

Test Species/ID *Chironomus tentans* / CHI 14 _____ / _____

Sample Information												Test Species Information	ID# CHI 14	ID#	ID#
Sample ID Number	Field ID	Collected Date	Collected Time	Total Residual Chlorine (mg/l) As Received / As Dechlor.	Ammonia mg/l NH_3-N Pre	Ammonia mg/l NH_3-N Post	Hardness mg/l CaCO Pre	Hardness mg/l CaCO Post	Alkalinity mg/l CaCO Pre	Alkalinity mg/l CaCO Post					
B1390-54	RM603A1(X1)	04/28/2005	10:45	- / -	0.18	0.32	104	98	92	80		Age or Size	2nd to 3rd Instar		
B1390-55	RM605A2(X8)	04/28/2005	9:47	- / -	0.47	0.25	96	92	89	74			-		
B1390-56	RM622A1(X3)	04/28/2005	9:58	- / -	0.27	0.14	102	96	98	89		Test Container Size	300 ml		
Sediment Cont.	Beaver Creek	4/22/05	0640	- / -	0.45	0.33	98	~~68~~ 74	82	~~66~~ 70		Test Volume	100 ml sample, 175 ml overlying water		
				/								Feeding: Type	1.5 ml of 6g/L		
				/								Amount	Tetrafin slurry		
				/									daily		
				/								Aeration: Began	none		
				/								Amount	-		
				/								Dilution Water ID#	2498, 2503		
				/								Acclimation Period	24 hours		
				/								Test Location	# 12		
				/								Condition of Survivors			
				/											
				/								Comments			

Dilution Water Source	ID#	Ammonia mg/l NH_3-N	Hardness mg/l CaCO	Alkalinity mg/l CaCO
Reconstitued water	2498	-	72	68
Reconstitued water	2503	-	72	58

Water Quality Meters Used/ID#

Dissolved Oxygen _____ pH _____ Temperature _____

Conductivity _____ Refractometer _____ Other _____

Randomization chart for *Chironomid* tests initiated on 5/6/2005

Batch ID: B1390 1st Beaker Number: 345

Lab ID:	Field Samp	Station Location	Replic	Rando	test chamber
B1390-42	5164496	RM685R1	A	0.213	549
B1390-42	5164496	RM685R1	B	0.579	451
B1390-42	5164496	RM685R1	C	0.025	594
B1390-42	5164496	RM685R1	D	0.298	531
B1390-42	5164496	RM685R1	E	0.831	390
B1390-42	5164496	RM685R1	F	0.317	527
B1390-42	5164496	RM685R1	G	0.335	520
B1390-42	5164496	RM685R1	H	0.382	505
B1390-38	5164489	RM686R1	A	0.538	463
B1390-38	5164489	RM686R1	B	0.01	598
B1390-38	5164489	RM686R1	C	0.866	379
B1390-38	5164489	RM686R1	D	0.755	413
B1390-38	5164489	RM686R1	E	0.445	488
B1390-38	5164489	RM686R1	F	0.725	422
B1390-38	5164489	RM686R1	G	0.588	448
B1390-38	5164489	RM686R1	H	0.433	491
B1390-36	5164486	RM705R1	A	0.514	467
B1390-36	5164486	RM705R1	B	0.717	424
B1390-36	5164486	RM705R1	C	0.882	375
B1390-36	5164486	RM705R1	D	0.856	383
B1390-36	5164486	RM705R1	E	0.056	582
B1390-36	5164486	RM705R1	F	0.832	387
B1390-36	5164486	RM705R1	G	0.968	352
B1390-36	5164486	RM705R1	H	0.191	556
B1390-31	5164476	RM721R1	A	0.426	495
B1390-31	5164476	RM721R1	B	0.521	466
B1390-31	5164476	RM721R1	C	0.526	464
B1390-31	5164476	RM721R1	D	0.858	382
B1390-31	5164476	RM721R1	E	0.115	569
B1390-31	5164476	RM721R1	F	0.983	348
B1390-31	5164476	RM721R1	G	0.707	425
B1390-31	5164476	RM721R1	H	0.031	591

Randomization chart for *Chironomid* tests initiated on 5/6/2005

Batch ID: B1390 1st Beaker Number: 345

Lab ID:	Field Samp	Station Location	Replic	Rando	test chamber
B1390-32	5164478	RM726R1	A	0.311	528
B1390-32	5164478	RM726R1	B	0.452	485
B1390-32	5164478	RM726R1	C	0.174	559
B1390-32	5164478	RM726R1	D	0.84	386
B1390-32	5164478	RM726R1	E	0.775	405
B1390-32	5164478	RM726R1	F	0.31	529
B1390-32	5164478	RM726R1	G	0.627	438
B1390-32	5164478	RM726R1	H	0.389	504
B1390-25	5164470	RM732R1	A	0.622	440
B1390-25	5164470	RM732R1	B	0.162	561
B1390-25	5164470	RM732R1	C	0.812	395
B1390-25	5164470	RM732R1	D	0.334	522
B1390-25	5164470	RM732R1	E	0.859	381
B1390-25	5164470	RM732R1	F	0.886	374
B1390-25	5164470	RM732R1	G	0.931	362
B1390-25	5164470	RM732R1	H	0.803	399
Sediment Control	0	Beaver Creek	A	0.263	542
Sediment Control	0	Beaver Creek	B	0.906	369
Sediment Control	0	Beaver Creek	C	0.598	445
Sediment Control	0	Beaver Creek	D	0.274	537
Sediment Control	0	Beaver Creek	E	0.422	498
Sediment Control	0	Beaver Creek	F	0.007	599
Sediment Control	0	Beaver Creek	G	0.951	358
Sediment Control	0	Beaver Creek	H	0.816	393
B1390-27	5164472	RM737A1(X3)	A	0.406	501
B1390-27	5164472	RM737A1(X3)	B	0.542	461
B1390-27	5164472	RM737A1(X3)	C	0.045	586
B1390-27	5164472	RM737A1(X3)	D	0.052	584
B1390-27	5164472	RM737A1(X3)	E	0.726	420
B1390-27	5164472	RM737A1(X3)	F	0.976	350
B1390-27	5164472	RM737A1(X3)	G	0.468	480
B1390-27	5164472	RM737A1(X3)	H	0.038	589

Randomization chart for *Chironomid* tests initiated on 5/6/2005

Batch ID: B1390 1st Beaker Number: 345

Lab ID:	Field Samp	Station Location	Replic	Rando	test chamber
B1390-28	5164473	RM723A1(X1)	A	0.61	443
B1390-28	5164473	RM723A1(X1)	B	0.078	576
B1390-28	5164473	RM723A1(X1)	C	0.986	347
B1390-28	5164473	RM723A1(X1)	D	0.759	410
B1390-28	5164473	RM723A1(X1)	E	0.544	460
B1390-28	5164473	RM723A1(X1)	F	0.582	450
B1390-28	5164473	RM723A1(X1)	G	0.448	486
B1390-28	5164473	RM723A1(X1)	H	0.403	502
B1390-29	5164474	RM736A1(X1)	A	0.245	544
B1390-29	5164474	RM736A1(X1)	B	0.483	475
B1390-29	5164474	RM736A1(X1)	C	0.678	429
B1390-29	5164474	RM736A1(X1)	D	0.952	357
B1390-29	5164474	RM736A1(X1)	E	0.16	564
B1390-29	5164474	RM736A1(X1)	F	0.13	567
B1390-29	5164474	RM736A1(X1)	G	0.408	499
B1390-29	5164474	RM736A1(X1)	H	0.229	545
B1390-30	5164475	RM723A2(X3)	A	0.875	376
B1390-30	5164475	RM723A2(X3)	B	0.758	411
B1390-30	5164475	RM723A2(X3)	C	0.207	552
B1390-30	5164475	RM723A2(X3)	D	0.743	415
B1390-30	5164475	RM723A2(X3)	E	0.298	533
B1390-30	5164475	RM723A2(X3)	F	0.335	521
B1390-30	5164475	RM723A2(X3)	G	0.989	346
B1390-30	5164475	RM723A2(X3)	H	0.018	596
B1390-33	5164479	RM734A1(X3)	A	0.47	478
B1390-33	5164479	RM734A1(X3)	B	0.744	414
B1390-33	5164479	RM734A1(X3)	C	0.476	476
B1390-33	5164479	RM734A1(X3)	D	0.674	430
B1390-33	5164479	RM734A1(X3)	E	0.431	492
B1390-33	5164479	RM734A1(X3)	F	0.872	377
B1390-33	5164479	RM734A1(X3)	G	0.367	509
B1390-33	5164479	RM734A1(X3)	H	0.441	490

Randomization chart for *Chironomid* tests initiated on 5/6/2005

Batch ID: B1390 1st Beaker Number: 345

Lab ID:	Field Samp	Station Location	Replic	Rando	test chamber
B1390-34	5164483	RM661A1(X1)	A	0.062	580
B1390-34	5164483	RM661A1(X1)	B	0.919	365
B1390-34	5164483	RM661A1(X1)	C	0.819	392
B1390-34	5164483	RM661A1(X1)	D	0.354	514
B1390-34	5164483	RM661A1(X1)	E	0.43	493
B1390-34	5164483	RM661A1(X1)	F	0.921	364
B1390-34	5164483	RM661A1(X1)	G	0.589	447
B1390-34	5164483	RM661A1(X1)	H	0.68	428
B1390-35	5164485	RM658A1(X3)	A	0.443	489
B1390-35	5164485	RM658A1(X3)	B	0.279	535
B1390-35	5164485	RM658A1(X3)	C	0.471	477
B1390-35	5164485	RM658A1(X3)	D	0.027	593
B1390-35	5164485	RM658A1(X3)	E	0.968	353
B1390-35	5164485	RM658A1(X3)	F	0.425	496
B1390-35	5164485	RM658A1(X3)	G	0.782	403
B1390-35	5164485	RM658A1(X3)	H	0.942	359
B1390-37	5164487	RM713A1(X3)	A	0.775	404
B1390-37	5164487	RM713A1(X3)	B	0.966	354
B1390-37	5164487	RM713A1(X3)	C	0.467	482
B1390-37	5164487	RM713A1(X3)	D	0.511	469
B1390-37	5164487	RM713A1(X3)	E	0.831	389
B1390-37	5164487	RM713A1(X3)	F	0.345	517
B1390-37	5164487	RM713A1(X3)	G	0.891	373
B1390-37	5164487	RM713A1(X3)	H	0.364	510
B1390-39	5164491	RM730A1(X1)	A	0.445	487
B1390-39	5164491	RM730A1(X1)	B	0.959	356
B1390-39	5164491	RM730A1(X1)	C	0.092	573
B1390-39	5164491	RM730A1(X1)	D	0.363	511
B1390-39	5164491	RM730A1(X1)	E	0.772	406
B1390-39	5164491	RM730A1(X1)	F	0.16	563
B1390-39	5164491	RM730A1(X1)	G	0.808	398
B1390-39	5164491	RM730A1(X1)	H	0.897	372

Randomization chart for *Chironomid* tests initiated on 5/6/2005

Batch ID: B1390 1st Beaker Number: 345

Lab ID:	Field Samp	Station Location	Replic	Rando	test chamber
B1390-40	5164493	RM733A1(X1)	A	0.575	454
B1390-40	5164493	RM733A1(X1)	B	0.184	558
B1390-40	5164493	RM733A1(X1)	C	0.464	483
B1390-40	5164493	RM733A1(X1)	D	0.402	503
B1390-40	5164493	RM733A1(X1)	E	0.935	360
B1390-40	5164493	RM733A1(X1)	F	0.578	453
B1390-40	5164493	RM733A1(X1)	G	0.213	550
B1390-40	5164493	RM733A1(X1)	H	0.019	595
B1390-41	5164494	RM729A1(X1)	A	0.139	565
B1390-41	5164494	RM729A1(X1)	B	0.188	557
B1390-41	5164494	RM729A1(X1)	C	0.406	500
B1390-41	5164494	RM729A1(X1)	D	0.809	397
B1390-41	5164494	RM729A1(X1)	E	0.513	468
B1390-41	5164494	RM729A1(X1)	F	0.8	400
B1390-41	5164494	RM729A1(X1)	G	0.378	506
B1390-41	5164494	RM729A1(X1)	H	0.103	571
B1390-43	5164507	RM727A1(X1)	A	0.217	548
B1390-43	5164507	RM727A1(X1)	B	0.97	351
B1390-43	5164507	RM727A1(X1)	C	0.269	540
B1390-43	5164507	RM727A1(X1)	D	0.263	543
B1390-43	5164507	RM727A1(X1)	E	0.318	526
B1390-43	5164507	RM727A1(X1)	F	0.702	426
B1390-43	5164507	RM727A1(X1)	G	0.768	408
B1390-43	5164507	RM727A1(X1)	H	0.827	391
B1390-44	5174405	RM644A1(X3)	A	0.9	371
B1390-44	5174405	RM644A1(X3)	B	0.607	444
B1390-44	5174405	RM644A1(X3)	C	0.085	575
B1390-44	5174405	RM644A1(X3)	D	0.812	396
B1390-44	5174405	RM644A1(X3)	E	0.036	590
B1390-44	5174405	RM644A1(X3)	F	0.96	355
B1390-44	5174405	RM644A1(X3)	G	0.586	449
B1390-44	5174405	RM644A1(X3)	H	0.131	566

Randomization chart for *Chironomid* tests initiated on 5/6/2005

Batch ID: B1390 1st Beaker Number: 345

Lab ID:	Field Samp	Station Location	Replic	Rando	test chamber
B1390-45	5174406	RM637A1(X1)	A	0.855	384
B1390-45	5174406	RM637A1(X1)	B	0.637	434
B1390-45	5174406	RM637A1(X1)	C	0.172	560
B1390-45	5174406	RM637A1(X1)	D	0.086	574
B1390-45	5174406	RM637A1(X1)	E	0.617	442
B1390-45	5174406	RM637A1(X1)	F	0.044	587
B1390-45	5174406	RM637A1(X1)	G	0.771	407
B1390-45	5174406	RM637A1(X1)	H	0.623	439
B1390-46	5174407	RM634A1(X1)	A	0.934	361
B1390-46	5174407	RM634A1(X1)	B	0.096	572
B1390-46	5174407	RM634A1(X1)	C	0.297	534
B1390-46	5174407	RM634A1(X1)	D	0.269	539
B1390-46	5174407	RM634A1(X1)	E	0.028	592
B1390-46	5174407	RM634A1(X1)	F	0.359	513
B1390-46	5174407	RM634A1(X1)	G	0.063	579
B1390-46	5174407	RM634A1(X1)	H	0.578	452
B1390-47	5174408	RM642A1(X1)	A	0.111	570
B1390-47	5174408	RM642A1(X1)	B	0.719	423
B1390-47	5174408	RM642A1(X1)	C	0.428	494
B1390-47	5174408	RM642A1(X1)	D	0.73	419
B1390-47	5174408	RM642A1(X1)	E	0.523	465
B1390-47	5174408	RM642A1(X1)	F	0.369	508
B1390-47	5174408	RM642A1(X1)	G	0.467	481
B1390-47	5174408	RM642A1(X1)	H	0.353	515
B1390-48	5174409	RM605A1(X1)	A	0.743	416
B1390-48	5174409	RM605A1(X1)	B	0.854	385
B1390-48	5174409	RM605A1(X1)	C	0.56	457
B1390-48	5174409	RM605A1(X1)	D	0.732	418
B1390-48	5174409	RM605A1(X1)	E	0.618	441
B1390-48	5174409	RM605A1(X1)	F	0.069	577
B1390-48	5174409	RM605A1(X1)	G	0.063	578
B1390-48	5174409	RM605A1(X1)	H	0.756	412

Randomization chart for *Chironomid* tests initiated on 5/6/2005

Batch ID: B1390 1st Beaker Number: 345

Lab ID:	Field Samp	Station Location	Replic	Rando	test chamber
B1390-49	5174410	RM606A1(X3)	A	0.212	551
B1390-49	5174410	RM606A1(X3)	B	0.726	421
B1390-49	5174410	RM606A1(X3)	C	0.633	436
B1390-49	5174410	RM606A1(X3)	D	0.046	585
B1390-49	5174410	RM606A1(X3)	E	0.735	417
B1390-49	5174410	RM606A1(X3)	F	0.363	512
B1390-49	5174410	RM606A1(X3)	G	0.494	473
B1390-49	5174410	RM606A1(X3)	H	0.199	554
B1390-50	5174411	RM616A1(X3)	A	0.656	431
B1390-50	5174411	RM616A1(X3)	B	0.541	462
B1390-50	5174411	RM616A1(X3)	C	0.226	546
B1390-50	5174411	RM616A1(X3)	D	0.815	394
B1390-50	5174411	RM616A1(X3)	E	0.498	471
B1390-50	5174411	RM616A1(X3)	F	0.759	409
B1390-50	5174411	RM616A1(X3)	G	0.789	402
B1390-50	5174411	RM616A1(X3)	H	0.924	363
B1390-51	5174412	RM641A1(X1)	A	0.053	583
B1390-51	5174412	RM641A1(X1)	B	0.563	456
B1390-51	5174412	RM641A1(X1)	C	0.161	562
B1390-51	5174412	RM641A1(X1)	D	0.469	479
B1390-51	5174412	RM641A1(X1)	E	0.269	541
B1390-51	5174412	RM641A1(X1)	F	0.454	484
B1390-51	5174412	RM641A1(X1)	G	0.861	380
B1390-51	5174412	RM641A1(X1)	H	0.901	370
B1390-52	5174413	RM640A1(X3)	A	0.635	435
B1390-52	5174413	RM640A1(X3)	B	0.499	470
B1390-52	5174413	RM640A1(X3)	C	0.202	553
B1390-52	5174413	RM640A1(X3)	D	0.127	568
B1390-52	5174413	RM640A1(X3)	E	0.334	523
B1390-52	5174413	RM640A1(X3)	F	0.344	518
B1390-52	5174413	RM640A1(X3)	G	0.651	432
B1390-52	5174413	RM640A1(X3)	H	0.913	367

Randomization chart for *Chironomid* tests initiated on 5/6/2005

Batch ID: B1390 1st Beaker Number: 345

Lab ID:	Field Samp	Station Location	Replic	Rando	test chamber
B1390-53	5174415	RM628A1(X1)	A	0.219	547
B1390-53	5174415	RM628A1(X1)	B	0.977	349
B1390-53	5174415	RM628A1(X1)	C	0.551	458
B1390-53	5174415	RM628A1(X1)	D	0.277	536
B1390-53	5174415	RM628A1(X1)	E	0.575	455
B1390-53	5174415	RM628A1(X1)	F	0.593	446
B1390-53	5174415	RM628A1(X1)	G	0.043	588
B1390-53	5174415	RM628A1(X1)	H	0.27	538
B1390-54	5174423	RM603A1(X1)	A	0.195	555
B1390-54	5174423	RM603A1(X1)	B	0.489	474
B1390-54	5174423	RM603A1(X1)	C	0.329	525
B1390-54	5174423	RM603A1(X1)	D	7E-04	600
B1390-54	5174423	RM603A1(X1)	E	0.914	366
B1390-54	5174423	RM603A1(X1)	F	0.353	516
B1390-54	5174423	RM603A1(X1)	G	0.997	345
B1390-54	5174423	RM603A1(X1)	H	0.869	378
B1390-55	5174424	RM605A2(X8)	A	0.018	597
B1390-55	5174424	RM605A2(X8)	B	0.832	388
B1390-55	5174424	RM605A2(X8)	C	0.639	433
B1390-55	5174424	RM605A2(X8)	D	0.423	497
B1390-55	5174424	RM605A2(X8)	E	0.793	401
B1390-55	5174424	RM605A2(X8)	F	0.55	459
B1390-55	5174424	RM605A2(X8)	G	0.631	437
B1390-55	5174424	RM605A2(X8)	H	0.302	530
B1390-56	5174427	RM622A1(X3)	A	0.913	368
B1390-56	5174427	RM622A1(X3)	B	0.331	524
B1390-56	5174427	RM622A1(X3)	C	0.057	581
B1390-56	5174427	RM622A1(X3)	D	0.372	507
B1390-56	5174427	RM622A1(X3)	E	0.683	427
B1390-56	5174427	RM622A1(X3)	F	0.495	472
B1390-56	5174427	RM622A1(X3)	G	0.337	519
B1390-56	5174427	RM622A1(X3)	H	0.298	532

CH2M HILL

FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Client: Upper Columbia — Beginning, Date: 5-6-05 — Time: 1055

Sample Description: See Cross Reference Sheet batch Number B1390 — Ending, Date: 5-16-05 — Time: —

Test Species: Chironomus tentans

ID#: CHI 14

AM change: Tech. Day 0 BM/DW Day 1 MS Day 2 MS Day 3 BM Day 4 BM/MS Day 5 DW Day 6 DW Day 7 BM/DW Day 8 MS Day 9 MS Day 10 DW/MS

Time Day 0 1000 Day 1 0630 Day 2 0630 Day 3 0625 Day 4 0615 Day 5 0610 Day 6 0615 Day 7 0615 Day 8 0620 Day 9 0615 Day 10 0615

PM change: Tech. Day 0 BM/DW Day 1 BM Day 2 BM Day 3 MS/BM Day 4 MS Day 5 MS Day 6 BM Day 7 BM Day 8 RKW Day 9 RKW

Time Day 0 1720 Day 1 1235 Day 2 1245 Day 3 1780 Day 4 1800 Day 5 1745 Day 6 1745 Day 7 1745 Day 8 1800 Day 9 1611

Feeding: ✓ when done Day 0 ✓ Day 1 ✓ Day 2 ✓ Day 3 ✓ Day 4 ✓ Day 5 ✓ Day 6 ✓ Day 7 ✓ Day 8 ✓ Day 9 ✓

Beaker Number	Dissolved Oxygen (mg/l)											Temperature (°C)											pH		Conduetivity (µmohs/cm)	
	0	1	2	3	4	5	6	7	8	9	10	0	1	2	3	4	5	6	7	8	9	10	0	10	0	10
361	7.4	6.0	5.8	5.7	5.6	5.5	5.0	5.1	4.3	5.1	5.5	22.7	23.1	23.1	23.3	22.8	23.0	23.0	23.2	23.1	23.1	23.0	7.8	7.2	285	307
368	6.8	6.5	4.8	4.2	4.0	4.0	3.8	4.1	4.0	4.5	5.0	22.8	23.3	23.1	23.2	23.4	23.2	23.4	23.1	23.5	23.2	23.2	7.7	7.0	306	297
371	7.6	5.8	5.3	5.1	5.0	4.6	4.1	4.0	3.9	4.4	4.6	22.9	23.2	23.0	23.2	23.5	23.2	23.6	23.4	23.6	23.1	23.5	7.8	7.0	283	293
376	6.8	5.9	4.8	4.3	4.2	4.1	4.0	3.9	3.8	3.6	3.9	22.8	23.1	23.2	23.3	23.1	23.0	23.0	23.0	23.1	23.0	23.1	7.6	6.7	340	296
384	9.1	6.6	4.5	4.2	4.1	3.6	3.2	3.1	3.1	4.6	5.0	23.0	23.1	23.2	23.1	23.4	23.4	23.4	23.2	23.4	23.3	23.2	7.8	7.1	274	292
404	6.8	6.8	4.5	4.3	3.8	3.4	3.7	3.6	3.0	4.0	5.1	23.1	23.1	23.1	23.4	23.2	23.0	23.2	23.2	23.5	23.1	23.3	7.1	6.5	282	274
416	7.9	6.9	4.6	4.1	4.0	3.5	4.7	4.5	4.4	5.1	5.3	23.0	23.1	23.4	23.3	23.1	23.1	23.1	23.2	23.3	23.1	23.0	7.7	6.8	279	285
431	7.2	5.0	4.4	4.2	4.5	3.4	3.4	3.1	3.4	4.6	4.9	23.0	23.1	23.5	23.3	23.3	23.3	23.3	23.3	23.3	23.2	23.1	7.6	6.8	295	290
435	7.4	6.0	5.3	3.4	3.1	3.2	3.4	3.1	3.2	4.0	5.0	23.1	23.0	23.4	23.5	23.2	23.5	23.3	23.4	23.5	23.4	23.4	7.5	6.7	311	287
440	6.6	5.5	5.1	3.6	3.4	3.1	3.0	2.9	2.8	3.0	4.0	23.1	23.0	23.6	23.3	23.1	23.0	22.9	23.1	23.2	23.0	23.0	7.7	6.8	333 ~~324~~	331
443	6.7	4.9	4.0	3.7	3.5	3.3	3.7	3.4	3.2	3.6	4.1	23.1	23.1	23.5	23.4	23.2	23.1	23.2	23.1	23.3	23.2	23.0	7.6	6.7	329	284
454	6.8	5.3	4.1	3.7	3.6	3.1	3.3	3.6	2.9	5.8	5.4	23.1	23.3	23.5	23.2	23.0	23.0	23.1	23.2	23.4	23.3	23.0	7.4	6.8	309	300
463	6.6	5.5	4.2	4.1	3.7	3.0	3.4	3.5	~~23.5~~	3.9	4.3	23.1	23.1	23.4	23.4	23.3	23.4	23.5	23.5	23.5	23.4	23.4	7.2	6.5	282	284
467	6.2	5.3	4.2	3.0	2.9	3.0	3.1	2.5	2.5	2.7	3.3	23.1	23.1	23.5	23.5	23.1	23.1	22.9	23.0	23.3	23.2	23.0	7.2	6.5	301	286
478	7.9	5.9	5.3	4.5	4.2	3.1	2.8	2.2	4.0	5.2	4.1	23.0	23.1	~~23.5~~ 23.5	23.4	23.0	22.9	23.0	22.1	23.3	23.0	23.0	7.7	6.9	273	286
487	7.3	6.0	5.0	4.7	4.1	4.0	4.7	4.0	3.6	4.4	4.6	23.2	23.1	23.7	23.5	23.4	23.1	23.4	23.1	23.8	23.3	23.3	7.6	7.0	286	295
489	7.2	6.4	4.9	4.6	4.2	3.9	3.6	3.1	3.9	4.5	4.4	23.3	23.2	23.7	23.6	23.7	23.4	23.7	23.2	23.7	23.7	23.6	7.6	6.8	291	279
495	6.5	5.6	4.6	4.7	4.5	3.5	3.0	2.6	3.2	3.2	3.7	23.3	23.7	23.9	23.6	23.2	23.0	23.2	23.3	23.3	23.3	23.2	7.5	7.1	340	319

CH2M HILL

FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Client: Upper Columbia
Beginning, Date: 5-6-05 Time: 1055
Sample Description: See Cross Reference Sheet batch Number B1390
Ending, Date: 5-16-05 Time: —

Test Species: Chironomus tentans

ID#: CHI 14

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
AM change: Tech.	[illegible]	MS	MS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	JS	[illegible]/MS
AM change: Time	1055	0630	0630	0625	0615	0610	0615	0615	0620	0615	0615
PM change: Tech.	[illegible]	[illegible]	[illegible]	AAA/[illegible]	AAA	AAA	[illegible]	[illegible]	RKW	[illegible]	
PM change: Time	1720	1835	1845	1745	1800	1745	1745	1745	1800	1811	
Feeding: ✓ when done	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Beaker Number	Dissolved Oxygen (mg/l)											Temperature (°C)											pH		Conductivity (µmohs/cm)	
	0	1	2	3	4	5	6	7	8	9	10	0	1	2	3	4	5	6	7	8	9	10	0	10	0	10
501	8.3	7.0	4.7	4.0	3.1	3.0	4.3	2.9	2.8	5.1	4.6	23.4	23.3	23.9	23.5	23.4	23.4	23.3	23.3	23.7	23.2	23.4	7.8	7.1	274	283
528	6.7	5.8	4.5	3.3	2.9	3.0	3.1	2.7	2.7	3.4	3.6	23.3	23.4	~~23.3~~ 23.7 MS	23.6	23.6	23.5	23.4	23.4	23.6	23.4	23.7	7.5	7.4	327	323
542	6.4	6.0	5.2	4.6	3.2	3.1	2.8	2.4	3.0	3.6	3.7	23.5	23.2	~~23.3~~ 23.8	23.5	23.8	23.7	23.6	23.3	23.6	23.4	23.5	7.4	7.1	361	281
544	6.5	6.7	3.8	2.6	2.8	2.6	3.1	2.6	2.5	2.4	3.3	23.3	23.5	23.8	23.4	23.1	22.9	23.0	23.1	23.2	23.3	23.1	7.3	6.8	333	313
547	7.2	6.5	5.1	3.9	3.6	3.0	4.1	3.4	4.1	4.0	3.7	23.3	23.3	23.9	23.7	23.1	23.1	23.2	23.0	23.3	23.2	23.1	7.6	6.9	293	286
548	7.0	5.9	4.1	3.1	3.4	3.6	3.5	3.0	3.8	4.1	4.0	23.3	23.4	23.7	23.7	23.3	23.3	23.2	23.3	23.3	23.2	23.0	7.4	6.6	299	300
549	6.0	5.5	4.3	3.6	2.9	3.1	3.4	3.0	3.1	2.6	3.6	23.4	23.6	23.7	24.0	23.4	23.4	23.4	23.1	23.6	23.4	23.4	7.5	6.6	342	327
551	6.5	5.0	3.9	3.4	3.3	3.1	3.6	3.1	3.1	3.6	4.2	23.5	24.1	23.7	24.0	23.5	23.6	23.4	22.9	23.6	23.3	23.2	7.1	6.9	276	281
555	7.9	5.9	4.5	3.7	3.4	4.0	4.4	4.5	4.0	4.0	4.4	23.2	23.3	23.5	23.7	23.5	23.5	23.4	22.9	23.5	23.5	23.4	7.8	7.0	283	280
565	7.3	5.8	4.0	3.7	3.5	3.7	3.1	2.9	3.1	3.6	4.7	22.0	22.9	22.9	22.8	23.6	23.5	23.4	23.5	23.5	23.4	23.5	7.5	6.7	294	286
570	7.1	5.9	4.3	3.6	3.4	3.7	4.0	3.6	4.0	4.8	4.9	22.1	23.1	23.0	23.1	23.0	23.1	23.0	22.6	23.5	23.4	23.0	7.0	6.7	254	271
580	7.7	5.7	4.0	3.8	3.5	3.7	4.1	4.2	4.2	5.1	5.0	22.4	23.2	23.0	22.9	23.6	23.2	23.3	23.1	24.0	23.4	23.8	7.4	6.8	279	272
583	6.7	4.8	4.1	3.6	3.6	3.6	3.2	3.9	2.7	3.4	3.9	22.3	23.1	23.0	22.8	22.9	23.2	23.0	22.7	23.3	23.2	23.2	7.0	6.7	264	270
597	7.0	4.9	4.1	3.6	3.6	3.5	4.4	3.7	4.3	4.5	4.0	22.3	23.1	23.1	22.7	23.0	23.4	23.1	22.6	23.4	23.4	23.1	7.2	6.8	269	274

CH2M HILL FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Client: Upper Columbia
Beginning, Date: 5-6-05 Time: 1055
Sample Description: scc randomization sheet. Batch number: B1390
Ending, Date: 5-16-05 Time: 0830
Test Species: Chironomus tentans ID#: CHI 14

Test Initiation: Tech: EW/SM/SS/KS Time: 1055 Test Termination: Tech: MS Time: 0830

Beaker Number	Number of Live Organisms 0	10	Comments:
345	10	7	5 Tin / 2 emerging
346	10	7	
347	10	8	~~1 emerged~~ 5-15 / 7 Tin 1 emerged
348	10	~~9~~ 6 MS	
349	10	8	6 Tin / 2 Emerged
350	10	10	
351	10	10	7 Tin / 3 Emerged
352	10	7	5 Tin / 2 emerged
353	10	7	6 Tin / 1 emerging
354	10	~~6~~ 8 MS	~~1 emerged~~ 5-15 / 6/2 emerged 6 Tin
355	10	8	6 Tin / 2 emerged
356	10	9	5 Tin / 4 emerging
357	10	8	7 Tin / 1 emerged
358	10	10	
359	10	8	7 Tin / 1 emerged
360	10	6	~~1 emerged~~ 5-15 / 4 Tin / ~~6~~ 2 emerged MS
361	10	5	4 Tin / 1 emerged
362	10	9	7 Tin / 2 emerged

Beaker Number	Number of Live Organisms 0	10	Comments:
363	10	8	~~1 emerged 5-15~~ MS / 5 Tin 3 emerged
364	10	7	
365	10	9	7 Tin / 2 emerged
366	10	9	6 Tin / 3 emerged
367	10	7	4 Tin / 3 emerged
368	10	5	~~1 emerged 5-15~~ / 3 Tin / 2 emerged
369	10	8	7 Tin / 1 emerged
370	10	8	~~1 emerged 5-15~~ / 6 Tin / 2 emerged
371	10	3	2 Tin / 1 emerged
372	10	8	3 Tin / 5 emerged
373	10	~~8~~ 9 MS	7 Tin / ~~1~~ 2 emerged MS
374	10	7	3 Tin / 4 emerged
375	10	7	~~1 emerged 5-15~~ MS / 6 Tin / 1 emerged
376	10	10	
377	10	7	
378	10	7	
379	10	7	6 Tin / 1 emerge

CH2M HILL FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Client: Upper Columbia — Beginning, Date: 5-6-05 — Time: 1055

Sample Description: see randomization sheet. Batch number: B1390 — Ending, Date: 5-16-05 — Time:

Test Species: Chironomus tentans — ID#: CH1 14

Test Initiation: Tech: Bm/DW/JS/KS — Time: 1135 — Test Termination: Tech: Bm — Time: 1030

Beaker Number	Number of Live Organisms 0	10	Comments:
380	10	9	7 in tin, 2 emerging
381	10	9	8 in tin, 1 emerging
382	10	9	8 in tin, 1 emerging
383	10	7	4 in tin, 1 emerging, 2 emerged
384	10	8	6 in tin, 2 emerging
385	10	9	8 in tin, 1 emerging
386	10	7	
387	10	8	4 in tin, 4 emerged
388	10	8	~~removed 5-15 Bm~~ 5 in tin, 3 emerged
389	10	5	3 in tin, 2 emerged
390	10	10	9 in tin, 1 emerged
391	10	10	
392	10	9	~~1 removed, this process~~ 5-15 Bm 6 in tin, 3 emerged
393	10	9	3 in tin, 6 emerged
394	10	7	~~removed 5-15 Bm~~ Bm 4 in tin, 3 emerged
395	10	5	5 in tin
396	10	8	
397	10	9	~~2 emerged 5-15 Bm~~ 5 in tin, 4 emerged

Beaker Number	Number of Live Organisms 0	10	Comments:
398	10	8	6 in tin, 2 emerged ~~removed 5-15 Bm~~
399	10	10	7 in tin, 3 emerged
400	10	10	7 in tin, 3 emerged
401	10	10	9 in tin, 1 emerged
402	10	10	9 in tin, 1 emerged
403	10	7	5 in tin, 2 emerged
404	10	9	8 in tin, 1 emerged
405	10	7	6 in tin, 1 emerged
406	10	9	7 in tin, 2 emerged
407	10	8	7 in tin, 1 emerged
408	10	8	5 in tin, 3 emerged
409	10	8	~~removed 5-15 Bm~~ Bm 5 in tin, 3 emerged
410	10	7	1 emerged 5-15 Bm 6 in tin
411	10	8	~~removed 5-15 Bm~~ Bm 5 in tin, 3 emerged
412	10	9	~~1 emerged 5-15 Bm~~ Bm 6 in tin, 3 emerged
413	10	9	8 in tin, 1 emerged
414	10	8	7 in tin, 1 emerged

* previous emerged chironomid notations are included in final number recorded 5-16-05 Bm

CH2MHILL **FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA**

C ent Upper Columbia Beginning, Date 5-6-05 Time 1055

S ple Description see randomization sheet. Batch number: B1390 Ending, Date 5-16-05 Time 1115

Test Species: Chironomus tentans ID#: CHI 14

T t Initiation: Tech: DW/AW/JS/KS Time: 1210 Test Termination: Tech: DW Time: 1115

Beaker Number	Number of Live Organisms 0	10	Comments:
415	10	8	5 in tin / 3 emerged
416	10	9	7 in tin / 2 emerged
417	10	9	~~1 emerged 5-15 Br~~ DW 7 in tin / 2 emerged
418	10	MS 9/10	~~1 emerged 5-15 Br DW~~ 9 in tin / 1 emerged
419	10	10	7 in tin / 3 emerged
420	10	8	4 in tin / 4 emerged
421	10	10	~~1 emerged 5-15 Br~~ DW 9 in tin / 1 emerged
422	10	7	~~1 emerged 5-15 Br~~ DW 3 in tin / 4 emerged
423	10	8	~~1 emerged 5-15 Br~~ DW 6 in tin / 2 emerged
424	10	10	8 in tin / 2 emerged
425	10	7	4 in tin / 3 emerged
426	10	10	7 in tin / 3 emerged
427	10	9	~~1 emerged 5-15 Br~~ DW 4 in tin / 5 emerged
428	10	8	4 in tin / 4 emerged
429	10	10	8 in tin / 2 emerged
430	10	9	7 in tin / 2 emerged
431	10	9	6 in tin / 3 emerged
432	10	7	3 in tin / 4 emerged

Beaker Number	Number of Live Organisms 0	10	Comments:
433	10	7	~~1 emerged 5-0~~ DW 4 in tin / 3 emerged
434	10	9	5 in tin / 4 emerged
435	10	8	5 in tin / 3 emerged
436	10	8	~~1 emerged 5-15 Br~~ DW 4 in tin / 4 emerged
437	10	8	6 in tin / 2 emerged
438	10	DW 6/8	3 emerged 5-15 Br 5 in tin / 3 emerged
439	10	7	6 in tin / 1 emerged
440	10	DW 8/7	DW 6 in tin / 2 emerged
441	10	DW 6/5	5/6 in tin
442	10	8	5 in tin / 3 emerged
443	10	DW 8/10	1 emerged + 1 in process of emerging 5-15 Br removed 5 in tin / 5 ~~to~~ emerge
444	10	5	~~1 emerged 5-15 Br~~ DW 2 in tin / 3 emerged
445	10	10	7 in tin / 3 emerged
446	10	8	5 in tin / 3 emerged
447	10	8	1 dead Chiro on bottom 5-15-05 7 in tin / 1 emerged
448	10	7	4 in tin / 3 emerged
449	10	9	7 in tin / 2 emerged

CH2M HILL FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

C nt Upper Columbia — Beginning, Date 5-6-05 Time 1055

S ple Description see randomization sheet. Batch number: B1390 — Ending, Date 5-16-05 Time 1100

Test Species: Chironomus tentans — ID#: CHI 14

T t Initiation: Tech: BW/DW/SS/KS Time: 1235 — Test Termination: Tech: MS Time: 1100

Beaker Number	Number of Live Organisms 0	10	Comments:
450	10	7 (6 MS)	~~1 emerged 5-15 BR~~ ✓MS 4 Tin / 3 emerged
451	10	11	Removed worm from test ~~1 emerged 5-15~~ 10 Tin / 1 emerged
452	10	8	2 Tin / 6 emerged
453	10	10	7 Tin / 3 emerged
454	10	9	7 Tin / 2 emerged
455	10	MS 9/10	6 MS 8 Tin / 4 emerged
456	10	6	~~1 emerged 5-15 BR~~ 4 Tin / 2 emerged
457	10	6	4 Tin / 2 emerged
458	10	9	4 Tin / 5 emerged
459	10	8	6 Tin / 2 emerged
460	10	8	4 Tin / 4 emerged
461	10	10	~~1 emerged 5-15 BR~~ ✓MS 2 Tin / 8 emerged
462	10	6 (6 MS)	~~0 emerged 5-15 BR~~ ✓MS 4 Tin / 4 emerged 1 small nematode not counted
463	10	5	3 Tin / 2 emerged
464	10	9	5 Tin / 4 emerged
465	10	4	
466	10	5	4 Tin / 1 emerged
467	10	6	4 Tin / 2 emerged
468	10	8	5 Tin / ~~8~~ 3 MS emerged
469	10	4	
470	10	2	2 emerged
471	10	9	1 Tin / ~~9~~ 8 emerging
472	10	7	5 Tin / 2 emerging
473	10	4	1 Tin / 3 emerged
474	10	7	~~1 emerged 5-15 BR~~ ✓MS 4 Tin / 3 emerged
475	10	8	6 Tin / 2 emerged
476	10	8	
477	10	8	6 Tin / 2 emerged
478	10	9	5 Tin / 4 emerging
479	10	10	3 Tin / 7 emerged
480	10	7	6 Tin / 1 emerged
481	10	7	4 Tin / 3 emerged
482	10	7	~~1 emerged 5-15 BR~~ ✓MS 6 Tin / 1 emerged
483	10	8	~~1 emerged 5-15 BR~~ ✓MS 4 Tin / 4 emerged
484	10	10	7 Tin / 3 emerge

* START COUNT IN 451 increased to 11 BR

CH2M HILL **FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA**

C nt Upper Columbia — Beginning, Date 5-6-05 Time 1055

S ple Description see randomization sheet. Batch number: B1390 — Ending, Date 5-16-05 Time 1300

Test Species: Chironomus tentans — ID#: CHI 14

T Initiation: Tech: BM/AW/SS/KS Time: 1250 — Test Termination: Tech: BM Time: 1300

Beaker Number	Number of Live Organisms 0	10	Comments:
485	10	3	
486	10	8	6 in tin, 2 emerged
487	10	5	4 in tin, 1 emerged
488	10	7	2 emerged 5-15 BM 5 in tin
489	10	8	1 emerged 5-15 BM 7 in tin
490	10	8	~~1 emerged 5-15 BM~~ BM 2 in tin, 6 emerged
491	10	~~9~~ 8	~~7~~ 8 in tin, 1 emerged
492	10	9	
493	10	9	6 in tin, 3 emerged
494	10	1	
495	10	8	~~1 emerged 5-15 BM~~ BM 5 in tin, 3 emerged
496	10	6	5 in tin, 1 emerged
497	10	7	~~1 emerged 5-15~~ BM 4 in tin, 3 emerged
498	10	9	~~1 emerged 5-15~~ BM 6 in tin, 3 emerged
499	10	8	6 in tin, 2 emerged
500	10	9	5 in tin, 4 emerged
501	10	8	4 in tin, 4 emerged
502	10	9	~~1 emerged 5-15 BM~~ BM 5 in tin, 4 emerged

Beaker Number	Number of Live Organisms 0	10	Comments:
503	10	8	~~1 emerged 5-15 BM~~ BM 5 in tin, 3 emerged
504	10	7	6 in tin, 1 emerged
505	10	7	5 in tin, 2 emerged
506	10	10	~~1 emerged 5-15 BM~~ BM 4 in tin, 6 emerged
507	10	8	~~1 emerged 5-15 BM~~ BM 7 in tin, 1 emerged
508	10	6	2 emerged 5-15 BM 4 in tin
509	10	7	~~1 emerged 5-15 BM~~ BM 4 in tin, 3 emerged
510	10	8	5 in tin, 3 emerged
511	10	9	8 in tin, 1 emerged
512	10	9	4 in tin, 5 emerged
513	10	7	4 in tin, 3 emerged
514	10	8	
515	10	7	
516	10	6	6 in tin, 1 dead body found
517	10	10	~~1 emerged 5-15 BM~~ BM 8 in tin, 2 emerged
518	10	3	2 in tin, 1 emerged
519	10	9	7 in tin, 2 emerged

CH2M HILL **FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA**

ient Upper Columbia — Beginning, Date 5-6-05 — Time 1055

mple Description see randomization sheet. Batch number: B1390 — Ending, Date 5-16-05 — Time 1410

Test Species: Chironomus tentans — ID#: CH1 14

st Initiation: Tech: BW/AW/JS/KS — Time: 1320 — Test Termination: Tech: DW — Time: 1410

Beaker Number	Number of Live Organisms 0	10	Comments:
520	10	9	7 in tin / 2 emerged 1 worm (~4°) removed 5-7 pm BW
521	10	8	8 in tin
522	10	8	~~1 emerged 5-15 BW~~ 6 in tin / 2 emerged DW
523	10	8	5 in tin / 3 emerged
524	10	8	~~3 emerged 5-15 BW~~ 5 in tin / 3 emerged DW
525	10	7	~~1 emerged 5-15 BW~~ 5 in tin / 2 emerged DW
526	10	10	~~1 emerged 5-15 BW~~ 8 in tin / 2 emerged DW
527	10	9	None emerged - DW 1 worm (~4 inches) removed 5-7 pm BW
528	10	8	8 in tin
529	10	10	6 in tin / 4 emerged
530	10	9	8 in tin / 1 emerged
531	10	10	8 in tin / 2 emerged 1 exuvia (hatch) 5/14/05 KS
532	10	9	6 in tin / 3 emerged
533	10	10	~~1 emerged 5-15 BW~~ 7 in tin / 3 emerged DW 1 hatch 5/14/05 KS
534	10	10	8 in tin / 2 emerged
535	10	10	9 in tin / 1 emerged
536	10	8	6 in tin / 2 emerged
537	10	10	10 in tin

Beaker Number	Number of Live Organisms 0	10	Comments:
538	10	10	~~2 emerged 5-15 BW~~ 7 in tin / 3 emerged DW
539	10	8	6 in tin / 2 emerged
540	10	10	7 in tin / 3 emerged
541	10	10	7 in tin / 3 emerged
542	10	9	~~1 emerged 5-15 BW~~ 6 in tin / 3 emerged DW
543	10	9	9 in tin
544	10	8	1 emerged 5-15 BW 5 in tin / 3 emerged
545	10	9	1 emerged 5-15 BW 4 in tin / 5 emerged
546	10	8	1 emerged 5-15 BW 5 in tin / 3 emerged
547	10	10	7 in tin / 3 emerged
548	10	7	3 in tin / 4 emerged
549	10	7	5 in tin / 2 emerged
550	10	8	5 in tin / 3 emerged
551	10	8	7 in tin / 1 emerged
552	10	8	8 in tin
553	10	8	3 in tin / 5 emerged
554	10	8	~~1 emerged 5-15 BW~~ 6 in tin / 2 emerged DW

CH2M HILL **FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA**

Client: Upper Columbia — Beginning, Date: 5-6-05 — Time: 1055

Sample Description: see randomization sheet. Batch number: B1390 — Ending, Date: 5-16-05 — Time: 1230

Test Species: Chironomus tentans — ID#: CHI 14

Test Initiation: Tech: BM/DW/JS/KS — Time: 1335 — Test Termination: Tech: KS/BM/JS/DW — Time: 1230

Beaker Number	Number of Live Organisms 0	10	Comments:
555	10	8	2 emerged / 6 in tin
556	10	6 KS	6 in tin
557	10	KS BM 8 9	24 emerged 5-15 BM / 7 in tin
558	10	10	10 in tins
559	10	10	9 in tin / 1 emerged
560	10	9	9 in tin
561	10	6	1 emerged 5-15 BM 5 in tin
562	10	7	4 in tin / 3 emerged
563	10	8	7 in tin / 1 emerged
564	10	6	5 in tin / 1 emerged
565	10	8	7 in tin / 1 emergence
566	10	8	6 in tin / 2 emerged
567	10	8	7 in tin / 1 emerged
568	10	5	4 in tin / 1 emerged
569	10	11	8 in cup / 3 emerged
570	10	10	6 in tins / 4 emerged
571	10	9	5 in tin / 4 emerged
572	10	9	6 in tin / 3 emerged

Beaker Number	Number of Live Organisms 0	10	Comments:
573	10	10	8 in tin / 2 emerged
574	10	6	4 in tin / 2 emerged
575	10	5	4 in tin / 1 emerged
576	10	12	9 in tin / 3 emerged
577	10	7	7 in tin
578	10	7	3 emerged 5-15 BM 4 in tin
579	10	8	6 in tin / 2 emerged
580	10	7	6 in tin / 1 emerged
581	10	7	3 in tin / 4 emerged
582	10	9	7 in tin / 2 emerged
583	10	9	7 in tin, 2 emerged
584	10	8	~~4 emerged 5-15 BM~~ 6 in tin, 2 emerged
585	10	2	0 in tin, 2 emerged
586	10	5	
587	10	7	5 in tin, 2 emerged
588	10	7	
589	10	10	

* START COUNT IN 569 increased to 11. BM

* START COUNT IN 576 increased to 12. BM

CH2M HILL **FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA**

(ent Upper Columbia — Beginning, Date 5-6-05 Time 1055

: nple Description see randomization sheet. Bateh number: B1390 — Ending, Date 5-16-05 Time 1355

Test Species: Chironomus tentans ID#: CHI 14

' st Initiation: Tech: BM/DW/SJ/KS Time: 1355 — Test Termination: Tech: BM Time: 1355

eaker Number	Number of Live Organisms 0	10	Comments:
590	10	10	
591	10	9	
592	10	9	7 in tin, 2 emerged
593	10	10	9 in tin, 1 emerged
594	10	9	6 in tin, 3 emerged
595	10	8	6 in tin, 2 emerged
596	10	8	7 in tin, 1 emerged
597	10	8	7 in tin, 1 emerged
598	10	10	1 emerged 5-15 9 in tin
599	10	6	
600	10	6	

Beaker Number	Number of Live Organisms 0	10	Comments:

5-11-05 #593 had Low Water Volume (≈180 mL mark) Before change out AM (P.M. out)

Chironomid GROWTH (ASH FREE DRY WEIGHT) DATA

Client: Upper Columbia Species ID#: CHI 14

ID: see randomization sheet batch number: B1390 Start Date: 04/29/2005

Sample Description:

Technician:	BM	BM	BM
Date:	04/19/2005	05/20/2005	05/21/2005

Tin ID Number	Tare Weight (mg) (after 550°C for 2 hr)	Dry Weight (mg) (after 60°C for 24 hr)	Ash Weight (mg) (after 550°C for 2 hr)	Ash Free Dry Weight (mg) (Dry - Ash Wt.)	No. of Chironomids in Tin	No. of Chironomids surviving
345	69.50	87.35	75.81	11.54	5	7
346	69.90	90.24	76.07	14.17	7	7
347	69.96	95.67	77.06	18.61	7	8
348	69.88	89.43	74.05	15.38	8	8
349	69.46	90.19	75.85	14.34	6	8
350	70.07	88.14	73.25	14.89	10	10

Weigh to 0.01 mg

Chironomid GROWTH (ASH FREE DRY WEIGHT) DATA

Client: Upper Columbia — Species ID# CHI 14

Test ID: see randomization sheet — batch number: B1390 — Start Date: 05/06/2005

Sample Description:

Technician:	BM	BM	BM
Date:	04/18/2005	05/20/2005	05/21/2005

Tin ID Number	Tare Weight (mg) (after 550°C for 2 hr)	Dry Weight (mg) (after 60°C for 24 hr)	Ash Weight (mg) (after 550°C for 2 hr)	Ash Free Dry Weight (mg) (Dry - Ash Wt.)	No. of Chironomids in Tin	No. of Chironomids surviving
351	69.98	87.87	75.69	12.18	7	10
352	70.19	83.39	73.18	10.21	5	7
353	69.91	86.27	73.87	12.40	6	7
354	69.78	81.88	72.26	9.62	6	8
355	70.02	88.81	77.72	11.09	6	8
356	70.09	83.55	72.87	10.68	5	9
357	69.79	88.27	77.11	11.16	7	8
358	69.85	92.12	74.44	17.68	10	10
359	69.35	89.99	77.39	12.60	7	8
360	69.38	81.58	72.99	8.59	4	6
361	69.46	83.78	74.03	9.75	4	5
362	69.88	88.79	73.63	15.16	7	9
363	69.81	85.80	75.62	10.18	5	8
364	69.71	96.09	80.93	15.16	7	7
365	69.85	89.99	78.19	11.80	7	9
366	69.76	86.05	75.47	10.58	6	9
367	69.61	79.75	72.84	6.91	4	7
368	69.79	81.32	74.18	7.14	3	5
369	69.03	89.09	74.45	14.64	7	8
370	69.71	89.48	76.89	12.59	6	8
371	69.68	76.01	70.98	5.03	2	3
372	69.80	77.45	71.26	6.19	3	8
373	68.80	84.36	71.88	12.48	7	9
374	69.43	75.67	70.29	5.38	3	7
375	69.52	86.33	71.94	14.39	6	7
376	69.72	91.58	74.48	17.10	10	10
377	69.82	85.79	71.24	14.55	7	7
378	69.89	88.31	75.59	12.72	7	7
379	69.90	83.58	72.41	11.17	6	7
380	69.80	86.31	75.01	11.30	7	9
381	71.02	88.25	75.46	12.79	8	9
382	69.89	84.24	73.67	10.57	8	9
383	69.90	81.09	71.63	9.46	4	7
384	69.75	82.63	72.43	10.20	6	8
385	69.63	86.47	72.58	13.89	8	9

Chironomid GROWTH (ASH FREE DRY WEIGHT) DATA

Client: Upper Columbia — Species ID#: CHI 14

L. ID: see randomization sheet — batch number: B1390 — Start Date: 05/06/2005

Sample Description:

Technician:	BM	BM	BM
Date:	04/18/2005	05/20/2005	05/21/2005

Tin ID Number	Tare Weight (mg) (after 550°C for 2 hr)	Dry Weight (mg) (after 60°C for 24 hr)	Ash Weight (mg) (after 550°C for 2 hr)	Ash Free Dry Weight (mg) (Dry - Ash Wt.)	No. of Chironomids in Tin	No. of Chironomids surviving
386	62.55	79.72	65.32	14.40	7	7
387	69.54	80.54	71.89	8.65	4	8
388	69.92	85.27	75.43	9.84	5	8
389	69.85	84.05	73.75	10.30	3	5
390	70.01	91.24	74.38	16.86	9	10
391	69.17	96.11	76.44	19.67	10	10
392	69.41	88.56	75.86	12.70	6	9
393	69.68	77.83	71.53	6.30	3	9
394	69.37	81.34	72.98	8.36	4	7
395	69.64	81.65	72.27	9.38	5	5
396	69.19	88.69	75.61	13.08	8	8
397	69.87	83.93	73.47	10.46	5	9
398	69.98	84.91	72.74	12.17	6	8
399	69.41	85.02	72.18	12.84	7	10
400	69.70	91.23	76.37	14.86	7	10
401	69.85	93.43	78.86	14.57	9	10
402	69.73	95.65	79.36	16.29	9	10
403	69.37	88.37	75.61	12.76	5	7
404	68.70	84.29	73.63	10.66	8	9
405	68.74	81.96	71.38	10.58	6	7
406	69.91	88.83	76.28	12.55	7	9
407	69.43	85.93	74.41	11.52	7	8
408	70.11	85.64	75.87	9.77	5	8
409	69.87	83.81	74.80	9.01	5	8
410	69.96	89.21	75.75	13.46	6	7
411	70.03	82.78	74.08	8.70	5	8
412	69.48	78.13	71.66	6.47	6	9
413	73.29	97.02	79.49	17.53	8	9
414	69.95	83.35	73.02	10.33	7	8
415	74.23	92.85	79.41	13.44	5	8
416	69.04	82.62	70.67	11.95	7	9
417	69.54	89.50	77.62	11.88	7	9
418	69.93	86.07	73.42	12.65	9	10
419	69.69	87.41	75.73	11.68	7	10
420	69.28	77.63	70.10	7.53	4	8

Chironomid GROWTH (ASH FREE DRY WEIGHT) DATA

Client: Upper Columbia Species ID# CHI 14

Test ID: see randomization sheet batch number: B1390 Start Date 05/06/2005

Sample Description:

Technician:	BM	BM	BM
Date:	04/27/2005	05/20/2005	05/21/2005

Tin ID Number	Tare Weight (mg) (after 550°C for 2 hr)	Dry Weight (mg) (after 60°C for 24 hr)	Ash Weight (mg) (after 550°C for 2 hr)	Ash Free Dry Weight (mg) (Dry - Ash Wt.)	No. of Chironomids in Tin	No. of Chironomids surviving
421	69.14	88.43	75.42	13.01	9	10
422	69.64	79.89	72.22	7.67	3	7
423	69.26	85.60	73.76	11.84	6	8
424	69.73	90.21	74.24	15.97	8	10
425	69.77	80.32	71.80	8.52	4	7
426	69.21	84.10	73.09	11.01	7	10
427	69.18	77.88	71.90	5.98	4	9
428	69.40	81.64	73.92	7.72	4	8
429	69.18	91.83	75.04	16.79	8	10
430	69.54	82.70	70.82	11.88	7	9
431	69.25	86.44	74.41	12.03	6	9
432	69.16	77.29	70.65	6.64	3	7
433	68.91	79.46	70.90	8.56	4	7
434	68.74	83.59	70.86	12.73	5	9
435	69.63	85.29	73.48	11.81	5	8
436	68.51	84.43	72.37	12.06	4	8
437	69.40	85.22	73.92	11.30	6	8
438	69.12	81.60	71.77	9.83	5	8
439	69.27	81.91	71.51	10.40	6	7
440	69.35	87.40	72.09	15.31	7	9
441	69.06	83.68	70.81	12.87	5	5
442	69.12	82.96	73.02	9.94	5	8
443	69.21	84.07	72.48	11.59	5	10
444	69.17	77.61	72.23	5.38	2	5
445	68.94	83.93	71.25	12.68	7	10
446	70.21	85.33	73.53	11.80	5	8
447	68.88	86.81	75.14	11.67	7	8
448	69.24	78.53	72.54	5.99	4	7
449	69.25	82.81	73.99	8.82	7	9
450	69.46	82.00	73.16	8.84	4	7
451	69.29	90.75	72.53	18.22	10	11
452	69.06	77.20	71.14	6.06	2	8
453	69.22	85.46	73.11	12.35	7	10
454	69.57	83.75	72.57	11.18	7	9
455	69.41	81.55	72.20	9.35	6	10

Chironomid GROWTH (ASH FREE DRY WEIGHT) DATA

Client: Upper Columbia — Species ID#: CHI 14

Lab ID: see randomization sheet — batch number: B1390 — Start Date: 05/06/2005

Sample Description:

Technician:	BM	BM	BM
Date:	04/20/2005	05/20/2005	05/21/2005

Tin ID Number	Tare Weight (mg) (after 550°C for 2 hr)	Dry Weight (mg) (after 60°C for 24 hr)	Ash Weight (mg) (after 550°C for 2 hr)	Ash Free Dry Weight (mg) (Dry - Ash Wt.)	No. of Chironomids in Tin	No. of Chironomids surviving
456	69.34	81.83	71.73	10.10	4	6
457	68.91	82.42	69.78	12.64	4	6
458	69.44	79.10	72.23	6.87	4	9
459	69.19	83.26	72.75	10.51	6	8
460	69.22	80.91	71.43	9.48	4	8
461	68.82	71.99	69.60	2.39	2	10
462	69.34	79.03	72.74	6.29	4	8
463	68.94	79.13	70.62	8.51	3	5
464	69.54	80.36	71.43	8.93	5	9
465	69.32	81.38	71.80	9.58	4	4
466	69.36	81.28	71.81	9.47	4	5
467	69.61	81.02	71.74	9.28	4	6
468	69.97	83.10	73.86	9.24	5	8
469	69.33	82.38	72.35	10.03	4	4
470	69.33	69.34	69.32	0.02	0	2
471	69.64	73.97	69.84	4.13	1	9
472	69.48	82.16	73.59	8.57	5	7
473	69.23	74.68	70.99	3.69	1	4
474	69.48	81.14	72.90	8.24	4	7
475	69.48	88.79	75.43	13.36	6	8
476	69.23	83.72	71.91	11.81	8	8
477	69.48	83.52	72.55	10.97	6	8
478	69.39	78.23	70.71	7.52	5	9
479	69.47	76.82	71.35	5.47	3	10
480	69.01	76.42	69.55	6.87	6	7
481	69.62	79.99	72.59	7.40	4	7
482	69.58	89.39	74.37	15.02	6	7
483	69.45	80.91	72.73	8.18	4	8
484	69.11	86.51	74.79	11.72	7	10
485	69.40	85.71	71.98	13.73	8	8
486	68.37	83.30	71.81	11.49	6	8
487	69.86	80.12	71.05	9.07	4	5
488	69.76	86.95	74.63	12.32	5	7
489	69.73	84.53	75.60	8.93	7	8
490	69.90	73.92	70.36	3.56	2	8

Chironomid GROWTH (ASH FREE DRY WEIGHT) DATA

Client: Upper Columbia — Species ID#: CHI 14

ID: see randomization sheet — batch number: B1390 — Start Date: 05/06/2005

Sample Description:

Technician:	BM	BM	BM
Date:	04/27/2005	05/20/2005	05/21/2005

Tin ID Number	Tare Weight (mg) (after 550°C for 2 hr)	Dry Weight (mg) (after 60°C for 24 hr)	Ash Weight (mg) (after 550°C for 2 hr)	Ash Free Dry Weight (mg) (Dry - Ash Wt.)	No. of Chironomids in Tin	No. of Chironomids surviving
491	68.44	89.41	74.52	14.89	7	8
492	69.72	81.01	71.18	9.83	9	9
493	69.24	85.54	73.91	11.63	6	9
494	69.52	71.90	69.69	2.21	1	1
495	69.03	83.10	71.82	11.28	5	8
496	69.63	83.88	74.25	9.63	5	6
497	69.69	81.47	72.56	8.91	4	7
498	69.26	84.74	71.75	12.99	6	9
499	75.56	95.26	81.62	13.64	6	8
500	69.73	82.30	73.12	9.18	5	9
501	69.87	77.35	70.44	6.91	4	8
502	69.49	82.04	72.33	9.71	5	9
503	68.98	79.27	72.18	7.09	5	8
504	69.84	86.30	72.45	13.85	6	7
505	69.71	84.69	72.85	11.84	5	7
506	69.54	80.74	71.55	9.19	4	10
507	69.58	88.08	74.67	13.41	7	8
508	69.26	81.60	73.54	8.06	4	6
509	69.28	77.94	70.78	7.16	4	7
510	68.70	87.59	73.79	13.80	5	8
511	69.74	92.59	75.70	16.89	8	9
512	69.13	80.07	73.01	7.06	4	9
513	69.28	83.70	74.21	9.49	4	7
514	69.77	91.19	78.26	12.93	8	8
515	69.56	90.32	75.43	14.89	7	7
516	69.55	88.55	75.88	12.67	6	6
517	69.92	92.38	77.18	15.20	8	10
518	69.09	74.98	69.87	5.11	2	3
519	69.89	91.27	77.34	13.93	7	9
520	69.64	87.40	73.25	14.15	7	9
521	69.47	93.26	74.10	19.16	8	8
522	69.00	85.62	71.75	13.87	6	8
523	69.92	85.64	72.74	12.90	5	8
524	69.67	83.76	74.75	9.01	5	8
525	69.60	81.20	73.64	7.56	5	7

Chironomid GROWTH (ASH FREE DRY WEIGHT) DATA

Client: Upper Columbia — Species ID#: CHI 14

ID: see randomization sheet — batch number: B1390 — Start Date: 05/06/2005

Sample Description:

Technician:	BM	BM	BM
Date:	04/19/2005	05/20/2005	05/21/2005

Tin ID Number	Tare Weight (mg) (after 550°C for 2 hr)	Dry Weight (mg) (after 60°C for 24 hr)	Ash Weight (mg) (after 550°C for 2 hr)	Ash Free Dry Weight (mg) (Dry - Ash Wt.)	No. of Chironomids in Tin	No. of Chironomids surviving
526	68.94	90.86	76.10	14.76	8	10
527	69.06	88.14	73.29	14.85	9	9
528	69.28	91.53	72.64	18.89	8	8
529	69.50	83.91	71.73	12.18	6	10
530	69.30	90.31	77.57	12.74	8	9
531	69.59	88.44	74.13	14.31	8	10
532	69.32	83.30	73.05	10.25	6	9
533	69.24	82.66	72.47	10.19	7	10
534	69.49	85.48	74.32	11.16	8	10
535	69.53	90.30	78.88	11.42	9	10
536	69.33	86.74	75.66	11.08	6	8
537	69.49	91.39	74.07	17.32	10	10
538	69.02	82.01	72.90	9.11	7	10
539	69.36	84.96	75.31	9.65	6	8
540	69.71	84.67	74.83	9.84	7	10
541	69.11	87.75	75.91	11.84	7	10
542	69.47	84.35	72.64	11.71	6	9
543	69.17	92.83	76.44	16.39	9	9
544	69.23	81.01	72.72	8.29	5	8
545	69.52	82.13	73.49	8.64	4	9
546	69.53	85.77	74.27	11.50	5	8
547	69.12	85.10	72.95	12.15	7	10
548	69.56	75.87	71.11	4.76	3	7
549	69.58	81.46	71.81	9.65	5	7
550	69.49	81.12	72.37	8.75	5	8
551	68.71	85.58	74.46	11.12	7	8
552	69.53	90.53	75.08	15.45	8	8
553	69.30	83.99	73.49	10.50	3	8
554	68.77	77.85	71.25	6.60	6	8
555	69.15	85.37	74.12	11.25	6	8
556	69.59	88.19	74.03	14.16	6	6
557	69.34	87.63	73.34	14.29	7	9
558	69.02	91.04	75.31	15.73	10	10
559	75.19	92.95	77.96	14.99	9	10
560	69.23	83.78	72.80	10.98	9	9

Chironomid GROWTH (ASH FREE DRY WEIGHT) DATA

Client: Upper Columbia — Species ID# CHI 14

Lab ID: see randomization sheet — batch number: B1390 — Start Date: 05/06/2005

Sample Description:

Technician:	BM	BM	BM
Date:	04/27/2005	05/20/2005	05/21/2005

Tin ID Number	Tare Weight (mg) (after 550°C for 2 hr)	Dry Weight (mg) (after 60°C for 24 hr)	Ash Weight (mg) (after 550°C for 2 hr)	Ash Free Dry Weight (mg) (Dry - Ash Wt.)	No. of Chironomids in Tin	No. of Chironomids surviving
561	69.34	80.32	70.78	9.54	5	6
562	69.22	79.68	71.54	8.14	4	7
563	68.75	85.19	72.72	12.47	7	8
564	68.84	78.07	70.05	8.02	5	6
565	69.31	88.26	71.94	16.32	7	8
566	68.94	81.24	71.67	9.57	6	8
567	69.40	87.53	74.18	13.35	7	8
568	68.43	80.59	69.91	10.68	4	5
569	68.79	86.56	72.81	13.75	8	11
570	69.55	84.51	75.23	9.28	6	10
571	73.54	83.22	75.74	7.48	5	9
572	68.97	81.68	71.68	10.00	6	9
573	68.78	85.01	72.71	12.30	8	10
574	69.28	77.80	70.50	7.30	4	6
575	69.67	80.50	72.54	7.96	4	5
576	69.51	87.41	74.31	13.10	9	12
577	69.26	83.07	72.65	10.42	7	7
578	68.85	75.06	69.73	5.33	4	7
579	69.07	83.27	75.10	8.17	6	8
580	68.93	82.79	73.32	9.47	6	7
581	69.83	76.97	72.31	4.66	3	7
582	69.43	85.10	71.59	13.51	7	9
583	69.20	87.84	74.13	13.71	7	9
584	69.36	78.32	70.44	7.88	6	8
585	69.91	69.89	69.89	0.00	0	2
586	71.40	80.47	72.30	8.17	5	5
587	71.86	82.99	74.67	8.32	5	7
588	68.67	91.24	73.77	17.47	7	7
589	68.81	87.53	74.16	13.37	10	10
590	68.23	84.57	74.29	10.28	10	10
591	69.30	92.70	74.45	18.25	9	9
592	68.81	86.36	76.07	10.29	7	9
593	69.41	93.29	79.67	13.62	9	10
594	68.95	82.90	72.00	10.90	6	9
595	69.53	85.29	74.43	10.86	6	8

Weigh to 0.01 mg

Chironomid GROWTH (ASH FREE DRY WEIGHT) DATA

lient Upper Columbia Species ID# CHI 14

a: D: see randomization sheet batch number: B1390 Start Date 05/06/2005

ample Description:

Technician: BM BM BM
Date: 04/27/2005 05/20/2005 05/21/2005

Tin ID Number	Tare Weight (mg) (after 550°C for 2 hr)	Dry Weight (mg) (after 60°C for 24 hr)	Ash Weight (mg) (after 550°C for 2 hr)	Ash Free Dry Weight (mg) (Dry - Ash Wt.)	No. of Chironomids in Tin	No. of Chironomids surviving
596	68.88	86.16	74.22	11.94	7	8
597	69.90	88.87	77.47	11.40	7	8
598	69.68	91.47	76.82	14.65	9	10
599	70.40	86.70	73.91	12.79	6	6
600	70.74	88.00	77.33	10.67	6	6

CH2M HILL *TOXICITY TEST ORGANISM AND WATER QUALITY DATA*

Client: Upper Columbia Test Initiation: Date 4-29-05 Time 1100-1540 Test Termination: Date 5-9-05 Time 0915-1[illegible]

Contact: ______ Technician: ______

Test Species/ID: *Chironomus tentans* / CHI 13 /

Sample ID Number	Field ID	Collected Date	Collected Time	Total Residual Chlorine (mg/l) As Received	Total Residual Chlorine (mg/l) As Dechlor.	Ammonia mg/l NH_3-N Pre	Ammonia Post	Hardness mg/l CaCO Pre	Hardness Post	Alkalinity mg/l CaCO Pre	Alkalinity Post
B1390-01	RM704A1(X1)	04/20/2005	8:50	-	-	0.16	0.16	~~98~~ 100	84	~~76~~ 86	68
B1390-02	RM698A1(X1)	04/20/2005	10:10	-	-	0.30	0.17	92	78	80	62
B1390-03	RM744A1(X1)	04/20/2005	10:45	-	-	0.26	0.19	100	88	89	70
B1390-04	RM744A2(X3)	04/20/2005	11:45	-	-	0.19	0.15	90	80	82	70
B1390-05	RM692A1(X1)	04/20/2005	11:15	-	-	0.10	0.25	90	80	80	70
B1390-06	RM687A1	04/20/2005	14:00	-	-	0.34	0.17	92	76	76	64
B1390-07	RM689A1(X3)	04/20/2005	12:55	-	-	0.24	0.14	96	86	84	74
B1390-08	RM706A1(X1)	04/20/2005	13:30	-	-	0.38	0.22	94	78	86	62
B1390-09	RM743A2(X3)	04/20/2005	13:15	-	-	0.07	0.13	106	86	84	70
B1390-10	RM706A2(X7)	04/20/2005	16:25	-	-	0.75	0.93	96	80	86	70
B1390-11	RM676A1(X3)	04/21/2005	14:05	-	-	0.29	0.08	90	90	84	74
B1390-12	RM741A1(X3)	04/21/2005	13:30	-	-	0.41	0.46	110	92	96	80
B1390-13	RM740A1(X1)	04/21/2005	14:30	-	-	0.40	0.85	116	92	108	86
B1390-14	RM724A1(X1)	04/21/2005	13:20	-	-	0.44	0.48	98	86	90	78

Test Species Information		ID# CHI 13	ID#	ID#
Age or Size		2nd to 3rd Instar		
		-		
Test Container Size		300 ml		
Test Volume		100 ml sample, 175 ml overlying water		
Feeding:	Type	1.5 ml of 6g/L		
	Amount	Tetrafin slurry		
		daily		
Aeration:	Began	none		
	Amount	-		
Dilution Water ID#		2498, 2503		
Acclimation Period		24 hours		
Test Location		# 12		
Condition of Survivors				

Comments

Dilution Water Source	ID#	Ammonia mg/l NH_3-N	Hardness mg/l CaCO	Alkalinity mg/l CaCO
Reconstitued water	2498	-	72	68
Reconstitued water	2503	-	72	58

Water Quality Meters Used/ID#

Dissolved Oxygen ______ pH ______ Temperature ______

Conductivity ______ Refractometer ______ Other ______

CH2M HILL **TOXICITY TEST ORGANISM AND WATER QUALITY DATA**

Client Upper Columbia Test Initiation: Date 4-25-05 Time 1100-1540 Test Termination: Date 5-9-05 Time 0915 1405

Contact _____ Technician _____

Test Species/ID *Chironomus tentans* / CHI 13 /

Sample Information												Test Species Information	ID# CHI 13	ID#	ID#
Sample ID Number	Field ID	Collected Date	Collected Time	Total Residual Chlorine (mg/l) As Received / As Dechlor.	Ammonia mg/l NH_3-N Pre	Ammonia mg/l NH_3-N Post	Hardness mg/l CaCO Pre	Hardness mg/l CaCO Post	Alkalinity mg/l CaCO Pre	Alkalinity mg/l CaCO Post					
B1390-15	RM686A1(X3)	04/21/2005	9:30	- / -	0.22	0.22	82	80	78	66		Age or Size	2nd to 3rd Instar		
B1390-16	RM708A1(X3)	04/21/2005	9:43	- / -	0.35	0.33	110	80	94	70			-		
B1390-17	RM680A1(X1)	04/21/2005	10:40	- / -	0.19	0.17	92	82	86	72		Test Container Size	300 ml		
B1390-18	RM742A1(X1)	04/21/2005	11:00	- / -	0.22	0.16	94	92	86	74		Test Volume	100 ml sample, 175 ml overlying water		
B1390-19	RM743A1(X1)	04/21/2005	10:15	- / -	0.52	0.40	92	86	76	72		Feeding: Type	1.5 ml of 6g/L		
B1390-20	RM678A1(X1)	04/21/2005	12:35	- / -	0.07	0.14	96	78	92	64		Amount	Tetrafin slurry		
B1390-21	RM742A2(X5)	04/21/2005	12:20	- / -	0.28	0.17	98	84	88	72			daily		
B1390-22	RM677A1(X3)	04/21/2005	13:20	- / -	0.34	0.15	98	94	88	84		Aeration: Began	none		
B1390-23	RM738A1(X3)	04/22/2005	11:00	- / -	0.33	0.19	86	80	84	66		Amount	-		
B1390-24	RM739A1(X3)	04/22/2005	10:00	- / -	0.43	1.21	118	92	108	103		Dilution Water ID#	2498, 2503		
B1390-25	RM732R1	04/22/2005	11:35	- / -	0.33	0.60	118	103	120	100		Acclimation Period	24 hours		
B1390-26	RM724A2(X3)	04/22/2005	11:27	- / -	0.41	0.79	106	97	102	89		Test Location	# 12		
B1390-31	RM721R1	04/22/2005	14:39	- / -	0.32	0.34	110	-	100	-		Condition of Survivors			
B1390-32	RM726R1	04/22/2005	13:20	- / -	0.36	0.26	124	114	110	110					

Dilution Water Source	ID#	Ammonia mg/l NH_3-N	Hardness mg/l CaCO	Alkalinity mg/l CaCO
Reconstitued water	2498	-	72	68
Reconstitued water	2503	-	72	58

Comments

Water Quality Meters Used/ID#

Dissolved Oxygen _____ pH _____ Temperature _____

Conductivity _____ Refractometer _____ Other _____

CH2M HILL *TOXICITY TEST ORGANISM AND WATER QUALITY DATA*

Client Upper Columbia Test Initiation: Date 4-29-05 Time 1100-1540 Test Termination: Date 5-9-05 Time 0915 1005

Contact _____ Technician _____

Test Species/ID *Chironomus tentans* / CHI 13 _____ /

Sample Information

Sample ID Number	Field ID	Collected Date	Collected Time	Total Residual Chlorine (mg/l) As Received / As Dechlor.	Ammonia mg/l NH_3-N Pre	Ammonia mg/l NH_3-N Post	Hardness mg/l CaCO Pre	Hardness mg/l CaCO Post	Alkalinity mg/l CaCO Pre	Alkalinity mg/l CaCO Post
B1390-36	RM705R1	04/23/2005	9:25	- / -	0.26	0.73	104	92	90	83
B1390-38	RM686R1	04/23/2005	11:20	- / -	0.31	0.55	101	86	94	76
B1390-42	RM685R1	04/23/2005	13:50	- / -	0.31	0.25	120	115	116	113
Sediment Cont.	Beaver Creek	4/22/05	0640	- / -	0.36	0.29	80	68	76	66
				/						
				/						
				/						
				/						
				/						
				/						
				/						
				/						
				/						
				/						

Test Species Information	ID# CHI 13	ID#	ID#
Age or Size	2nd to 3rd Instar		
	-		
Test Container Size	300 ml		
Test Volume	100 ml sample, 175 ml overlying water		
Feeding: Type	1.5 ml of 6g/L		
Amount	Tetrafin slurry		
	daily		
Aeration: Began	none		
Amount	-		
Dilution Water ID#	2498, 2503		
Acclimation Period	24 hours		
Test Location	# 12		
Condition of Survivors			

Comments

Dilution Water Source	ID#	Ammonia mg/l NH_3-N	Hardness mg/l CaCO	Alkalinity mg/l CaCO
Reconstitued water	2498	-	72	68
Reconstitued water	2503	-	72	58

Water Quality Meters Used/ID#

Dissolved Oxygen _____ pH _____ Temperature _____

Conductivity _____ Refractometer _____ Other _____

Randomization chart for *Chironomid* tests initiated on 4/29/2005

Batch ID: B1390 1st Beaker Number: 89

Lab ID:	Field Sample Numb	Station Location	Replicate ID:	Random number	test chamber number:
B1390-42	5164496	RM685R1	A	0.941145814	108
B1390-42	5164496	RM685R1	B	0.204363534	292
B1390-42	5164496	RM685R1	C	0.265595538	278
B1390-42	5164496	RM685R1	D	0.625102946	189
B1390-42	5164496	RM685R1	E	0.34735938	252
B1390-42	5164496	RM685R1	F	0.627798864	186
B1390-42	5164496	RM685R1	G	0.823967112	133
B1390-42	5164496	RM685R1	H	0.392329908	242
B1390-38	5164489	RM686R1	A	0.017223186	341
B1390-38	5164489	RM686R1	B	0.360239133	250
B1390-38	5164489	RM686R1	C	0.119848015	319
B1390-38	5164489	RM686R1	D	0.238679567	282
B1390-38	5164489	RM686R1	E	0.283358751	271
B1390-38	5164489	RM686R1	F	0.077622362	328
B1390-38	5164489	RM686R1	G	0.540548805	207
B1390-38	5164489	RM686R1	H	0.131681223	317
B1390-36	5164486	RM705R1	A	0.472627705	224
B1390-36	5164486	RM705R1	B	0.88802256	122
B1390-36	5164486	RM705R1	C	0.480886722	220
B1390-36	5164486	RM705R1	D	0.999826468	89
B1390-36	5164486	RM705R1	E	0.507067574	213
B1390-36	5164486	RM705R1	F	0.121973672	318
B1390-36	5164486	RM705R1	G	0.114755865	322
B1390-36	5164486	RM705R1	H	0.228673852	285
B1390-31	5164476	RM721R1	A	0.356943871	251
B1390-31	5164476	RM721R1	B	0.757087087	149
B1390-31	5164476	RM721R1	C	0.563606518	201
B1390-31	5164476	RM721R1	D	0.390942027	243
B1390-31	5164476	RM721R1	E	0.65297445	178
B1390-31	5164476	RM721R1	F	0.073404621	331
B1390-31	5164476	RM721R1	G	0.118113994	321
B1390-31	5164476	RM721R1	H	0.208858759	290
B1390-32	5164478	RM726R1	A	0.413199434	239
B1390-32	5164478	RM726R1	B	0.242970223	281
B1390-32	5164478	RM726R1	C	0.421882226	237
B1390-32	5164478	RM726R1	D	0.516663772	210
B1390-32	5164478	RM726R1	E	0.366232152	247
B1390-32	5164478	RM726R1	F	0.977287806	100
B1390-32	5164478	RM726R1	G	0.154865026	310
B1390-32	5164478	RM726R1	H	0.140745474	314
B1390-25	5164470	RM732R1	A	0.413258403	238
B1390-25	5164470	RM732R1	B	0.822098383	134
B1390-25	5164470	RM732R1	C	0.039547297	336
B1390-25	5164470	RM732R1	D	0.60533153	194
B1390-25	5164470	RM732R1	E	0.1722788	299
B1390-25	5164470	RM732R1	F	0.161419266	307
B1390-25	5164470	RM732R1	G	0.509936929	212
B1390-25	5164470	RM732R1	H	0.301904227	264

Batch ID: B1390 1st Beaker Number: 89

Lab ID:	Field Sample Numb	Station Location	Replicate ID:	Random number	test chamber number:
Sediment Control	0	Beaver Creek	A	0.283351554	272
Sediment Control	0	Beaver Creek	B	0.006934011	342
Sediment Control	0	Beaver Creek	C	0.310252396	261
Sediment Control	0	Beaver Creek	D	0.200105645	294
Sediment Control	0	Beaver Creek	E	0.448867949	230
Sediment Control	0	Beaver Creek	F	0.543451608	204
Sediment Control	0	Beaver Creek	G	0.44957178	229
Sediment Control	0	Beaver Creek	H	0.455780707	226
B1390-01	5164433	RM704A1(X1)	A	0.452621008	228
B1390-01	5164433	RM704A1(X1)	B	0.402247969	241
B1390-01	5164433	RM704A1(X1)	C	0.688633408	169
B1390-01	5164433	RM704A1(X1)	D	0.280022348	274
B1390-01	5164433	RM704A1(X1)	E	0.310811119	260
B1390-01	5164433	RM704A1(X1)	F	0.687329177	170
B1390-01	5164433	RM704A1(X1)	G	0.471176411	225
B1390-01	5164433	RM704A1(X1)	H	0.634859393	185
B1390-02	5164434	RM698A1(X1)	A	0.165423338	304
B1390-02	5164434	RM698A1(X1)	B	0.833933191	132
B1390-02	5164434	RM698A1(X1)	C	0.269192674	277
B1390-02	5164434	RM698A1(X1)	D	0.952578166	105
B1390-02	5164434	RM698A1(X1)	E	0.481490991	219
B1390-02	5164434	RM698A1(X1)	F	0.934346474	111
B1390-02	5164434	RM698A1(X1)	G	0.428047169	236
B1390-02	5164434	RM698A1(X1)	H	0.062577711	334
B1390-03	5164435	RM744A1(X1)	A	0.787023658	147
B1390-03	5164435	RM744A1(X1)	B	0.570674829	199
B1390-03	5164435	RM744A1(X1)	C	0.808821204	142
B1390-03	5164435	RM744A1(X1)	D	0.644370349	180
B1390-03	5164435	RM744A1(X1)	E	0.572521084	198
B1390-03	5164435	RM744A1(X1)	F	0.940890554	109
B1390-03	5164435	RM744A1(X1)	G	0.697455034	166
B1390-03	5164435	RM744A1(X1)	H	0.917213682	116
B1390-04	5164436	RM744A2(X3)	A	0.166900833	302
B1390-04	5164436	RM744A2(X3)	B	0.344404787	253
B1390-04	5164436	RM744A2(X3)	C	0.610737383	191
B1390-04	5164436	RM744A2(X3)	D	0.263164189	279
B1390-04	5164436	RM744A2(X3)	E	0.746831684	152
B1390-04	5164436	RM744A2(X3)	F	0.845290835	131
B1390-04	5164436	RM744A2(X3)	G	0.812615493	139
B1390-04	5164436	RM744A2(X3)	H	0.908081121	120
B1390-05	5164437	RM692A1(X1)	A	0.476020281	223
B1390-05	5164437	RM692A1(X1)	B	0.206504698	291
B1390-05	5164437	RM692A1(X1)	C	0.293964293	266
B1390-05	5164437	RM692A1(X1)	D	0.234646932	283
B1390-05	5164437	RM692A1(X1)	E	0.678844308	174
B1390-05	5164437	RM692A1(X1)	F	0.141276281	312
B1390-05	5164437	RM692A1(X1)	G	0.68567859	172
B1390-05	5164437	RM692A1(X1)	H	0.260762323	280

Batch ID: B1390 1st Beaker Number: 89

Lab ID:	Field Sample Numb	Station Location	Replicate ID:	Random number	test chamber number:
B1390-06	5164440	RM687A1	A	0.158100261	309
B1390-06	5164440	RM687A1	B	0.913993688	118
B1390-06	5164440	RM687A1	C	0.543337973	205
B1390-06	5164440	RM687A1	D	0.333557504	256
B1390-06	5164440	RM687A1	E	0.079571236	327
B1390-06	5164440	RM687A1	F	0.68043797	173
B1390-06	5164440	RM687A1	G	0.792633216	146
B1390-06	5164440	RM687A1	H	0.662145615	176
B1390-07	5164441	RM689A1(X3)	A	0.143408108	311
B1390-07	5164441	RM689A1(X3)	B	0.622351722	190
B1390-07	5164441	RM689A1(X3)	C	0.32758818	257
B1390-07	5164441	RM689A1(X3)	D	0.45483908	227
B1390-07	5164441	RM689A1(X3)	E	0.18593519	296
B1390-07	5164441	RM689A1(X3)	F	0.280824112	273
B1390-07	5164441	RM689A1(X3)	G	0.184929873	297
B1390-07	5164441	RM689A1(X3)	H	0.407612684	240
B1390-08	5164442	RM706A1(X1)	A	0.375498742	246
B1390-08	5164442	RM706A1(X1)	B	0.984471099	98
B1390-08	5164442	RM706A1(X1)	C	0.701989326	164
B1390-08	5164442	RM706A1(X1)	D	0.448495546	231
B1390-08	5164442	RM706A1(X1)	E	0.88608452	124
B1390-08	5164442	RM706A1(X1)	F	0.447399216	232
B1390-08	5164442	RM706A1(X1)	G	0.119023366	320
B1390-08	5164442	RM706A1(X1)	H	0.139803635	315
B1390-09	5164443	RM743A2(X3)	A	0.222821527	287
B1390-09	5164443	RM743A2(X3)	B	0.54154137	206
B1390-09	5164443	RM743A2(X3)	C	0.689117499	168
B1390-09	5164443	RM743A2(X3)	D	0.034280149	339
B1390-09	5164443	RM743A2(X3)	E	0.876665926	127
B1390-09	5164443	RM743A2(X3)	F	0.947386145	106
B1390-09	5164443	RM743A2(X3)	G	0.490660848	217
B1390-09	5164443	RM743A2(X3)	H	0.991517048	92
B1390-10	5164449	RM706A2(X7)	A	0.900257864	121
B1390-10	5164449	RM706A2(X7)	B	0.643810843	181
B1390-10	5164449	RM706A2(X7)	C	0.07761155	329
B1390-10	5164449	RM706A2(X7)	D	0.43435751	235
B1390-10	5164449	RM706A2(X7)	E	0.036429215	338
B1390-10	5164449	RM706A2(X7)	F	0.98264273	99
B1390-10	5164449	RM706A2(X7)	G	0.745582181	153
B1390-10	5164449	RM706A2(X7)	H	0.573924661	197
B1390-11	5164457	RM676A1(X3)	A	0.725425013	158
B1390-11	5164457	RM676A1(X3)	B	0.610375827	192
B1390-11	5164457	RM676A1(X3)	C	0.712320211	160
B1390-11	5164457	RM676A1(X3)	D	0.908115212	119
B1390-11	5164457	RM676A1(X3)	E	0.810823218	141
B1390-11	5164457	RM676A1(X3)	F	0.306150529	263
B1390-11	5164457	RM676A1(X3)	G	0.915667999	117
B1390-11	5164457	RM676A1(X3)	H	0.986741609	97

Batch ID: B1390 1st Beaker Number: 89

Lab ID:	Field Sample Numb	Station Location	Replicate ID:	Random number	test chamber number:
B1390-12	5164459	RM741A1(X3)	A	0.000667153	344
B1390-12	5164459	RM741A1(X3)	B	0.763433011	148
B1390-12	5164459	RM741A1(X3)	C	0.886925804	123
B1390-12	5164459	RM741A1(X3)	D	0.709652729	162
B1390-12	5164459	RM741A1(X3)	E	0.710783317	161
B1390-12	5164459	RM741A1(X3)	F	0.814285481	138
B1390-12	5164459	RM741A1(X3)	G	0.309039218	262
B1390-12	5164459	RM741A1(X3)	H	0.285488343	270
B1390-13	5164460	RM740A1(X1)	A	0.992342248	90
B1390-13	5164460	RM740A1(X1)	B	0.00454668	343
B1390-13	5164460	RM740A1(X1)	C	0.864270853	128
B1390-13	5164460	RM740A1(X1)	D	0.215377735	288
B1390-13	5164460	RM740A1(X1)	E	0.43606465	234
B1390-13	5164460	RM740A1(X1)	F	0.802255714	144
B1390-13	5164460	RM740A1(X1)	G	0.164698532	305
B1390-13	5164460	RM740A1(X1)	H	0.715605389	159
B1390-14	5164461	RM724A1(X1)	A	0.171852654	300
B1390-14	5164461	RM724A1(X1)	B	0.976241467	101
B1390-14	5164461	RM724A1(X1)	C	0.878772793	126
B1390-14	5164461	RM724A1(X1)	D	0.638926195	184
B1390-14	5164461	RM724A1(X1)	E	0.105485731	323
B1390-14	5164461	RM724A1(X1)	F	0.186690694	295
B1390-14	5164461	RM724A1(X1)	G	0.700637001	165
B1390-14	5164461	RM724A1(X1)	H	0.167309909	301
B1390-15	5164439	RM686A1(X3)	A	0.361945848	248
B1390-15	5164439	RM686A1(X3)	B	0.881502393	125
B1390-15	5164439	RM686A1(X3)	C	0.44633073	233
B1390-15	5164439	RM686A1(X3)	D	0.625430636	188
B1390-15	5164439	RM686A1(X3)	E	0.565600228	200
B1390-15	5164439	RM686A1(X3)	F	0.97116644	102
B1390-15	5164439	RM686A1(X3)	G	0.036934266	337
B1390-15	5164439	RM686A1(X3)	H	0.942750689	107
B1390-16	5164450	RM708A1(X3)	A	0.965841956	104
B1390-16	5164450	RM708A1(X3)	B	0.745178294	154
B1390-16	5164450	RM708A1(X3)	C	0.607349614	193
B1390-16	5164450	RM708A1(X3)	D	0.99188144	91
B1390-16	5164450	RM708A1(X3)	E	0.478949121	221
B1390-16	5164450	RM708A1(X3)	F	0.970646711	103
B1390-16	5164450	RM708A1(X3)	G	0.932672442	112
B1390-16	5164450	RM708A1(X3)	H	0.987383089	96
B1390-17	5164451	RM680A1(X1)	A	0.300642544	265
B1390-17	5164451	RM680A1(X1)	B	0.821753668	136
B1390-17	5164451	RM680A1(X1)	C	0.654097181	177
B1390-17	5164451	RM680A1(X1)	D	0.099738305	324
B1390-17	5164451	RM680A1(X1)	E	0.741220948	156
B1390-17	5164451	RM680A1(X1)	F	0.742258347	155
B1390-17	5164451	RM680A1(X1)	G	0.930553288	113
B1390-17	5164451	RM680A1(X1)	H	0.175164802	298

Batch ID: B1390 1st Beaker Number: 89

Lab ID:	Field Sample Numb	Station Location	Replicate ID:	Random number	test chamber number:
B1390-18	5164452	RM742A1(X1)	A	0.50485186	214
B1390-18	5164452	RM742A1(X1)	B	0.361447795	249
B1390-18	5164452	RM742A1(X1)	C	0.990117978	93
B1390-18	5164452	RM742A1(X1)	D	0.159990375	308
B1390-18	5164452	RM742A1(X1)	E	0.476795706	222
B1390-18	5164452	RM742A1(X1)	F	0.821956943	135
B1390-18	5164452	RM742A1(X1)	G	0.650459875	179
B1390-18	5164452	RM742A1(X1)	H	0.377764252	245
B1390-19	5164453	RM743A1(X1)	A	0.23404955	284
B1390-19	5164453	RM743A1(X1)	B	0.811961124	140
B1390-19	5164453	RM743A1(X1)	C	0.481525665	218
B1390-19	5164453	RM743A1(X1)	D	0.274879922	275
B1390-19	5164453	RM743A1(X1)	E	0.807038374	143
B1390-19	5164453	RM743A1(X1)	F	0.135197837	316
B1390-19	5164453	RM743A1(X1)	G	0.989280008	94
B1390-19	5164453	RM743A1(X1)	H	0.930286218	114
B1390-20	5164454	RM678A1(X1)	A	0.552270943	203
B1390-20	5164454	RM678A1(X1)	B	0.064256466	333
B1390-20	5164454	RM678A1(X1)	C	0.274078746	276
B1390-20	5164454	RM678A1(X1)	D	0.938688306	110
B1390-20	5164454	RM678A1(X1)	E	0.069181337	332
B1390-20	5164454	RM678A1(X1)	F	0.641236637	182
B1390-20	5164454	RM678A1(X1)	G	0.796342026	145
B1390-20	5164454	RM678A1(X1)	H	0.086363492	326
B1390-21	5164455	RM742A2(X5)	A	0.387184235	244
B1390-21	5164455	RM742A2(X5)	B	0.7476965	151
B1390-21	5164455	RM742A2(X5)	C	0.338654873	254
B1390-21	5164455	RM742A2(X5)	D	0.140831319	313
B1390-21	5164455	RM742A2(X5)	E	0.315715303	259
B1390-21	5164455	RM742A2(X5)	F	0.851321502	130
B1390-21	5164455	RM742A2(X5)	G	0.039800535	335
B1390-21	5164455	RM742A2(X5)	H	0.092385133	325
B1390-22	5164456	RM677A1(X3)	A	0.525717984	209
B1390-22	5164456	RM677A1(X3)	B	0.287648117	269
B1390-22	5164456	RM677A1(X3)	C	0.203485263	293
B1390-22	5164456	RM677A1(X3)	D	0.640099415	183
B1390-22	5164456	RM677A1(X3)	E	0.627683357	187
B1390-22	5164456	RM677A1(X3)	F	0.689573705	167
B1390-22	5164456	RM677A1(X3)	G	0.514684478	211
B1390-22	5164456	RM677A1(X3)	H	0.927590346	115
B1390-23	5164468	RM738A1(X3)	A	0.076116744	330
B1390-23	5164468	RM738A1(X3)	B	0.753872027	150
B1390-23	5164468	RM738A1(X3)	C	0.988506962	95
B1390-23	5164468	RM738A1(X3)	D	0.338203501	255
B1390-23	5164468	RM738A1(X3)	E	0.707905674	163
B1390-23	5164468	RM738A1(X3)	F	0.552949767	202
B1390-23	5164468	RM738A1(X3)	G	0.73098599	157
B1390-23	5164468	RM738A1(X3)	H	0.224733582	286

Batch ID: B1390 1st Beaker Number: 89

Lab ID:	Field Sample Numb	Station Location	Replicate ID:	Random number	test chamber number:
B1390-24	5164469	RM739A1(X3)	A	0.319833197	258
B1390-24	5164469	RM739A1(X3)	B	0.293155274	267
B1390-24	5164469	RM739A1(X3)	C	0.289273112	268
B1390-24	5164469	RM739A1(X3)	D	0.162557222	306
B1390-24	5164469	RM739A1(X3)	E	0.685808348	171
B1390-24	5164469	RM739A1(X3)	F	0.535116109	208
B1390-24	5164469	RM739A1(X3)	G	0.586629948	196
B1390-24	5164469	RM739A1(X3)	H	0.504042555	215
B1390-26	5164471	RM724A2(X3)	A	0.212736631	289
B1390-26	5164471	RM724A2(X3)	B	0.497775418	216
B1390-26	5164471	RM724A2(X3)	C	0.863705623	129
B1390-26	5164471	RM724A2(X3)	D	0.664250416	175
B1390-26	5164471	RM724A2(X3)	E	0.814663264	137
B1390-26	5164471	RM724A2(X3)	F	0.019239945	340
B1390-26	5164471	RM724A2(X3)	G	0.16682472	303
B1390-26	5164471	RM724A2(X3)	H	0.596899055	195

CH2M HILL

FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Client: Upper Columbia — Beginning, Date: 4-29-05 — Time: 1100 - 1540

Sample Description: See Cross Reference Sheet batch Number B1390 — Ending Date: 5-9-05 — Time: 0915-1605

Test Species: Chironomus tentans

ID#: CHI 13

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
AM change: Tech.	[illegible]	[illegible]	DW	[illegible]	[illegible]	[illegible]	[illegible]	MS/[illegible]	MS/RK	MS/[illegible]	MS
AM change: Time	0630	0600	0605	0605	0610	0610	0605	0600	0600	0600	0830
PM change: Tech.	MS/AAA	MS	DW	AAA	[illegible]	AA/AB	B-/ADA	MS	[illegible]	RK	
PM change: Time	1700	1730	1808	1800	1900	1800	1825	1730	1835	18:30	
Feeding: ✓ when done	✓	✓	✓	✓	✓	✓	✓	No food	.5 ml ✓	✓	

Beaker Number	Dissolved Oxygen (mg/l)											Temperature (°C)											pH		Conductivity (µmohs/cm)	
	0	1	2	3	4	5	6	7	8	9	10	0	1	2	3	4	5	6	7	8	9	10	0	10	0	10
90	6.2	6.0	6.1	6.2	6.0	4.1	4.6	3.2	4.4	3.2	2.9	23.2	23.1	23.1	23.4	23.4	23.5	[illegible]	23.4	23.2	23.7	23.6	6.9	6.7	376	294
104	6.4	5.1	5.4	5.6	5.7	4.0	3.3	3.8	5.0	4.5	3.4	23.1	23.2	23.1	23.1	23.5	23.5	23.0	23.4	23.4	23.7	23.7	7.0	6.7	382	279
108	6.5	5.0	5.2	5.3	5.4	4.6	1.6*	2.4	3.5	3.7	3.0	23.3	23.1	23.0	23.3	23.6	23.4	23.4	23.5	23.4	23.7	23.6	7.3	7.0	365	316
121	6.3	4.9	4.8	4.6	3.7	4.9	2.3	2.7	4.0	4.0	4.2	23.3	23.4	23.3	23.3	23.4	23.5	23.3	23.5	23.3	23.6	23.5	6.8	6.8	311	271
147	6.4	5.8	5.6	5.4	3.9	3.7	3.0	3.3	4.5	4.4	4.3	23.2	23.4	22.6	23.2	23.4	23.3	23.2	23.3	23.4	23.5	23.4	7.3	7.0	321	273
158	7.3	5.5	5.1	5.0	4.6	4.6	3.4	4.3	4.9	4.8	4.5	23.0	23.3	23.1	23.2	23.5	23.3	23.2	23.3	23.2	23.4	23.4	7.5	7.1	314	284
203	7.0	6.6	5.1	5.0	4.7	3.6	3.5	4.0	5.3	4.9	4.2	22.8	23.0	22.9	23.1	23.4	23.1	23.1	23.3	23.1	23.6	23.5	7.4	7.0	323	272
209	7.1	5.3	5.4	5.2	4.7	3.9	4.1	4.5	5.8	5.8	4.5	23.0	~~22.9~~ 23.4	23.1	23.1	23.5	23.3	23.2	23.2	23.3	23.3	23.4	7.4	7.2	321	291
214	7.7	5.1	6.0	5.9	5.1	4.4	4.2	4.6	5.7	6.0	4.9	23.2	23.1	23.0	23.3	23.3	23.4	23.2	23.2	23.3	23.5	23.4	7.6	7.2	317	285
223	8.0	5.0	6.0	5.9	5.6	5.0	3.6	4.5	5.0	5.1	4.4	23.0	23.1	23.3	23.4	23.5	23.2	23.1	23.2	23.3	23.4	23.3	7.6	7.0	308	265
224	6.7	5.4	5.5	5.3	4.9	4.7	2.6	2.8	4.0	4.1	3.7	23.0	23.2	22.9	23.4	23.5	23.3	23.1	23.2	23.3	23.4	23.4	7.1	6.9	302	278
228	6.9	6.0	5.9	5.8	5.0	4.6	3.1	4.2	5.5	5.0	4.0	23.2	23.3	23.1	23.1	23.2	23.3	23.2	23.3	23.3	23.4	23.5	7.2	6.9	316	275
238	6.6	4.1	5.1	5.6	5.4	3.9	3.0	3.3	4.3	4.2	3.0	23.0	23.3	23.0	23.2	23.5	23.5	23.1	23.4	23.2	23.4	23.4	7.6	7.4	321	326
239	6.7	3.9	4.9	4.2	3.9	3.1	2.9	3.2	4.3	4.2	3.1	23.0	23.0	23.3	23.0	23.4	23.3	23.1	23.5	23.2	23.4	23.4	7.4	7.4	315	320
244	7.3	5.1	3.6	3.1	3.0	3.3	2.9	3.0	5.5	5.0	4.1	23.2	23.1	23.1	23.0	23.5	23.4	23.2	23.5	23.3	23.4	23.4	7.5	7.1	309	278
246	6.8	4.8	3.7	3.0	3.2	3.0	3.2	3.8	5.0	5.4	4.3	22.8	23.5	23.1	23.1	23.5	23.3	23.1	23.3	23.1	23.3	23.5	7.2	6.9	321	266
248	7.5	5.5	4.6	3.6	3.5	3.3	3.5	4.7	5.0	5.1	4.1	22.8	23.4	22.9	23.1	23.4	23.1	23.0	23.3	23.2	23.3	23.5	7.4	7.0	309	268
251	6.6	5.6	4.7	4.1	4.0	3.4	3.5	4.0	5.0	5.0	4.1	22.8	23.1	22.4	23.2	23.6	23.2	23.0	23.4	23.0	23.3	23.6	7.5	7.2	316	312

* Day 6 & 7 Beaker 108 – Excess organic matter/food on bottom – meter recalibrated – measurements may be off 0.6 too low
DO on meter was off 0.6 mg/L too low

CH2M HILL

FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Client: Upper Columbia
Sample Description: See Cross Reference Sheet batch Number B1390
Test Species: Chironomus tentans
ID#: CHI 13

Beginning, Date 4-29-05 Time 1100 - 1540
Ending, Date 5-9-05 Time 0815 - 1605

AM change: Tech. Day 0 BW/DO Day 1 [illegible] Day 2 [illegible] Day 3 [illegible] Day 4 [illegible] Day 5 [illegible] Day 6 [illegible] Day 7 MS/RB Day 8 MS/RW Day 9 MS/RW Day 10 MS
Time Day 0 0630 Day 1 0600 Day 2 0605 Day 3 0605 Day 4 0810 Day 5 0610 Day 6 0605 Day 7 0600 Day 8 0600 Day 9 0600 Day 10 0630

PM change: Tech. Day 0 MS/RW Day 1 MS Day 2 DW Day 3 AM Day 4 BW Day 5 AM/BW Day 6 BW/AM Day 7 MS Day 8 BW Day 9 RW
Time Day 0 1700 Day 1 1730 Day 2 1800 Day 3 1800 Day 4 1900 Day 5 1800 Day 6 1925 Day 7 1730 Day 8 1835 Day 9 18:30
Feeding: ✓ when done Day 0 ✓ Day 1 ✓ Day 2 ✓ Day 3 ✓ Day 4 ✓ Day 5 ✓ Day 6 ✓ Day 7 No Food Day 8 ✓ Day 9 ✓

Beaker Number	Dissolved Oxygen (mg/l)											Temperature (°C)											pH		Conductivity (µmohs/cm)	
	0	1	2	3	4	5	6	7	8	9	10	0	1	2	3	4	5	6	7	8	9	10	0	10	0	10
258	5.3	4.1	4.0	4.2	4.4	4.4	1.2	2.0	2.7	2.3	1.6	22.9 23.2	23.1	23.2	23.5	23.4	23.3	23.1	23.4	23.2	23.4	23.6	7.2	6.9	376	294
265	6.3	3.8	3.6	3.9	4.1	4.0	4.4	4.8	5.4	5.0	4.2	22.7	23.1	23.1	23.4	23.5	23.2	23.0	23.3	22.9	23.4	23.5	7.6	6.9	387	276
272	6.5	3.6	3.9	3.7	4.1	3.9	2.9	3.4	5.3	4.7	4.4	22.9	23.8	23.1	23.2	23.5	23.3	23.1	23.4	23.3	23.4	23.6	7.4	6.9	372	276
284	7.0	4.7	4.6	4.5	4.4	3.6	3.6	3.9	5.0	4.7	4.3	22.9	22.8	23.0	23.4	23.6	23.2	23.0	23.4	23.1	23.4	23.6	7.6	6.9	364	286
287	7.5	5.1	5.2	4.6	5.0	4.4	3.4	3.9	5.4	5.1	4.0	22.9	23.0	22.9	23.4	23.4	23.3	23.1	23.3	23.3	23.3	23.3	7.4	7.0	356	280
289	5.7	5.0	5.2	4.6	4.4	4.0	3.5	4.0	4.5	5.0	3.6	23.1	22.4	23.4	23.5	23.5	23.3	23.1	23.3	23.4	23.5	23.4	7.4	7.1	347	293
300	6.5	3.6	4.0	4.0	3.6	3.2	3.5	3.8	4.4	5.1	4.2	22.9	22.6	23.4	23.5	23.5	23.1	23.0	23.3	23.3	23.4	23.4	7.6	7.1	349	275
302	7.6	4.5	4.0	3.7	3.4	3.3	3.0	4.1	5.5	5.2	4.3	22.9	22.6	23.1	23.4	23.4	23.1	23.1	23.4	23.3	23.3	23.3	7.3 7.6	7.1	315	274
304	7.0	5.1	4.1	3.6	3.6	3.5	3.8	3.9	5.0	5.5	4.1	23.0	23.0	23.2	23.3	23.4	23.2	23.1	23.3	23.3	23.5	23.1	7.3 7.6	7.0	309	27~~0~~ MS 266
309	7.1	5.3	3.7	3.5	3.5	3.4	3.6	4.4	5.4	5.2	4.0	22.6	22.4	23.0	23.3	23.3	23.2	23.0	23.2	23.0	23.1	23.2	7.1 7.6	7.1	292	266
311	7.2	5.0	4.2	4.1	4.0	3.9	3.6	4.5	4.9	4.7	4.1	22.8	22.9	23.1	23.4	23.5	23.1	23.0	23.2	23.0	23.2	23.2	7.6	7.1 MS 7.0	321	277
330	7.9	6.1	5.1	4.6	4.1	4.0	4.4	4.6	4.5	4.1	4.0	22.7	22.6	22.9	23.5	23.4	23.1	22.9	23.2	23.0	23.2	23.3	7.6	7.1	293	270
341	6.3	5.0	4.9	4.6	4.4	3.2	2.4	3.6	4.4	3.9	3.7	22.5	22.7	22.9	23.4	23.3	23.3	22.9	23.1	23.0	23.2	23.1	7.1	7.0	300	278
344	6.6	4.9	4.7	4.3	4.4	3.6	4.2	3.9	4.0	4.2	3.6	22.6	22.7	23.0	23.4	23.5	23.2	22.9	23.1	23.0	23.1	23.3	7.3	7.0	349	293

* D.O on Day 6 meter was off 0.6 mg/L too low - Measurements may be off 0.6 too low

CH2M HILL **FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA**

(ent Upper Columbia — Beginning, Date 4-29-05 Time 1100 ~~1540~~

: nple Description see randomization sheet. Batch number: B1390 — Ending, Date 5-9-05 Time 0815

Test Species: Chironomus tentans ID#: CHI 13

: st Initiation: Tech: MS/BM/DW/KS Time: ~~1100 1540~~ 1100 START Test Termination: Tech: MS Time: 0815

Beaker Number	Number of Live Organisms 0	10	Comments:
89	10	6	
90	10	9	
91	10	6	✓ lots of Hyalella
92	10	8	
93	10	10	
94	10	8	1 Hatched 8 Total 7 in Tin
95	10	6	
96	10	9	✓
97	10	7	1 Hatch MS ~~BB~~ Total (6) 7 in Tin
98	10	4	✓
99	10	2	
100	10	6	
101	10	MS 5/5	1 hatched (5 Total)
102	10	MS 3/3	✓ ~~Hatched~~ MS 1 Hatched 4 in Tin 2 in Tin 3 Total MS
103	10	6	✓
104	10	4	✓ ~~Hatched~~ - MS Hyalella in sample
105	10	8	
106	10	8	1 Hatched 8 Total 7 in Tin

Beaker Number	Number of Live Organisms 0	10	Comments:
107	10	8	
108	10	6	2 Hatched (6 Total) 4 in Tin
109	10	5	2 Hatched 3 in Tin
110	10	7	5 in Tin 2 Hatched
111	10	5	4 in Tin 1 Hatching
112	10	9	Hyalella in Sample ✓
113	10	4	3 in Tin 1 Hatched
114	10	5	
115	10	3	
116	10	4	
117	10	MS ~~9~~ 2	
118	10	9	
119	10	1	
120	10	6	
121	10	4	3 Tin 1 MS 4 Hatched 4 Total
122	10	7	5 in Tin 7 Total 2 Hatched
123	10	8	

4 # 315 Spider like organism

* ORGANISMS PICKED AND ADDED TO THE TEST CHAMBERS SEQUENTIALLY STARTING W/ # 89 @ 11:00

/ = CHIRONOMIDS NOTED IN NATIVE SAMPLE

CH2M HILL **FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA**

Client: Upper Columbia — Beginning, Date: 4-29-05 — Time: 1135

Sample Description: see randomization sheet. Batch number: B1390 — Ending, Date: 5-9-05 — Time: 1100-1400

Test Species: Chironomus tentans — ID#: CHI 13

Test Initiation: Tech: MS/BM/DW/KT Time: 1135 — Test Termination: Tech: DW Time: 1100-1400

Beaker Number	Number of Live Organisms 0	10	Comments:
124	10	9	✓
125	10	8 ← 8 D.W.	
126	10	7	✓ 2 hatched / 5 in Tin
127	10	9	1 DW hatched / 8 in Tin
128	10	7	2 hatched / 5 in Tin
129	10	7	
130	10	6	1 hatched / 5 in Tin
131	10	9	1 hatched / 8 in Tin
132	10	8 DW	2 hatched / 6 in Tin
133	10	7	
134	10	7 5 DW	6 Tin 1 hatch
135	10	7	~~2 hatched / 5 in Tin~~ DW
136	10	6	
137	10	5	~~1 hatched removed Tuesday~~ 3 hatched / 2 in Tin ← DW
138	10	7	1 hatched / 6 in Tin
139	10	7	1 hatched / 6 in Tin
140	10	8	1 hatched / 7 in Tin
141	10	6 DW 3	hatched / DW 4 in Tin

Beaker Number	Number of Live Organisms 0	10	Comments:
142	10	5	
143	10	9	2 hatched / 7 in Tin
144	10	8	2 hatched / 6 in Tin
145	10	7	1 hatched / 6 in Tin
146	10	8	
147	10	7	
148	10	5	
149	10	5	
150	10	6	
151	10	DW 7	~~1 hatched removed Tues~~ 3 hatched / 4 in Tin ← DW
152	10	7	1 hatched / 6 in Tin
153	10	7	2 hatched / 5 in Tin
154	10	DW 9	✓ 1 hatched / 8 in Tin
155	10	7	1 hatched / 6 in Tin
156	10	5	
157	10	6	
158	10	8	2 hatched / 6 in Tin

✓: chironomids noted in native samples

CH2M HILL **FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA**

Client: Upper Columbia — Beginning, Date: 4-29-05 — Time: 1210

Sample Description: see randomization sheet. Batch number: B1390 — Ending, Date: 5-9-05 — Time: 1030

Test Species: Chironomus tentans — ID#: CHI 13

Test Initiation: Tech: MWB/OW/KS — Time: 1210 — Test Termination: Tech: MS — Time: 1030

Beaker Number	Number of Live Organisms 0	10	Comments:
159	10	10	5 in Tin 1 hatch Small worms (Lumbriculus)
160	10	6	
161	10	4	
162	10	2	1 Hatch 1 in Tin
163	10	8	
164	10	8	✓
165	10	6	✓ 2 small native worms & 2nd instar not counted in Final #
166	10	8	5 in Tin 3 hatched
167	10	8	
168	10	10	
169	10	5	
170	10	7 6 MS	~~4~~ MS in Tin 2 hatch 4 Tin
171	10	7	6 in Tin 1 hatch
172	10	6	
173	10	6	1 hatch 5 in Tin
174	10	9	
175	10	7	6 Tin 1 hatch
176	10	4	

Beaker Number	Number of Live Organisms 0	10	Comments:
177	10	0	
178	10	6 MS	
179	10	10	
180	10	7	6 Tin 1 hatch
181	10	7 MS 6	
182	10	8	4 Tin 4 hatch
183	10	7	7
184	10	8	✓ 1 hatched removed 7 Tin 8 Total
185	10	1	
186	10	6	5 Tin 1 hatched Worm in Sample
187	10	~~10~~ 10 DD (4)	1 Dead Chiro on bottom of Sample
188	10	9	
189	10	6	
190	10	5	
191	10	7	
192	10	3	
193	10	9	✓ 9 in Tin 1 hatched

✓ = chironomids noted in native sample

CH2M HILL **FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA**

(ent Upper Columbia — Beginning, Date 4-29-05 — Time 1245

: nple Description see randomization sheet. Batch number: B1390 — Ending, Date 5-9-05 — Time 1400

Test Species: Chironomus tentans — ID#: CHI 13

' st Initiation: Tech: MS/BM/DU/KS Time: 1245 — Test Termination: Tech: BM Time: 1400

eaker Number	Number of Live Organisms 0	10	Comments:
194	10	8	7 in tin, 1 emerged, 1 small "native"
195	10	6	5 in tin, 1 emerging
196	10	9	
197	10	3	
198	10	6	1 dead Chiro on 5-3-05 BM
199	10	7	
200	10	7	5 in Tin, 2 emerging. Spider like free swimming organism
201	10	6	
202	10	8	7 in tin, 1 emerging
203	10	~~5~~ 4	~~5~~ 4 in tin, 1 emerging
204	10	10	1 hatched removed MS 5-7-05 BM 7 in tin, 2 more emerging
205	10	7	
206	10	5	
207	10	7	6 in tin, 1 emerging
208	10	8	
209	10	4	
210	10	6	
211	10	4	

Beaker Number	Number of Live Organisms 0	10	Comments:
212	10	7	4 in tin, 3 emerging
213	10	7	
214	10	8	7 in tin, 1 emerging
215	10	6	5 in tin, 1 emerging
216	10	9	4 in tin, 4 emerging, 1 emerged
217	10	6	
218	10	~~9~~ 8	
219	10	10	
220	10	4	
221	10	4	✓
222	10	7	
223	10	8	1 dead on surface (Chironomid) 6 in tin, 2 emerging
224	10	7	6 in tin, 1 emerging
225	10	5	
226	10	9	
227	10	8	6 in tin, 2 emerging
228	10	~~9~~ 8	1 hatched removed 6 in tin, 2 more emerging

✓: chironomids noted in native sample

CH2M HILL FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Client: Upper Columbia — Beginning, Date: 4-29-05 — Time: 1320

Sample Description: see randomization sheet. Batch number: B1390 — Ending, Date: 5-9-05 — Time: 1300

Test Species: Chironomus tentans — ID#: CHI 13

Test Initiation: Tech: MS/BM/DW/KS — Time: 1320 — Test Termination: Tech: MS — Time: 1300

Beaker Number	Number of Live Organisms 0	Number of Live Organisms 10	Comments:
229	10	9	
230	10	7	6 Tin 1 hatch
231	10	9	✓ 8 Tin 1 hatch
232	10	7	✓
233	10	~~8~~ ~~7~~ 9	7 ~~6~~ Tin ~~2~~ Hatch 2 hatches
234	10	~~8~~ ~~8~~ 7	6 Tin 1 hatch
235	10	7	2 hatched 5 tin
236	10	8	
237	10	8	
238	10	7	
239	10	7	
240	10	9	7 Tin 2 hatch
241	10	9	8 Tin 1 hatch
242	10	9	Lumbriculus noted day 5. Worms in sample container
243	10	7	
244	10	10	
245	10	6	
246	10	7	✓

Beaker Number	Number of Live Organisms 0	Number of Live Organisms 10	Comments:
247	10	~~8~~	8 (De)
248	10	6	
249	10	~~9~~ 10	9 ~~8~~ Tin 1 hatch
250	10	10	9 Tin 1 hatch
251	10	6	5 Tin 1 hatch
252	10	~~6~~ 7	6 ~~8~~ Tin 1 hatch
253	10	~~8~~ 9 MS	8 Tin 1 hatch
254	10	9	8 Tin 1 hatch
255	10	8	
256	10	9	
257	10	3	
258	10	7 ~~6~~ MS	5 ~~4~~ Tin 2 Hatch
259	10	9	
260	10	8	
261	10	6	
262	10	5	
263	10	3	

∴ chironomids noted in native sample

CH2M HILL FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

ient Upper Columbia — Beginning, Date 4-29-05 Time 1355
mple Description see randomization sheet. Batch number: B1390 — Ending, Date 5-6-05 Time 1245
Test Species: Chironomus tentans ID#: CHI 3
st Initiation: Tech: MS/BW/DW/KS Time: 1355 — Test Termination: Tech: CEA/MS Time: 1245

Beaker Number	Number of Live Organisms 0	10	Comments:
264	10	6	
265	10	0	
266	10	5	4P, 1 meta
267	10	8	7N, 1 meta
268	10	8	
269	10	0	
270	10	~~9~~ 10 CEA	
271	10	6	
272	10	7	
273	10	3	
274	10	7	
275	10	10	
276	10	8	7P 1 Meta
277	10	~~7~~ 6 MS	1 hatched removed / 6 Tin
278	10	~~8~~ 9 CEA	
279	10	9	8 N, 1 Meta
280	10	7	1 dead Chironomid on Day 1 bottom of container (6N 1 meta)
281	10	~~8~~ 5	4 Tin 1 meta (dead)

Beaker Number	Number of Live Organisms 0	10	Comments:
282	10	5	
283	10	7	6N, 1 meta
284	10	9	
285	10	8	7N, 1 meta
286	10	4	
287	10	~~3~~ 8 MS	~~2 Tin 1 hatch~~ MS ~~Fungus noted in sample~~ M
288	10	7	4 Tin 3 Hatch
289	10	3	2 Tin 1 hatch Fungus in Sample
290	10	7	
291	10	6	
292	10	8	
293	10	4	
294	10	9	8 Tin 1 Hatch
295	10	4	✓
296	10	1	
297	10	6	
298	10	4	

1 chironomids noted in active sample
→ 4 sin tin, 1 hatching = 5 alive BW

CH2M HILL FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Client: Upper Columbia | Beginning, Date: 4-29-05 | Time: 1430
Sample Description: see randomization sheet. Batch number: B1390 | Ending, Date: 5-9-05 | Time: 1605
Test Species: Chironomus tentans | ID#: CHI 13

Test Initiation: Tech: ms/Bm/DJ/KS Time: 1430 | Test Termination: Tech: Bm Time: 1605

Beaker Number	Number of Live Organisms 0	10	Comments:
299	10	7	+ 1 very small, considered native & not counted
300	10	7	✓
301	10	6	✓
302	10	7	6 in tin, 1 emerging + 1 small native
303	10	5	4 in tin, 1 emerging
304	10	6	5 in tin, 1 emerged
305	10	7	6 in tin, 1 emerging
306	10	5	
307	10	6	worms in sample
308	10	~~7~~ 8 Bm	~~6 in tin, 1 emerged~~ Bm
309	10	~~8~~ ~~6~~ 7 Bm	6 in tin, 1 emerged
310	10	~~7~~ 8 Bm	~~5 in tin, 1 emerging~~ Bm
311	10	~~10~~ 5 Bm	4 in tin, 1 emerging
312	10	10	
313	10	6	
314	10	6	
315	10	3	Spider like organism, ✓
316	10	9	

Beaker Number	Number of Live Organisms 0	10	Comments:
317	10	6	
318	10	10	
319	10	6	5 in tin, 1 emerging
320	10	~~7~~ 8 Bm	~~7~~ ~~6~~ 8 in tin, 1 emerging
321	10	7	
322	10	7	lumbriculus in sediment 5 in tin, 2 emerging
323	10	2	✓
324	10	5	2 in tin, 3 emerging
325	10	4	
326	10	8	6 in tin 1 emerging, 1 emerged spider like free swimming organisms
327	10	9	
328	10	7	
329	10	4	
330	10	8	✓ #331, 8 in tin, 1 emerged Bm 5-4-c
* 331	10	9	* tipped over in water bath - No Chironomids came out - water changed may not be able to use. MS
332	10	10	
333	10	4	2 in tin, 2 emerging

✓ = chironomids noted in native sample

CH2M HILL FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

C'' :nt Upper Columbia
S ıple Description see randomization sheet. Batch number: B1390
Test Species: Chironomus tentans ID#: CHI 13

Beginning, Date 4-29-05 Time 1515
Ending, Date 5-9-05 Time 1445

T t Initiation: Tech: MD/EM/DW/KS Time: 1515
Test Termination: Tech: DW Time: 1445

aker Number	Number of Live Organisms 0	10	Comments:
:34	10	2	
335	10	8	
:36	10	8	2 hatched / 6 in Tin
337	10	8	4 hatched / 4 in Tin
:38	10	9	2 hatched / 7 in Tin
339	10	10	
340	10	10	1 hatched / 9 in Tin
341	10	9	2 hatched / 7 in Tin
342	10	10	
343	10	9 8 DW	2 hatched / 9 in Tin
344	10	9	3 hatched / 6 in Tin

Beaker Number	Number of Live Organisms 0	10	Comments:

* LAST BATCH OF CHIRONOMIDS ADDED @ 1540. BW

✓: chironomids noted in native sample.

Chironomid GROWTH (ASH FREE DRY WEIGHT) DATA

lient Upper Columbia Species ID# CHI 13

Lab ID: see randomization sheet batch number: B1390 Start Date 04/29/2005

ample Description:

Technician:	BM	BM	BM
Date:	04/18/2005	05/11/2005	05/13/2005

Tin ID Number	Tare Weight (mg) (after 550°C for 2 hr)	Dry Weight (mg) (after 60°C for 24 hr)	Ash Weight (mg) (after 550°C for 2 hr)	Ash Free Dry Weight (mg) (Dry - Ash Wt.)	No. of Chironomids in Tin	No. of Chironomids surviving
71	na					
72	na					
73	na					
74	na					
75	na					
76	na					
77	na					
78	na					
79	na					
80	na					
81	na					
82	na					
83	na					
84	na					
85	na					
86	na					
87	na					
88	na					
89	69.79	96.29	78.26	18.03	6	6
90	69.12	86.58	72.07	14.51	9	9
91	69.92	85.78	72.60	13.18	6	6
92	68.96	81.99	71.56	10.43	8	8
93	69.24	80.02	72.36	7.66	10	10
94	68.95	85.04	73.74	11.30	7	8
95	69.97	77.20	71.47	5.73	6	6
96	69.41	88.50	74.43	14.07	9	9
97	69.78	87.48	78.21	9.27	7	8
98	69.49	79.28	71.92	7.36	4	4
99	66.68	73.99	68.20	5.79	2	2
100	69.46	82.53	71.83	10.70	6	6
101	68.41	79.12	70.57	8.55	4	5
102	68.99	74.74	69.83	4.91	2	3
103	69.21	81.36	72.22	9.14	6	6
104	69.48	78.83	71.69	7.14	4	4
105	68.97	86.58	75.12	11.46	8	8

weigh to 0.01 mg

Chironomid GROWTH (ASH FREE DRY WEIGHT) DATA

li it Upper Columbia Species ID# CHI 13

ab ID: see randomization sheet batch number: B1390 Start Date 04/29/2005

a ple Description:

Technician:	BM	BM	BM
Date:	04/19/2005	05/11/2005	05/12/2005

Tin ID Number	Tare Weight (mg) (after 550°C for 2 hr)	Dry Weight (mg) (after 60°C for 24 hr)	Ash Weight (mg) (after 550°C for 2 hr)	Ash Free Dry Weight (mg) (Dry - Ash Wt.)	No. of Chironomids in Tin	No. of Chironomids surviving
106	68.69	87.71	78.12	9.59	7	8
107	69.63	90.04	77.14	12.90	8	8
108	69.04	78.50	70.25	8.25	4	6
109	79.16	88.43	80.92	7.51	3	5
110	68.48	81.67	72.63	9.04	5	7
111	69.24	78.09	71.10	6.99	4	5
112	70.00	83.89	73.52	10.37	9	9
113	69.11	77.87	71.70	6.17	3	4
114	68.73	81.94	71.00	10.94	5	5
115	69.50	79.56	72.04	7.52	3	3
116	69.22	77.60	70.21	7.39	4	4
117	69.48	75.88	71.02	4.86	2	2
118	69.24	83.75	72.92	10.83	9	9
119	60.21	66.15	63.27	2.88	1	1
120	68.56	79.14	70.90	8.24	6	6
121	69.63	77.00	70.56	6.44	3	4
122	69.52	82.12	71.42	10.70	5	7
123	68.82	89.00	75.49	13.51	8	8
124	69.45	85.49	74.25	11.24	9	9
125	68.28	85.25	73.25	12.00	8	8
126	69.65	81.18	71.24	9.94	5	7
127	69.45	83.34	72.09	11.25	8	9
128	65.31	79.46	68.07	11.39	5	7
129	69.51	90.11	73.22	16.89	7	7
130	69.41	81.11	71.30	9.81	5	6
131	68.82	79.18	70.11	9.07	8	9
132	69.09	82.12	70.95	11.17	6	8
133	69.03	87.41	71.16	16.25	7	7
134	68.93	79.25	70.01	9.24	6	7
135	68.71	77.06	69.97	7.09	7	7
136	69.22	83.42	73.25	10.17	6	6
137	69.53	77.30	70.60	6.70	2	5
138	69.69	85.12	74.16	10.96	6	7
139	65.12	73.09	65.99	7.10	6	7
140	69.05	79.47	70.44	9.03	7	8

Chironomid GROWTH (ASH FREE DRY WEIGHT) DATA

Client: Upper Columbia — Species ID# CHI 13

Lab ID: see randomization sheet — batch number: B1390 — Start Date 04/29/2005

Sample Description:

Technician:	BM	BM	BM
Date:	04/18/2005	05/11/2005	05/13/2005

Tin ID Number	Tare Weight (mg) (after 550°C for 2 hr)	Dry Weight (mg) (after 60°C for 24 hr)	Ash Weight (mg) (after 550°C for 2 hr)	Ash Free Dry Weight (mg) (Dry - Ash Wt.)	No. of Chironomids in Tin	No. of Chironomids surviving
141	69.20	78.98	72.75	6.23	4	6
142	69.39	83.46	71.27	12.19	5	5
143	69.23	85.15	72.54	12.61	7	9
144	69.31	83.56	72.22	11.34	6	8
145	68.85	88.34	75.30	13.04	6	7
146	69.26	88.30	74.82	13.48	8	8
147	68.96	84.80	72.56	12.24	7	7
148	69.39	84.34	72.03	12.31	5	5
149	68.89	82.27	71.70	10.57	5	5
150	69.06	75.80	69.88	5.92	6	6
151	68.88	73.78	69.73	4.05	4	7
152	70.02	79.03	70.97	8.06	6	7
153	69.18	79.98	71.48	8.50	5	7
154	69.06	84.19	72.92	11.27	8	9
155	69.20	85.15	74.72	10.43	6	7
156	69.88	89.99	78.68	11.31	5	5
157	69.65	78.90	72.01	6.89	6	6
158	69.59	89.02	80.15	8.87	6	8
159	69.13	84.28	72.36	11.92	5	6
160	69.83	85.07	74.12	10.95	6	6
161	69.77	94.13	76.59	17.54	8	8
162	69.60	74.24	70.26	3.98	1	2
163	69.74	82.11	72.71	9.40	8	8
164	69.94	88.09	74.98	13.11	8	8
165	68.29	83.90	72.47	11.43	6	6
166	69.94	80.72	73.01	7.71	5	8
167	68.70	88.20	76.68	11.52	8	8
168	68.86	87.41	76.54	10.87	10	10
169	68.75	91.89	83.16	8.73	5	5
170	73.36	89.02	78.60	10.42	4	6
171	68.71	84.06	72.21	11.85	6	7
172	69.29	84.62	74.33	10.29	6	6
173	69.04	82.56	73.13	9.43	5	6
174	68.95	100.33	83.07	17.26	9	9
175	69.15	88.14	75.00	13.14	6	7

Chironomid GROWTH (ASH FREE DRY WEIGHT) DATA

Client: Upper Columbia — Species ID# CHI 13

Lab ID: see randomization sheet batch number: B1390 — Start Date 04/29/2005

Sample Description:

Technician:	BM	BM	BM
Date:	04/27/2005	05/11/2005	05/12/2005

Tin ID Number	Tare Weight (mg) (after 550°C for 2 hr)	Dry Weight (mg) (after 60°C for 24 hr)	Ash Weight (mg) (after 550°C for 2 hr)	Ash Free Dry Weight (mg) (Dry - Ash Wt.)	No. of Chironomids in Tin	No. of Chironomids surviving
176	69.21	81.00	73.02	7.98	4	4
177	69.56	69.57	69.58	-0.01	0	0
178	69.42	84.76	72.65	12.11	6	6
179	68.58	85.14	74.15	10.99	10	10
180	69.29	86.02	74.95	11.07	6	7
181	69.48	85.83	74.32	11.51	8	8
182	69.15	79.12	72.07	7.05	4	8
183	69.53	90.05	78.25	11.80	7	7
184	68.55	85.28	74.76	10.52	7	8
185	69.72	74.54	70.30	4.24	1	1
186	69.05	83.70	72.12	11.58	5	6
187	68.66	81.11	72.43	8.68	4	4
188	69.76	94.43	76.56	17.87	9	9
189	69.18	86.98	72.15	14.83	6	6
190	69.14	91.53	77.37	14.16	5	5
191	68.98	87.15	73.13	14.02	7	7
192	69.12	80.09	71.84	8.25	3	3
193	69.02	86.02	73.32	12.70	8	9
194	69.29	86.00	72.38	13.62	7	8
195	64.13	76.19	66.41	9.78	5	6
196	68.41	91.97	72.90	19.07	9	9
197	69.09	78.81	71.29	7.52	3	3
198	68.89	86.43	73.50	12.93	6	6
199	68.53	85.67	73.37	12.30	7	7
200	68.35	80.56	72.01	8.55	5	7
201	69.65	85.30	73.34	11.96	6	6
202	69.42	83.85	72.59	11.26	7	8
203	69.62	79.66	71.97	7.69	4	5
204	69.56	83.05	71.85	11.20	7	10
205	69.69	90.87	76.49	14.38	7	7
206	69.16	77.96	70.19	7.77	5	5
207	68.40	84.92	72.13	12.79	6	7
208	69.00	87.13	72.35	14.78	8	8
209	69.68	82.25	74.01	8.24	4	4
210	69.50	83.66	71.39	12.27	6	6

Chironomid GROWTH (ASH FREE DRY WEIGHT) DATA

Client: Upper Columbia Species ID# CHI 13

Test ID: see randomization sheet batch number: B1390 Start Date 04/29/2005

Sample Description:

Technician:	BM	BM	BM
Date:	04/18/2005	05/11/2005	05/12/2005

Tin ID Number	Tare Weight (mg) (after 550°C for 2 hr)	Dry Weight (mg) (after 60°C for 24 hr)	Ash Weight (mg) (after 550°C for 2 hr)	Ash Free Dry Weight (mg) (Dry - Ash Wt.)	No. of Chironomids in Tin	No. of Chironomids surviving
211	69.17	79.86	71.26	8.60	4	4
212	62.78	72.76	64.51	8.25	4	7
213	68.94	87.34	73.36	13.98	7	7
214	69.34	79.58	71.69	7.89	7	8
215	68.85	82.46	70.91	11.55	5	6
216	69.33	80.54	71.29	9.25	4	9
217	69.54	85.31	73.44	11.87	6	6
218	72.98	88.66	76.39	12.27	8	8
219	67.47	85.29	73.27	12.02	10	10
220	69.44	80.37	71.51	8.86	4	4
221	68.69	79.35	71.39	7.96	4	4
222	69.07	82.50	70.89	11.61	7	7
223	68.62	84.40	71.48	12.92	6	8
224	68.73	82.21	70.80	11.41	6	7
225	68.96	81.87	71.84	10.03	5	5
226	69.07	85.93	72.30	13.63	9	9
227	69.10	85.59	75.31	10.28	6	8
228	68.82	80.92	72.58	8.34	6	9
229	68.86	84.03	73.32	10.71	9	9
230	70.43	83.85	73.07	10.78	6	7
231	69.20	87.08	73.70	13.38	8	9
232	68.85	83.78	72.23	11.55	7	7
233	69.41	87.01	74.62	12.39	7	9
234	69.52	90.61	75.17	15.44	6	7
235	69.22	84.96	72.73	12.23	5	7
236	69.08	88.35	74.06	14.29	8	8
237	69.61	87.81	72.87	14.94	8	8
238	69.53	83.90	72.64	11.26	7	7
239	69.44	84.98	71.66	13.32	7	7
240	69.57	82.88	73.37	9.51	7	9
241	69.33	84.47	75.06	9.41	8	9
242	68.38	87.70	73.32	14.38	9	9
243	69.20	85.71	73.47	12.24	7	7
244	69.07	85.40	73.38	12.02	10	10
245	68.80	84.18	75.05	9.13	6	6

Chironomid GROWTH (ASH FREE DRY WEIGHT) DATA

Client: Upper Columbia — Species ID# CHI 13

Lab ID: see randomization sheet batch number: B1390 — Start Date: 04/29/2005

Sample Description:

Technician:	BM	BM	BM
Date:	04/18/2005	05/11/2005	05/12/2005

Tin ID Number	Tare Weight (mg) (after 550°C for 2 hr)	Dry Weight (mg) (after 60°C for 24 hr)	Ash Weight (mg) (after 550°C for 2 hr)	Ash Free Dry Weight (mg) (Dry - Ash Wt.)	No. of Chironomids in Tin	No. of Chironomids surviving
246	68.84	85.81	73.75	12.06	7	7
247	69.26	85.02	72.26	12.76	8	8
248	69.04	84.16	73.69	10.47	6	6
249	69.10	82.95	72.78	10.17	9	10
250	69.32	88.36	75.96	12.40	9	10
251	69.08	82.89	71.52	11.37	5	6
252	69.28	83.02	71.45	11.57	6	7
253	69.06	80.81	70.56	10.25	8	9
254	68.65	88.16	77.60	10.56	8	9
255	68.65	79.17	72.76	6.41	8	8
256	68.83	89.24	77.13	12.11	9	9
257	69.23	82.92	73.33	9.59	3	3
258	61.42	74.92	63.86	11.06	5	7
259	68.94	78.95	71.19	7.76	9	9
260	69.86	91.43	77.46	13.97	8	8
261	68.79	83.22	71.68	11.54	6	6
262	68.59	86.89	75.25	11.64	5	5
263	68.98	79.78	72.21	7.57	3	3
264	68.91	85.50	72.64	12.86	6	6
265	69.06	69.06	69.04	0.02	0	0
266	69.16	80.06	71.30	8.76	4	5
267	68.45	84.55	71.30	13.25	7	8
268	68.91	93.04	74.77	18.27	8	8
269	69.26	69.24	69.25	-0.01	0	0
270	69.10	92.78	77.23	15.55	10	10
271	69.77	89.59	75.12	14.47	6	6
272	69.54	85.71	72.79	12.92	7	7
273	70.45	82.20	75.21	6.99	3	3
274	69.63	86.56	77.89	8.67	7	7
275	70.12	87.05	74.68	12.37	10	10
276	68.25	87.78	75.52	12.26	7	8
277	68.75	82.24	73.79	8.45	6	7
278	68.80	90.49	74.40	16.09	9	9
279	68.61	78.03	70.19	7.84	8	9
280	68.91	84.28	72.90	11.38	7	7

weigh to 0.01 mg

Chironomid GROWTH (ASH FREE DRY WEIGHT) DATA

Test: Upper Columbia — Species ID# CHI 13

Lab ID: see randomization sheet — batch number: B1390 — Start Date 04/29/2005

Sample Description:

Technician:	BM	BM	BM
Date:	04/19/2005	05/11/2005	05/12/2005

Tin ID Number	Tare Weight (mg) (after 550°C for 2 hr)	Dry Weight (mg) (after 60°C for 24 hr)	Ash Weight (mg) (after 550°C for 2 hr)	Ash Free Dry Weight (mg) (Dry - Ash Wt.)	No. of Chironomids in Tin	No. of Chironomids surviving
281	68.90	81.81	71.23	10.58	4	5
282	69.07	86.98	74.05	12.93	5	5
283	68.31	83.34	73.48	9.86	6	7
284	68.02	88.41	72.28	16.13	9	9
285	68.85	85.54	72.72	12.82	7	8
286	68.96	75.63	69.84	5.79	4	4
287	68.77	85.59	72.70	12.89	8	8
288	68.78	80.80	71.89	8.91	4	7
289	68.64	77.42	70.78	6.64	2	3
290	68.85	85.62	73.01	12.61	7	7
291	69.54	84.30	73.26	11.04	6	6
292	69.11	87.80	73.59	14.21	8	8
293	68.45	80.66	73.09	7.57	4	4
294	70.93	86.60	74.65	11.95	8	9
295	68.62	79.95	71.56	8.39	4	4
296	68.34	73.89	70.24	3.65	1	1
297	68.72	83.99	73.08	10.91	6	6
298	68.34	78.88	70.38	8.50	4	4
299	68.44	85.62	71.45	14.17	7	7
300	69.17	85.24	74.51	10.73	7	7
301	69.15	83.28	72.11	11.17	6	6
302	69.92	77.88	70.79	7.09	6	7
303	69.68	83.05	72.21	10.84	4	5
304	69.48	80.36	72.74	7.62	5	6
305	68.95	85.65	73.52	12.13	6	7
306	69.49	79.26	70.73	8.53	5	5
307	69.02	86.01	72.42	13.59	6	6
308	69.67	82.83	73.67	9.16	8	8
309	68.61	85.82	75.72	10.10	6	7
310	68.55	88.89	73.04	15.85	8	8
311	68.86	81.22	72.83	8.39	4	5
312	68.41	86.44	73.33	13.11	10	10
313	68.38	81.54	71.25	10.29	6	6
314	68.31	85.11	71.83	13.28	6	6
315	69.14	77.94	71.61	6.33	3	3

Chironomid GROWTH (ASH FREE DRY WEIGHT) DATA

Client: Upper Columbia — Species ID#: CHI 13

ID: see randomization sheet — batch number: B1390 — Start Date: 04/29/2005

Sample Description:

Technician:	BM	BM	BM
Date:	04/19/2005	05/11/2005	05/12/2005

Tin ID Number	Tare Weight (mg) (after 550°C for 2 hr)	Dry Weight (mg) (after 60°C for 24 hr)	Ash Weight (mg) (after 550°C for 2 hr)	Ash Free Dry Weight (mg) (Dry - Ash Wt.)	No. of Chironomids in Tin	No. of Chironomids surviving
316	68.72	84.82	73.00	11.82	9	9
317	68.67	83.52	72.05	11.47	6	6
318	68.62	92.35	74.62	17.73	10	10
319	69.45	82.36	73.33	9.03	5	6
320	68.43	86.08	74.45	11.63	7	8
321	69.97	86.49	73.91	12.58	7	7
322	69.89	82.45	71.88	10.57	5	7
323	69.15	80.19	72.21	7.98	2	2
324	69.70	76.44	70.21	6.23	2	5
325	70.03	75.27	70.94	4.33	4	4
326	69.38	84.47	74.04	10.43	6	8
327	69.13	86.69	76.73	9.96	9	9
328	71.39	87.71	75.62	12.09	7	7
329	69.75	78.79	72.15	6.64	4	4
330	70.00	79.53	71.35	8.18	8	8
331	69.97	87.80	74.25	13.55	8	9
332	69.24	90.25	78.61	11.64	10	10
333	69.97	79.68	73.38	6.30	2	4
334	69.94	77.23	71.21	6.02	2	2
335	70.00	81.86	71.53	10.33	8	8
336	69.46	83.77	71.72	12.05	6	8
337	69.83	79.49	72.18	7.31	4	8
338	69.50	82.99	71.97	11.02	7	9
339	69.71	83.59	72.53	11.06	10	10
340	69.56	85.11	73.59	11.52	9	10
341	69.77	83.73	72.60	11.13	7	9
342	69.90	78.78	71.60	7.18	10	10
343	69.70	85.87	74.57	11.30	7	9
344	70.05	81.42	73.04	8.38	6	9

igh to 0.01 mg

APPENDIX B
REFERENCE TOXICANT DATA SHEETS
AND
CUSUM CHARTS

REFERENCE TOXICANT DATA SHEET

29 MS

Client: QA/QC
Test Organism: Chironomus dentans
Source: ABS
ID#: CHI 13
Age: 2nd to 3rd Instar
Size: —
Loading: —

Reference Toxicant: KCL (CCO 408)
Solvent: Recon MH
Stock Solution: 10%
Reagent Log ID #: 15028-04
*Dilution Water: Recon MH
ID#: 2496
Total Hardness as CaCO3: 88
Conductivity (µmhos/cm) / Salinity (ppt): 281
Technician: 0 hr MS; 24 hr MS; 48 hr DW; 72 hr MS; 96 hr MS
Time: 0 hr 1500; 24 hr 1200; 48 hr 1245; 72 hr 1250; 96 hr 1515

Test Begin: Date 4-~~29~~-05 MS Time 1500
Test End: Date 5-3-05 Time 1515
Total Alkalinity as CaCO3: 62
Temperature: 23 ± 1

Toxicant Concen. g/L	Test Chamber Number	Number Surviving 0	24	48	72	96	Dissolved Oxygen mg/l 0	24	48	72	96	pH 0	24	48	72	96	Temperature °C 0	24	48	72	96	Cond. 0
Control		10	10	10	10	10	8.0	7.0	7.1	5.9	6.1	7.6	7.2	7.3	7.1	6.9	22.9	23.1	22.8	22.8	23.3	300
1.25		10	10	10	10	10	8.0	6.7	6.5	6.2	5.9	MS 7.6	7.4	7.5	7.3	7.1	22.8	23.1	23.0	22.6	23.4	2500
2.5		10	10	9	9	9	8.0	7.0	7.0	6.3	7.0	7.7	7.5	7.7	7.3	7.2	22.9	23.2	23.1	22.7	23.3	4800
5.0		10	10	10	10	10	8.0	6.8	6.7	6.8	6.4	7.7	7.6	7.7	7.4	7.4	22.9	23.1	23.1	22.8	23.4	8980
7.5		10	9	9	6	4	8.1	6.9	6.9	6.5	6.3	7.9	7.7	7.7	7.6	7.6	22.9	23.1	23.0	22.9	23.4	13000
10.0		10	5	0	—	—	8.2	7.0	6.8	—	—	8.0	7.6	7.7	—	—	22.9	23.3	23.0	—	—	17030
Test Acceptability Limits:		Survival in Controls: > or = 90%					For RBT (12°C): >6.0 and <10.8 All Others (at 20°C): > 4.0 and < 9.1					pH: > 6.0 and < 9.0					Temperature ± 1 °C					

*Dilution Water Code
Recon. - reconstituted water
S - soft
MH - moderately hard
H - hard
Art. Sea - Artificial Sea Water

START of test Fed ✓ MS
48 hr Fed ✓ DW

96 h LC50: 6.6

Cusum Chart Limits: 0.7 to 7.4

Statistical Method: Spearman-Karber

We verify this data is true and correct

Task Manager

Project Manager

QA Officer

CETIS Test Summary

Report Date: 03 May-05 4:24 PM
Link: 06-0747-6832/RCTA013

Chironomus 96 hour static Acute test — **CH2M Hill**

Test No:	02-5461-0531	Test Type:	Survival (96h)	Duration:	4d 0h
Start Date:	29 Apr-05 03:00 PM	Protocol:		Species:	Chironomus tentans
Ending Date:	03 May-05 03:15 PM	Dil Water:		Source:	Aquatic Biosystems, CO
Setup Date:	29 Apr-05 03:00 PM	Brine:			

Sample No:	14-1397-5136	Material:	Potassium chloride	Client:	
Sample Date:	26 Apr-05	Code:	1B028-04	Project:	
Receive Date:		Source:	Reference Toxicant		
Sample Age:	87h	Station:			

Point Estimate Summary

Analysis	Endpoint	% Effect	Conc-gm/L	95% LCL	95% UCL	Method
05-3314-7150	96h Proportion Survived	50	6.61062	5.61937	7.77672	Trimmed Spearman-Karber

96h Proportion Survived Summary

Conc-gm/L	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Dilution Water	1	1.00000	1.00000	1.00000			
1.25		1	1.00000	1.00000	1.00000			
2.5		1	0.90000	0.90000	0.90000			
5		1	1.00000	1.00000	1.00000			
7.5		1	0.40000	0.40000	0.40000			
10		1	0.00000	0.00000	0.00000			0.00%

96h Proportion Survived Detail

Conc-gm/L	Control Type	Rep 1
0	Dilution Water	1.00000
1.25		1.00000
5		0.90000
5		1.00000
7.5		0.40000
10		0.00000

CETIS Analysis Detail

Report Date: 03 May-05 4:24 PM
Analysis: 05-3314-7150/RCTA013

Chironomus 96 hour static Acute test — **CH2M Hill**

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
96h Proportion Survived	Trimmed Spearman-Karber	06-0747-6832	06-0747-6832	03 May-05 4:21 PM	CETISv1.025

Spearman-Karber Options

Threshold Option	Lower Threshold	Trim Level	Mu	Sigma
Control Threshold	0	0.00%	0.8202421	0.03527723

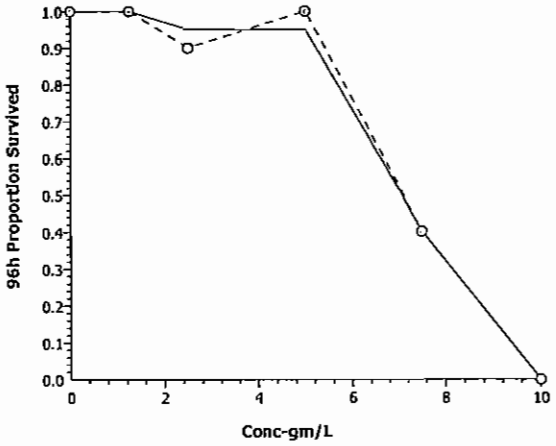
Point Estimates

EC50/LC50	95% LCL	95% UCL
6.61062	5.61937	7.77672

Data Summary

Conc-gm/	Control Type	Count	Calculated Variate(A/B) Mean	Minimum	Maximum	SE	SD	A	B
0	Dilution Water	1	1.00000	1.00000	1.00000			10	10
1.25		1	1.00000	1.00000	1.00000			10	10
2.5		1	0.90000	0.90000	0.90000			9	10
5		1	1.00000	1.00000	1.00000			10	10
7.5		1	0.40000	0.40000	0.40000			4	10
10		1	0.00000	0.00000	0.00000			0	10

Graphics



REFERENCE TOXICANT DATA SHEET

Client: QA/QC
Test Organism: Chironomus Tentans
Source: ABS
ID#: Citt 14
Age: 2nd - 3rd instar
Size: –
Loading: –

Reference Toxicant: KCl
Solvent: Recon MH
Stock Solution: 10 g/L
Reagent Log ID #: 13028.06
*Dilution Water: Recon MH (AMW) ID#: 2497
Total Hardness as CaCO3: 88
Total Alkalinity as CaCO3: 64
Conductivity (µmhos/cm) / Salinity (ppt): 291
Temperature: 23±1°C

Test Begin: Date 5-6-05 Time 1530
Test End: Date 5-10-05 Time 1625

	0 hr	24 hr	48 hr	72 hr	96 hr
Technician	Bm	Bm	MS	MS	Bm
Time	1530 Fed ✓	0950	0940 Fed	1700	1625

Toxicant Concen. g/L	Test Chamber Number	Number Surviving					Dissolved Oxygen mg/l					pH					Temperature °C					Cond.
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0
Control		10	10	10	10	10	7.8	–	6.3	6.1	6.0	7.6	–	7.6	7.4	7.7	23.0	22.9	23.0	23.2	22.7	390
1.25		10	10	10	10	9	7.8	–	6.1	6.0	6.0	7.7	–	7.6	7.5	7.5	23.1	23.0	23.1	23.2	22.9	2330
2.5		10	10	10	10	8	7.8	–	6.0	5.9	5.8	7.9	–	7.5	7.4	7.6	23.1	22.9	23.1	23.2	22.9	4260
5.0		10	10	10	9	8	7.8	–	6.5	6.3	5.9	7.9	–	7.6	7.4	7.7	23.0	23.0	23.1	23.2	23.1	7960
7.5		10	3	2	0	–	7.9	–	6.4	3.4	–	7.9	–	7.6	7.2	–	23.0	23.1	23.0	23.1	–	11650
10.0		10	0	—	—	—	7.9	8.4	–	—	–	7.9	8.0	—	—	—	23.1	23.1	~~23.2~~ MS	—	—	15340
Test Acceptability Limits:		Survival in Controls: > or = 90%					For RBT (12°C): >6.0 and <10.8; All Others (at 20°C): > 4.0 and < 9.1					pH: > 6.0 and < 9.0					Temperature ± 1 °C					

* Ten replicates w/ 1 organism each

*Dilution Water Code
Recon. - reconstituted water
S - soft
MH - moderately hard
H - hard
Art. Sea - Artificial Sea Water

96 h LC50: 5.1
Cusum Chart Limits: 1.6 to 7.4
Statistical Method: Spearman-Karber

We verify this data is true and correct.
Task Manager: [signature]
Project Manager: [signature]
QA Officer: [signature]

CETIS Test Summary

Report Date: 24 May-05 4:13 PM
Link: 18-9817-2453/rcta014

Chironomus 96 hour static Acute test — **CH2M Hill**

Test No:	11-9073-8265	Test Type:	Survival (96h)	Duration:	4d 0h
Start Date:	06 May-05 03:30 PM	Protocol:		Species:	Chironomus tentans
Ending Date:	10 May-05 04:25 PM	Dil Water:		Source:	Aquatic Biosystems, CO
Setup Date:	06 May-05 03:30 PM	Brine:			

Sample No:	16-1218-9109	Material:	Potassium chloride	Client:	
Sample Date:	06 May-05	Code:	1B028-06	Project:	
Receive Date:		Source:			
Sample Age:	16h	Station:			

Comments: 10 g/L stock in Recon MH

Point Estimate Summary

Analysis	Endpoint	% Effect	Conc-gm/L	95% LCL	95% UCL	Method
10-7181-1717	96h Proportion Survived	50	5.12787	3.83351	6.85926	Trimmed Spearman-Karber

96h Proportion Survived Summary

Conc-gm/L	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Dilution Water	1	1.00000	1.00000	1.00000			
1.25		1	0.90000	0.90000	0.90000			
2.5		1	0.80000	0.80000	0.80000			
5		1	0.80000	0.80000	0.80000			
7.5		1	0.00000	0.00000	0.00000			0.00%
10		1	0.00000	0.00000	0.00000			0.00%

96h Proportion Survived Detail

Conc-gm/L	Control Type	Rep 1
0	Dilution Water	1.00000
1.25		0.90000
2.5		0.80000
5		0.80000
7.5		0.00000
10		0.00000

CETIS Analysis Detail

Report Date: 24 May-05 4:13 PM
Analysis: 10-7181-1717/rcta014

Chironomus 96 hour static Acute test — **CH2M Hill**

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
96h Proportion Survived	Trimmed Spearman-Karber	18-9817-2453	18-9817-2453	10 May-05 4:32 PM	CETISv1.025

Spearman-Karber Options

Threshold Option	Lower Threshold	Trim Level	Mu	Sigma
Control Threshold	0	10.00%	0.7099368	0.06317022

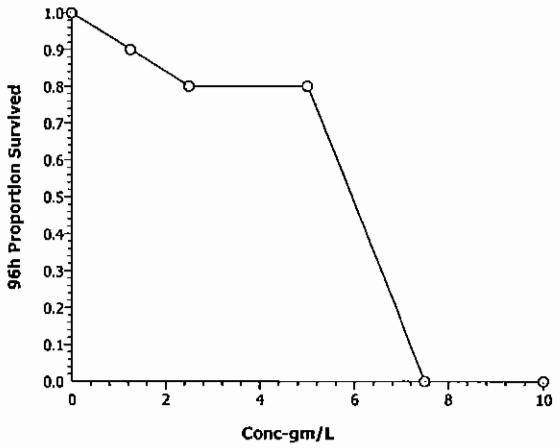
Point Estimates

EC50/LC50	95% LCL	95% UCL
5.12787	3.83351	6.85926

Data Summary

Conc-gm/	Control Type	Count	Calculated Variate(A/B) Mean	Minimum	Maximum	SE	SD	A	B
0	Dilution Water	1	1.00000	1.00000	1.00000			10	10
1.25		1	0.90000	0.90000	0.90000			9	10
2.5		1	0.80000	0.80000	0.80000			8	10
5		1	0.80000	0.80000	0.80000			8	10
7.5		1	0.00000	0.00000	0.00000			0	10
10		1	0.00000	0.00000	0.00000			0	10

Graphics



Chironomus tentans LC50 REFERENCE TOXICANT LOG Potassium chloride (g/L)							
Event #	CHI ID #	Start Date	LC50	Running Average LC50	Accum. Standard Dev.	95% Confidence Limits AVG+2SD	AVG-2SD
1	2	09/10/1999	4.2				
2	3	10/05/1999	2.5	3.4	1.22	5.8	0.9
3	4	10/12/1999	2.3	3.0	1.05	5.1	0.9
4	4	10/12/1999	2.2	2.8	0.96	4.7	0.9
5	5	10/20/1999	4.2	3.1	1.04	5.2	1.0
6	6	11/02/1999	4.9	3.4	1.19	5.8	1.0
7	8	07/29/2002	2.0	3.2	1.20	5.6	0.8
8	11	10/01/2004	5.4	3.5	1.36	6.2	0.8
9	12	04/26/2005	5.8	3.7	1.49	6.7	0.8
10	13	04/29/2005	6.6	4.0	1.67	7.4	0.7
11	14	05/06/2005	5.1	4.1	1.62	7.4	0.9
12							
13							
14							
15							
16							
17							
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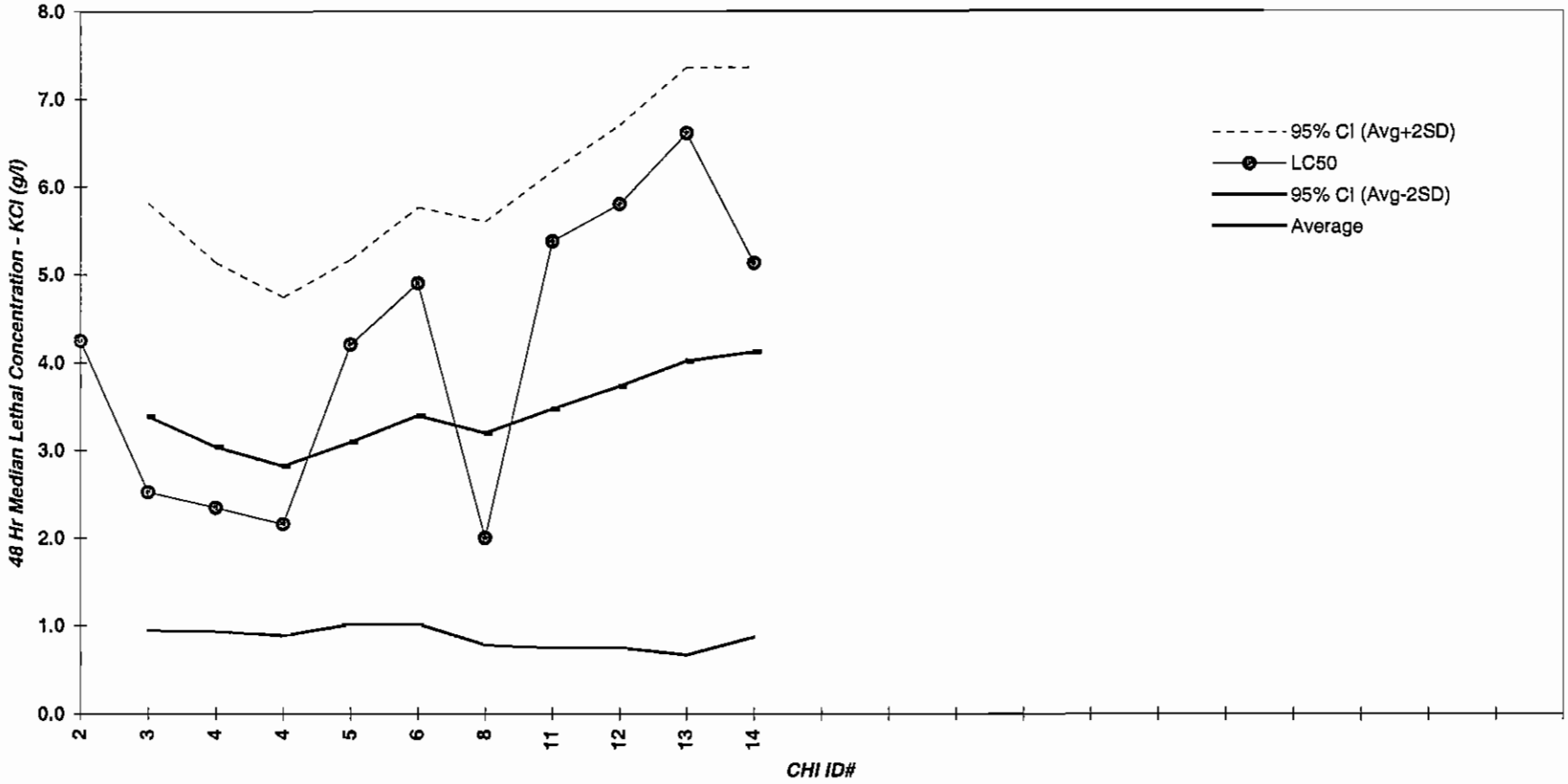
36							
37							
38							

REFERENCE TOXICANT QA/QC CHART

Chironomid tentans



CH2M HILL

Ceriodaphnia dubia
Survival and Reproduction
Reference Toxicant Test Data Summary

Client: QA/QC – May
Test Start Date: 4-28-05
Sample Description: 50 g/L NaCl IB027-08
Sample ID#: ——
Ceriodaphnia Lot#: Cd 1782
Statistician: DM

Percent or Concentration	Total Young Per Replicate										# Alive Adults	Total Live Young
	A	B	C	D	E	F	G	H	I	J		
Control	18	23	31	30	30	31	26	30	29	26	10	279
0.25 g/L	22	21	17	19	21	29	23	23	29	24	10	228
0.5 g/L	10	22	16	26	9	25	26	22	22	22	10	200
1.0 g/L	2	13	11	2	14	11	13	19	0	14	10	99
1.5 g/L	0	0	0 (AD)	0	0	0 (AD)	0 (AD)	0	0	0	7	0
2.0 g/L	0	0 (AD)	0	0 (AD)	0 (AD)	0 (AD)	0 (AD)	0 (AD)	0 (AD)	0 (AD)	2	0
4.0 g/L	0	0	0	0	0	0	0	0	0	0	0	0

Footnote: *Ceriodaphnia dubia* test should be terminated when 60% of the control organisms have produced their third brood, or at the end of eight days, whichever occurs first.

Endpoint	IC25	Cusum Chart Limits
Survival	1.42	1.03 to 2.00
Reproduction	0.42	021 to 0.90

Task Manager: Doug Winner
Project Manager: [signature]
QA Officer: [signature]

CH2M HILL

CERIODAPHNIA 7-DAY SURVIVAL AND REPRODUCTION DATA

Client QA / QC - May Test Beginning: Date 4-28-05 Time 0815

Sample Description NaCl - 50g/L (18027-08) Test Ending: Date 5-4-05 Time 1205

Ceriodaphnia Lot# Cd 1782 Dilution Water Recon MH(FHM) ID# 2496

Technician Day 1 (NB) Day 2 DW Day 3 DW Day 4 MS Day 5 MS Day 6 JS Day 7 ____

Time Day 1 0910 Day 2 0810 Day 3 0845 Day 4 1100 Day 5 0950 Day 6 1205 Day 7 ____

Percent or Concentration	Day	Replicate A	B	C	D	E	F	G	H	I	J	No. Live Adults	Total Live Young
Control	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	5	5	6	0	5	5	4	5	0	5	10	40
	4	0	10	11	6	11	0	10	13	6	7	10	74
	5	6	0	0	12	0	14	0	0	10	0	10	3=32=42
	6	7	13	14	12	14	12	12	12	13	14	10	123
	7												
0.25 g/L	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	5	5	3	0	5	5	5	4	0	4	10	36
	4	0	0	10	9	8	9	10	9	6	0	10	61
	5	12	11	0	0	0 M/0	0 M/0	0	0	13	10	10	54
	6	5	5	4	10	8	7	8	10	10	10	10	77
	7												
0.5 g/L	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	5	4	4	0	0	5	5	4	3	3	10	33
	4	0	0	0	5	3	8	9	8	0	0	10	33
	5	0	11	5	12	6	0	0	0	10	10	10	54
	6	5	7	7	9	0	12	12	10	9	9	10	80
	7												
1.0 g/L	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	3	0	0	3	2	3	0	3	10	14
	4	2	2	0	2	2	4	6	0	0	0	10	18
	5	0	4	6	0	8	0	0	8	0	6	10	32
	6	0	7	2	0	4	4	5	3	0	5	10	35
	7												
1.5 g/L	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0/AD	0/AD	0	0	0	8	0
	4	0	0	0	0	0	↓	↓	0	0	0	8	0
	5	0	0	0	0	0	↓	↓	0	0	0	8	0
	6	0	0	0 M/0	0	0	↓	↓	0	0	0	7	0
	7			↓			↓	↓					
2.0 g/L	1	0	0	0	0	0	AD/0	AD/0	0	0	0	8	0
	2	0	0/AD	0	0/AD	0/AD	↓	↓	0/AD	0/AD	0/AD	2	0
	3	0	↓	0	↓	↓	↓	↓	↓	↓	↓	2	0
	4	0	↓	0	↓	↓	↓	↓	↓	↓	↓	2	0
	5	0	↓	0	↓	↓	↓	↓	↓	↓	↓	2	0
	6		↓		↓	↓	↓	↓	↓	↓	↓		
	7		↓		↓	↓	↓	↓	↓	↓	↓		
4.0 g/L	1	AD/0	AD/0	AD/0	AD/0	AD/0	AD/0	AD/0	AD/0	AD/0	AD/0	0	0
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

* large yg possibly split brood

CH2M HILL

CERIODAPHNIA WATER QUALITY DATA

Client: QA / QC - May
Initiated Date: 4-28-05 Time: 0815
Adults Isolated Date: 4-27-05 Time: 1600
Sample Description: NaCl Reagent Log # 1B027-08
Terminated Date: _____ Time: _____
Neo's Collected Date: 4-27-05 Time: 2230

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Technician	DW	[illegible]	DW	DW	MS	MS	[illegible]	
Time	0815	0910	0810	0845	1100	0850	1205	

Percent or Concentration	Dissolved Oxygen (mg/l) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Control	7.8	7.7 / 7.8	7.7 / 7.9	7.7 / 7.9	7.6 / 7.8	7.5 / 7.6	7.5 / 7.3	
0.25 g/L	7.8	7.6 / 7.8	7.7 / 7.9	7.7 / 7.9	7.5 / 7.7	7.5 / 7.5	7.4 / 7.3	
0.50 g/L	7.8	7.7 / 7.9	7.7 / 7.9	7.7 / 7.8	7.4 / 7.8	7.4 / 7.5	7.4 / 7.3	
1.0 g/L	7.8	7.8 / 7.9	7.7 / 7.9	7.7 / 7.8	7.4 / 7.7	7.5 / 7.5	7.6 / 7.3	
1.5 g/L	7.8	7.8 / 7.9	7.7 / 7.8	7.7 / 7.8	7.4 / 7.6	7.5 / 7.7	7.6 / 7.2	
2.0 g/L	7.8	8.0 / 7.9	7.7 / 7.8	7.6 / 7.8	7.5 / 7.7	7.6 / 7.6	7.9 / 7.6	
4.0 g/L	7.8	8.0 / 7.9	— / —	— / —	— / —	— / —	— / —	—

Percent or Concentration	pH Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Control	7.6	7.5 / 7.6	7.4 / 7.6	7.5 / 7.6	7.5 / 7.6	7.6 / 7.5	7.5 / 7.4	
0.25 g/L	7.6	7.6 / 7.6	7.4 / 7.6	7.5 / 7.6	7.4 / 7.5	7.7 / 7.4	7.5 / 7.2	
0.50 g/L	7.6	7.6 / 7.7	7.5 / 7.6	7.5 / 7.7	7.4 / 7.6	7.7 / 7.6	7.6 / 7.5	
1.0 g/L	7.7	7.6 / 7.7	7.6 / 7.7	7.6 / 7.7	7.7 / 7.7	7.7 / 7.6	7.7 / 7.5	
1.5 g/L	7.8	7.6 / 7.9	7.8 / 7.8	7.7 / 7.7	7.7 / 7.7	7.7 / 7.6	7.8 / 7.6	
2.0 g/L	7.8	7.7 / 7.8	7.8 / 7.8	7.8 / 7.8	7.9 / 7.6	7.8 / 7.4	7.9 / 7.6	
4.0 g/L	7.9	7.8 / —	— / —	— / —	— / —	— / —	— / —	—

Percent or Concentration	Temperature (C) / Conductivity (µmhos/cm) Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Control	25.3 / 319	25.4 / 326	24.2 / 321	24.7 / 322	24.3 / 300	24.4 / 310	25.2 / 294	
0.25 g/L	25.4 / 810	25.6 / 883	24.4 / 796	24.9 / 790	25.1 / 680	24.9 / 780	25.9 / 761	
0.50 g/L	25.1 / 1250	26.4 / 1350	24.2 / 1300	24.6 / 1281	25.3 / 1210	24.3 / 1200	25.7 / 1187	
1.0 g/L	25.3 / 2230	25.4 / 2050	24.1 / 2260	24.4 / 2240	25.1 / 2050	24.4 / 2040	25.5 / 2060	
1.5 g/L	25.2 / 3200	25.4 / 3290	24.5 / 3150	24.7 / 3120	25.3 / 3000	24.3 / 2840	25.2 / 2974	
2.0 g/L	25.4 / 4060	25.4 / 4240	24.6 / 4100	24.8 / 4090	25.3 / 4080	24.1 / 4040	25.7 / 4010	
4.0 g/L	25.2 / 7610	25.3 / --	— / —	— / —	— / —	— / —	— / —	—

COMMENTS:

CETIS Test Summary

Report Date: 04 May-05 1:31 PM
Link: 03-0789-7451/rcdc1782

Ceriodaphnia 7-d Survival and Reproduction Test — **CH2M Hill**

st No:	13-8464-1205	Test Type:	Reproduction-Survival (7d)	Duration:	6d 3h
art Date:	28 Apr-05 08:15 AM	Protocol:	EPA/821/R-02-013 (2002)	Species:	Ceriodaphnia dubia
Ending Date:	04 May-05 12:05 PM	Dil Water:		Source:	In-House Culture
Setup Date:	28 Apr-05 08:15 AM	Brine:			

Sample No:	08-9695-8586	Material:	Sodium chloride	Client:	
Sample Date:	04 Apr-05	Code:	1B027-08	Project:	
Receive Date:		Source:	Reference Toxicant		
Sample Age:	24d 8h	Station:			

Comments: 50 g/L stock

Point Estimate Summary

Analysis	Endpoint	% Effect	Conc-gm/L	95% LCL	95% UCL	Method
10-8414-6325	6d Proportion Survived	25	1.41667	1.20833	1.63889	Linear Interpolation
18-0059-7763	Reproduction	25	0.41741	0.22713	0.59698	Linear Interpolation

Test Acceptability

Analysis	Endpoint	Attribute	Statistic	Acceptable Range	Decision
18-0059-7763	Reproduction	Control Response	27.9	15 - N/A	Passes acceptability criteria

6d Proportion Survived Summary

Conc-gm/L	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Dilution Water	10	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
0.25		10	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
0.5		10	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
1		10	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
5		10	0.70000	0.00000	1.00000	0.15275	0.48305	69.01%
		10	0.20000	0.00000	1.00000	0.13333	0.42164	210.82
4		10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00%

Reproduction Summary

Conc-gm/L	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Dilution Water	10	27.9	18	31	1.2423	3.9285	14.08%
0.25		10	22.8	17	29	1.2184	3.8528	16.90%
0.5		10	20	9	26	1.9720	6.2361	31.18%
1		10	9.9	0	19	2.0025	6.3325	63.96%
1.5		10	0	0	0	0	0	0.00%
2		10	0	0	0	0	0	0.00%
4		10	0	0	0	0	0	0.00%

CETIS Test Summary

Report Date: 04 May-05 1:31 PM
Link: 03-0789-7451/rcdc1782

6d Proportion Survived Detail

Conc-gm/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
	Dilution Water	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
0.25		1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
0.5		1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
1		1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
1.5		1.00000	1.00000	0.00000	1.00000	1.00000	0.00000	0.00000	1.00000	1.00000	1.00000
2		1.00000	0.00000	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Reproduction Detail

Conc-gm/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	18	28	31	30	30	31	26	30	29	26
0.25		22	21	17	19	21	29	23	23	29	24
0.5		10	22	16	26	9	25	26	22	22	22
1		2	13	11	2	14	11	13	19	0	14
1.5		0	0	0	0	0	0	0	0	0	0
2		0	0	0	0	0	0	0	0	0	0
4		0	0	0	0	0	0	0	0	0	0

CETIS Analysis Detail

Report Date: 04 May-05 1:31 PM
Analysis: 10-8414-6325/rcdc1782

Ceriodaphnia 7-d Survival and Reproduction Test — **CH2M Hill**

dpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Linear Interpolation	03-0789-7451	03-0789-7451	04 May-05 1:30 PM	CETISv1.025

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Expanded CL	Method
Linear	Linear	7055475	200	Yes	Two-Point Interpolation

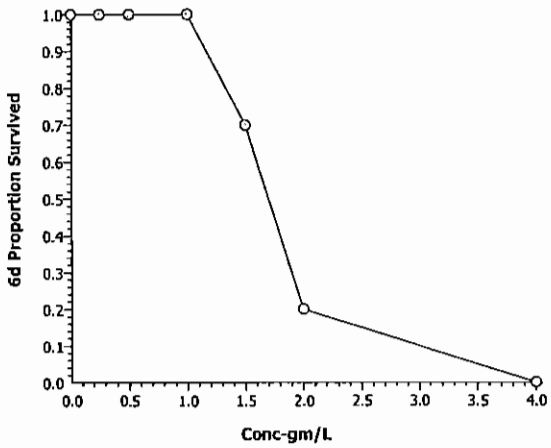
Point Estimates

% Effect	Conc-gm/L	95% LCL	95% UCL
25	1.41667	1.20833	1.63889

Data Summary

			Calculated Variate(A/B)						
Conc-gm/	Control Type	Count	Mean	Minimum	Maximum	SE	SD	A	B
0	Dilution Water	10	1.00000	1.00000	1.00000	0.00000	0.00000	10	10
0.25		10	1.00000	1.00000	1.00000	0.00000	0.00000	10	10
0.5		10	1.00000	1.00000	1.00000	0.00000	0.00000	10	10
1		10	1.00000	1.00000	1.00000	0.00000	0.00000	10	10
1.5		10	0.70000	0.00000	1.00000	0.09860	0.48305	7	10
2		10	0.20000	0.00000	1.00000	0.08607	0.42164	2	10
4		10	0.00000	0.00000	0.00000	0.00000	0.00000	0	10

Graphics



CETIS Analysis Detail

Ceriodaphnia 7-d Survival and Reproduction Test — **CH2M Hill**

‡point	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
,roduction	Linear Interpolation	03-0789-7451	03-0789-7451	04 May-05 1:31 PM	CETISv1.025

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Expanded CL	Method
Linear	Linear	7055475	200	Yes	Two-Point Interpolation

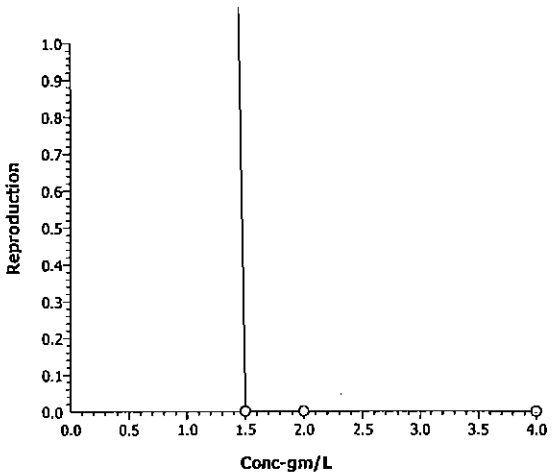
Point Estimates

% Effect	Conc-gm/L	95% LCL	95% UCL
25	0.41741	0.22713	0.59698

Data Summary

			Calculated Variate				
Conc-gm/	Control Type	Count	Mean	Minimum	Maximum	SE	SD
0	Dilution Water	10	27.9	18	31	0.80191	3.92853
0.25		10	22.8	17	29	0.78646	3.85285
0.5		10	20	9	26	1.27294	6.2361
1		10	9.9	0	19	1.29261	6.33246
1.5		10	0	0	0	0	0
2		10	0	0	0	0	0
4		10	0	0	0	0	0

Graphics



Ceriodaphnia dubia

REFERENCE TOXICANT LOG

SODIUM CHLORIDE (g/L)

Endpoint: Chronic Survival

Stats Method: Linear Interpolation

Test Conditions: Recon MH, 25 °C

From EPA 833-R-00-003:

25th Percentile of CV = 0.11

75th Percentile of CV = 0.41

90th Percentile of CV = 0.81

Event #	CD ID #	Start Date	IC25	Running Average IC25	Accum. Standard Dev.	95% Confidence Limits AVG-2SD	AVG+2SD	Intralab CV
140	1561	07/29/03	1.58	1.49	0.46	0.58	2.40	0.31
141	1588	10/02/03	1.58	1.45	0.41	0.63	2.27	0.28
142	1595	11/05/03	1.63	1.47	0.41	0.65	2.29	0.28
143	1604	12/05/03	1.58	1.51	0.38	0.74	2.27	0.25
144	1611	01/08/04	1.53	1.50	0.38	0.74	2.25	0.25
145	1620	01/30/04	1.59	1.50	0.38	0.74	2.25	0.25
146	1630	02/27/04	1.55	1.47	0.35	0.77	2.16	0.24
147	1643	04/09/04	1.66	1.48	0.35	0.78	2.18	0.24
148	1652	05/11/04	1.39	1.47	0.35	0.77	2.17	0.24
149	1661	06/04/04	1.58	1.49	0.34	0.80	2.18	0.23
150	1673	06/29/04	1.15	1.51	0.32	0.88	2.14	0.21
151	1687	07/29/04	1.63	1.50	0.31	0.89	2.11	0.20
152	1707	08/31/04	2.13	1.52	0.34	0.85	2.19	0.22
153	1721	10/01/04	1.15	1.54	0.30	0.93	2.15	0.20
154	1734	11/05/04	1.79	1.54	0.30	0.93	2.15	0.20
155	1739	11/30/04	1.04	1.51	0.32	0.87	2.16	0.21
156	1753	01/07/05	1.66	1.52	0.33	0.87	2.17	0.21
157	1764	02/01/05	1.53	1.55	0.28	0.99	2.11	0.18
158	1772	03/01/05	1.25	1.51	0.25	1.01	2.01	0.17
159	1783	04/05/05	1.53	1.53	0.24	1.04	2.01	0.16
160	1782	04/28/05	1.42	1.52	0.24	1.03	2.00	0.16
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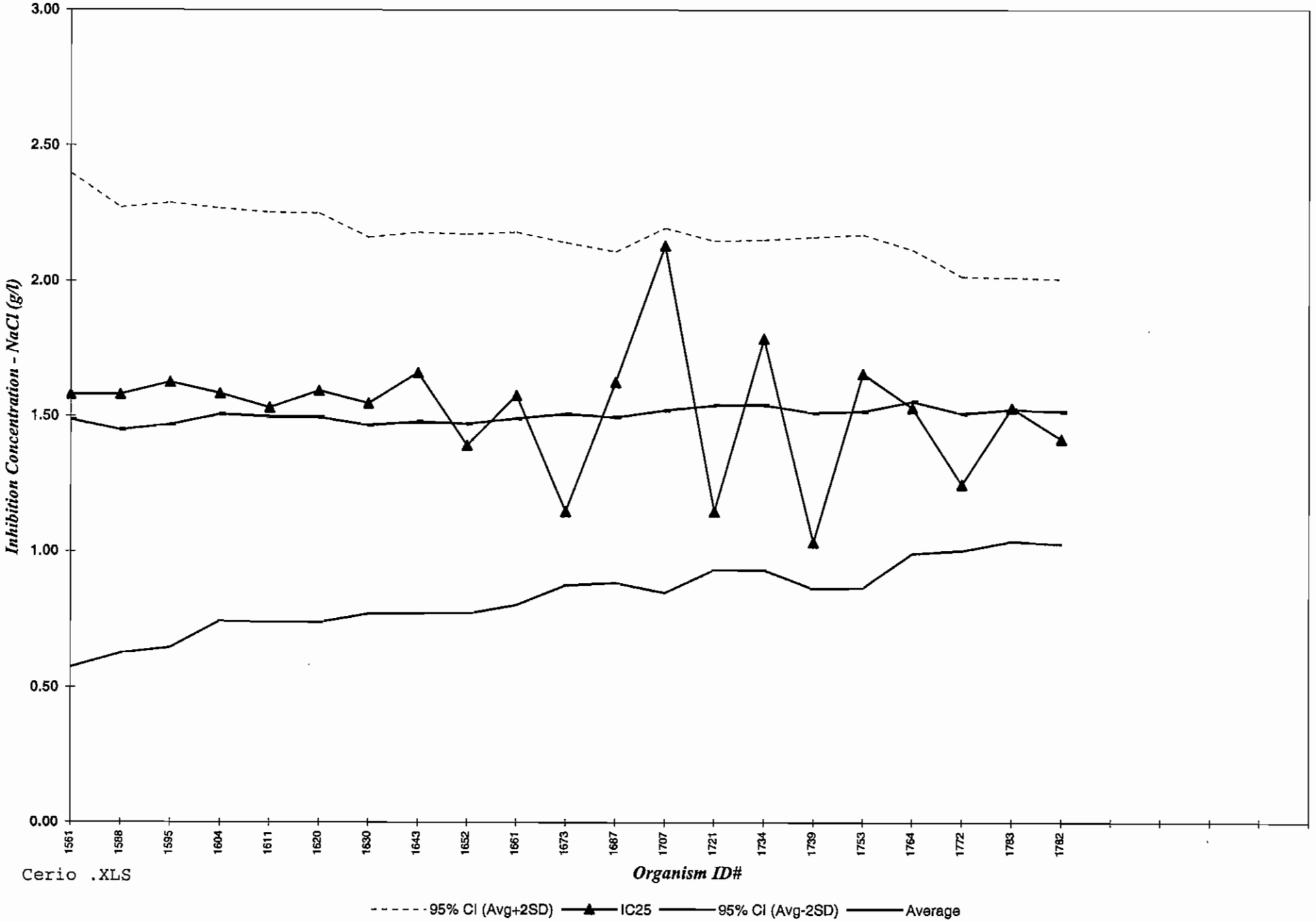
180								

REFERENCE TOXICANT QA/QC CHART

Ceriodaphnia dubia - Chronic Survival

IC25 Values



Cerio .XLS

Ceriodaphnia dubia

REFERENCE TOXICANT LOG

SODIUM CHLORIDE (g/L)

Endpoint: Chronic Reproduction

Stats Method: Linear Interpolation

Test Conditions: Recon MH, 25 °C

From EPA 833-R-00-003:

25th Percentile of CV = 0.17

75th Percentile of CV = 0.45

90th Percentile of CV = 0.62

Event #	CD ID #	Start Date	IC25	Running Average IC25	Accum. Standard Dev.	95% Confidence Limits AVG-2SD	AVG+2SD	Intralab CV
140	1561	07/29/03	0.47	0.57	0.23	0.12	1.03	0.40
141	1588	10/02/03	0.67	0.59	0.21	0.17	1.02	0.36
142	1595	11/05/03	0.41	0.59	0.22	0.15	1.02	0.37
143	1604	12/05/03	0.72	0.60	0.22	0.16	1.04	0.37
144	1611	01/08/04	0.73	0.61	0.22	0.17	1.05	0.36
145	1620	01/30/04	0.88	0.62	0.23	0.16	1.07	0.37
146	1630	02/27/04	0.47	0.60	0.22	0.16	1.04	0.37
147	1643	04/09/04	0.42	0.58	0.22	0.14	1.01	0.38
148	1652	05/11/04	0.27	0.56	0.23	0.10	1.01	0.41
149	1661	06/04/04	0.60	0.58	0.21	0.16	1.00	0.36
150	1673	06/29/04	0.67	0.59	0.21	0.16	1.01	0.36
151	1687	07/29/04	0.38	0.56	0.19	0.17	0.94	0.35
152	1707	08/31/04	0.28	0.53	0.20	0.14	0.92	0.37
153	1721	10/01/04	0.66	0.55	0.19	0.16	0.93	0.35
154	1734	11/05/04	0.59	0.53	0.17	0.19	0.87	0.32
155	1739	11/30/04	0.41	0.53	0.17	0.19	0.87	0.32
156	1753	01/07/05	0.58	0.53	0.17	0.19	0.86	0.32
157	1764	02/01/05	0.54	0.53	0.17	0.19	0.86	0.32
158	1772	03/01/05	0.83	0.54	0.18	0.19	0.90	0.33
159	1783	04/05/05	0.52	0.55	0.17	0.21	0.89	0.31
160	1782	04/28/05	0.42	0.55	0.17	0.21	0.90	0.31
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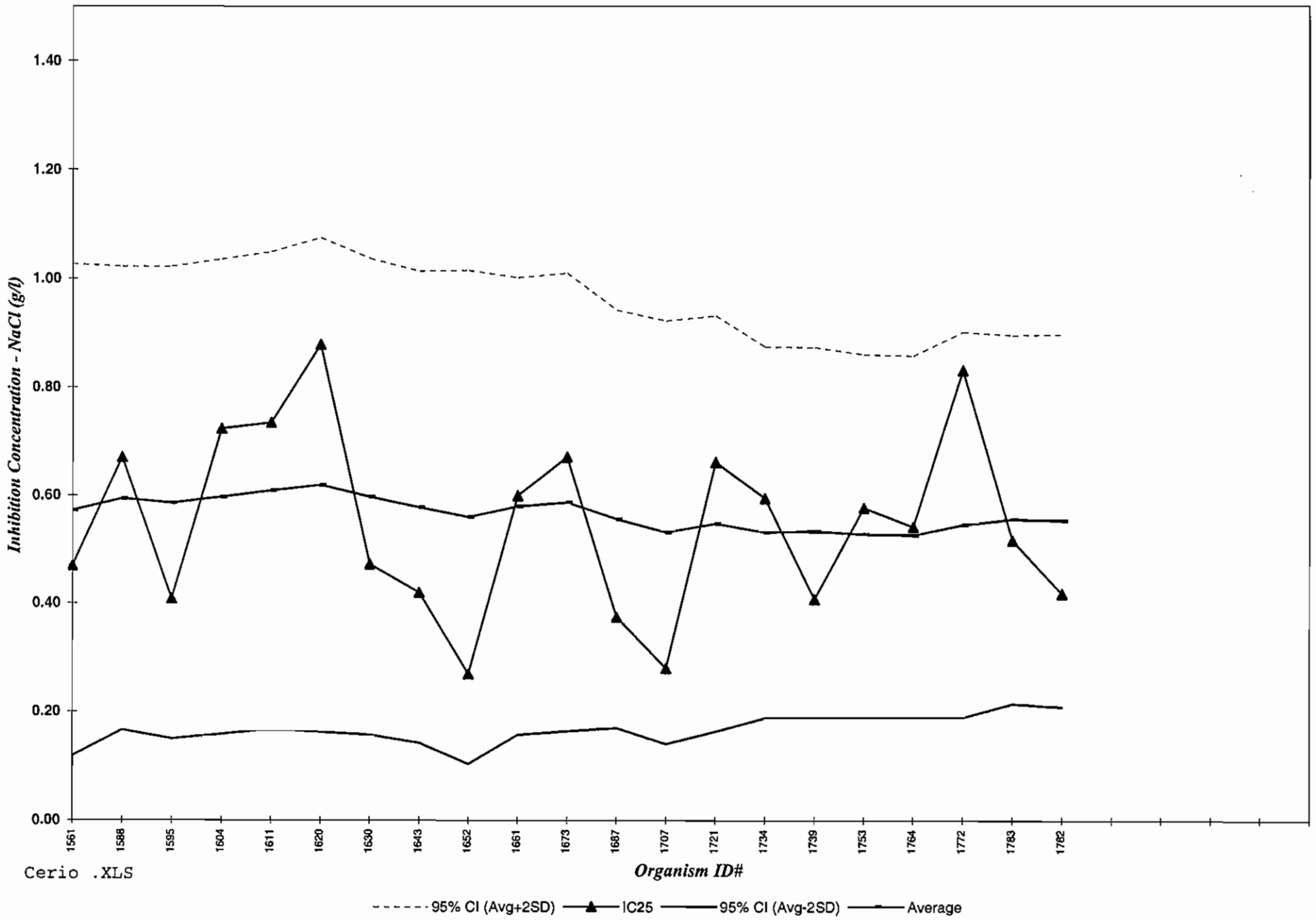
REFERENCE TOXICANT QA/QC CHART

***Ceriodaphnia dubia* - Chronic Reproduction**

IC25 Values



Cerio .XLS

APPENDIX C
CHAIN OF CUSTODY

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/21/2005
Carrier Name:	FedEx
Airbill:	850842532416
Shipped to:	Bioassay Laboratory - ASL 2300 NW Walnut Blvd. Corvallis OR 97330 (541) 758-0235

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1		4/21/05 12:00		4/22/05 1155
2				
3				
4				

Sampler Signature:

For Lab Use Only
Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164433	Sediment/ Jeff Franklin	L/G	BIO-7 (60)	05164433 (Ice Only) (1)	RM704A1(X1)	S: 4/20/2005	8:50	B390 - 01
05164434	Sediment/ Jeff Franklin	L/G	BIO-7 (60)	05164434 (Ice Only) (1)	RM698A1(X1)	S: 4/20/2005	10:10	B390 -02
05164435	Sediment/ Jeff Schut	L/G	BIO-7 (60)	05164435 (Ice Only) (1)	RM744A1(X1)	S: 4/20/2005	10:45	B390 -03
05164436	Sediment/ Jeff Schut	L/G	BIO-7 (60)	05164436 (Ice Only) (1)	RM744A2(X3)	S: 4/20/2005	11:45	B390 -04
05164437	Sediment/ Jeff Franklin	L/G	BIO-7 (60)	05164437 (Ice Only) (1)	RM692A1(X1)	S: 4/20/2005	11:15	B390 -05
05164440	Sediment/ Jeff Franklin	L/G	BIO-7 (60)	05164440 (Ice Only) (1)	RM687A1	S: 4/20/2005	14:00	B390 -06
05164441	Sediment/ Jeff Franklin	L/G	BIO-7 (60)	05164441 (Ice Only) (1)	RM689A1(X3)	S: 4/20/2005	12:55	B390 -07
05164442	Sediment/ Josh Butler	L/G	BIO-7 (60)	05164442 (Ice Only) (1)	RM706A1(X1)	S: 4/20/2005	13:30	B390 -08
05164443	Sediment/ Jeff Schut	L/G	BIO-7 (60)	05164443 (Ice Only) (1)	RM743A2(X3)	S: 4/20/2005	13:15	B390 -09
05164449	Sediment/ Josh Butler	L/G	BIO-7 (60)	05164449 (Ice Only) (1)	RM706A2(X7)	S: 4/20/2005	16:25	B390 -10

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number:
			2.8 °C	

Analysis Key: **Concentration:** L = Low, M = Low/Medium, H = High **Type/Designate:** Composite = C, Grab = G

Custody Seal Intact? ___ Shipment Iced? ___

BIO-7 = Bioassay 7-day

TR Number: 10-555125664-042105-0002

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

CH2MHILL
Analytical Services

Sample Receipt Record

Batch Number: B1390 - Cerio -01 to -10

Date received: 4-22-05

Client/Project:

VERIFICATION OF SAMPLE CONDITIONS (verify all items) * HD = Client Hand delivered Samples

Observation	YES	NO
Radiological Screening for AFCEE	na	
Were custody seals intact and on the outside of the cooler?	✓	
If yes, Where? Front ✓ Rear ___ Lt Side ___ Rt Side ✓ , inside bag ✓	✓	
Type of packing material: (Ice) Blue Ice Bubble wrap	✓	
Was the Chain of Custody inside the cooler?	✓	
Was the Chain of Custody properly filled out?	✓	
Were the sample containers in good condition?	✓	
Containers supplied by ASL?	✓	✓ MS
Any sample with < 1/2 holding time remaining? If so contact LPM	na	
Was there (ice) in the cooler? Enter temp. 2.8 C	✓	
All VOCs free of air bubbles ?	na	

If the answer to any of the questions above is NO, a Sample Receipt Exceptions Report Must be written.

VERIFICATION OF SAMPLE PRESERVATION (verify all preserved samples except HAAs, HANs and CH)

Sample No	Nutrients pH <2	Metals pH <2	Volatiles pH <2	Cyanides pH >12	TOC pH <2	TOX pH <2	Other (specify)	N/A (soils/unpres)
1								
2								
3								
4								
5								
6								
7								
8								
9								
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21								
22								
23								
24								
25								
26								
27								

LOGIN AND pH VERIFICATIONS PERFORMED BY

[signature] 4/22/05 11:55
Date/Time

Date/Time

~~B1390 11 to -15~~

B1390-01 to -10 Cert3

ALIGN FEDEX AIRBILL POUCH HERE

NO POUCH NEEDED.
See back for peel and stick application instructions.

RECIPIENT: PEEL HERE

FedEx Express **US Airbill** FedEx Tracking Number 8508 4253 2

1 From This portion can be removed for Recipient's records.

Date 4/21/200 FedEx Tracking Number 850842532416

Sender's Name [illegible] Phone [illegible]

Company CH2M HILL

Address [illegible] Dept./Floor/Suite/Room

City SPOKANE State [illegible] ZIP [illegible]

2 Your Internal Billing Reference

3 To

Recipient's Name [illegible] Phone [illegible]

Company [illegible]

Recipient's Address [illegible] Dept./Floor/Suite/Room

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address

To request a package be held at a specific FedEx location, print FedEx address here.

City [illegible] State ZIP

8508 4253 2416

FedEx

FedEx emp# 92604 21APR05 PRIORITY OVERNIGHT FRI

TRK# 8508 4253 2416 FORM 0215

Deliver By: 22APR05

97330 -OR -US PDX

86 CVOA

4b Express ...

FedEx 1Day Freight* Next business day** FedEx 2Day Freight Second business day**

* Call for Confirmation.

5 Packaging * Declared value limit $500

FedEx Envelope* FedEx Pak* Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak FedEx Box FedEx Tube Other

6 Special Handling Include FedEx address in Section 3.

SATURDAY Delivery Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1Day Freight, and FedEx 2Day Freight to select ZIP codes

HOLD Weekday at FedEx Location Not available for FedEx First Overnight

HOLD Saturday at FedEx Location Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.

No Yes As per attached Shipper's Declaration Yes Shipper's Declaration not required Dry Ice Dry Ice, 9, UN 1845 ____ x ____ kg

Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging. Cargo Aircraft Only

7 Payment Bill to: Enter FedEx Acct. No. or Credit Card No. below. Obtain Recipient's Acct. No.

Sender Acct. No. in Section 1 will be billed. Recipient Third Party Credit Card Cash/Check

[illegible]

Total Packages [illegible] Total Weight 53 Total Charges

†Our liability is limited to $100 unless you declare a higher value. See the *FedEx Service Guide* for details.

8 Sign to Authorize Delivery Without a Signature

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

Questions? Visit our Web site at fedex.com or call 1.800.GoFedEx 1.800.463.3339.

466

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USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No:
L

Date Shipped:	4/22/2005
Carrier Name:	FedEx
Airbill:	8508 4253 3560
Shipped to:	Bioassay Laboratory - ASL 2300 NW Walnut Blvd. Corvallis OR 97330 (541) 758-0235

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/22/05/11:00	[signature]	4-23-05 1248
2				
3				
4				

Sampler Signature: [signature]

For Lab Use Only
Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164439	Sediment/ Jeff Franklin	L/G	BIO-7 (60)	05164439 (Ice Only) (1)	RM686A1(X3)	S: 4/21/2005	9:30	B1390-15
05164450	Sediment/ Greg Warren	L/G	BIO-7 (60)	05164450 (Ice Only) (1)	RM708A1(X3)	S: 4/21/2005	9:43	B1390-16
05164451	Sediment/ Jeff Franklin	L/G	BIO-7 (60)	05164451 (Ice Only) (1)	RM680A1(X1)	S: 4/21/2005	~~10:25~~ 10:40	NG B1390-17
05164452	Sediment/ Jeff Schut	L/G	BIO-7 (60)	05164452 (Ice Only) (1)	RM742A1(X1)	S: 4/21/2005	11:00	B1390-18
05164453	Sediment/ Jeff Schut	L/G	BIO-7 (60)	05164453 (Ice Only) (1)	RM743A1(X1)	S: 4/21/2005	10:15	B1390-19
05164454	Sediment/ Jeff Franklin	L/G	BIO-7 (60)	05164454 (Ice Only) (1)	RM678A1(X1)	S: 4/21/2005	12:35	B1390-20
05164455	Sediment/ Jeff Schut	L/G	BIO-7 (60)	05164455 (Ice Only) (1)	RM742A2(X5)	S: 4/21/2005	12:20	B1390-21
05164456	Sediment/ Jeff Franklin	L/G	BIO-7 (60)	05164456 (Ice Only) (1)	RM677A1(X3)	S: 4/21/2005	13:20	B1390-22
05164457	Sediment/ Jeff Franklin	L/G	BIO-7 (60)	05164457 (Ice Only) (1)	RM676A1(X3)	S: 4/21/2005	14:05	B1390-11
05164459	Sediment/ Jeff Schut	L/G	BIO-7 (60)	05164459 (Ice Only) (1)	RM741A1(X3)	S: 4/21/2005	13:30	B1390-12

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 2.6 °C	Chain of Custody Seal Number:
Analysis Key: BIO-7 = Bioassay 7-day	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G		Custody Seal Intact? ___ Shipment Iced? ___

TR Number: 10-555125664-042105-0012

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No:
L

Date Shipped:	4/22/2005
Carrier Name:	FedEx
Airbill:	8508 4253 3560
Shipped to:	Bioassay Laboratory - ASL 2300 NW Walnut Blvd. Corvallis OR 97330 (541) 758-0235

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/22/05/ 11:00	[signature]	4-23-05 1240
2				
3				
4				

Sampler Signature: [signature]

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164460	Sediment/ Jeff Schut	L/G	BIO-7 (60)	05164460 (Ice Only) (1)	RM740A1(X1)	S: 4/21/2005	14:30	B1390-13
05164461	Sediment/ Greg Warren	L/G	BIO-7 (60)	05164461 (Ice Only) (1)	RM724A1(X1)	S: 4/21/2005	13:20	B1390-14

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number:
			2.6 °C	

Analysis Key:
BIO-7 = Bioassay 7-day

Concentration: L = Low, M = Low/Medium, H = High
Type/Designate: Composite = C, Grab = G

Custody Seal Intact? ___ Shipment Iced? ___

TR Number: 10-555125664-042105-0012

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax

CH2MHILL
Analytical Services

Sample Receipt Record

Batch Number: B1390 11-22 Carlo Date received: 4-23-05

Client/Project: UPPER Columbia

VERIFICATION OF SAMPLE CONDITIONS (verify all items) * HD = Client Hand delivered Samples

Observation	YES	NO
Radiological Screening for AFCEE	Na	
Were custody seals intact and on the outside of the cooler?		
If yes, Where? Front X Rear ____ Lt Side ____ Rt Side X	✓	
Type of packing material: (Ice) Blue Ice Bubble wrap	✓	
Was the Chain of Custody inside the cooler?	✓	
Was the Chain of Custody properly filled out?	✓	
Were the sample containers in good condition?	✓	
Containers supplied by ASL?	✓	
Any sample with < 1/2 holding time remaining? If so contact LPM		✓
Was there ice in the cooler? Enter temp. 2.6 °C C	✓	
All VOCs free of air bubbles ?		

If the answer to any of the questions above is NO, a Sample Receipt Exceptions Report Must be written.

VERIFICATION OF SAMPLE PRESERVATION (verify all preserved samples except HAAs, HANs and CH)

Sample No	Nutrients pH <2	Metals pH <2	Volatiles pH <2	Cyanides pH >12	TOC pH <2	TOX pH <2	Other (specify)	N/A (soils/unpres)
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
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22								
23								
24								
25								
26								
27								

LOGIN AND pH VERIFICATIONS PERFORMED BY

4-23-05 1240
Date/Time

Date/Time

166

200

B1390-11-22 Caro

FedEx Express

US Airbill FedEx Tracking Number 8508 4253 3560

1 From This portion can be removed for Recipient's records

Date FedEx Tracking Number 850842533560

Sender's Name Phone

Company

Address Dept./Floor/Suite/Room

City State ZIP

2 Your Internal Billing Reference

3 To

Recipient's Name Phone

Company — ASL

Recipient's Address We cannot deliver to P.O. boxes or P.O. ZIP codes. Dept./Floor/Suite/Room

Address

To request a package be held at a specific FedEx location, print FedEx address here.

City State OR ZIP 97330

8508 4253 3560

emp: 14 22 ### #### PRIORITY SATURDAY

Deliver By: 23APR05

TRK# 8508 4253 3560 FORM 0215

AA

PDX

97330 -OR-US X0 CVOA

Second business day

FedEx Envelope rate not available. Minimum charge: One-pound rate

4b Express Freight Service Packages over 150 lbs.

- [ ] FedEx 1Day Freight* Next business day**
- [ ] FedEx 2Day Freight Second business day**
- [ ] FedEx 3Day Freight Third business day**

* Call for Confirmation

5 Packaging * Declared value limit $500

- [ ] FedEx Envelope*
- [ ] FedEx Pak* Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak
- [ ] FedEx Box
- [ ] FedEx Tube
- [x] Other

6 Special Handling Include FedEx address in Section 3.

- [x] SATURDAY Delivery Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1Day Freight, and FedEx 2Day Freight to select ZIP codes
- [ ] HOLD Weekday at FedEx Location Not available for FedEx First Overnight
- [ ] HOLD Saturday at FedEx Location Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.

- [x] No
- [ ] Yes As per attached Shipper's Declaration
- [ ] Yes Shipper's Declaration not required
- [ ] Dry Ice Dry Ice, 9, UN 1845 ___ x ___ kg

Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging.

- [ ] Cargo Aircraft Only

7 Payment Bill to: Enter FedEx Acct. No. or Credit Card No. below.

- [ ] Sender Acct. No. in Section 1 will be billed.
- [ ] Recipient
- [x] Third Party
- [ ] Credit Card
- [ ] Cash/Check

Total Packages 1 | Total Weight 51 | Total Charges | Credit Card Auth.

†Our liability is limited to $100 unless you declare a higher value. See the FedEx Service Guide for details.

8 Sign to Authorize Delivery Without a Signature

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

Questions? Visit our Web site at fedex.com or call 1.800.GoFedEx 1.800.463.3339.

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466

USEPA Contract Laboratory Program
Generic Chain of Custody

1.9°C on arrival

Reference Case 34063
Client No:
SDG No:
L

Date Shipped:	4/25/2005
Carrier Name:	FedEx
Airbill:	8508 4253 2520
Shipped to:	Bioassay Laboratory - ASL 2300 NW Walnut Blvd. Corvallis OR 97330 (541) 758-0235

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1		4/25/05 13:00		4-26-05 1030
2				
3				
4				

Sampler Signature:

For Lab Use Only
Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164468	Sediment/ Jeff Schut	L/G	BIO-7 (60)	05164468 (Ice Only) (1)	RM738A1(X3)	S: 4/22/2005	11:00	B1390 -23
05164469	Sediment/ Jeff Schut	L/G	BIO-7 (60)	05164469 (Ice Only) (1)	RM739A1(X3)	S: 4/22/2005	10:00	-24
05164470	Sediment/ John Culley	L/G	BIO-7 (60)	~~05164470 (Ice Only)~~, NG 05164470 (Ice Only) (2)	RM732R1	S: 4/22/2005	11:35	-25
05164471	Sediment/ Josh Butler	L/G	BIO-7 (60)	05164471 (Ice Only) (1)	RM724A2(X3)	S: 4/22/2005	11:27	-26
05164472	Sediment/ Jeff Schut	L/G	BIO-7 (60)	05164472 (Ice Only) (1)	RM737A1(X3)	S: 4/22/2005	12:15	-27
05164473	Sediment/ Josh Butler	L/G	BIO-7 (60)	05164473 (Ice Only) (1)	RM723A1(X1)	S: 4/22/2005	12:55	-28
05164474	Sediment/ Jeff Schut	L/G	BIO-7 (60)	05164474 (Ice Only) (1)	RM736A1(X1)	S: 4/22/2005	13:45	-29
05164475	Sediment/ Josh Butler	L/G	BIO-7 (60)	05164475 (Ice Only) (1)	RM723A2(X3)	S: 4/22/2005	15:16	-30
05164476	Sediment/ John Culley	L/G	BIO-7 (60)	~~05164476 (Ice Only)~~, NG 05164476 (Ice Only) (2)	RM721R1	S: 4/22/2005	14:39	-31
05164478	Sediment/ John Culley	L/G	BIO-7 (60)	~~05164478 (Ice Only)~~, NG 05164478 (Ice Only) (2)	RM726R1	S: 4/22/2005	13:20	-32

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 1.9°C	Chain of Custody Seal Number:

Analysis Key: Concentration: L = Low, M = Low/Medium, H = High Type/Designate: Composite = C, Grab = G

Custody Seal Intact? ___ Shipment Iced? ___

BIO-7 = Bioassay 7-day

TR Number: 10-555125664-042305-0004

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No:
L

Date Shipped:	4/25/2005
Carrier Name:	FedEx
Airbill:	8508 4253 2520
Shipped to:	Bioassay Laboratory - ASL 2300 NW Walnut Blvd. Corvallis OR 97330 (541) 758-0235

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/25/05/13:00	[signature]	4-26-05 1030
2				
3				
4				

Sampler Signature: [signature]

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164479	Sediment/ Jeff Schut	L/G	BIO-7 (60)	05164479 (Ice Only) (1)	RM734A1(X3)	S: 4/22/2005	15:00	B1340-33
05164483	Sediment/ Jeff Franklin	L/G	BIO-7 (60)	05164483 (Ice Only) (1)	RM661A1(X1)	S: 4/22/2005	10:15	-34
05164485	Sediment/ Jeff Franklin	L/G	BIO-7 (60)	05164485 (Ice Only) (1)	RM658A1(X3)	S: 4/22/2005	11:30	-35

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G		Custody Seal Intact? ___ Shipment Iced? ___
BIO-7 = Bioassay 7-day				

TR Number: 10-555125664-042305-0004

LABORATORY COPY

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Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

CH2MHILL
Analytical Services

Sample Receipt Record

Batch Number: B1390-23 to -35 Cation

Date received: 4-26-05

Client/Project: Upper Columbia

VERIFICATION OF SAMPLE CONDITIONS (verify all items) * HD = Client Hand delivered Samples

Observation	YES	NO
Radiological Screening for AFCEE	na	
Were custody seals intact and on the outside of the cooler?	✓	
If yes, Where? Front ✓ Rear ____ Lt Side ✓ Rt Side ____ interior bag ✓	✓	
Type of packing material (Ice) Blue Ice Bubble wrap	✓	
Was the Chain of Custody inside the cooler?	✓	
Was the Chain of Custody properly filled out?	✓	
Were the sample containers in good condition?	✓	
Containers supplied by ASL?		✓
Any sample with < 1/2 holding time remaining? If so contact LPM	na	
Was there ice in the cooler? Enter temp. C 1.9°C	✓	
All VOCs free of air bubbles ?	na	

If the answer to any of the questions above is NO, a Sample Receipt Exceptions Report Must be written.

VERIFICATION OF SAMPLE PRESERVATION (verify all preserved samples except HAAs, HANs and CH)

Sample No	Nutrients pH <2	Metals pH <2	Volatiles pH <2	Cyanides pH >12	TOC pH <2	TOX pH <2	Other (specify)	N/A (soils/unpres)
1								
2								
3								
4								
5								
6								
7								
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9								
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26								
27								

LOGIN AND pH VERIFICATIONS PERFORMED BY

[signature] 4-26-05 1030
Date/Time

Date/Time

62

200

B1390 - 23 to 35 Cars

Bio 7d

7R4

FedEx Express US Airbill

FedEx Tracking Number 8508 4253 2520

NO POUCH NEEDED.
See back for peel and stick application instructions.

RECIPIENT: PEEL HERE

1 From This portion can be removed for Recipient's records.

Date

FedEx Tracking Number 850842532520

Sender's Name

Phone

Company

Address

Dept./Floor/Suite/Room

City

State

ZIP

2 Your Internal Billing Reference

3 To

Recipient's Name

Phone

Company

Recipient's Address

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Dept./Floor/Suite/Room

Address

To request a package be held at a specific FedEx location, print FedEx address here.

City

State

ZIP

8508 4253 2520

0215

4a Express Package Service *Packages up to 150 lbs.*

- [x] FedEx Priority Overnight — Next business morning*
- [ ] FedEx Standard Overnight — Next business afternoon*
- [ ] FedEx First Overnight — Earliest next business morning delivery to select locations*
- [ ] FedEx 2Day — Second business day*
- [ ] FedEx Express Saver — Third business day*

FedEx Envelope rate not available. Minimum charge: One-pound rate

4b Express Freight Service *Packages over 150 lbs.*

- [ ] FedEx 1Day Freight* — Next business day**
- [ ] FedEx 2Day Freight — Second business day**
- [ ] FedEx 3Day Freight — Third business day**

* Call for Confirmation:

† Declared value limit $500

5 Packaging

- [ ] FedEx Envelope*
- [ ] FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak
- [ ] FedEx Box
- [ ] FedEx Tube
- [ ] Other

6 Special Handling Include FedEx address in Section 3.

- [ ] SATURDAY Delivery — Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1Day Freight, and FedEx 2Day Freight to select ZIP codes
- [ ] HOLD Weekday at FedEx Location — Not available for FedEx First Overnight
- [ ] HOLD Saturday at FedEx Location — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods?
One box must be checked.

- [ ] No
- [ ] Yes — As per attached Shipper's Declaration
- [ ] Yes — Shipper's Declaration not required
- [ ] Dry Ice — Dry Ice, 9, UN 1845 ____ x ____ kg
- [ ] Cargo Aircraft Only

Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging.

7 Payment *Bill to:* Enter FedEx Acct. No. or Credit Card No. below.

- [ ] Sender — Acct. No. in Section 1 will be billed.
- [ ] Recipient
- [x] Third Party
- [ ] Credit Card
- [ ] Cash/Check

[redacted]

Total Packages | Total Weight | [redacted] | Total Charges

Credit Card Auth.

†Our liability is limited to $100 unless you declare a higher value. See the *FedEx Service Guide* for details.

8 Sign to Authorize Delivery Without a Signature

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

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or call 1.800.GoFedEx 1.800.463.3339.

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466

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No:
L

Date Shipped:	4/21/2005
Carrier Name:	FedEx
Airbill:	850842532600
Shipped to:	Bioassay Laboratory - ASL 2300 NW Walnut Blvd. Corvallis OR 97330 (541) 758-0235

Chain of Custody Record

	Relinquished By	(Date / Time)	Sampler Signature: / Received By	(Date / Time)
1	[signature]	4/21/05/12:00	[signature]	4/22/05 1050
2				
3				
4				

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164433	Sediment/ Jeff Franklin	L/G	BIO-10 (60)	05164433 (Ice Only) (1)	RM704A1(X1)	S: 4/20/2005	8:50	B1390-01
05164434	Sediment/ Jeff Franklin	L/G	BIO-10 (60)	05164434 (Ice Only) (1)	RM698A1(X1)	S: 4/20/2005	10:10	-02
05164435	Sediment/ Jeff Schut	L/G	BIO-10 (60)	05164435 (Ice Only) (1)	RM744A1(X1)	S: 4/20/2005	10:45	-03
05164436	Sediment/ Jeff Schut	L/G	BIO-10 (60)	05164436 (Ice Only) (1)	RM744A2(X3)	S: 4/20/2005	11:45	-04
05164437	Sediment/ Jeff Franklin	L/G	BIO-10 (60)	05164437 (Ice Only) (1)	RM692A1(X1)	S: 4/20/2005	11:15	-05

Cooler packed w/ ice.

3.2°C

VERMICULITE BETWEEN OUTER & INNER BAG WAS DRY

CHIRONOMID SAMPLES

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number:
			3.2 °C	

Analysis Key: Concentration: L = Low, M = Low/Medium, H = High — Type/Desiginate: Composite = C, Grab = G — Custody Seal Intact? ___ Shipment Iced? ___

BIO-10 = Bioassay 10-day

TR Number: 10-555125664-042105-0003

LABORATORY COPY

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Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

CH2MHILL
Analytical Services

Sample Receipt Record

Cltcradamos

Batch Number: B1390 -01 to 05   Date received: 4-22-05

Client/Project: Upper Columbia Proj.

VERIFICATION OF SAMPLE CONDITIONS (verify all items) * HD = Client Hand delivered Samples

Observation	YES	NO
Radiological Screening for AFCEE		na
Were custody seals intact and on the outside of the cooler?	✓	
If yes, Where? Front ✓ Rear ___ Lt Side ___ Rt Side ✓ , inside on bag	✓	
Type of packing material: (Ice) Blue Ice Bubble wrap	✓	
Was the Chain of Custody inside the cooler?	✓	
Was the Chain of Custody properly filled out?	✓	
Were the sample containers in good condition?	✓	
Containers supplied by ASL?		✓
Any sample with < 1/2 holding time remaining? If so contact LPM	na	
Was there ice in the cooler? Enter temp. 3.2 C	✓	
All VOCs free of air bubbles ?	na	

If the answer to any of the questions above is NO, a Sample Receipt Exceptions Report Must be written.

VERIFICATION OF SAMPLE PRESERVATION (verify all preserved samples except HAAs, HANs and CH)

Sample No	Nutrients pH <2	Metals pH <2	Volatiles pH <2	Cyanides pH >12	TOC pH <2	TOX pH <2	Other (specify)	N/A (soils/unpres)
1								
2								
3								
4								
5								
6								
7								
8								
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26								
27								

LOGIN AND pH VERIFICATIONS PERFORMED BY

[signature] 4-22-05
Date/Time

Date/Time

B1390-01 to 05

FedEx US Airbill
Express

FedEx Tracking Number 8508 4253 2600

This portion can be removed for Recipient's records.

Date 4/21/2005 FedEx Tracking Number 850842532600

Sender's Name Phone

Company CH2M HILL

Address WASHINGTON ST

City SPOKANE State ZIP

2 Your Internal Billing Reference

3 To
Recipient's Name Phone

Company

Recipient's Address
We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address
To request a package be held at a specific FedEx location, print FedEx address here.

City Corvallis State ZIP

NO POUCH NEEDED.
See back for peel and stick application instructions.
RECIPIENT: PEEL HERE

8508 4253 2600

FedEx

FedEx PRIORITY OVERNIGHT FRI
emp# 92604 21APR05
Deliver By: 22APR05
TRK# 8508 4253 2600 FORM 0215
PDX
97330 -OR-US
86 CVOA

4b Express Freight Service — Packages over 150 lbs.
- [x] FedEx 1Day Freight* Next business day**
- [ ] FedEx 2Day Freight Second business day**
- [ ] FedEx 3Day Freight Third business day**

Call for Confirmation:

5 Packaging *Declared value limit $500
- [ ] FedEx Envelope*
- [ ] FedEx Pak* Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak
- [ ] FedEx Box
- [ ] FedEx Tube
- [x] Other

6 Special Handling — Include FedEx address in Section 3.
- [ ] SATURDAY Delivery Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1Day Freight, and FedEx 2Day Freight to select ZIP codes
- [ ] HOLD Weekday at FedEx Location Not available for FedEx First Overnight
- [ ] HOLD Saturday at FedEx Location Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.
- [x] No
- [ ] Yes As per attached Shipper's Declaration
- [ ] Yes Shipper's Declaration not required
- [ ] Dry Ice Dry Ice, 9, UN 1845 ___ x ___ kg
- [ ] Cargo Aircraft Only

Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging.

7 Payment Bill to: Enter FedEx Acct. No. or Credit Card No. below.
- [ ] Sender Acct. No. in Section 1 will be billed.
- [ ] Recipient
- [x] Third Party
- [ ] Credit Card
- [ ] Cash/Check

[redacted]

Total Packages	Total Weight		Total Charges
1	70	[redacted]	Credit Card Auth.

†Our liability is limited to $100 unless you declare a higher value. See the FedEx Service Guide for details.

8 Sign to Authorize Delivery Without a Signature

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.
Questions? Visit our Web site at fedex.com
or call 1.800.GoFedEx 1.800.463.3339.
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466

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/21/2005
Carrier Name:	FedEx
Airbill:	850842533618
Shipped to:	Bioassay Laboratory - ASL 2300 NW Walnut Blvd. Corvallis OR 97330 (541) 758-0235

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[illegible]	4/21/05 12:00	[illegible]	4/22/05 1125
2				
3				
4				

Sampler Signature: Jeff Franklin

For Lab Use Only
Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164440	Sediment/ Jeff Franklin	L/G	BIO-10 (60)	05164440 (Ice Only) (1)	RM687A1	S: 4/20/2005	14:00	B1390 - 06
05164441	Sediment/ Jeff Franklin	L/G	BIO-10 (60)	05164441 (Ice Only) (1)	RM689A1(X3)	S: 4/20/2005	12:55	-07
05164442	Sediment/ Josh Butler	L/G	BIO-10 (60)	05164442 (Ice Only) (1)	RM706A1(X1)	S: 4/20/2005	13:30	-08
05164443	Sediment/ Jeff Schut	L/G	BIO-10 (60)	05164443 (Ice Only) (1)	RM743A2(X3)	S: 4/20/2005	13:15	-09
05164449	Sediment/ Josh Butler	L/G	BIO-10 (60)	05164449 (Ice Only) (1)	RM706A2(X7)	S: 4/20/2005	16:25	-10

CHIRONOMID SAMPLES

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 3.2 °C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? ___	Shipment Iced? ___

BIO-10 = Bioassay 10-day

TR Number: 10-555125664-042105-0004

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

CH2MHILL
Analytical Services

Sample Receipt Record

Batch Number: B1390-06 & -10 (CHIRONOMIDS) Date received: 4/22/05

Client/Project

VERIFICATION OF SAMPLE CONDITIONS (verify all items) * HD = Client Hand delivered Samples

Observation	YES	NO
Radiological Screening for AFCEE	na	
Were custody seals intact and on the outside of the cooler?	✓	
If yes, Where? Front ✓ Rear ____ Lt Side ____ Rt Side ✓ , inside on bag	✓	
Type of packing material: (Ice) Blue Ice Bubble wrap	✓	
Was the Chain of Custody inside the cooler?	✓	
Was the Chain of Custody properly filled out?	✓	
Were the sample containers in good condition?	✓	
Containers supplied by ASL?		✓
Any sample with < 1/2 holding time remaining? If so contact LPM	na	
Was there ice in the cooler? Enter temp. 3.2 C	✓	
All VOCs free of air bubbles ?	na	

If the answer to any of the questions above is NO, a Sample Receipt Exceptions Report Must be written.

VERIFICATION OF SAMPLE PRESERVATION (verify all preserved samples except HAAs, HANs and CH)

Sample No	Nutrients pH <2	Metals pH <2	Volatiles pH <2	Cyanides pH >12	TOC pH <2	TOX pH <2	Other (specify)	N/A (soils/unpres)
1								
2								
3								
4								
5								
6								
7								
8								
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LOGIN AND pH VERIFICATIONS PERFORMED BY

4-22-05
Date/Time

Date/Time

Rev 11/05/2003-receipt.xls

vermiculite between bags in cooler was dry

DO NOT LIFT USING THIS TAG — ALIGN FEDEX AIRBILL POUCH HERE

B1390 · 06 + -10

FedEx Express **US Airbill** FedEx Tracking Number 8508 4253 3618

1 From (This portion can be removed for Recipient's records.)

Date ____ FedEx Tracking Number 850842533618

Sender's Name ____ Phone ____

Company ____

Address ____ Dept./Floor/Suite/Room

City ____ State ____ ZIP ____

2 Your Internal Billing Reference

3 To

Recipient's Name ____ Phone ____

Company ____

Recipient's Address ____ Dept./Floor/Suite/Room

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address ____

To request a package be held at a specific FedEx location, print FedEx address here.

City ____ State ____ ZIP ____

8508 4253 3618

FedEx ... PRIORITY OVERNIGHT FRI

emp# 92604 21APR05

TRK# 8508 4253 3618 FORM 0215

Deliver By: 22APR05

PDX

97330 -OR-US 86 CVOA

4b Express Freight Service — Packages over 150 lbs.

- FedEx 1Day Freight* Next business day**
- FedEx 2Day Freight Second business day**
- FedEx 3Day Freight Third business day**

* Call for Confirmation

5 Packaging — * Declared value limit $500

- FedEx Envelope*
- FedEx Pak*
- FedEx Box
- FedEx Tube
- Other

6 Special Handling

- SATURDAY Delivery
- HOLD Weekday at FedEx Location
- HOLD Saturday at FedEx Location — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods?

- No
- Yes
- Yes
- Dry Ice
- Cargo Aircraft Only

7 Payment Bill to:

- Sender
- Recipient
- Third Party
- Credit Card
- Cash/Check

Obtain Recip. Acct. No.

Total Packages | Total Weight | Total Charges

Credit Card Auth.

8 Sign to Authorize Delivery Without a Signature

466

0302376116

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/22/2005
Carrier Name:	FedEx
Airbill:	8508 4253 2460
Shipped to:	Bioassay Laboratory - ASL 2300 NW Walnut Blvd. Corvallis OR 97330 (541) 758-0235

Chain of Custody Record

Sampler Signature: Jeff Franklin

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[illegible]	4/22/05 11:00	[illegible] Stanaway	4-23-05 1200
2				
3				
4				

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164457	Sediment/ Jeff Franklin	L/G	BIO-10 (60)	05164457 (Ice Only) (1)	RM676A1(X3)	S: 4/21/2005	14:05	B1390-11
05164459	Sediment/ Jeff Schut	L/G	BIO-10 (60)	05164459 (Ice Only) (1)	RM741A1(X3)	S: 4/21/2005	13:30	B1390-12
05164460	Sediment/ Jeff Schut	L/G	BIO-10 (60)	05164460 (Ice Only) (1)	RM740A1(X1)	S: 4/21/2005	14:30	B1390-13
05164461	Sediment/ Greg Warren	L/G	BIO-10 (60)	05164461 (Ice Only) (1)	RM724A1(X1)	S: 4/21/2005	13:20	B1390-14

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 3.7°C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? ✓	Shipment Iced? ✓

BIO-10 = Bioassay 10-day - Chironomid

TR Number: 10-555125664-042105-0015

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

CH2MHILL
Analytical Services

Sample Receipt Record

Baich Number: B1390-11-14 Chironomid Date received:

Client/Project: Upper Columbia

VERIFICATION OF SAMPLE CONDITIONS (verify all items) * HD = Client Hand delivered Samples

Observation	YES	NO
Radiological Screening for AFCEE	Na	
Were custody seals intact and on the outside of the cooler? Y	✓	
If yes, Where? Front X Rear ____ Lt Side ____ Rt Side X	✓	
Type of packing material: (Ice) Blue Ice Bubble wrap	✓	
Was the Chain of Custody inside the cooler? Y	✓	
Was the Chain of Custody properly filled out? Y	✓	
Were the sample containers in good condition? Y	✓	
Containers supplied by ASL? Y	✓	
Any sample with < 1/2 holding time remaining? If so contact LPM N	✓	✓
Was there ice in the cooler? Enter temp. 3.7 °C C	✓	
All VOCs free of air bubbles ?	NA	

If the answer to any of the questions above is NO, a Sample Receipt Exceptions Report Must be written.

VERIFICATION OF SAMPLE PRESERVATION (verify all preserved samples except HAAs, HANs and CH)

Sample No	Nutrients pH <2	Metals pH <2	Volatiles pH <2	Cyanides pH >12	TOC pH <2	TOX pH <2	Other (specify)	N/A (soils/unpres)
1								
2								
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LOGIN AND pH VERIFICATIONS PERFORMED BY

Mike Stanaway 4-23-05 1200

Date/Time Date/Time

ALIGN FEDEX AIRBILL POUCH HERE

emp: 173384 22APR05 ##### PRIORITY SATURDAY

TRK# 8508 4253 2460 FORM 0215

Deliver By: 23APR05 AA

97330 -OR-US PDX X0 CVOA

B 1390-11-14

FedEx Express US Airbill

FedEx Tracking Number 8508 4253 2460

1 From (Information can be removed for Recipient's records.)

Date FedEx Tracking Number 850842532460

Sender's Name Phone

Company

Address

Dept./Floor/Suite/Room

City State ZIP

2 Your Internal Billing Reference

3 To

Recipient's Name Phone

Company

Recipient's Address

We cannot deliver to P.O. boxes or P.O. ZIP codes. Dept./Floor/Suite/Room

Address

To request a package be held at a specific FedEx location, print FedEx address here.

City State ZIP

4e Express Package Service

☐ FedEx Priority Overnight — Next business morning* ☐ FedEx Standard Overnight — Next business afternoon* ☐ Earliest next business morning delivery to select locations*

☐ FedEx 2Day — Second business day* ☐ FedEx Express Saver — Third business day*

FedEx Envelope rate not available. Minimum charge: One-pound rate

4b Express Freight Service — Packages over 150 lbs.

☐ FedEx 1Day Freight* — Next business day** ☐ FedEx 2Day Freight — Second business day** ☐ FedEx 3Day Freight — Third business day**

* Call for Confirmation:

5 Packaging — * Declared value limit $500

☐ FedEx Envelope* ☐ FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak ☐ FedEx Box ☐ FedEx Tube ☑ Other

6 Special Handling — Include FedEx address in Section 3

☒ SATURDAY Delivery — Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1Day Freight, and FedEx 2Day Freight to select ZIP codes

☐ HOLD Weekday at FedEx Location — Not available for FedEx First Overnight

☐ HOLD Saturday at FedEx Location — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.

☑ No ☐ Yes — As per attached Shipper's Declaration ☐ Yes — Shipper's Declaration not required ☐ Dry Ice — Dry Ice, 9, UN 1845 ____ x ____ kg

☐ Cargo Aircraft Only

Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging.

7 Payment — Bill to: Enter FedEx Acct. No. or Credit Card No. below.

☐ Sender — Acct. No. in Section 1 will be billed. ☐ Recipient ☒ Third Party ☐ Credit Card ☐ Cash/Check

Total Packages: 1 Total Weight: 5 Total Charges

†Our liability is limited to $100 unless you declare a higher value. See the *FedEx Service Guide* for details.

Credit Card Auth.

8 Sign to Authorize Delivery Without a Signature

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

Questions? Visit our Web site at fedex.com or call 1.800.GoFedEx 1.800.463.3339.

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466

8508 4253 2460

FedEx Express

Saturday

SD

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/22/2005
Carrier Name:	FedEx
Airbill:	8508 4253 3629
Shipped to:	Bioassay Laboratory - ASL 2300 NW Walnut Blvd. Corvallis OR 97330 (541) 758-0235

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/22/05 11:00	[signature]	4-23-05 1210
2				
3				
4				

Sampler Signature: [signature]

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164439	Sediment/ Jeff Franklin	L/G	BIO-10 (60)	05164439 (Ice Only) (1)	RM686A1(X3)	S: 4/21/2005	9:30	B1390-15 – Not full
05164450	Sediment/ Greg Warren	L/G	BIO-10 (60)	05164450 (Ice Only) (1)	RM708A1(X3)	S: 4/21/2005	9:43	B1390-16 – Not full
05164451	Sediment/ Jeff Franklin	L/G	BIO-10 (60)	05164451 (Ice Only) (1)	RM680A1(X1)	S: 4/21/2005	~~10:25~~ 10:40 NG	B1390-17
05164452	Sediment/ Jeff Schut	L/G	BIO-10 (60)	05164452 (Ice Only) (1)	RM742A1(X1)	S: 4/21/2005	11:00	B1390-18

Add N 1

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 2.7 °C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G		Custody Seal Intact? ___ Shipment Iced? ___
BIO-10 = Bioassay 10-day				

TR Number: 10-555125664-042105-0013

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

CH2MHILL
Analytical Services

Sample Receipt Record

Batch Number: B1390 15-18 Chironomid 22 Date received: 4-23-05

Client/Project Upper Columbia

VERIFICATION OF SAMPLE CONDITIONS (verify all items) * HD = Client Hand delivered Samples

Observation	YES	NO
Radiological Screening for AFCEE	NA	
Were custody seals intact and on the outside of the cooler?	✓	
If yes, Where? Front X Rear ____ Lt Side ____ Rt Side X	✓	
Type of packing material: (Ice) Blue Ice Bubble wrap	ICE	
Was the Chain of Custody inside the cooler?	✓	
Was the Chain of Custody properly filled out?	✓	
Were the sample containers in good condition?	✓	
Containers supplied by ASL?	✓	
Any sample with < 1/2 holding time remaining? If so contact LPM	N	
Was there ice in the cooler? Enter temp. 2.7 C	✓	
All VOCs free of air bubbles ?		

If the answer to any of the questions above is NO, a Sample Receipt Exceptions Report Must be written.

VERIFICATION OF SAMPLE PRESERVATION (verify all preserved samples except HAAs, HANs and CH)

Sample No	Nutrients pH <2	Metals pH <2	Volatiles pH <2	Cyanides pH >12	TOC pH <2	TOX pH <2	Other (specify)	N/A (soils/unpres)
1								
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LOGIN AND pH VERIFICATIONS PERFORMED BY

Mike Stanway 4-23-05 1210

Date/Time Date/Time

172

200

B1390 #5 15-18

FedEx Express *US Airbill*

FedEx Tracking Number 8508 4253 3629

1 From
Date FedEx Tracking Number 850842533629

Sender's Name Phone

Company

Address Dept/Floor/Suite/Room

City State ZIP

2 Your Internal Billing Reference

3 To
Recipient's Name Phone

Company Ast.

Recipient's Address
We cannot deliver to P.O. boxes or P.O. ZIP codes. Dept/Floor/Suite/Room

Address
To request a package be held at a specific FedEx location, print FedEx address here.

City State ZIP

8508 4253 3629

FedEx. emp: 173384 22APR05

Deliver By: 23APR05 AA

TRK# 8508 4253 3629 FORM 0215

PDX

97330 -OR-US **X0 CVOA**

FedEx 3Day Freight
Third business day**

5 Packaging * Declared value limit $500
FedEx Envelope* | FedEx Pak* (Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak) | FedEx Box | FedEx Tube | [X] Other

6 Special Handling — Include FedEx address in Section 3.
[X] SATURDAY Delivery — Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1Day Freight, and FedEx 2Day Freight to select ZIP codes
HOLD Weekday at FedEx Location — Not available for FedEx First Overnight
HOLD Saturday at FedEx Location — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.
[X] No | Yes As per attached Shipper's Declaration | Yes Shipper's Declaration not required | Dry Ice Dry Ice, 9, UN 1845 ___ x ___ kg
Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging. | Cargo Aircraft Only

7 Payment *Bill to:* Enter FedEx Acct. No. or Credit Card No. below. Obtain Recip. Acct. No.
Sender (Acct. No. in Section 1 will be billed.) | Recipient | [X] Third Party | Credit Card | Cash/Check

[redacted]

Total Packages | Total Weight | [redacted] | Total Charges
Credit Card Auth.

†Our liability is limited to $100 unless you declare a higher value. See the *FedEx Service Guide* for details.

8 Sign to Authorize Delivery Without a Signature

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.
Questions? Visit our Web site at fedex.com
or call 1.800.463.3339.

466

151966 7/00 SRC

SDR

FedEx Express Saturday Delivery

ALIGN OPEN END OF FEDEX AIRBILL POUCH HERE

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/22/2005
Carrier Name:	FedEx
Airbill:	8508 4253 2438
Shipped to:	Bioassay Laboratory - ASL 2300 NW Walnut Blvd, Corvallis OR 97330 (541) 758-0235

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/22/05 11:00	[signature]	4-23-05 1230
2				
3				
4				

Sampler Signature: [signature]

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164463	Sediment/ Jeff Schut	L/G	BIO-10 (60)	05164463 (Ice Only) (1)	RM743A1(X1)	S: 4/21/2005	10:18	B1390 - 19
05164454	Sediment/ Jeff Franklin	L/G	BIO-10 (60)	05164454 (Ice Only) (1)	RM678A1(X1)	S: 4/21/2005	12:35	B1390 - 20
05164455	Sediment/ Jeff Schut	L/G	BIO-10 (60)	05164455 (Ice Only) (1)	RM742A2(X5)	S: 4/21/2005	12:20	B1390 - 21
05164456	Sediment/ Jeff Franklin	L/G	BIO-10 (60)	05164456 (Ice Only) (1)	RM677A1(X3)	S: 4/21/2005	13:20	B1390 - 22

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 2,3°C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G		Custody Seal Intact? ___ Shipment Iced? ___

BIO-10 = Bioassay 10-day

TR Number: 10-555125664-042105-0014

LABORATORY COPY

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Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

CH2MHILL
Analytical Services

Sample Receipt Record

Batch Number: B1390-19-22 Date received: 4-23-05

Client/Project Upper Columbia

VERIFICATION OF SAMPLE CONDITIONS (verify all items) * HD = Client Hand delivered Samples

Observation	YES	NO
Radiological Screening for AFCEE	Na	
Were custody seals intact and on the outside of the cooler?	✓	
If yes, Where? Front X Rear ___ Lt Side ✓ Rt Side X MS	✓	
Type of packing material: (Ice) Blue Ice Bubble wrap	✓	
Was the Chain of Custody inside the cooler?	✓	
Was the Chain of Custody properly filled out?	✓	
Were the sample containers in good condition?	✓	
Containers supplied by ASL?	✓	
Any sample with < 1/2 holding time remaining? If so contact LPM	NA	
Was there ice in the cooler? Enter temp. 2, 3° C C	✓	
All VOCs free of air bubbles ?		

If the answer to any of the questions above is NO, a Sample Receipt Exceptions Report Must be written.

VERIFICATION OF SAMPLE PRESERVATION (verify all preserved samples except HAAs, HANs and CH)

Sample No	Nutrients pH <2	Metals pH <2	Volatiles pH <2	Cyanides pH >12	TOC pH <2	TOX pH <2	Other (specify)	N/A (soils/unpres)
1								
2								
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LOGIN AND pH VERIFICATIONS PERFORMED BY

4-23-05 1230

Date/Time Date/Time

B1390 #5-19-22

TRK# 8508 4253 2438 FORM 0215

PDX

97330 -OR-US X0 CVOA

FedEx Express **US Airbill** FedEx Tracking Number 8508 4253 2438

1 From This portion can be removed for Recipient's records

Date FedEx Tracking Number 850842532438

Sender's Name Phone

Company

Address Dept./Floor/Suite/Room

City State ZIP

2 Your Internal Billing Reference

3 To

Recipient's Name Phone

Company

Recipient's Address Dept./Floor/Suite/Room

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address

To request a package be held at a specific FedEx location, print FedEx address here.

City State ZIP

4a Express Pack

☑ FedEx Priority Ov Next business morning*

☐ FedEx 2Day Second business day*

☐ FedEx Express Saver Third business day*

FedEx Envelope rate not available. Minimum charge: One-pound rate

4b Express Freight Service *Packages over 150 lbs.*

☐ FedEx 1Day Freight* Next business day**

☐ FedEx 2Day Freight Second business day**

☐ FedEx 3Day Freight Third business day**

* Call for Confirmation:

5 Packaging * Declared value limit $500

☐ FedEx Envelope* ☐ FedEx Pak* Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak ☐ FedEx Box ☐ FedEx Tube ☐ Other

6 Special Handling Include FedEx address in Section 3.

☐ SATURDAY Delivery Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1Day Freight, and FedEx 2Day Freight to select ZIP codes

☐ HOLD Weekday at FedEx Location Not available for FedEx First Overnight

☐ HOLD Saturday at FedEx Location Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.

☑ No ☐ Yes As per attached Shipper's Declaration ☐ Yes Shipper's Declaration not required ☐ Dry Ice Dry Ice, 9, UN 1845 ____ x ____ kg

☐ Cargo Aircraft Only

Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging.

7 Payment *Bill to:* Enter FedEx Acct. No. or Credit Card No. below.

☐ Sender Acct. No. in Section 1 will be billed. ☐ Recipient ☒ Third Party ☐ Credit Card ☐ Cash/Check

Total Packages Total Weight Total Charges

Credit Card Auth.

*Our liability is limited to $100 unless you declare a higher value. See the *FedEx Service Guide* for details.

8 Sign to Authorize Delivery Without a Signature

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

Questions? Visit our Web site at fedex.com or call 1.800.GoFedEx 1.800.463.3339.

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466

FedEx Express

Saturday Delivery

SDR

151966 7/00 SRC

ALIGN OPEN END OF FEDEX AIRBILL POUCH HERE

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: L

Date Shipped:	4/25/2005
Carrier Name:	FedEx
Airbill:	8508 4253 3353
Shipped to:	Bioassay Laboratory - ASL 2300 NW Walnut Blvd. Corvallis OR 97330 (541) 758-0235

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1		4/25/05 13:00		4/26/05 12:15
2				
3				
4				

Sampler Signature:

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164468	Sediment/ Jeff Schut	L/G	BIO-10 (60)	05164468 (Ice Only) (1)	RM738A1(X3)	S: 4/22/2005	11:00	B1390 - 23
05164469	Sediment/ Jeff Schut	L/G	BIO-10 (60)	05164469 (Ice Only) (1)	RM739A1(X3)	S: 4/22/2005	10:00	B1390 - 24
05164470	Sediment/ John Culley	L/G	BIO-10 (60)	~~051644 (Ice Only),~~ NG 05164470 (Ice Only) (2)	RM732R1	S: 4/22/2005	11:35	B1390 - 25
05164471	Sediment/ Josh Butler	L/G	BIO-10 (60)	05164471 (Ice Only) (1)	RM724A2(X3)	S: 4/22/2005	11:27	B1390 - 26
05164472	Sediment/ Jeff Schut	L/G	BIO-10 (60)	05164472 (Ice Only) (1)	RM737A1(X3)	S: 4/22/2005	12:15	B1390 - 27

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 1.2°C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G		Custody Seal Intact? ___ Shipment Iced? ___

BIO-10 = Bioassay 10-day

TR Number: 10-555125664-042205-0014

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

CH2MHILL
Analytical Services

Sample Receipt Record

Batch Number: B1390-23 & 27 Chinook   Date received: 4/26/04

Client/Project: Upper Columbia

VERIFICATION OF SAMPLE CONDITIONS (verify all items) * HD = Client Hand delivered Samples

Observation	YES	NO
Radiological Screening for AFCEE	na	
Were custody seals intact and on the outside of the cooler?	✓	
If yes, Where? Front ✓ Rear ___ Lt Side ___ Rt Side ✓ internal bags ✓	✓	
Type of packing material: (Ice) Blue Ice Bubble wrap	✓	
Was the Chain of Custody inside the cooler?	✓	
Was the Chain of Custody properly filled out?	✓	
Were the sample containers in good condition?	✓	
Containers supplied by ASL?		✓
Any sample with < 1/2 holding time remaining? If so contact LPM	na	
Was there ice in the cooler? Enter temp. 1.2 C	✓	
All VOCs free of air bubbles ?	na	

If the answer to any of the questions above is NO, a Sample Receipt Exceptions Report Must be written.

VERIFICATION OF SAMPLE PRESERVATION (verify all preserved samples except HAAs, HANs and CH)

Sample No	Nutrients pH <2	Metals pH <2	Volatiles pH <2	Cyanides pH >12	TOC pH <2	TOX pH <2	Other (specify)	N/A (soils/unpres)
1								
2								
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27								

LOGIN AND pH VERIFICATIONS PERFORMED BY

[signature] 4/26/05 1215
Date/Time

Date/Time

B1390-23 h-27 Chironomids

145

200

BED 10D

FedEx Express **US Airbill** FedEx Tracking Number **8508 4253 3353**

0215 Recipient's Copy

1 From This portion can be removed for Recipient's records

Date — FedEx Tracking Number 850842533353

Sender's Name — Phone

Company

Address — Dept./Floor/Suite/Room

City — State — ZIP

2 Your Internal Billing Reference

3 To

Recipient's Name — Phone

Company

Recipient's Address — We cannot deliver to P.O. boxes or P.O. ZIP codes. — Dept./Floor/Suite/Room

Address — To request a package be held at a specific FedEx location, print FedEx address here.

City — State — ZIP

8508 4253 3353

4a Express Package Service — *Packages up to 150 lbs.*

- [x] FedEx Priority Overnight — Next business morning*
- [ ] FedEx Standard Overnight — Next business afternoon*
- [ ] FedEx First Overnight — Earliest next business morning delivery to select locations*
- [ ] FedEx 2Day — Second business day*
- [ ] FedEx Express Saver — Third business day*

FedEx Envelope rate not available. Minimum charge: One-pound rate

4b Express Freight Service — *Packages over 150 lbs.*

- [ ] FedEx 1Day Freight* — Next business day**
- [ ] FedEx 2Day Freight — Second business day**
- [ ] FedEx 3Day Freight — Third business day**

* Call for Confirmation:

5 Packaging — * Declared value limit $500

- [ ] FedEx Envelope*
- [ ] FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak
- [ ] FedEx Box
- [ ] FedEx Tube
- [x] Other

6 Special Handling — Include FedEx address in Section 3.

- [ ] SATURDAY Delivery — Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1Day Freight, and FedEx 2Day Freight to select ZIP codes
- [ ] HOLD Weekday at FedEx Location — Not available for FedEx First Overnight
- [ ] HOLD Saturday at FedEx Location — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked

- [x] No
- [ ] Yes — As per attached Shipper's Declaration
- [ ] Yes — Shipper's Declaration not required
- [ ] Dry Ice — Dry Ice, 9, UN 1845 ___ x ___ kg
- [ ] Cargo Aircraft Only

Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging.

7 Payment *Bill to:* — Enter FedEx Acct. No. or Credit Card No. below.

- [ ] Sender — Acct. No. in Section 1 will be billed.
- [ ] Recipient
- [x] Third Party
- [ ] Credit Card
- [ ] Cash/Check

Total Packages	Total Weight	Total Charges

Credit Card Auth.

†Our liability is limited to $100 unless you declare a higher value. See the *FedEx Service Guide* for details.

8 Sign to Authorize Delivery Without a Signature

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

Questions? Visit our Web site at fedex.com or call 1.800.GoFedEx 1.800.463.3339.

466

ALIGN OPEN END OF FEDEX AIRBILL POUCH HERE

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: L

Date Shipped:	4/25/2005
Carrier Name:	FedEx
Airbill:	8508 4253 2379
Shipped to:	Bioassay Laboratory - ASL 2300 NW Walnut Blvd. Corvallis OR 97330 (541) 758-0235

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/25/05 13:00	[signature]	4/26/05 1205
2				
3				
4				

Sampler Signature: [signature]

For Lab Use Only

Leb Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164473	Sediment/ Josh Butler	L/G	BIO-10 (60)	05164473 (Ice Only) (1)	RM723A1(X1)	S: 4/22/2005	12:55	B1390 - 28
05164474	Sediment/ Jeff Schut	L/G	BIO-10 (60)	05164474 (Ice Only) (1)	RM736A1(X1)	S: 4/22/2005	13:45	B1390 - 29
05164475	Sediment/ Josh Butler	L/G	BIO-10 (60)	05164475 (Ice Only) (1)	RM723A2(X3)	S: 4/22/2005	15:16	B1390 - 30
05164476	Sediment/ John Culley	L/G	BIO-10 (60)	~~051644 (Ice Only),~~ NG 05164476 (Ice Only) (2)	RM721R1	S: 4/22/2005	14:39	B1390 - 31

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.7 °C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Dealgnate: Composite = C, Grab = G		Custody Seal Intact? ___ Shipment Iced? ___

BIO-10 = Bioassay 10-day

TR Number: 10-555125664-042205-0015

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

CH2MHILL
Analytical Services

Sample Receipt Record

Batch Number: B1390 - 28 to 31 Chrono Date received: 4/26/05

Client/Project Upper Columbia

VERIFICATION OF SAMPLE CONDITIONS (verify all items) * HD = Client Hand delivered Samples

Observation	YES	NO
Radiological Screening for AFCEE	na	
Were custody seals intact and on the outside of the cooler?	✓	
If yes, Where? Front ✓ Rear ____ Lt Side ____ Rt Side ✓ internal bag ✓	✓	
Type of packing material: (Ice) Blue Ice Bubble wrap	✓	
Was the Chain of Custody inside the cooler?	✓	
Was the Chain of Custody properly filled out?	✓	
Were the sample containers in good condition?	✓	
Containers supplied by ASL?		✓
Any sample with < 1/2 holding time remaining? If so contact LPM	na	
Was there ice in the cooler? Enter temp. 0.7 °C	✓	
All VOCs free of air bubbles ?	na	

If the answer to any of the questions above is NO, a Sample Receipt Exceptions Report Must be written.

VERIFICATION OF SAMPLE PRESERVATION (verify all preserved samples except HAAs, HANs and CH)

Sample No	Nutrients pH <2	Metals pH <2	Volatiles pH <2	Cyanides pH >12	TOC pH <2	TOX pH <2	Other (specify)	N/A (soils/unpres)
1								
2								
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LOGIN AND pH VERIFICATIONS PERFORMED BY

4/26/05 1205
Date/Time

Date/Time

D1390-29 & 31 Chromium

47

200

B10
10x1

FedEx Express **US Airbill**

FedEx Tracking Number 8508 4253 2379

Form ID No. 0215 Recipient's Copy

1 From Please print and press hard. For Recipient's records.

Date FedEx Tracking Number 850842532379

Sender's Name Phone

Company

Address

Dept/Floor/Suite/Room

City State ZIP

2 Your Internal Billing Reference

3 To

Recipient's Name Phone

Company

Recipient's Address

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Dept/Floor/Suite/Room

Address

To request a package be held at a specific FedEx location, print FedEx address here.

City State ZIP

4a Express Package Service *Packages up to 150 lbs.* * To most locations

- FedEx Priority Overnight — Next business morning*
- FedEx Standard Overnight — Next business afternoon*
- FedEx First Overnight — Earliest next business morning delivery to select locations**
- FedEx 2Day — Second business day**
- FedEx Express Saver — Third business day**

FedEx Envelope rate not available. Minimum charge: One-pound rate

4b Express Freight Service *Packages over 150 lbs.* ** To most locations

- FedEx 1Day Freight* — Next business day**
- FedEx 2Day Freight — Second business day**
- FedEx 3Day Freight — Third business day**

* Call for Confirmation:

5 Packaging * Declared value limit $500

- FedEx Envelope*
- FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak
- FedEx Box
- FedEx Tube
- Other

6 Special Handling Include FedEx address in Section 3.

- SATURDAY Delivery — Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1Day Freight, and FedEx 2Day Freight to select ZIP codes
- HOLD Weekday at FedEx Location — Not available for FedEx First Overnight
- HOLD Saturday at FedEx Location — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.

- No
- Yes — As per attached Shipper's Declaration
- Yes — Shipper's Declaration not required
- Dry Ice — Dry Ice, 9, UN 1845 ____ x ____ kg
- Cargo Aircraft Only

Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging.

7 Payment *Bill to:* Enter FedEx Acct No. or Credit Card No. below. Obtain Recip. Acct. No.

- Sender — Acct. No. in Section 1 will be billed.
- Recipient
- Third Party
- Credit Card
- Cash/Check

Total Packages | Total Weight | Total Charges | Credit Card Auth.

†Our liability is limited to $100 unless you declare a higher value. See the *FedEx Service Guide* for details.

8 Sign to Authorize Delivery Without a Signature

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify us from any resulting liability.

8508 4253 2379

PEEL OPEN END OF FEDEX AIRBILL POUCH HERE

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No:
L

Date Shipped:	4/25/2005
Carrier Name:	FedEx
Airbill:	8508 4253 2508
Shipped to:	Bioassay Laboratory - ASL 2300 NW Walnut Blvd. Corvallis OR 97330 (541) 758-0235

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/25/05 13:00	[signature]	4/26/05 1245
2				
3				
4				

Sampler Signature: [signature]

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164478	Sediment/ John Culley	L/G	BIO-10 (60)	~~051644 (Ice Only),~~ NG 05164478 (Ice Only) (2)	RM726R1	S: 4/22/2005	13:20	B1390-32
05164486	Sediment/ John Culley	L/G	BIO-10 (60)	~~051644 (Ice Only),~~ NG 05164486 (Ice Only) (2)	RM705R1	S: 4/23/2005	9:25	B1390-36
05164489	Sediment/ John Culley	L/G	BIO-10 (60)	~~051644 (Ice Only),~~ NG 05164489 (Ice Only) (2)	RM686R1	S: 4/23/2005	11:20	B1390-38

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 2.4 °C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? ___	Shipment Iced? ___
BIO-10 = Bioassay 10-day				

TR Number: 10-555125664-042505-0006

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

CH2MHILL
Analytical Services

Sample Receipt Record

Batch Number: B1390-32, 36 38 Chirvno   Date received: 4-26-05

Client/Project: Upper Columbia

VERIFICATION OF SAMPLE CONDITIONS (verify all items) * HD = Client Hand delivered Samples

Observation	YES	NO
Radiological Screening for AFCEE	na	
Were custody seals intact and on the outside of the cooler?	✓	
If yes, Where? Front ✓ Rear____ Lt Side____ Rt Side ✓ internal bag ✓	✓	
Type of packing material: (Ice) Blue Ice Bubble wrap	✓	
Was the Chain of Custody inside the cooler?	✓	
Was the Chain of Custody properly filled out?	✓	
Were the sample containers in good condition?	✓	
Containers supplied by ASL?		✓
Any sample with < 1/2 holding time remaining? If so contact LPM	na	
Was there ice in the cooler? Enter temp. 2.4 C		
All VOCs free of air bubbles ?	na	

If the answer to any of the questions above is NO, a Sample Receipt Exceptions Report Must be written.

VERIFICATION OF SAMPLE PRESERVATION (verify all preserved samples except HAAs, HANs and CH)

Sample No	Nutrients pH <2	Metals pH <2	Volatiles pH <2	Cyanides pH >12	TOC pH <2	TOX pH <2	Other (specify)	N/A (soils/unpres)
1								
2								
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27								

LOGIN AND pH VERIFICATIONS PERFORMED BY

[signature] 4/26/05 12:45
Date/Time

Date/Time

B1390 · 32, 36, 38 Chrono

FedEx Express US Airbill

FedEx Tracking Number 8508 4253 2508

0215	Recipient's Copy

1 From This portion can be removed for Recipient's records

Date | FedEx Tracking Number 850842532508

Sender's Name | Phone

Company

Address | Dept/Floor/Suite/Room

City | State | ZIP

2 Your Internal Billing Reference

3 To

Recipient's Name | Phone

Company

Recipient's Address — We cannot deliver to P.O. boxes or P.O. ZIP codes. | Dept/Floor/Suite/Room

Address — To request a package be held at a specific FedEx location, print FedEx address here.

City | State | ZIP

4a Express Package Service — *Packages up to 150 lbs.*

- [x] FedEx Priority Overnight — Next business morning*
- [ ] FedEx Standard Overnight — Next business afternoon*
- [ ] FedEx First Overnight — Earliest next business morning delivery to select locations*
- [ ] FedEx 2Day — Second business day*
- [ ] FedEx Express Saver — Third business day*

FedEx Envelope rate not available. Minimum charge: One-pound rate

4b Express Freight Service — *Packages over 150 lbs.*

- [ ] FedEx 1Day Freight* — Next business day**
- [ ] FedEx 2Day Freight — Second business day**
- [ ] FedEx 3Day Freight — Third business day**

* Call for Confirmation:

5 Packaging — * Declared value limit $500

- [ ] FedEx Envelope*
- [ ] FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak
- [ ] FedEx Box
- [ ] FedEx Tube
- [x] Other

6 Special Handling — Include FedEx address in Section 3.

- [ ] SATURDAY Delivery — Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1Day Freight, and FedEx 2Day Freight to select ZIP codes
- [ ] HOLD Weekday at FedEx Location — Not available for FedEx First Overnight
- [ ] HOLD Saturday at FedEx Location — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.

- [x] No
- [ ] Yes — As per attached Shipper's Declaration
- [ ] Yes — Shipper's Declaration not required
- [ ] Dry Ice — Dry Ice, 9, UN 1815 ____ x ____ kg
- [ ] Cargo Aircraft Only

Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging.

7 Payment *Bill to:* — Enter FedEx Acct. No. or Credit Card No. below.

- [ ] Sender — Acct. No. in Section 1 will be billed.
- [ ] Recipient
- [x] Third Party
- [ ] Credit Card
- [ ] Cash/Check

Total Packages	Total Weight		Total Charges

8508 4253 2508

FedEx

FedEx PRIORITY OVERNIGHT TUE

emp# 92604 25APR05

Deliver By: 26APR05

TRK# 8508 4253 2508 FORM 0215

PDX

AA

97330 -OR -US

86 CVOA

ALIGN OPEN END OF FEDEX AIRBILL POUCH HERE

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/25/2005
Carrier Name:	FedEx
Airbill:	8508 4253 3364
Shipped to:	Bioassay Laboratory - ASL 2300 NW Walnut Blvd. Corvallis OR 97330 (541) 758-0235

Chain of Custody Record

	Relinquished By (Date / Time)	Received By (Date / Time)
1	4/25/05/13:00	4/26/05 1230
2		
3		
4		

Sampler Signature:

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164483	Sediment/ Jeff Franklin	L/G	BIO-10 (60)	05164483 (Ice Only) (1)	RM661A1(X1)	S: 4/22/2005	10:15	B1390 - 34
05164485	Sediment/ Jeff Franklin	L/G	BIO-10 (60)	05164485 (Ice Only) (1)	RM658A1(X3)	S: 4/22/2005	11:30	B1390 - 35
05164487	Sediment/ Greg Warren	L/G	BIO-10 (60)	05164487 (Ice Only) (1)	RM713A1(X3)	S: 4/23/2005	9:30	B1390 - 37
05164494	Sediment/ Jeff Schut	L/G	BIO-10 (60)	05164494 (Ice Only) (1)	RM729A1(X1)	S: 4/23/2005	12:30	B1390 - 41
05164507	Sediment/ Jeff Schut	L/G	BIO-10 (60)	05164507 (Ice Only) (1)	RM727A1(X1)	S: 4/23/2005	14:15	B1390 - 43

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 1.5 °C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G		Custody Seal Intact? ___ Shipment Iced? ___

BIO-10 = Bioassay 10-day

TR Number: 10-555125664-042305-0012

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

CH2MHILL
Analytical Services

Sample Receipt Record

Batch Number: B1390 - 34 35 37 41 43 Chromo Date received: 4/26/05

Client/Project: Upper Columbia

VERIFICATION OF SAMPLE CONDITIONS (verify all items) * HD = Client Hand delivered Samples

Observation	YES	NO
Radiological Screening for AFCEE	na	
Were custody seals intact and on the outside of the cooler?	✓	
If yes, Where? Front ✓ Rear ___ Lt Side ✓ Rt Side ___ Internal bag	✓	
Type of packing material: (Ice) Blue Ice Bubble wrap	✓	
Was the Chain of Custody inside the cooler?	✓	
Was the Chain of Custody properly filled out?	✓	
Were the sample containers in good condition?	✓	
Containers supplied by ASL?		✓
Any sample with < 1/2 holding time remaining? If so contact LPM	na	
Was there ice in the cooler? Enter temp. 1.5 C		
All VOCs free of air bubbles ?	na	

If the answer to any of the questions above is NO, a Sample Receipt Exceptions Report Must be written.

VERIFICATION OF SAMPLE PRESERVATION (verify all preserved samples except HAAs, HANs and CH)

Sample No	Nutrients pH <2	Metals pH <2	Volatiles pH <2	Cyanides pH >12	TOC pH <2	TOX pH <2	Other (specify)	N/A (soils/unpres)
1								
2								
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27								

LOGIN AND pH VERIFICATIONS PERFORMED BY

[signature] 4/26/05 1230
Date/time

Date/Time

B1390-34,35,37,41,43 chrono

146

200

FedEx Express **US Airbill** FedEx Tracking Number **8508 4253 3364**

B10/10D

1 From This section must be completed for Recipient's records.

Date [illegible] FedEx Tracking Number 850842533364

Sender's Name [illegible] Phone [illegible]

Company [illegible]

Address [illegible] Dept/Floor/Suite/Room

City [illegible] State [illegible] ZIP [illegible]

2 Your Internal Billing Reference [illegible]

3 To

Recipient's Name [illegible] Phone [illegible]

Company [illegible]

Recipient's Address [illegible] Dept/Floor/Suite/Room

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address [illegible]

To request a package be held at a specific FedEx location, print FedEx address here.

City [illegible] State [illegible] ZIP [illegible]

8508 4253 3364

For FedEx Use 0215

4a Express Package Service *Packages up to 150 lbs.*

- [x] FedEx Priority Overnight — Next business morning*
- [ ] FedEx Standard Overnight — Next business afternoon*
- [ ] FedEx First Overnight — Earliest next business morning delivery to select locations*
- [ ] FedEx 2Day — Second business day*
- [ ] FedEx Express Saver — Third business day*

FedEx Envelope rate not available. Minimum charge. One-pound rate

4b Express Freight Service *Packages over 150 lbs.*

- [ ] FedEx 1Day Freight* — Next business day**
- [ ] FedEx 2Day Freight — Second business day**
- [ ] FedEx 3Day Freight — Third business day**

* Call for Confirmation:

5 Packaging * Declared value limit $500

- [ ] FedEx Envelope*
- [ ] FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak
- [ ] FedEx Box
- [ ] FedEx Tube
- [x] Other

6 Special Handling Includes FedEx address in Section 3.

- [ ] SATURDAY Delivery — Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1Day Freight, and FedEx 2Day Freight to select ZIP codes
- [ ] HOLD Weekday at FedEx Location — Not available for FedEx First Overnight
- [ ] HOLD Saturday at FedEx Location — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods?

One box must be checked.

- [x] No
- [ ] Yes — As per attached Shipper's Declaration
- [ ] Yes — Shipper's Declaration not required
- [ ] Dry Ice — Dry Ice, 9, UN 1845 ____ x ____ kg
- [ ] Cargo Aircraft Only

Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging.

7 Payment *Bill to:* Enter FedEx Acct. No. or Credit Card No. below. Obtain Rate to Acct. No.

- [ ] Sender — Acct. No. in Section 1 will be billed.
- [ ] Recipient
- [x] Third Party
- [ ] Credit Card
- [ ] Cash/Check

[illegible]

Total Packages	Total Weight	Total Charges
		Credit Card Auth.

†Our liability is limited to $100 unless you declare a higher value. See the *FedEx Service Guide* for details.

8 Sign to Authorize Delivery Without a Signature

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.
Questions? Visit our Web site at fedex.com or call 1.800.GoFedEx 1.800.463.3339.

466

*01F • Rev. Date 11AUG • Part #150279 • ©1994–2007 FedEx • PRINTED IN U.S.A.

ALIGN OPEN END OF FEDEX AIRBILL POUCH HERE

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: L

Date Shipped:	4/25/2005
Carrier Name:	FedEx
Airbill:	8508 4253 3526
Shipped to:	Bioassay Laboratory - ASL 2300 NW Walnut Blvd. Corvallis OR 97330 (541) 758-0235

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1		4/25/05 13:00		4/26/05 1145
2				
3				
4				

Sampler Signature: Jeff Trumbo

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164479	Sediment/ Jeff Schut	L/G	BIO-10 (60)	05164479 (Ice Only) (1)	RM734A1(X3)	S: 4/22/2005	16:00	B1390-33
05164491	Sediment/ Jeff Schut	L/G	BIO-10 (60)	05164491 (Ice Only) (1)	RM730A1(X1)	S: 4/23/2005	11:15	B1390-39
05164493	Sediment/ Jeff Schut	L/G	BIO-10 (60)	05164493 (Ice Only) (1)	RM733A1(X1)	S: 4/23/2005	9:45	B1390-40
05164496	Sediment/ John Culley	L/G	BIO-10 (60)	~~05164~~ (Ice Only); NG 05164496 (Ice Only) (2)	RM685R1	S: 4/23/2005	13:50	B1390-42

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 1.2°C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? ___	Shipment Iced? ___

BIO-10 = Bioassay 10-day

TR Number: 10-555125664-042305-0013

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

CH2MHILL
Analytical Services

Sample Receipt Record

Batch Number: 1350-33, 39, 40, 42 Chironomid Date received: 4-26-05

Client/Project Upper Columbia

VERIFICATION OF SAMPLE CONDITIONS (verify all items) * HD = Client Hand delivered Samples

Observation	YES	NO
Radiological Screening for AFCEE	na	
Were custody seals intact and on the outside of the cooler?	✓	
If yes, Where? Front ✓ Rear ____ Lt Side ✓ Rt Side ____ internal bag ✓	✓	
Type of packing material: (Ice) Blue Ice Bubble wrap	✓	
Was the Chain of Custody inside the cooler?	✓	
Was the Chain of Custody properly filled out?	✓	
Were the sample containers in good condition?	✓	
Containers supplied by ASL?		✓
Any sample with < 1/2 holding time remaining? If so contact LPM	na	
Was there ice in the cooler? Enter temp. 1.2 °C	✓	
All VOCs free of air bubbles ?	na	

If the answer to any of the questions above is NO, a Sample Receipt Exceptions Report Must be written.

VERIFICATION OF SAMPLE PRESERVATION (verify all preserved samples except HAAs, HANs and CH)

Sample No	Nutrients pH <2	Metals pH <2	Volatiles pH <2	Cyanides pH >12	TOC pH <2	TOX pH <2	Other (specify)	N/A (soils/unpres)
1								
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27								

LOGIN AND pH VERIFICATIONS PERFORMED BY

[signature] 4/26/05 1145
Date/Time

Date/Time

D1390 - 33, 39, 40, 42 Chronid

162

200

BZD
10D

FedEx Express US Airbill

FedEx Tracking Number 8508 4253 3526

0215

Recipient's Copy

1 From This portion can be removed for Recipient's records.

Date [illegible] FedEx Tracking Number 850842533526

Sender's Name [illegible] Phone [illegible] 737-2000

Company [illegible]

Address [illegible]

Dept./Floor/Suite/Room

City [illegible] State WA ZIP 99201 [illegible]

2 Your Internal Billing Reference [illegible]

3 To Recipient's Name [illegible] Phone [illegible]

Company [illegible] LAB - ACL

Recipient's Address [illegible]
We cannot deliver to P.O. boxes or P.O. ZIP codes.

Dept./Floor/Suite/Room

Address
To request a package be held at a specific FedEx location, print FedEx address here.

City [illegible] State [illegible] ZIP [illegible]

8508 4253 3526

4a Express Package Service — Packages up to 150 lbs.

- [x] FedEx Priority Overnight — Next business morning*
- [ ] FedEx Standard Overnight — Next business afternoon*
- [ ] FedEx First Overnight — Earliest next business morning delivery to select locations*
- [ ] FedEx 2Day — Second business day*
- [ ] FedEx Express Saver — Third business day*

FedEx Envelope rate not available. Minimum charge: One-pound rate

4b Express Freight Service — Packages over 150 lbs.

- [ ] FedEx 1Day Freight* — Next business day**
- [ ] FedEx 2Day Freight — Second business day**
- [ ] FedEx 3Day Freight — Third business day**

* Call for Confirmation:

5 Packaging — * Declared value limit $500

- [ ] FedEx Envelope*
- [ ] FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak
- [ ] FedEx Box
- [ ] FedEx Tube
- [x] Other

6 Special Handling — Include FedEx address in Section 3

- [ ] SATURDAY Delivery — Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1Day Freight, and FedEx 2Day Freight to select ZIP codes
- [ ] HOLD Weekday at FedEx Location — Not available for FedEx First Overnight
- [ ] HOLD Saturday at FedEx Location — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.

- [x] No
- [ ] Yes — As per attached Shipper's Declaration
- [ ] Yes — Shipper's Declaration not required
- [ ] Dry Ice — Dry Ice, 9, UN 1845 ___ x ___ kg
- [ ] Cargo Aircraft Only

Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging.

7 Payment Bill to: Enter FedEx Acct. No. or Credit Card No. below.

- [ ] Sender — Acct. No. in Section 1 will be billed.
- [ ] Recipient
- [x] Third Party
- [ ] Credit Card
- [ ] Cash/Check

[redacted]

Total Packages | Total Weight | Total Charges

Credit Card Auth.

†Our liability is limited to $100 unless you declare a higher value. See the *FedEx Service Guide* for details.

8 Sign to Authorize Delivery Without a Signature

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

Questions? Visit our Web site at fedex.com or call 1.800.GoFedEx 1.800.463.3339.

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466

ALIGN OPEN END OF FEDEX AIRBILL POUCH HERE

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: L

Date Shipped:	4/27/2005
Carrier Name:	FedEx
Airbill:	8508 4253 3099
Shipped to:	Bioassay Laboratory - ASL 2300 NW Walnut Blvd. Corvallis OR 97330 (541) 758-0235

Chain of Custody Record

Relinquished By	(Date / Time)	Received By	(Date / Time)
1	4/27/05 12:00	Kathy McKinley	4/28/05 1045
2			
3			
4			

Sampler Signature:

For Lab Use Only 22C

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME			FOR LAB USE ONLY Sample Condition On Receipt
05174405	Sediment/ Jeff Schut	L/G	BIO-10 (60)	05174405 (Ice Only) (1)	RM644A1(X3)	S: 4/26/2005	10:15	B1390-44	N
05174406	Sediment/ Josh Butler	L/G	BIO-10 (60)	05174406 (Ice Only) (1)	RM637A1(X1)	S: 4/26/2005	11:26	B1390-45	
05174408	Sediment/ Jeff Schut	L/G	BIO-10 (60)	05174408 (Ice Only) (1)	RM642A1(X1)	S: 4/26/2005	11:50	B1390-47	
05174412	Sediment/ Jeff Schut	L/G	BIO-10 (60)	05174412 (Ice Only) (1)	RM641A1(X1)	S: 4/26/2005	13:54	B1390-51	N
05174413	Sediment/ Jeff Schut	L/G	BIO-10 (60)	05174413 (Ice Only) (1)	RM640A1(X3)	S: 4/26/2005	15:20	B1390-52	N

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number:	
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G		Custody Seal Intact? ___	Shipment Iced? ___
BIO-10 = Bioassay 10-day					

TR Number: 10-555125664-042605-0009

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

CH2MHILL
Analytical Services

Sample Receipt Record

Batch Number: B1390 - 44-52

Date received: 4/28/05 1045

Client/Project UCR

VERIFICATION OF SAMPLE CONDITIONS (verify all items) * HD = Client Hand delivered Samples

Observation	YES	NO
Radiological Screening for AFCEE		X
Were custody seals intact and on the outside of the cooler?	✓	
If yes, Where? Front X Rear ____ Lt Side ____ Rt Side X		
Type of packing material: (Ice) Blue Ice Bubble wrap		
Was the Chain of Custody inside the cooler?	X	
Was the Chain of Custody properly filled out?	X	
Were the sample containers in good condition?	X	
Containers supplied by ASL?	X	
Any sample with < 1/2 holding time remaining? If so contact LPM		X
Was there ice in the cooler? Enter temp. 2.2 C	X	
All VOCs free of air bubbles ?		

If the answer to any of the questions above is NO, a Sample Receipt Exceptions Report Must be written.

VERIFICATION OF SAMPLE PRESERVATION (verify all preserved samples except HAAs, HANs and CH)

Sample No	Nutrients pH <2	Metals pH <2	Volatiles pH <2	Cyanides pH >12	TOC pH <2	TOX pH <2	Other (specify)	N/A (soils/unpres)
1								
2								
3								
4								
5								
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LOGIN AND pH VERIFICATIONS PERFORMED BY

Kathy McKinley 4/28/05 1045
Date/time

Date/Time

FedEx Express **US Airbill**

FedEx Tracking Number **8508 4253 3099**

1 From This section must be completed for Recipient's records.

Date _____ FedEx Tracking Number **850842533099**

Sender's Name _____ Phone _____

Company _____

Address _____ Dept./Floor/Suite/Room

City _____ State _____ ZIP _____

2 Your Internal Billing Reference _____

3 To

Recipient's Name _____ Phone _____

Company _____

Recipient's Address _____ Dept./Floor/Suite/Room

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address _____

To request a package be held at a specific FedEx location, print FedEx address here.

City _____ State _____ ZIP _____

0215 Recipient's Copy

4a Express Package Service — *Packages up to 150 lbs.* (* To most locations)

- [x] FedEx Priority Overnight — Next business morning*
- [ ] FedEx Standard Overnight — Next business afternoon*
- [ ] FedEx First Overnight — Earliest next business morning delivery to select locations*
- [ ] FedEx 2Day — Second business day*
- [ ] FedEx Express Saver — Third business day*

FedEx Envelope rate not available. Minimum charge: One-pound rate

4b Express Freight Service — *Packages over 150 lbs.* (** To most locations)

- [ ] FedEx 1Day Freight* — Next business day**
- [ ] FedEx 2Day Freight — Second business day**
- [ ] FedEx 3Day Freight — Third business day**

* Call for Confirmation: _____

5 Packaging (* Declared value limit $500)

- [ ] FedEx Envelope*
- [ ] FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak
- [ ] FedEx Box
- [ ] FedEx Tube
- [x] Other

6 Special Handling — Include FedEx address in Section 3.

- [ ] SATURDAY Delivery — Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1Day Freight, and FedEx 2Day Freight to select ZIP codes
- [ ] HOLD Weekday at FedEx Location — Not available for FedEx First Overnight
- [ ] HOLD Saturday at FedEx Location — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.

- [x] No
- [ ] Yes — As per attached Shipper's Declaration
- [ ] Yes — Shipper's Declaration not required
- [ ] Dry Ice — Dry Ice, 9, UN 1845 _____ x _____ kg

Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging.

- [ ] Cargo Aircraft Only

7 Payment Bill to: Enter FedEx Acct. No. or Credit Card No. below.

- [ ] Sender — Acct. No. in Section 1 will be billed
- [ ] Recipient
- [x] Third Party
- [ ] Credit Card
- [ ] Cash/Check

Total Packages: 1 | Total Weight: 70 | Total Charges: _____ Credit Card Auth

†Our liability is limited to $100 unless you declare a higher value. See the *FedEx Service Guide* for details.

8 Sign to Authorize Delivery Without a Signature

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

Questions? Visit our Web site at fedex.com or call 1.800.GoFedEx 1.800.463.3339.

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466

FedEx

FedEx PRIORITY OVERNIGHT THU

emp# 44465 27APR05

Deliver By 28APR05

TRK# 8508 4253 3099 FORM 0215

PDX

97330 -OR -US

86 CVOA

Part #158331-1022 03/05

ALIGN OPEN END OF FEDEX AIRBILL POUCH HERE

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/27/2005
Carrier Name:	FedEx
Airbill:	8508 4253 3206
Shipped to:	Bioassay Laboratory - ASL 2300 NW Walnut Blvd. Corvallis OR 97330 (541) 758-0235

Chain of Custody Record

	Relinquished By (Date / Time)	Received By (Date / Time)
1	4/27/2005/12:00	Kathay McKinley 4/28/05 1045
2		
3		
4		

Sampler Signature:

For Lab Use Only 2.6C

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt	
05174407	Sediment/ Josh Butler	L/G	BIO-10 (60)	05174407 (Ice Only) (1)	RM634A1(X1)	S: 4/26/2005	14:02	B1390-46	
05174409	Sediment/ Jeff Franklin	L/G	BIO-10 (60)	05174409 (Ice Only) (1)	RM605A1(X1)	S: 4/26/2005	14:17	B1390-48	
05174410	Sediment/ Jeff Franklin	L/G	BIO-10 (60)	05174410 (Ice Only) (1)	RM606A1(X3)	S: 4/26/2005	13:01	B 1390-49	
05174411	Sediment/ Jeff Franklin	L/G	BIO-10 (60)	05174411 (Ice Only) (1)	RM616A1(X3)	S: 4/26/2005	10:16	B 1390-50	N
05174415	Sediment/ Josh Butler	L/G	BIO-10 (60)	05174415 (Ice Only) (1)	RM628A1(X1)	S: 4/26/2005	15:42	B 1390-53	N

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G		Custody Seal Intact? ___ Shipment Iced? ___
BIO-10 = Bioassay 10-day				

TR Number: 10-555125664-042605-0008

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

CH2MHILL
Analytical Services

Sample Receipt Record

Batch Number: [ ] Date received: 4/28/05

Client/Project UCR

VERIFICATION OF SAMPLE CONDITIONS (verify all items) * HD = Client Hand delivered Samples

Observation	YES	NO
Radiological Screening for AFCEE		X
Were custody seals intact and on the outside of the cooler?	X	
If yes, Where? Front X Rear ___ Lt Side X Rt Side X		
Type of packing material: (Ice) Blue Ice Bubble wrap		
Was the Chain of Custody inside the cooler?	X	
Was the Chain of Custody properly filled out?	X	
Were the sample containers in good condition?	X	
Containers supplied by ASL?	X	
Any sample with < 1/2 holding time remaining? If so contact LPM		X
Was there ice in the cooler? Enter temp. 2.6 C	X	
All VOCs free of air bubbles ?		

If the answer to any of the questions above is NO, a Sample Receipt Exceptions Report Must be written.

VERIFICATION OF SAMPLE PRESERVATION (verify all preserved samples except HAAs, HANs and CH)

Sample No	Nutrients pH <2	Metals pH <2	Volatiles pH <2	Cyanides pH >12	TOC pH <2	TOX pH <2	Other (specify)	N/A (soils/unpres)
1								
2								
3								
4								
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LOGIN AND pH VERIFICATIONS PERFORMED BY

KMcKenley 4/28/05 1045

Date/Time

Date/Time

FedEx

FedEx PRIORITY OVERNIGHT THU

emp# 44465 27APR05

Deliver By 28APR05

TRK# 8508 4253 3206 FORM 0215

PDX

97330 -OR -US 86 CVOA

3206

0215 Recipient's Copy

Sender's Name _____ Phone _____

Company _____

Address _____ Dept/Floor/Suite/Room

City _____ State _____ ZIP _____

2 Your Internal Billing Reference

3 To

Recipient's Name _____ Phone _____

Company _____

Recipient's Address _____ Dept/Floor/Suite/Room

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address _____

To request a package be held at a specific FedEx location, print FedEx address here.

City _____ State OR ZIP _____

8508 4253 3206

4a Express Package Service — Packages up to 150 lbs.

- [X] FedEx Priority Overnight — Next business morning*
- [ ] FedEx Standard Overnight — Next business afternoon*
- [ ] FedEx First Overnight — Earliest next business morning delivery to select locations*
- [ ] FedEx 2Day — Second business day*
- [ ] FedEx Express Saver — Third business day*

FedEx Envelope rate not available. Minimum charge: One-pound rate

4b Express Freight Service — Packages over 150 lbs.

- [ ] FedEx 1Day Freight* — Next business day**
- [ ] FedEx 2Day Freight — Second business day**
- [ ] FedEx 3Day Freight — Third business day**

* Call for Confirmation: _____

5 Packaging — * Declared value limit $500

- [ ] FedEx Envelope*
- [ ] FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak
- [ ] FedEx Box
- [ ] FedEx Tube
- [X] Other

6 Special Handling — Include FedEx address in Section 3

- [ ] SATURDAY Delivery — Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1Day Freight, and FedEx 2Day Freight to select ZIP codes
- [ ] HOLD Weekday at FedEx Location — Not available for FedEx First Overnight
- [ ] HOLD Saturday at FedEx Location — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.

- [X] No
- [ ] Yes — As per attached Shipper's Declaration
- [ ] Yes — Shipper's Declaration not required
- [ ] Dry Ice — Dry Ice, 9, UN 1845 _____ x _____ kg
- [ ] Cargo Aircraft Only

Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging.

7 Payment Bill to: — Enter FedEx Acct. No. or Credit Card No. below. — Obtain Recipient Acct. No.

- [ ] Sender — Acct. No. in Section 1 will be billed.
- [ ] Recipient
- [X] Third Party
- [ ] Credit Card
- [ ] Cash/Check

Total Packages	Total Weight	Total Charges
	78	Credit Card Auth.

†Our liability is limited to $100 unless you declare a higher value. See the *FedEx Service Guide* for details.

8 Sign to Authorize Delivery Without a Signature

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

Questions? Visit our Web site at fedex.com or call 1.800.GoFedEx 1.800.463.3339.

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466

ALIGN OPEN END OF FEDEX AIRBILL POUCH HERE

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No:
L

Date Shipped:	4/29/2005
Carrier Name:	FedEx
Airbill:	8508 4253 3088
Shipped to:	Bioassay Laboratory - ASL 2300 NW Walnut Blvd. Corvallis OR 97330 (541) 758-0235

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/29/05 12:00	[signature]	4-30-05 1200
2				
3				
4				

Sampler Signature: [signature]

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05174423	Sediment/ Jeff Schut	L/G	BIO-10 (60), BIO-7 (60)	05174423 (Ice Only) (2)	RM603A1(X1)	S: 4/28/2005	10:45	B1390-54
05174424	Sediment/ Jeff Schut	L/G	BIO-10 (60), BIO-7 (60)	05174424 (Ice Only) (2)	RM605A2(X8)	S: 4/28/2005	9:47	B1390-55
05174427	Sediment/ Greg Warren	L/G	BIO-10 (60), BIO-7 (60)	05174427 (Ice Only) (2)	RM622A1(X3)	S: 4/28/2005	9:58	B1390-56

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 1.9°C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G		Custody Seal Intact? ___ Shipment Iced? ___

BIO-10 = Bioassay 10-day, BIO-7 = Bioassay 7-day

TR Number: 10-555125664-042805-0002

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

CH2MHILL
Analytical Services

Sample Receipt Record

Batch Number: B1390-54,55,56 Date received: 4-30-05

Client/Project: UPPER Columbia

VERIFICATION OF SAMPLE CONDITIONS (verify all items) * HD = Client Hand delivered Samples

Observation	YES	NO
Radiological Screening for AFCEE		NA
Were custody seals intact and on the outside of the cooler?		
If yes, Where? Front X Rear___ Lt Side___ Rt Side X	✓	
Type of packing material: (Ice) Blue Ice Bubble wrap	✓	
Was the Chain of Custody inside the cooler?	✓	
Was the Chain of Custody properly filled out?	✓	
Were the sample containers in good condition?	✓	
Containers supplied by ASL?	✓	
Any sample with < 1/2 holding time remaining? If so contact LPM		✓
Was there ice in the cooler? Enter temp. 1.9 C	✓	
All VOCs free of air bubbles ?		

If the answer to any of the questions above is NO, a Sample Receipt Exceptions Report Must be written.

VERIFICATION OF SAMPLE PRESERVATION (verify all preserved samples except HAAs, HANs and CH)

Sample No	Nutrients pH <2	Metals pH <2	Volatiles pH <2	Cyanides pH >12	TOC pH <2	TOX pH <2	Other (specify)	N/A (soils/unpres)
1								
2								
3								
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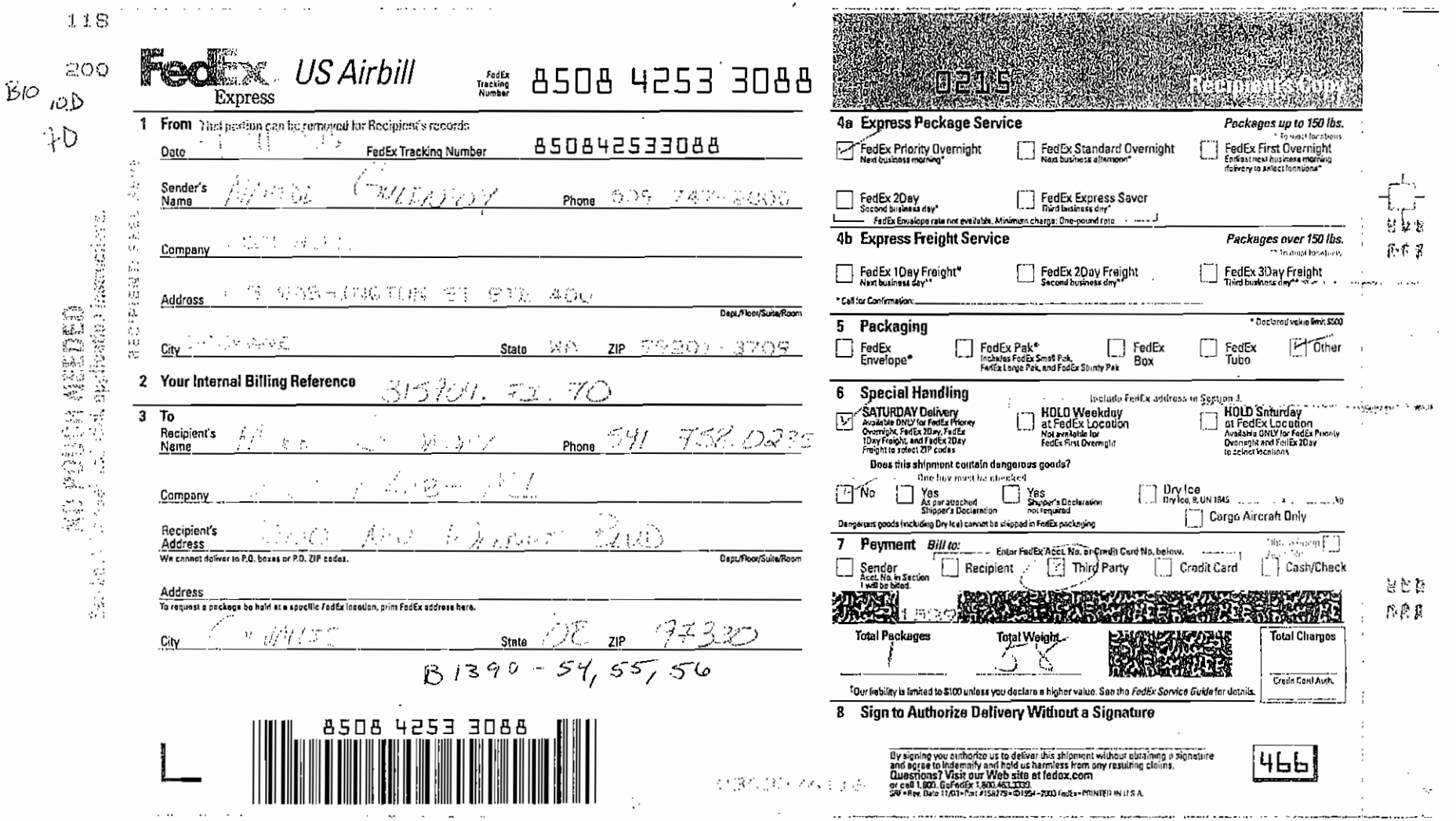
LOGIN AND pH VERIFICATIONS PERFORMED BY

[signature] / 4-30-05 1200
Date/Time

Date/Time



FedEx Express US Airbill

FedEx Tracking Number 8508 4253 3088

0215

1 From This portion can be removed for Recipient's records

Date

FedEx Tracking Number 850842533088

Sender's Name Phone

Company

Address

Dept./Floor/Suite/Room

City State ZIP

2 Your Internal Billing Reference

3 To

Recipient's Name Phone

Company

Recipient's Address

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Dept./Floor/Suite/Room

Address

To request a package be held at a specific FedEx location, print FedEx address here.

City State ZIP

4a Express Package Service — Packages up to 150 lbs.

- [x] FedEx Priority Overnight — Next business morning*
- [ ] FedEx Standard Overnight — Next business afternoon*
- [ ] FedEx First Overnight — Earliest next business morning delivery to select locations*
- [ ] FedEx 2Day — Second business day*
- [ ] FedEx Express Saver — Third business day*

FedEx Envelope rate not available. Minimum charge: One-pound rate

4b Express Freight Service — Packages over 150 lbs.

- [ ] FedEx 1Day Freight* — Next business day**
- [ ] FedEx 2Day Freight — Second business day**
- [ ] FedEx 3Day Freight — Third business day**

* Call for Confirmation:

5 Packaging — * Declared value limit $500

- [ ] FedEx Envelope*
- [ ] FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak
- [ ] FedEx Box
- [ ] FedEx Tube
- [x] Other

6 Special Handling — Include FedEx address in Section 3.

- [x] SATURDAY Delivery — Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1Day Freight, and FedEx 2Day Freight to select ZIP codes
- [ ] HOLD Weekday at FedEx Location — Not available for FedEx First Overnight
- [ ] HOLD Saturday at FedEx Location — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.

- [x] No
- [ ] Yes — As per attached Shipper's Declaration
- [ ] Yes — Shipper's Declaration not required
- [ ] Dry Ice — Dry Ice, 9, UN 1845 ____ x ____ kg
- [ ] Cargo Aircraft Only

Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging

7 Payment Bill to: Enter FedEx Acct. No. or Credit Card No. below.

- [ ] Sender — Acct. No. in Section 1 will be billed
- [ ] Recipient
- [x] Third Party
- [ ] Credit Card
- [ ] Cash/Check

Total Packages: 1 Total Weight: 2K Total Charges

†Our liability is limited to $100 unless you declare a higher value. See the *FedEx Service Guide* for details.

8 Sign to Authorize Delivery Without a Signature

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

Questions? Visit our Web site at fedex.com or call 1.800.GoFedEx 1.800.463.3339.

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466

8508 4253 3088

USEPA Contract Laboratory Program
Generic Chain of Custody

1.1°C

Reference Case 34063
Client No:
SDG No: L

Date Shipped:	4/25/2005
Carrier Name:	FedEx
Airbill:	8508 4253 2519
Shipped to:	Bioassay Laboratory - ASL 2300 NW Walnut Blvd. Corvallis OR 97330 (541) 758-0235

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1		4/25/05/13:00		4/26/05 1130
2				
3				
4				

Sampler Signature:

For Lab Use Only
Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164486	Sediment/ John Culley	L/G	BIO-7 (60)	~~051644 (Ice Only),~~ NG 05164486 (Ice Only) (2)	RM705R1	S: 4/23/2005	9:25	81390 - 36
05164487	Sediment/ Greg Warren	L/G	BIO-7 (60)	05164487 (Ice Only) (1)	RM713A1(X3)	S: 4/23/2005	9:30	- 37
05164489	Sediment/ John Culley	L/G	BIO-7 (60)	~~051644 (Ice Only),~~ NG 05164489 (Ice Only) (2)	RM686R1	S: 4/23/2005	11:20	- 38
05164491	Sediment/ Jeff Schut	L/G	BIO-7 (60)	05164491 (Ice Only) (1)	RM730A1(X1)	S: 4/23/2005	11:15	- 39
05164493	Sediment/ Jeff Schut	L/G	BIO-7 (60)	05164493 (Ice Only) (1)	RM733A1(X1)	S: 4/23/2005	9:45	- 40
05164494	Sediment/ Jeff Schut	L/G	BIO-7 (60)	05164494 (Ice Only) (1)	RM729A1(X1)	S: 4/23/2005	12:30	- 41
05164496	Sediment/ John Culley	L/G	BIO-7 (60)	~~051644 (Ice Only),~~ NG 05164496 (Ice Only) (2)	RM685R1	S: 4/23/2005	13:50	- 42
05164507	Sediment/ Jeff Schut	L/G	BIO-7 (60)	05164507 (Ice Only) (1)	RM727A1(X1)	S: 4/23/2005	14:15	- 43

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 1.1 °C	Chain of Custody Seal Number:
Analysis Key: BIO-7 = Bioassay 7-day	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G		Custody Seal Intact? ___ Shipment Iced? ___

TR Number: 10-555125664-042505-0005

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

CH2MHILL
Analytical Services

Sample Receipt Record

Batch Number: 31390 -36 to -43 Cont'd Date received: 4-26-05

Client/Project Upper Columbia

VERIFICATION OF SAMPLE CONDITIONS (verify all items) * HD = Client Hand delivered Samples

Observation	YES	NO
Radiological Screening for AFCEE	na	
Were custody seals intact and on the outside of the cooler?	✓	
If yes, Where? Front ✓ Rear ___ Lt Side ✓ Rt Side ___ internal bag ✓	✓	
Type of packing material: (Ice) Blue Ice Bubble wrap	✓	
Was the Chain of Custody inside the cooler?	✓	
Was the Chain of Custody properly filled out?	✓	
Were the sample containers in good condition?	✓	
Containers supplied by ASL?		✓
Any sample with < 1/2 holding time remaining? If so contact LPM	na	
Was there ice in the cooler? Enter temp. 1.1 C	✓	
All VOCs free of air bubbles ?	na	

If the answer to any of the questions above is NO, a Sample Receipt Exceptions Report Must be written.

VERIFICATION OF SAMPLE PRESERVATION (verify all preserved samples except HAAs, HANs and CH)

Sample No	Nutrients pH <2	Metals pH <2	Volatiles pH <2	Cyanides pH >12	TOC pH <2	TOX pH <2	Other (specify)	N/A (soils/unpres)
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								

LOGIN AND pH VERIFICATIONS PERFORMED BY

4-26-05 1130
Date/Time

Date/Time

Rev 11/05/2003-receipt.xls

61

200

B1390-36 to 43 Cerio

Bato 7d

FedEx Express *US Airbill* FedEx Tracking Number **8508 4253 2519**

0215 Recipient's Copy

1 From This portion can be removed for Recipient's records.

Date ____ FedEx Tracking Number 850842532519

Sender's Name ____ Phone ____

Company ____

Address ____ Dept./Floor/Suite/Room

City ____ State ____ ZIP ____

2 Your Internal Billing Reference

3 To

Recipient's Name ____ Phone ____

Company ____

Recipient's Address ____
We cannot deliver to P.O. boxes or P.O. ZIP codes. Dept./Floor/Suite/Room

Address ____
To request a package be held at a specific FedEx location, print FedEx address here.

City ____ State ____ ZIP ____

8508 4253 2519

4a Express Package Service *Packages up to 150 lbs.* * To most locations

- [x] FedEx Priority Overnight — Next business morning*
- [ ] FedEx Standard Overnight — Next business afternoon*
- [ ] FedEx First Overnight — Earliest next business morning delivery to select locations*
- [ ] FedEx 2Day — Second business day*
- [ ] FedEx Express Saver — Third business day*

FedEx Envelope rate not available. Minimum charge: One-pound rate

4b Express Freight Service *Packages over 150 lbs.* ** To most locations

- [ ] FedEx 1Day Freight* — Next business day**
- [ ] FedEx 2Day Freight — Second business day**
- [ ] FedEx 3Day Freight — Third business day**

* Call for Confirmation:

5 Packaging * Declared value limit $500

- [ ] FedEx Envelope*
- [ ] FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak
- [ ] FedEx Box
- [ ] FedEx Tube
- [x] Other

6 Special Handling Include FedEx address in Section 3.

- [ ] SATURDAY Delivery — Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1Day Freight, and FedEx 2Day Freight to select ZIP codes
- [ ] HOLD Weekday at FedEx Location — Not available for FedEx First Overnight
- [ ] HOLD Saturday at FedEx Location — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.

- [x] No
- [ ] Yes — As per attached Shipper's Declaration
- [ ] Yes — Shipper's Declaration not required
- [ ] Dry Ice — Dry Ice, 9, UN 1845 ____ x ____ kg
- [ ] Cargo Aircraft Only

Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging.

7 Payment *Bill to:* Enter FedEx Acct. No. or Credit Card No. below. Obtain Recip. Acct. No.

- [ ] Sender — Acct. No. in Section 1 will be billed.
- [ ] Recipient
- [x] Third Party
- [ ] Credit Card
- [ ] Cash/Check

[redacted]

Total Packages	Total Weight		Total Charges
			Credit Card Auth.

[1]Our liability is limited to $100 unless you declare a higher value. See the *FedEx Service Guide* for details.

8 Sign to Authorize Delivery Without a Signature

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.
Questions? Visit our Web site at fedex.com
or call 1.800.GoFedEx 1.800.463.3339.
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466

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No:
L

Date Shipped:	4/27/2005
Carrier Name:	FedEx
Airbill:	8508 4253 3537
Shipped to:	Bioassay Laboratory - ASL 2300 NW Walnut Blvd. Corvallis OR 97330 (541) 758-0235

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/27/05 12:00	Kathy McKinla	4/28/05 10:45
2				
3				
4				

Sampler Signature: [signature]

For Lab Use Only 1.8C

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME			FOR LAB USE ONLY Sample Condition On Receipt
05174405	Sediment/ Jeff Schut	L/G	BIO-7 (60)	05174405 (Ice Only) (1)	RM644A1(X3)	S: 4/26/2005	10:15	B1390-44	N
05174406	Sediment/ Josh Butler	L/G	BIO-7 (60)	05174406 (Ice Only) (1)	RM637A1(X1)	S: 4/26/2005	11:26	B1390-45	
05174407	Sediment/ Josh Butler	L/G	BIO-7 (60)	05174407 (Ice Only) (1)	RM634A1(X1)	S: 4/26/2005	14:02	B1390-46	
05174408	Sediment/ Jeff Schut	L/G	BIO-7 (60)	05174408 (Ice Only) (1)	RM642A1(X1)	S: 4/26/2005	11:50	B1390-47	N
05174409	Sediment/ Jeff Franklin	L/G	BIO-7 (60)	05174409 (Ice Only) (1)	RM605A1(X1)	S: 4/26/2005	14:17	B1390-48	N
05174410	Sediment/ Jeff Franklin	L/G	BIO-7 (60)	05174410 (Ice Only) (1)	RM606A1(X3)	S: 4/26/2005	13:01	B1390-49	
05174411	Sediment/ Jeff Franklin	L/G	BIO-7 (60)	05174411 (Ice Only) (1)	RM616A1(X3)	S: 4/26/2005	10:16	B1390-50	N
05174412	Sediment/ Jeff Schut	L/G	BIO-7 (60)	05174412 (Ice Only) (1)	RM641A1(X1)	S: 4/26/2005	13:54	B1390-51	N
05174413	Sediment/ Jeff Schut	L/G	BIO-7 (60)	05174413 (Ice Only) (1)	RM640A1(X3)	S: 4/26/2005	15:20	B1390-52	N
05174415	Sediment/ Josh Butler	L/G	BIO-7 (60)	05174415 (Ice Only) (1)	RM628A1(X1)	S: 4/26/2005	15:42	B1390-53	

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G		Custody Seal Intact? ___ Shipment Iced? ___

BIO-7 = Bioassay 7-day

TR Number: 10-555125664-042605-0010

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

CH2MHILL
Analytical Services

Sample Receipt Record

Batch Number: B1390-44-53   Date received: 4/28/05 1045

Client/Project: UCR

VERIFICATION OF SAMPLE CONDITIONS (verify all items) * HD = Client Hand delivered Samples

Observation	YES	NO
Radiological Screening for AFCEE		X
Were custody seals intact and on the outside of the cooler?	X	
If yes, Where? Front X Rear ___ Lt Side X Rt Side X		
Type of packing material: (Ice) Blue Ice Bubble wrap		
Was the Chain of Custody inside the cooler?	X	
Was the Chain of Custody properly filled out?	X	
Were the sample containers in good condition?	X	
Containers supplied by ASL?	X	
Any sample with < 1/2 holding time remaining? If so contact LPM		X
Was there ice in the cooler? Enter temp. 1.8 C	X	
All VOCs free of air bubbles ?		

If the answer to any of the questions above is NO, a Sample Receipt Exceptions Report Must be written.

VERIFICATION OF SAMPLE PRESERVATION (verify all preserved samples except HAAs, HANs and CH)

Sample No	Nutrients pH <2	Metals pH <2	Volatiles pH <2	Cyanides pH >12	TOC pH <2	TOX pH <2	Other (specify)	N/A (soils/unpres)
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								

LOGIN AND pH VERIFICATIONS PERFORMED BY

Kathy McKenley 4/28/05 1045
Date/Time

Date/Time

FedEx PRIORITY OVERNIGHT THU

emp# 44465 27APR05

TRK# 8508 4253 3537 FORM 0215

Deliver By: 28APR05

PDX

97330 -OR -US 86 CVOA

3 3537

37

Sender's Name ______ Phone 509 747-2000

Company ______

Address ______ Dept./Floor/Suite/Room

City ______ State ______ ZIP ______

2 Your Internal Billing Reference ______

3 To
Recipient's Name ______ Phone ______

Company ______

Recipient's Address ______
We cannot deliver to P.O. boxes or P.O. ZIP codes. Dept./Floor/Suite/Room

Address ______
To request a package be held at a specific FedEx location, print FedEx address here.

City ______ State ______ ZIP ______

8508 4253 3537

0215 Recipient's Copy

4a Express Package Service *Packages up to 150 lbs.*

- [x] FedEx Priority Overnight — Next business morning*
- [ ] FedEx Standard Overnight — Next business afternoon*
- [ ] FedEx First Overnight — Earliest next business morning delivery to select locations* (* To most locations)
- [ ] FedEx 2Day — Second business day*
- [ ] FedEx Express Saver — Third business day*

FedEx Envelope rate not available. Minimum charge: One-pound rate

4b Express Freight Service *Packages over 150 lbs.* (** To most locations)

- [ ] FedEx 1Day Freight* — Next business day**
- [ ] FedEx 2Day Freight — Second business day**
- [ ] FedEx 3Day Freight — Third business day**

* Call for Confirmation: ______

5 Packaging (* Declared value limit $500)

- [ ] FedEx Envelope*
- [ ] FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak
- [ ] FedEx Box
- [ ] FedEx Tube
- [x] Other

6 Special Handling — Include FedEx address in Section 3

- [ ] SATURDAY Delivery — Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1Day Freight, and FedEx 2Day Freight to select ZIP codes
- [ ] HOLD Weekday at FedEx Location — Not available for FedEx First Overnight
- [ ] HOLD Saturday at FedEx Location — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.

- [x] No
- [ ] Yes — As per attached Shipper's Declaration
- [ ] Yes — Shipper's Declaration not required
- [ ] Dry Ice — Dry Ice, 9, UN 1845 ______ x ______ kg
- [ ] Cargo Aircraft Only

Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging.

7 Payment Bill to: Enter FedEx Acct. No. or Credit Card No. below.

- [ ] Sender — Acct. No. in Section 1 will be billed.
- [ ] Recipient
- [x] Third Party
- [ ] Credit Card
- [ ] Cash/Check

[redacted]

Total Packages ______ Total Weight 49 [redacted] Total Charges ______ Credit Card Auth.

†Our liability is limited to $100 unless you declare a higher value. See the *FedEx Service Guide* for details.

8 Sign to Authorize Delivery Without a Signature

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

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INTERNAL CHAIN OF CUSTODY FORM - Samples into/out of 4°C cooler

Project ID: Upper Columbia

SAMPLE ID(s):	DATE	TIME CHECKED OUT	IN	BY	REASON
B1390-01 to -10 Corb / Chironomid	4-22-05		12:50	Bm	after log-in
B1390-11-22 Corb & Chironomid	4-23-05		1320	MS	after login
B1390-23-43 Corb / Chironomid	4-26-05		1325	Bm	after login
B1390-01 to 28 + 32, 38 36 42 + 31 Corb	4-28-05	0700	1230 *	Bm	test initiation (Ref sites used 1st + 2 cultures)
B1390-01 to -26, 31, 32, 30, 38 Chirono	4-28-05	0910	1400 *	Bm	test initiation (Ref sites, used 1 + 2)
B1390-54, 55, 56 Chiro cal	4-30-05		1255	MS	after log in
B1390-25, 31, 32, 36 (2nd subbatch)	5-4-05	0830	1130	[illegible]	test initiation (Ref sites 2nd + 2 used)
B1390-25, 27-56 CHIRONO	5-5-05	0745		Bm	CHIRONO Test initiation (Ref sites 2nd + 2 used)

* Nitrogen added to overlying head space MS

CHAIN OF CUSTODY RECORD

Log Number _____

Client name: CH2M HILL		Project or PO#:	
Address: 2300 NW WALNUT BLVD		Phone #:	
City, State, Zip: CORVALLIS, OR 97330		Report attention:	

Sampled by: GERALD IRISSARRI

Lab Sample number	Date sampled	Time sampled	Type* See key below	Sample description	Number of containers	Analyses required	Hazardous sample Special handling required	Remarks
49152F	4-22-05	0640		FRESHWATER CONTROL SEDIMENT (COLLECTED FROM BEAVER CREEK, OR)	1			B1395-01

Signature	Print Name	Company	Date	Time
Relinquished by: Gerald Irissarri	GERALD IRISSARRI	NORTHWESTERN AQUATIC SCIENCES	4-27-05	1500
Received by:	Brett Mackey	CH2m Hill	4-27-05	1730
Relinquished by:				
Received by:				
Relinquished by:				
Received by Laboratory:				

Note:
Samples are discarded 30 days after results are reported unless other arrangements are made.
Hazardous samples will be returned to client or disposed of at client expense.

*KEY: AQ—Aqueous NA—Nonaqueous SL—Sludge GW—Groundwater SO—Soil OT—Other PE—Petroleu

NORTHWESTERN AQUATIC SCIENCES
A Division of NAS Associates, Inc.
P.O. Box 1437, Newport, Oregon 97365 • (541) 265-7225

Stanaway, Mike/CVO

From: Stanaway, Mike/CVO
Sent: Friday, April 22, 2005 11:28 AM
To: 'girissarri@nwaquatic.com'
Cc: Gulensoy, Nahide/SPK
Subject: RE: Recommended Test Conditions for Conducting a 28-day Sediment Toxicity Test with hyalella

Hi Gerald,

The reference sites (labeled as stations on chain of custody) are:

RM 732R1
RM 726R1 These will be shipped first
RM 721R1

RM 705R1
RM 686R1 These will arrive on Tuesday
RM 685R1

I also need to talk to you about the reconstituted water hardness in the test.

Thanks
Mike

-----Original Message-----
From: Gerald Irissarri [mailto:girissarri@nwaquatic.com]
Sent: Monday, February 28, 2005 9:59 AM
To: Stanaway, Mike/CVO
Subject: RE: Recommended Test Conditions for Conducting a 28-day Sediment Toxicity Test with hyalella

APPENDIX D
ORGANISM CULTURE INFORMATION

Ceriodaphnia dubia
Culture Monitoring Data

Board ID HH

Start Date 4-22-05

Initials DW

Type of Water Recon MH

Neonate Source Board MM

Feeding Regime: Feed 0.10 ml of 3.0 to 3.5 x 10^6 cells/ml *Selenastrum* culture and 0.10 ml of YCT daily immediately following culture water renewal

✓ = 12+ neonates

Note: To use in a chronic test, The Adults must have a total of at least 15 young in 3 broods, and at least 8 young in the brood collected.

YCT 646
Algae 647

Count all cd

Slot #	Number of Live Young per Day											15+ neo in 3 broods
	1	2	3	4	5	6	7	8	9	10	11	
1	0	0	5	0	0							
2			4	0	0							
3			5	08	9							
4			5	0	0							
5			5	0	0							
6			6	0	8							
7			5	0	9							
8			5	0	0							
9			4	0	9							
10			5	0	9							
11			4	0	8							
12			5	8	0							
13			5	0	87							
14			5	0	8							
15			5	0	11							
16			5	0	8							
17			5	0	9							
18			5	0	0							
19			5	0	9							
20			5	0	0							
21			4	0	8							
22			5	8	0							
23			4	0	9							
24			4	0	8							
25			5	0	0							
26			6	9	0							
27			5	8	5							
28			5	7	0							
29			5	0	6							
30			5	0	8							
31			5	0	9							
32			5	0	10							
33			5	0	10							
34			5	7	0							
35			5	0	5							
36			4	7	10							
37			5	9	0							
38			5	0	7							
39			5	0	6							
40			5	0	0							
41			5	7	8							
42			5	0	2							
43			5	8	10							
44			5	8	9							
45			5	7	10							
46			5	10	0							
47			5	10	0							
48			4	9	0							
49			5	9	0							
50			6	8	11							
51			5	0	11							
52			5	0	10							
53			5	0	11							
54			5	0	11							
55			5	10	0							
56			5	0	11							
57			5	0	11							
58			5	8	0							
59			5	0	11							
60	✓	✓	5	9	0							
Initials	MS	MS	DW	DW	DW							
Time	0930	1030	0730	0820	0715							

Ceriodaphnia dubia Culture Isolation Data Board ID HH

ISOLATION Time # 1 4-27-05 @ 0715 ISOLATION Time # 2 _____ ISOLATION Time # 3 _____

NEONATE ID # cd 1782 NEONATE ID # _____ NEONATE ID # _____

TIME/ Initials	SLOT #	# YOUNG	TIME/ Initials	SLOT #	# YOUNG	TIME/ Initials	SLOT #	# YOUNG
8a 1030	none							
2p 1205	none							
DW/1435	47	12+						
	49	↓						
DW/1615	18	12+						
8a 1955	6	8						
	9	10						
	23	12+						
	25	10						
	28	10						
	33	12+						
	42	12+						
	48	9						
	51	12+						
	54	12+						
	55	12+						
	56	12+						
	59	12+						
	60	12+						
2p 2230	4	12+						
	9	12+						
	11	12+						
	14	12+						
	17	12+						
	19	12+						
	29	12+						
	30	12+						
	31	12+						
	32	10						
	47	12+						
	49	12+						
	57	11						

cd 1782

Ceriodaphnia dubia

Culture Monitoring Data

Board ID K

Start Date 4-27-05

Initials DW

Type of Water Recon MH (FHM)

Neonate Source

Feeding Regime: Feed 0.10 ml of 3.0 to 3.5 x 10^6 cells/ml *Selenastrum* culture and 0.10 ml of YCT daily immediately following culture water renewal

✓ = 12+ neonates

Note: To use in a chronic test, The Adults must have a total of at least 15 young in 3 broods, and at least 8 young in the brood collected.

Slot #	Number of Live Young per Day											15+ neo in 3 broods
	1	2	3	4	5	6	7	8	9	10	11	
1	0	0	0	5	10	10						
2			4	0	11	10						
3			4	9	0	12						
4			4	10	0	12						
5			6	4	7	10						
6			0	3	11	11						
7			4	9	0	12						
8			5	10	0	12						
9			5	0	11	10						
10			4	0	10	11						
11			5	0	13	12						
12			5	9	0	13						
13			4	0	12	14						
14			0	5	13	14						
15			5	0	15	13						
16			5	0	11	15						
17			5	0	10	14						
18			4	0	13	15						
19			5	0	11	15						
20			4	0	10	14						
21			4	9	12	12						
22			4	9	15	15						
23			5	9	0	15						
24			5	0	12	14						
25			4	9	0	0						
26			4	10	5	14						
27			5	0	13	13						
28			4	0	12	14						
29			4	0	8	14						
30			5	0	13	13						
31			4	9	0	13						
32			6	5	13	14						
33			4	11	0	14						
34			4	0	12	13						
35			4	0	13	13						
36			4	0	13	10						
37			4	0	12	13						
38			4	0	11	13						
39			3	0	12	14						
40			4	0	13	12						
41			4	9	0	15						
42			0	5	0	14						
43			4	0	12	14						
44			4	0	11	13						
45			0	6	11	15						
46			5	0	12	14						
47			4	0	10	14						
48			0	6	8	13						
49			4	0	12	14						
50			4	0	10	13						
51			4	0	10	14						
52			0	5	11	16						
53			4	0	12	14						
54			4	0	10	13						
55			4	0	8	14						
56			3	0	7	14						
57			4	0	11	13						
58			4	0	12	14						
59			4	0	14	14						
60	✓	✓	5	0	11	13						
Initials	DW	DW	MS	DW	MS	MS						
Time	0730	0740	0740	0830	0900	0930						

Ceriodaphnia dubia Culture Isolation Data Board ID K

ISOLATION Time # 1 5-3-05 1915 ISOLATION Time # 2 _____ ISOLATION Time # 3 _____

NEONATE ID # 1783 NEONATE ID # _____ NEONATE ID # _____

TIME/ Initials	SLOT #	# YOUNG	TIME/ Initials	SLOT #	# YOUNG	TIME/ Initials	SLOT #	# YOUNG
MS 1210	None	—						
MS 1530	None	—						
DW/1630	NONE							
BW 1915	- none -							
JD 2340	3	13						
	7	16						
	8	14						
	12	14						
	17	14						
	18	15						
	23	10						
	28	14						
	33	13						
	42	16						
MS 0620	4	12+						
	9	12+						
	13	12+						
	14	15						
	15	14						
	16	14						
	19	13						
	22	12						
	24	14						
	27	14						
	30	14						
	31	14						
	34	13						
	36	14						

5-3-05 → DW/1630

BW 1915

JD 2340 → 1783

MS 0620 → 1784 USE for IP

1300 Blue Spruce Drive, Suite C
Fort Collins, Colorado 80524

Toll Free: 800/331-5916
Tel: 970/484-5091 Fax:970/484-2514

ORGANISM HISTORY

DATE: 4/27/05

SPECIES: Chironomus tentans

AGE: Deposited on 4/16/05

LIFE STAGE: Second Instar 4/27/05

HATCH DATE: Emergent date 5/10/05

BEGAN FEEDING: Immediately

FOOD: Selenastrum, Flake slurry

13

Water Chemistry Record:	Current	Range
TEMPERATURE:	23°C	23-26°C
SALINITY/CONDUCTIVITY:	--	--
TOTAL HARDNESS (as $CaCO_3$):	150 mg/l	70-146 mg/l
TOTAL ALKALINITY (as $CaCO_3$):	95 mg/l	50-105 mg/l
pH:	8.09	7.52-8.26

Comments:

Facility Supervisor

Temp = 22°C 22.1 21.9 D.O. = 8.2

1300 Blue Spruce Drive, Suite C
Fort Collins, Colorado 80524

Toll Free: 800/331-5916
Tel: 970/484-5091 Fax:970/484-2514

ORGANISM HISTORY

DATE: 4/28/05

SPECIES: Chironomus tentans

AGE: Deposited on 4/17/05

LIFE STAGE: Second Instar 4/28/05

HATCH DATE: Emergent date 5/11/05

BEGAN FEEDING: Immediately

FOOD: Selenastrum, Flake slurry

Water Chemistry Record:	Current	Range
TEMPERATURE:	23°C	23-26°C
SALINITY/CONDUCTIVITY:	--	--
TOTAL HARDNESS (as $CaCO_3$):	150 mg/l	70-146 mg/l
TOTAL ALKALINITY (as $CaCO_3$):	95 mg/l	50-105 mg/l
pH:	8.09	7.52-8.26

Comments:

Facility Supervisor

APPENDIX E
CORRECTIVE ACTION REPORTS

CORRECTIVE-ACTION REPORT

ORIGINATOR: Katie Stanaway

DATE: 5-5-05

SUBJECT (i.e., Test method, instrument, sample nos.): Upper Columbia Chironomid test beaker(water quality) 108 & 258.

CONDITION/SITUATION: Dissolved Oxygen was below the recommended 2.5 mg/L test condition. Beaker 108 was 1.6 mg/L & Beaker 258 was 1.2 mg/L.

RECOMMENDED ACTION: Check D.O. calibration & cut back on the amount of food added to test beakers for this evenings feeding. Re-evaluate D.O measurments.

Approved by Department Manager/Designate: [signature]

Date: 5/10/05

ACTION TAKEN/RESULTS: D.O. Calibration was off by 0.6 mg/L. D.O. meter was recalibrated. Noted on bench sheets of tests mg

CORRECTIVE ACTION REPORT

Originator: Brett Mudrey

Date: 10-21-05

Subject (for example, test method, instrument, sample nos.): Upper Columbia Chironomid test beakers (478, 542, 544)

Condition/Situation:

☐ : Sample not delivered on Saturday: Lab ID Number(s): B_____

Was sample marked for Saturday Delivery? (Yes / No) _____

☐ : Reftox not in Cusum range: LC50/IC25 = _____, Cusum Range = _____ to _____

☐ : Temperature Deviation: _____

☒ : Other: DO Levels below 2.5 mg/L

Day 6 & 7 data beaker 478 : 2.2 mg/L

Day 7 data beaker 542 : 2.4 mg/L

Day 9 data beaker 544 : 2.4 mg/L

Recommended Action (s) (mark all that apply): ☐-Contact Regulatory Agency, ☐-Contact Client, ☐-Continue test(s), ☐-Discontinue test(s), ☐-Repeat test(s), ☐-Check for procedural errors, ☒-Document in test report, ☐-Other:

Approved by Department Manager/Designate: _____

Date: 10/21/05

Action Taken/Results: Deviation noted in test report

REPORT

of

TEST NO. 727-1

HYALELLA AZTECA 28-DAY SEDIMENT TOXICITY
TEST OF FRESHWATER SEDIMENTS

Submitted to

CH2M Hill
2300 N.W. WALNUT BLVD.
CORVALLIS, OR 97330

Submitted by

NORTHWESTERN AQUATIC SCIENCES
3814 YAQUINA BAY ROAD
P.O. BOX 1437
NEWPORT, OR 97365

November 29, 2005

TOXICITY TEST REPORT

TEST IDENTIFICATION

Test No.: 727-1

Title: Toxicity of freshwater sediments collected from the upper Columbia River using a 28-day amphipod, *Hyalella azteca*, sediment bioassay.

Protocol No.: NAS-XXX-HA4c, February 11, 2000 (Revision 3 (4-26-05). Based on ASTM 1996 (Standard test methods for measuring the toxicity of sediment-associated contaminants with fresh water invertebrates, E1706-95b), Am. Soc. Test. Mat. Phila., PA, and EPA Method 100.4 (Methods for measuring the toxicity and bioaccumulation of sediment-associated contaminants with freshwater invertebrates, EPA/600/R-94/024).

STUDY MANAGEMENT

Study Sponsor: CH2M-Hill, 2300 NW Walnut Blvd., Corvallis, OR 97330.

Sponsor's Study Monitor: Mr. Dennis Shelton

Testing Laboratory: Northwestern Aquatic Sciences, P.O. Box 1437, Newport, OR 97365

Test Location: Newport laboratory

Laboratory's Study Personnel: G.J. Irissarri, B.S., Proj. Man./Study Dir.; L.K. Nemeth, M.B.A., QA Officer; R.S. Caldwell, PhD, Sr. Aq. Toxicologist; M.S. Redmond, M.S., Aq. Toxicologist; G.A. Buhler, B.S., Aq. Toxicologist; W.T. Montgomery, A.A., Sr. Tech.; S.J. Gage, B.A., Tech.; B.B. Pridgeon, Lab Assistant.

Study Schedule:

Test Beginning: 4-28-05, 1050 hrs.

Test Ending: 5-26-05, 1210 hrs.

Disposition of Study Records: All specimens, raw data, reports and other study records are stored according to Good Laboratory Practice regulations at Northwestern Aquatic Sciences, 3814 Yaquina Bay Rd., Newport, OR 97365.

Good Laboratory Practices: The test was conducted following the principles of Good Laboratory Practices (GLP) as defined in the EPA/TSCA Good Laboratory Practice regulations revised August 17, 1989 (40 CFR Part 792).

Statement of Quality Assurance: The test data were reviewed by the Quality Assurance Unit to assure that the study was performed in accordance with the protocol and standard operating procedures. This report is an accurate reflection of the raw data.

TEST MATERIAL

Test Sediments: Upper Columbia River freshwater test sediments. Details are as follows:

NAS Sample No.	9953F	9954F	9955F	9956F	9957F
CH2M-Hill No.	05164433	05164434	05164435	05164436	05164437
Collection Date	4/20/05	4/20/05	4/20/05	4/20/05	4/20/05
Receipt Date	4/22/05	4/22/05	4/22/05	4/22/05	4/22/05

NAS Sample No.	9958F	9959F	9960F	9961F	9962F
CH2M-Hill No.	05164440	05164441	05164442	05164443	05164449
Collection Date	4/20/05	4/20/05	4/20/05	4/20/05	4/20/05
Receipt Date	4/22/05	4/22/05	4/22/05	4/22/05	4/22/05

NAS Sample No.	9966F	9967F	9968F	9969F	9970F
CH2M-Hill No.	05164439	05164450	05164451	05164452	05164453
Collection Date	4/21/05	4/21/05	4/21/05	4/21/05	4/21/05
Receipt Date	4/23/05	4/23/05	4/23/05	4/23/05	4/23/05

NAS Sample No.	9971F	9972F	9973F	9974F	9975F
CH2M-Hill No.	05164454	05164455	05164456	05164457	05164459
Collection Date	4/21/05	4/21/05	4/21/05	4/21/05	4/21/05
Receipt Date	4/23/05	4/23/05	4/23/05	4/23/05	4/23/05

NAS Sample No.	9976F	9977F	9981F	9982F	9983F
CH2M-Hill No.	05164460	05164461	05164468	05164469	05164470
Collection Date	4/21/05	4/21/05	4/22/05	4/22/05	4/22/05
Receipt Date	4/23/05	4/23/05	4/26/05	4/26/05	4/26/05

NAS Sample No.	9984F	9989F	9990F	9994F	9998F
CH2M-Hill No.	05164471	05164478	05164476	05164486	05164489
Collection Date	4/22/05	4/22/05	4/22/05	4/23/05	4/23/05
Receipt Date	4/26/05	4/26/05	4/26/05	4/26/05	4/26/05

NAS Sample No.	0002G
CH2M-Hill No.	05164496
Collection Date	4/23/05
Receipt Date	4/26/05

Control Sediment: The negative control sediment (NAS#9952F) was collected on 4-22-05 from an area approximately one mile east of the Hwy. 101 bridge at Beaver Creek, approx. 8 miles south of Newport, OR.
Treatments: Homogenized at test set up by mixing using stainless steel implements.
Storage: All test and reference sediments were stored at 4°C in the dark in sealed containers until used.

TEST WATER

Source: Modified tap water (tap water hardness adjusted to 70 ± 5 mg/L at client request).
Dates of Preparation: 4/25/05, 4/29/05, 5/2/05, 5/5/05, 5/8/05, 5/11/05, 5/13/05, 5/16/05, 5/19/05, 5/20/05, 5/24/05, 5/26/05.
Water Quality:

pH: 7.5, 7.5, 7.4, 7.4, 7.3, 7.3, 7.5, 7.3, 7.5, 7.4, 7.4, 7.5 (mean ± SD: 7.4 ± 0.1).
conductivity: 260, 260, 275, 270, 280, 280, 280, 280, 270, 270, 270, 270 µmhos/cm (mean ± SD: 272 ± 8).
hardness: 68, 68, 68, 68, 68, 68, 68, 68, 68, 68, 68, 68 mg/L as $CaCO_3$ (mean ± SD: 68 ± 0).
alkalinity: 60, 60, 60, 70, 70, 70, 60, 60, 60, 70, 60, 60 mg/L as $CaCO_3$. (mean ± SD: 63 ± 5).

Pretreatment: Aerated ≥24 hr.

TEST ORGANISMS

Species: *Hyalella azteca,* amphipod.
Age/Size: 7-8 days old.
Source: Chesapeake Cultures, Hayes, VA; received 4-26-05.
Acclimation: Temperature, 20.6 ± 0.4°C; dissolved oxygen, 9.3 ± 1.2 mg/L; pH, 7.7 ± 0.6; conductivity, 375 ± 66 µmhos/cm; hardness, 137 ± 34 mg/L as $CaCO_3$; and alkalinity, 143 ± 57 mg/L as $CaCO_3$. Half of the water was replaced daily with test dilution water during holding. Animals were fed YTC daily during holding.

TEST PROCEDURES AND CONDITIONS

The following is an abbreviated statement of the test procedures and a statement of the test conditions actually employed. See the test protocol (Appendix I) for a more detailed description of the test procedures used in this study.

Test Chambers: 300 ml high-form glass beakers.
Test Volumes: 100 ml sediment layer; 175 ml test water.
Replicates/Treatment: 8.
Organisms/Treatment: 80.
Water Volume Changes: 2 water volumes per day.
Aeration: None.
Feeding: Animals are fed 1.0 ml of YTC suspension per beaker daily.
Effects Criteria: 1) survival after 28 days, and 2) average individual dry weight after 28 days. Death is defined as no visible movement or response to tactile stimulation. Missing organisms were considered to be dead.
Water Quality and Other Test Conditions: The temperature, dissolved oxygen, conductivity, pH, hardness, alkalinity, and ammonia-nitrogen were measured in the overlying water of one replicate test container per

treatment on days 0 and 28 of the test. Temperature was measured daily, dissolved oxygen and pH three times per week, and conductivity weekly, in the overlying water of one replicate test container per treatment. Hardness and alkalinity were measured with titrimetric methods. Ammonia-N was measured using Hach reagents based on the salicylate (Clin. Chim. Acta 14:403, 1996) colorimetric method; samples were not distilled prior to analysis. The photoperiod was 16:8, L:D.

DATA ANALYSIS METHODS

Survival, mortality and average individual dry weight were calculated for each replicate as follows:

percent survival = 100 x (number surviving/initial number tested)
percent mortality = 100 x (number dead/initial number tested)

average individual dry weight = (final wt. - tare wt.)/number weighed,
where:
final wt. = tare wt. + dry weight of organisms recovered on day 28, in mg

Means and standard deviations for the biological endpoints described above, and for water quality data, were computed using Microsoft Excel 2000. The values for mortality and weight for each test sediment were statistically compared to each of six reference sediments. Where appropriate, an arcsine square root transformation was performed on proportional mortality data before analysis. Following determination of normality and homogeneity of variances, a one-tailed Student T-test, Mann-Whitney or Approximate T test was conducted at the 0.05 level of significance for mortality and weight data. The statistical software used was BioStat (Beta v.4.1 (EXCEL)) bioassay software developed by the U.S. Army Corps of Engineers, Seattle District.

PROTOCOL DEVIATIONS

None.

REFERENCE TOXICANT TEST

The reference toxicant test is a multi-concentration toxicity test using cadmium chloride, to evaluate the performance of the test organisms used in the sediment toxicity test. The performance is evaluated by comparing the results of this test with historical results obtained at the laboratory. A summary of the reference toxicant test result is given below. The reference toxicant test raw data are found in Appendix III.

Test No.: 999-1957
Reference Toxicant and Source: Cadmium as $CdCl_2 \bullet 2½ H_2O$, Mallinckrodt Lot #TNZ, 1.0 mg/ml stock prepared 7-13-04.
Test Date: 4-28-05.
Dilution Water Used: Moderately hard synthetic water prepared from Milli-Q® deionized water.
Result: 96-hr LC50, 7.89 µg/L. This result is within the laboratory's control chart warning limits (3.26 - 10.7 µg/L).

TEST RESULTS

Observations of water quality in the overlying water throughout the test are summarized in Table 1. A detailed tabulation of the water quality results by sample and test day can be found in Appendix II. The means and standard deviations of percent mortality and average individual biomass of *Hyalella* exposed for 28 days to sediments are summarized in Table 2. Statistical comparisons (p=0.05) of mortality and growth are presented in Tables 3 and 4, respectively. Statistical analysis (p=0.01) of mortality and growth are given in Tables 5 and 6. Detailed data organized by sample and replicate, and summary statistics for these observations, are given in Appendix II.

All water quality observations of overlying water temperature and dissolved oxygen were within the protocol specified ranges. Ammonia-N in the overlying water ranged from <0.1 to 1.1 mg/L in all day 0 and day 28 observations.

The test met the acceptability criteria specified in the test protocol with 96.3% mean control survival (≥80% required) and mean control dry weight of 0.41 mg/individual individual (initial average dry weight was 0.03 mg/individual, measurable growth required). The reference toxicant (positive control) result was within the laboratory's control chart limits (7.89 µ/L; control chart limits 3.26 to 10.7 µg/L).

STUDY APPROVAL

Project Manager/Study Director — Date: 11-28-05

Quality Assurance Unit — Date: 11-29-05

Laboratory Director — Date: 11/29/05

Table 1. Summary of water quality conditions during tests of the amphipod, *Hyalella azteca*, exposed to upper Columbia River freshwater sediments.

Water Quality Parameter	Mean ± S.D.	Minimum	Maximum	N
Temperature (°C)	23.0 ± 0.3	22.0	23.9	928
Dissolved oxygen (mg/L)	6.4 ± 0.9	3.2	8.3	448
Conductivity (µmhos/cm)	291 ± 15	265	350	192
pH	7.0 ± 0.2	6.6	7.8	448
Hardness (mg/L as $CaCO_3$)	91 ± 14	68	128	64
Alkalinity (mg/L as $CaCO_3$)	75 ± 15	60	130	64
Total ammonia (mg/L)	---	<0.1	1.1	64

Table 2. Mortality and growth results of *Hyalella* 28-day toxicity test for Upper Columbia River freshwater sediments.

Sample description		Percent mortality (Mean ± SD)	Average Individual Dry Weight (mg) (Mean ± SD)
CH2M Hill	NAS		
Control	9952F	3.8 ± 7.4	0.41 ± 0.04
05164433	9953F	3.8 ± 5.2	0.38 ± 0.06
05164434	9954F	3.8 ± 7.4	0.29 ± 0.04
05164435	9955F	16.3 ± 13.0	0.35 ± 0.04
05164436	9956F	25.0 ± 9.3	0.17 ± 0.05
05164437	9957F	5.0 ± 5.3	0.41 ± 0.08
05164440	9958F	6.3 ± 10.6	0.27 ± 0.06
05164441	9959F	6.3 ± 5.2	0.37 ± 0.06
05164442	9960F	5.0 ± 7.6	0.31 ± 0.05
05164443	9961F	18.8 ± 8.3	0.32 ± 0.08
05164449	9962F	5.0 ± 5.3	0.33 ± 0.05
05164439	9966F	6.3 ± 9.2	0.59 ± 0.14
05164450	9967F	7.5 ± 7.1	0.34 ± 0.05
05164451	9968F	3.8 ± 7.4	0.33 ± 0.09
05164452	9969F	11.3 ± 11.3	0.27 ± 0.07
05164453	9970F	8.8 ± 8.3	0.49 ± 0.07
05164454	9971F	2.5 ± 4.6	0.33 ± 0.07
05164455	9972F	5.0 ± 5.3	0.32 ± 0.04
05164456	9973F	10.0 ± 14.1	0.28 ± 0.09
05164457	9974F	7.5 ± 11.6	0.35 ± 0.03
05164459	9975F	20.0 ± 12.0	0.46 ± 0.06
05164460	9976F	2.5 ± 4.6	0.51 ± 0.10
05164461	9977F	1.3 ± 3.5	0.37 ± 0.05
05164468	9981F	13.8 ± 13.0	0.18 ± 0.03
05164469	9982F	8.8 ± 6.4	0.46 ± 0.06
05164470	9983F	3.8 ± 5.2	0.58 ± 0.04
05164471	9984F	5.0 ± 7.6	0.64 ± 0.10
05164478	9989F	3.8 ± 5.2	0.58 ± 0.05
05164476	9990F	0.0 ± 0.0	0.43 ± 0.03
05164486	9994F	3.8 ± 7.4	0.58 ± 0.05
05164489	9998F	3.8 ± 5.2	0.41 ± 0.02
05164496	0002G	1.3 ± 3.5	0.53 ± 0.07

Table 3. Comparison of mortality data for sediments compared to each reference sediment. A "+" indicates that the test sediment result is significantly greater than the reference sediment result at the 0.05 alpha level. A dash indicates that it is not significantly greater than the reference sediment.

CH2M Hill Sample No.	NAS No.	Reference 05164470 (9983F)	Reference 05164478 (9989F)	Reference 05164476 (9990F)	Reference 05164486 (9994F)	Reference 05164489 (9998F)	Reference 05164496 (0002G)
05164433	9953F	--	--	+	--	--	--
05164434	9954F	--	--	--	--	--	--
05164435	9955F	+	+	+	+	+	+
05164436	9956F	+	+	+	+	+	+
05164437	9957F	--	--	+	--	--	--
05164440	9958F	--	--	+	--	--	--
05164441	9959F	--	--	+	--	--	+
05164442	9960F	--	--	+	--	--	--
05164443	9961F	+	+	+	+	+	+
05164449	9962F	--	--	+	--	--	--
05164439	9966F	--	--	+	--	--	--
05164450	9967F	--	--	+	--	--	+
05164451	9968F	--	--	--	--	--	--
05164452	9969F	--	--	+	--	--	+
05164453	9970F	--	--	+	--	--	+
05164454	9971F	--	--	--	--	--	--
05164455	9972F	--	--	+	--	--	--
05164456	9973F	--	--	+	--	--	+
05164457	9974F	--	--	+	--	--	--
05164459	9975F	+	+	+	+	+	+
05164460	9976F	--	--	--	--	--	--
05164461	9977F	--	--	--	--	--	--
05164468	9981F	+	+	+	--	+	+
05164469	9982F	--	--	+	--	--	+
05164471	9984F	--	--	+	--	--	--

Table 4. Comparison of growth data for sediments compared to each reference sediment. A "+" indicates that the test sediment result is significantly less than the reference sediment result at the 0.05 alpha level. A dash indicates that it is not significantly less than the reference sediment.

CH2M Hill Sample No.	NAS No.	Reference 05164470 (9983F)	Reference 05164478 (9989F)	Reference 05164476 (9990F)	Reference 05164486 (9994F)	Reference 05164489 (9998F)	Reference 05164496 (0002G)
05164433	9953F	+	+	+	+	--	+
05164434	9954F	+	+	+	+	+	+
05164435	9955F	+	+	+	+	+	+
05164436	9956F	+	+	+	+	+	+
05164437	9957F	+	+	--	+	--	+
05164440	9958F	+	+	+	+	+	+
05164441	9959F	+	+	+	+	+	+
05164442	9960F	+	+	+	+	+	+
05164443	9961F	+	+	+	+	+	+
05164449	9962F	+	+	+	+	+	+
05164439	9966F	--	--	--	--	--	--
05164450	9967F	+	+	+	+	+	+
05164451	9968F	+	+	+	+	+	+
05164452	9969F	+	+	+	+	+	+
05164453	9970F	+	+	--	+	--	--
05164454	9971F	+	+	+	+	+	+
05164455	9972F	+	+	+	+	+	+
05164456	9973F	+	+	+	+	+	+
05164457	9974F	+	+	+	+	+	+
05164459	9975F	+	+	--	+	--	+
05164460	9976F	--	--	--	--	--	--
05164461	9977F	+	+	+	+	+	+
05164468	9981F	+	+	+	+	+	+
05164469	9982F	+	+	--	+	--	+
05164471	9984F	--	--	--	--	--	--

Table 5. Comparison of mortality data for sediments compared to each reference sediment. A "+" indicates that the test sediment result is significantly greater than the reference sediment result at the 0.01 alpha level. A dash indicates that it is not significantly greater than the reference sediment.

CH2M Hill Sample No.	NAS No.	Reference 05164470 (9983F)	Reference 05164478 (9989F)	Reference 05164476 (9990F)	Reference 05164486 (9994F)	Reference 05164489 (9998F)	Reference 05164496 (0002G)
05164433	9953F	--	--	--	--	--	--
05164434	9954F	--	--	--	--	--	--
05164435	9955F	+	+	+	--	+	+
05164436	9956F	+	+	+	+	+	+
05164437	9957F	--	--	--	--	--	--
05164440	9958F	--	--	--	--	--	--
05164441	9959F	--	--	--	--	--	--
05164442	9960F	--	--	--	--	--	--
05164443	9961F	+	+	+	+	+	+
05164449	9962F	--	--	--	--	--	--
05164439	9966F	--	--	--	--	--	--
05164450	9967F	--	--	--	--	--	--
05164451	9968F	--	--	--	--	--	--
05164452	9969F	--	--	--	--	--	--
05164453	9970F	--	--	--	--	--	--
05164454	9971F	--	--	--	--	--	--
05164455	9972F	--	--	--	--	--	--
05164456	9973F	--	--	--	--	--	--
05164457	9974F	--	--	--	--	--	--
05164459	9975F	+	+	+	+	+	+
05164460	9976F	--	--	--	--	--	--
05164461	9977F	--	--	--	--	--	--
05164468	9981F	--	--	+	--	--	--
05164469	9982F	--	--	+	--	--	--
05164471	9984F	--	--	--	--	--	--

Table 6. Comparison of growth data for sediments compared to each reference sediment. A "+" indicates that the test sediment result is significantly less than the reference sediment result at the 0.01 alpha level. A dash indicates that it is not significantly less than the reference sediment.

CH2M Hill Sample No.	NAS No.	Reference 05164470 (9983F)	Reference 05164478 (9989F)	Reference 05164476 (9990F)	Reference 05164486 (9994F)	Reference 05164489 (9998F)	Reference 05164496 (0002G)
05164433	9953F	+	+	--	+	--	+
05164434	9954F	+	+	+	+	+	+
05164435	9955F	+	+	+	+	+	+
05164436	9956F	+	+	+	+	+	+
05164437	9957F	+	+	--	+	--	+
05164440	9958F	+	+	+	+	+	+
05164441	9959F	+	+	--	+	--	+
05164442	9960F	+	+	+	+	+	+
05164443	9961F	+	+	+	+	--	+
05164449	9962F	+	+	+	+	+	+
05164439	9966F	--	--	--	--	--	--
05164450	9967F	+	+	+	+	+	+
05164451	9968F	+	+	+	+	--	+
05164452	9969F	+	+	+	+	+	+
05164453	9970F	+	+	--	+	--	--
05164454	9971F	+	+	+	+	--	+
05164455	9972F	+	+	+	+	+	+
05164456	9973F	+	+	+	+	--	+
05164457	9974F	+	+	+	+	+	+
05164459	9975F	+	+	--	+	--	--
05164460	9976F	--	--	--	--	--	--
05164461	9977F	+	+	+	+	--	+
05164468	9981F	+	+	+	+	+	+
05164469	9982F	+	+	--	--	--	--
05164471	9984F	--	--	--	--	--	--

APPENDIX I

PROTOCOL

TEST PROTOCOL

**FRESHWATER AMPHIPOD, *HYALELLA AZTECA*,
28-DAY SEDIMENT SURVIVAL AND GROWTH TEST**

1. INTRODUCTION

1.1 Purpose of Study: The purpose of this study is to characterize the chronic toxicity of freshwater sediments using a 28-day exposure and survival and growth endpoints with the amphipod, *Hyalella azteca*.

1.2 Referenced Method: This protocol is based on ASTM Method E 1706-00 (ASTM 2001) and EPA Method 100.1 (EPA/600/R-99/064)

1.3 Summary of Method: A summary of test conditions for the amphipod 28-day sediment survival and growth test is tabulated below. The test with *Hyalella azteca* is conducted at 23 ± 1°C with a 16L:8D photoperiod at an illuminance of about 100-1000 lux. Test chambers are 300-mL high-form lipless beakers containing 100 mL of sediment and 175 mL of overlying water. Ten 7-8day old amphipods are used in each replicate. The number of replicates/treatment depends on the objective of the test. Eight replicates are recommended for routine testing. Amphipods in each test chamber are fed 1.0 mL of YCT food daily. Each chamber receives two volume additions per day of overlying water. Test endpoints include survival and growth.

2. STUDY MANAGEMENT

2.1 Sponsor's Name and Address:

_____
_____
_____
_____

2.2 Sponsor's Study Monitor:

_____

2.3 Name of Testing Laboratory:
Northwestern Aquatic Sciences
3814 Yaquina Bay Road, P.O. Box 1437
Newport, OR 97365.

2.4 Test Location:

_____

2.5 Laboratory's Personnel to be Assigned to the Study:
Study Director: _____
Quality Assurance Unit: _____
Aquatic Toxicologist: _____
Aquatic Toxicologist: _____

2.6 Proposed Testing Schedule: Tests are normally begun within 14 days of sample collection. Reference toxicant test to be run concurrently.

2.7 Good Laboratory Practices: The test is conducted following the principles of Good Laboratory Practices (GLP) as defined in the EPA/TSCA Good Laboratory Practice regulations revised August 17, 1989 (40 CFR Part 792).

3. TEST MATERIAL

The test materials are freshwater sediments. The control, reference, and test sediments are placed in solvent cleaned 1 L glass jars fitted with PTFE-lined screw caps. At the laboratory the samples are stored at 4°C in the dark. The original sealed containers may be stored for up to 8 weeks prior to testing, depending on the testing requirements. If jars are not not full when received or if sediment is removed for testing, headspaces should be filled with nitrogen to retard deterioration. A negative control sediment is collected from a clean site. In addition, a reference sediment, a clean sediment with physical characteristics similar to the test sediments, may be employed as a comparison station.

4. TEST WATER

Test water (overlying water) at NAS is normally dechlorinated tap water or moderately hard synthetic water. Synthetic dilution water is prepared from Milli-Q reagent grade water and reagent grade chemicals. Test water may also be well water, surface water, site water, or other water depending on the study design. The hardness or other water quality parameters of the dilution water may need to be adjusted to meet the study design.

5. TEST ORGANISMS

5.1 Species: amphipod, *Hyalella azteca.*

5.2 Source: Cultured at NAS. Alternatively, animals may be purchased from a reputable commercial supplier.

5.3 Age: 7-8 days old at start of test

5.4 Acclimation and Pretest Observation: Cultures are maintained at 23 ± 1°C under a 16:8 L:D photoperiod. Cultured amphipods are fed dried maple leaves with YTC. Rabbit chow, Tetramin® or TetraFin® flakes may also be used. Acclimation of test organisms to the test water may be desirable, depending on culture water, but it is not required. If test organisms are to be acclimated, fifty percent of the holding water is changed daily with the addition of test water.

6. DESCRIPTION OF TEST SYSTEM

6.1 Test Chambers and Environmental Control: Test chambers used in the toxicity test are 300-mL high-form lipless glass beakers. Test chambers are maintained at constant temperature by partial immersion in a temperature-controlled water bath or by placement in a temperature-controlled room. Aeration is not empolyed unless dissolved oxygen drops below 2.5 mg/L. The test is conducted under an illuminance of 100-1000 lux with a 16L:8D photoperiod.

6.2 Cleaning: All laboratory glassware, including test chambers, is cleaned as described in EPA/600/4-90/027F. New glassware and test systems are soaked 15 minutes in tap water and scrubbed with detergent (or cleaned in automatic dishwasher); rinsed twice with tap water; carefully rinsed once with fresh, dilute (10%, V:V) hydrochloric or nitric acid to remove scale, metals, and bases; rinsed twice with deionized water; rinsed once with acetone to remove organic compounds (using a fume hood or canopy); and rinsed three times with deionized water. Test systems and chambers are rinsed again with dilution water just before use.

7. EXPERIMENTAL DESIGN AND TEST PROCEDURES

7.1 Experimental Design: The test involves exposure of amphipods to test, control, and reference sediments. The sediments are placed on the bottom of the test containers and are overlain with test water. The test exposure is for 28 days. The renewal of overlying water consists of two volume additions per day, either continuous or intermittent. Each treatment consists of eight replicate test containers, each containing 10 organisms. Test chamber positions are completely randomized. Test organisms are randomly distributed to the test chambers. Blind testing is normally used.

7.2 Setup of Test Containers: Sediments are homogenized and placed in test chambers on the day before addition of test organisms. Sediment (100 ml) is placed into each of eight replicate beakers. After addition of the sediment, 175 ml of test water is gently added to each beaker in a manner to prevent resuspension. The overlying water is replaced twice daily. The test begins when amphipods are introduced to the test chambers. Initial water quality measurements are taken prior to the addition of test organisms.

7.3 Effect Criterion: The effect criteria used in the 28-day amphipod bioassay are mortality and growth. Death is defined as the lack of movement of body or appendages on response to tactile stimulation. Growth is measured as change in dry weight.

7.4 Test Conditions: No aeration is employed unless dissoved oxygen falls below 2.5 mg/L. The test temperature employed is 23 ± 1°C. A 16:8, L:D photoperiod is used. Illumination is supplied by daylight fluorescent lamps at 100-1000lux. The overlying water is replaced twice daily.

7.5 Beginning the Test: On the day the test begins, amphipods are impartially counted into small containers of test water (10/container). The test is begun by rinsing test organisms into the equilibrated test containers. For the growth endpoint, time-zero weight data should be collected.

7.6 Feeding: Amphipods are fed 1.0 mL of YCT daily per test chamber. A feeding may be skipped if there is a build up of excess food. However, all beakers must be treated similarly.

7.7 Test Duration, Type and Frequency of Observations, and Methods: The duration of the toxicity test is 28 days. The type and frequency of observations to be made are summarized as follows:

TYPE OF OBSERVATION	TIMES OF OBSERVATION
BIOLOGICAL DATA	
Survival, growth	Day 28
PHYSICAL AND CHEMICAL DATA	
Hardness, alkalinity, conductivity, and ammonia-N	Beginning and end of test in overlying water of one replicate beaker from each treatment.
Temperature	Daily in overlying water of one replicate beaker from each treatment.
Conductivity	Weekly
Dissolved oxygen and pH	3X/week
Optional pore water ammonia and/or sulfide	In test sediments prior to initiating the tests. Optionally in sediments from sacrificial test chambers at test beginning and/or end.

Dissolved oxygen is measured using a polarographic oxygen probe calibrated according to the manufacturer's recommendations. The pH is measured using a pH probe and a properly calibrated meter with scale divisions of 0.1 pH units. Temperature is measured with a calibrated mercury thermometer or telethermometer. Conductivity is measured with a conductivity meter. Hardness and alkalinity are measured using titrometric methods. Total soluble sulfide and total ammonia-N were

measured using Hach test kits based on the methylene blue (EPA Method 376.2) and salicylate (Clin. Chim. Acta 14:403, 1996) colorimetric methods, respectively; samples were not distilled prior to analysis.

Overlying water should be sampled just before water renewal from about 1 to 2 cm above the sediment surface using a pipet. It may be necessay to pool water samples from individual replicates. The pipet should be checked to make sure no organisms are removed during sampling of overlying water.

7.8 Test Termination: At test termination, the contents of each test container are sieved through a #35 (500 µm mesh) sieve to recover the amphipods. Amphipods from each replicate are put into a 30 mL plastic cup, rinsed with DI water, gently blotted and place into the appropriate tared aluminum weighing pan. The number of survivors for each container is recorded on the datasheet.

7.9 Growth Measurement: Growth is measured as average dry weight of animals in a test replicate at the end of the test on day 28. Pooled animals from each test replicate are gently blotted and placed into tared aluminum weigh pans. The pans are dried at 60-90°C to constant weight. The dried amphipods are placed into a dessicator and weighed as soon as possible to the nearest 0.01 mg (desirable to use 0.001 mg). The total weight of the dried amphipods in each pan is divided by the number of amphipods weighed to obtain an average dry weight per surviving amphipod per replicate.

8. CRITERIA OF TEST ACCEPTANCE

The test results are acceptable if the minimum survival of organisms in the control treatment at the end of the test is at least 80%.

9. DATA ANALYSIS

The endpoints of the toxicity test are survival and growth. Survival is obtained as a direct count of living organisms in each test container at the end of the test. Average amphipod dry weight, also measured at the end of the test, may be used to compare growth between treatment sediments and the control or reference sediment. Ordinarily the following data analysis is performed. Due to special requirements, alternative methods may be used. The means and standard deviations are calculated for each treatment level. Identification of toxic sediments is established by statistical comparison of test endpoints between test and control or reference sediments. Between treatment comparisons may be made using a Student's t-test or Wilcoxon's Two-Sample test, where each treatment is compared to the control or the reference sediment. An arcsine-square root transformation of proportional data, and tests for normality and heterogeneity of variances, are performed prior to statistical comparisons.

10. REPORTING

The final report of the test results must include all of the following standard information at a minimum: name and identification of the test; the investigator and laboratory; date and time of test beginning and end; information on the test material; information on the source and quality of the overlying/test water; detailed information about the test organisms including acclimation conditions; a description of the experimental design and test chambers and other test conditions including feeding, if any, and water quality; definition of the effect criteria and other observations; responses, if any, in the control treatment; tabulation and statistical analysis of measured responses and a summary table of endpoints; a description of the statistical methods used; any unusual information about the test or deviations from procedures; reference toxicant testing information.

11. STUDY DESIGN ALTERATION

Amendments made to the protocol must be approved by the sponsor and study director and should include a description of the change, the reason for the change, the date the change took effect and the dated signatures of the study director and sponsor. Any deviations in the protocol must be described and recorded in the study raw data.

12. REFERENCE TOXICANT

The reference toxicant test is a standard multi-concentration toxicity test using a specified chemical toxicant to evaluate the performance of test organisms used in the study. Reference toxicant tests are 96-hour, water only exposures, not 28-day sediment exposures. The reference toxicant test is run concurrently. Performance is evaluated by comparing the results of the reference toxicant test with historical results (e.g., control charts) obtained at the laboratory.

13. REFERENCED GUIDELINES

ASTM. 2001. Standard Test Methods for Measuring the Toxicity of Sediment-Associated Contaminants with Fresh Water Invertebrates. ASTM Standard Method No. E 1706-00. Am. Soc. Test. Mat., Philadelphia, PA.

U.S. EPA. 2000. Section 11, Test Method 100.1, *Hyalella azteca* 10-d Survival and Growth Test for Sediments, pp. 47-54 In: Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates (Second Edition). EPA/600/R-99/064.

Weber, C.I. (Ed.) 1993. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms (Fourth Edition). EPA/600/4-90/027F.

14. APPROVALS

_____ for _____
Name Date

_____ for **Northwestern Aquatic Sciences**
Name Date

Appendix A
Test Conditions Summary

1. Test type	whole sediment toxicity test with renewal of overlying water
2. Test duration	28 days
3. Temperature	23 ± 1°C
4. Light quality	daylight fluorescent light
5. Illuminance	100-1000 lux
6. Photoperiod	16L:8D
7. Test chamber size	300-mL high-form lipless beakers, (Pyrex® 1040 or equivalent)
8. Sediment volume	100 mL
9. Overlying water volume	175 mL
10. Renewal overlying water	2 volume additions/day (continuous or intermittent)
11. Age of test organisms	7-8 days old at test initiation
12. Organisms per test chamber	10
13. Replicates per treatment	8 recommended for routine testing (depends on design)
14. Organisms per treatment	80
15. Feeding regime	YCT food, fed 1.0 mL daily/chamber
16. Cleaning	if screens are used, clean as needed
17. Aeration	None, unless DO falls below 2.5 mg/L
18. Overlying (test) water	Dechlorinated tap water, culture water, well water, surface water, site water or reconstituted water, depending on study design.
19. Water quality	Hardness, alkalinity, conductivity, ammonia-N beginning and end; temperature daily; conductivity weekly; DO & pH 3X/wk
20. Endpoints	Survival & growth (based on weight)
21. Test acceptability criteria	Minimum control survival of 80%
22. Sample holding	14 days at 4°C in the dark (recommended)
23. Sample volume required	1L (800 mL per sediment)
24. Reference toxicant	Concurrent testing required

APPENDIX II

RAW DATA

TEST DESCRIPTION, MONITORING, AND RESULTS BENCHSHEETS

Test No. 727-1 Client CH2M Hill Investigator

STUDY MANAGEMENT

Client: CH2M Hill, Inc., 2300 NW Walnut Blvd., Corvallis, OR 97330
Client's Study Monitor: Mr. Dennis Shelton
Testing Laboratory: Northwestern Aquatic Sciences
Test Location: Newport Laboratory
Laboratory's Study Personnel:
Proj. Man./Study Dir. G.J. Irissarri GJI
QA Officer L.K. Nemeth
1. [signature] CAS 2. B.B. Pirsigson BBP
3. Susan Gore SG 4. Bill Montgomery WM
Study Schedule: 5. M.D. Redwood MDR 6. [signature]
Test Beginning: 4-28-05 1050 Test Ending: 5-26-05 1210

TEST MATERIAL

General description (see sample logbook/chain-of-custody for details):

NAS Sample No.:	9952F	9953F	9954F	9955F	9956F
Description:	Contol	05164433	05164434	05164435	05164436
Collection Date:	4/22/05	4/20/05	4/20/05	4/20/05	4/20/05
Receipt Date:	4/22/05	4/22/05	4/22/05	4/22/05	4/22/05
:					
NAS Sample No.:	9957F	9958F	9959F	9960F	9961F
Description:	05164437	05164440	05164441	05164442	05164443
Collection Date:	4/20/05	4/20/05	4/20/05	4/20/05	4/20/05
Receipt Date:	4/22/05	4/22/05	4/22/05	4/22/05	4/22/05
:					
NAS Sample No.:	9962F	9966F	9967F	9968F	9969F
Description:	05164449	05164439	05164450	05164451	05164452
Collection Date:	4/20/05	4/21/05	4/21/05	4/21/05	4/21/05
Receipt Date:	4/22/05	4/23/05	4/23/05	4/23/05	4/23/05
:					
NAS Sample No.:	9970F	9971F	9972F	9973F	9974F
Description:	05164453	05164454	05164455	05164456	05164457
Collection Date:	4/21/05	4/21/05	4/21/05	4/21/05	4/21/05
Receipt Date:	4/23/05	4/23/05	4/23/05	4/23/05	4/23/05
:					
NAS Sample No.:	9975F	9976F	9977F	9981F	9982F
Description:	05164459	05164460	05164461	05164468	05164469
Collection Date:	4/21/05	4/21/05	4/21/05	4/22/05	4/22/05
Receipt Date:	4/23/05	4/23/05	4/23/05	4/26/05	4/26/05
:					
NAS Sample No.:	9983F	9984F	9989F	9990F	9994F
Description:	05164470	05164471	05164478	05164476	05164486
Collection Date:	4/22/05	4/22/05	4/22/05	4/22/05	4/23/05
Receipt Date:	4/26/05	4/26/05	4/26/05	4/26/05	4/26/05
:					

Error codes: 1) correction of handwriting error
2) written in wrong location; entry deleted
3) wrong date deleted, replaced with corrrect date
4) error found in measurement; measurement repeated

Test No. 727-1 Client CH2M Hill Investigator ____________

TEST MATERIAL CONTINUATION SHEET

NAS Sample No.:	9998F	0002G			
Description:	05164489	05164496			
Collection Date:	4/23/05	4/23/05			
Receipt Date:	4/26/05	4/26/05			
____________:					
NAS Sample No.:					
Description:					
Collection Date:					
Receipt Date:					
____________:					
NAS Sample No.:					
Description:					
Collection Date:					
Receipt Date:					
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NAS Sample No.:					
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Collection Date:					
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NORTHWESTERN AQUATIC SCIENCES — PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator

SEDIMENT DESCRIPTIONS -- SUPPLEMENTAL NOTES

Sample No.	Description
9952F	BLACK FINE MUD
9953F	Fine gray-brown mud
9954F	Fine gray-green mud
9955F	sand w/ plant materials & few rocks
9956F	sand - coarse grain @ LSI 4-28-05
9957F	~~Brown Sandy mud w/ rocks~~ LIGHT BROWN SAND W/ ROCKS
9958F	Gray-brown Sandy soil @ rocks
9959F	Fine Grey-green mud
9960F	Fine dark grey brown mud W/Chironomid larvae
9961F	Fine grain sand - brown w/ roots + other plant debris
9962F	med brown fine Sandy mud
9966F	COARSE BROWN SAND W/ ROCKS
9967F	Fine black mud with chironomids, worms and plant material
9968F	Tan Sandy Mud W/ROCKS
9969F	brown sand
9970F	BROWN SAND W/ ROOTS
~~9971F~~ 9972F	Green brown Sand
~~9972F~~ 9971F	FINE light brown sand, fine grained
9973F	Tan Sandy Mud W/woody debris
9974F	Green/Brown fine mud - clay
9975F	GRAY BROWN SAND WITH PLANT DEBRIS AND SHELLS
9976F	Gray brown sand @ shells, rocks, @ plant particles
9977F	Dark grey sandy Mud W/ very ~~brown~~ Chironomid larvae
9981F	DARK GRAY SAND W/ ROCKS +BROWNS
9982F	Dark gray Sand W/ snail shells & woody / plant debris
9983F	Fine light brown sand with plant roots and shoots, worms
9984F	Black/brown sandy mud w/ plant debris
9989F	Dark Gray Mud W/ woody debris
9990F	DARK GRAY BROWN FINE SAND W/ PLANT DEBRIS
9994F	DARK GRAY BROWN FINE SAND W/ WOODY PLANT DEBRIS AND WORMS
9998F	DARK GRAY BROWN FINE SAND W/ GRASS DEBRIS
0002G	DARK BROWN MUD W/ WOODY PLANT DEBRIS

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator

TEST WATER

Source: Modified dechlorinated municipal water

Date of Collection/Preparation:

pH SEE MODIFIED TAP WATER RECORD

Cond (umhos/cm2) FOR DETAILS

Hardness (mg/La0

Alkalinity (mg/L)

Treatments: Aerated ≥ 24 hrs

TEST ORGANISMS

Species: *Hyalella azteca* Age: 7-8 DAYS Date received: 4-26-05

Source: Chesapeake Cultures, Hayes, VA

Acclimation Data:

Date	Temp. (deg.C)	DO (mg/L)	pH	Cond umhos/cm	Feeding * amount	Feeding * description	Water changes	Hardness (mg/L)	Alkalinity (mg/L)
4-26-05	20.1	10.6	7.1	435	20 mL	YTC	YES	170	190
4-27-05	20.8	8.8	8.2	385	10 mL	YTC	YES	137	160
4-28-05	20.8	8.4	7.9	305	10 mL	YTC		103	80
Mean	20.6	9.3	7.7	375				137	143
S.D.	0.4	1.2	0.6	66				34	57
(N)	3	3	3	3				3	3

Photoperiod during acclimation: 16:8, L:D

* PER PAN

TEST PROCEDURES AND CONDITIONS

Test chambers: 300 ml glass beakers

Test volumes: 100 ml of test sediment; 275 ml total volume

Replicates/treatment: (8) 8 Organisms/treatment: (80) 80 (10/REP)

Test water changes: Twice daily

Aeration: only if DO falls below 2.5 mg/L

Feeding: everyday beginning with day zero

Test temperature (deg.C): 23

Beaker placement: Total randomization

Photoperiod: 16:8, L:D

Control Sediment:

Source: From an area approximately one mile east of the Hwy. 101 bridge at Beaver Creek, approx. 8 miles south of Newport, OR.

Date collected: 4/22/05

Sieved through 0.5 -mm screen NAS# 9952 F

Storage: 4°C in the dark in closed containers.

MISCELLANEOUS NOTES

Date:	Light Intensity (ft-candles*) Site A	Site B	Comments	Initials
4-29-05	62	84		GJ
5-9-05	81	64		GJ
5-20-05	82	60		GJ

*To convert ft-candles to lux divide by ~~0.0929~~ 0.929 GJ 5-3-05 DECIMAL PT OFF

MODIFIED TAP WATER RECORD

BATCH #	LOCATION	DATE	VOLUME (gal.)	$MgSO_4$* Lot #	KCl* Lot #	$NaHCO_3$* Lot #	$CaSO_4$* Lot #	Total Chlorine (mg/L)	HARD (mg/L)	ALK (mg/L)	COND (µmhos/cm)	pH	Init.
1	ROOM #1	4-25-05	100	034818	020565A	041522	A0174038701	<0.02	68	60	260	7.5	GJ
2	ROOM #2	4-29-05	100	"	"	"	"	<0.02	68	60	260	7.5	GJ
3	"	5-2-05	"	"	"	"	"	<0.02	68	60	275	7.4	GJ
4	"	5-5-05	"	"	"	"	"	<0.02	68	70	270	7.4	GJ
5	"	5-8-05	"	"	"	"	"	<0.02	68	70	280	7.3	GJ
6	"	5-11-05	"	"	"	"	"	<0.02	68	70	280	7.3	GJ
7	"	5-13-05	"	"	"	"	"	<0.02	68	60	280	7.5	GJ
8	"	5-16-05	"	"	"	"	"	<0.02	68	60	280	7.3	GJ
9	"	5-19-05	"	"	"	"	"	<0.02	68	60	270	7.5	GJ
10	"	5-20-05	"	"	"	"	"	<0.02	68	70	270	7.4	GJ
11	"	5-24-05	"	"	"	"	"	<0.02	68	60	270	7.4	GJ
12	"	5-26-05	"	"	"	"	"	<0.02	68	60	270	7.5	GJ

*Amounts of reagents per 100 gals: $MgSO_4$ = 9.46g, KCl = 0.64g, $NaHCO_3$ = 15.1g, $CaSO_4$•2 1/2H_2O = 9.46g.

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Test No. 727-1 Client CH2M Hill Investigator ______

Test conducted in (circle one): (room 1) room 2 trailer water bath other: ______

Randomization chart: TOP SHELF

5								255	
4								254	
3								253	
2								252	
1								251	256

Randomization chart:

Randomization chart:

Randomization chart:

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 0 (4/28/05) AB/GJ/BBP

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond.* (umhos/cm)	pH*	Hardness* (mg/L)	Alkalinity* (mg/L	NH3* (ppm)	Comments
17	22-1	6.4	350	7.6	111	130		Each beaker fed 1.0 ml
23	22-1	6.3	320	7.4	103	90		YTC suspension
25	22-0	6.7	340	7.2	120	80		Initials: GJ
28	22-1	8.1	290	7.1	77	60		
29	22-1	6.9	320	7.1	103	80		
42	22-2	7.4	295	7.5	85	80		
44	22-1	7.0	305	7.4	103	80		
49	22-1	7.2	300	7.2	103	80		
51	22-2	6.0	300	7.0	111	90		
56	22-2	6.8	295	7.1	103	70		
58	22-0	7.2	270	7.2	77	60		
69	22-0	6.4	340	7.3	120	110		
79	22-1	6.5	330	7.2	68	60		
82	22-3	6.2	325	7.1	120	70		
101	22-2	7.9	270	7.3	77	60		
115	22-2	7.8	290	7.3	86	70		
119	22-2	7.4	275	7.2	86	60		
126	22-1	7.3	290	7.4	86	70		
127	22-0	5.9	330	7.4	120	110		
129	22-1	6.2	270	7.0	86	70		
131	22-1	7.0	280	7.1	86	60		
136	22-0	7.0	280	7.1	86	70		
142	22-2	6.9	275	7.0	86	60		
150	22-0	6.6	280	7.1	94	80		
191	22-1	5.6	330	7.3	120	110		
194	22-1	6.8	280	7.5	94	80		
195	22-3	6.3	275	7.2	86	70		
206	22-2	7.1	285	7.2	86	80		
224	22-3	6.4	265	7.2	86	70		
235	22-1	6.9	290	7.1	86	80		
240	22-1	6.4	340	7.2	128	90		
252	22-0	7.2	275	7.4	86	60		
								Water changed in all
								beakers.
								Time: 0710
								Initials: GJ
								Water changed in all
								beakers.
								Time: 1710
								Initials: BBP

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator _____

DAILY RECORD SHEET

Day 1 (4/29/05) GJ1

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	23.4	5.8		7.6				Each beaker fed 1.0 ml
23	23.4	5.4		7.4				YTC suspension
25	23.6	5.6		7.1				Initials: GJ1
28	23.4	6.8		7.2				
29	23.5	6.3		7.1				
42	23.5	6.9		7.3				
44	23.2	6.4		7.3				
49	23.5	6.8		7.2				
51	23.3	6.4		7.2				
56	23.3	6.4		7.4				
58	23.4	6.4		7.1				
69	23.4	6.2		7.3				
79	23.5	6.2		7.1				
82	23.4	6.6		7.1				
101	23.3	6.9		7.2				
115	23.7	6.8		7.3				
119	23.3	6.8		7.2				
126	23.2	6.6		7.3				
127	23.1	5.6		7.0				
129	23.5	5.8		7.0				
131	23.3	6.5		7.1				
136	23.2	6.6		7.1				
142	23.2	6.6		7.1				
150	23.7	6.0		6.9				
191	23.4	3.2		7.0				
194	23.3	6.4		7.1				
195	23.5	5.6		6.9				
206	23.5	6.3		7.3				
224	23.5	6.0		7.0				
235	23.6	6.2		7.1				
240	23.7	6.2		7.3				
252	23.3	6.6		7.2				
								Water changed in all
								beakers.
								Time: 0645
								Initials: MB
								Water changed in all
								beakers.
								Time: 1615
								Initials: AJ

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator _____

DAILY RECORD SHEET

Day 2 (4/30/05) GJ

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	22.2							Each beaker fed 1.0 ml
23	22.3							YTC suspension
25	22.5							Initials: GJ
28	22.3							
29	22.3							
42	22.2							
44	22.3							
49	22.3							
51	22.3							
56	22.3	GJ @ 4-30-05						
58	22.3							
69	22.3							
79	22.4							
82	22.3							
101	22.3							
115	22.6							
119	22.3							
126	22.2							
127	22.1							
129	22.3							
131	22.2							
136	22.2							
142	22.2							
150	22.7							
191	22.3							
194	22.3							
195	22.5							
206	22.3							
224	22.5							
235	22.5							
240	22.4							
252	22.4							
								Water changed in all
								beakers.
								Time: 0650
								Initials: GJ
								Water changed in all
								beakers.
								Time: 1745
								Initials: BBP

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator _____

DAILY RECORD SHEET

Day 3 (5/1 0655) GJL

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	22.1							Each beaker fed 1.0 ml
23	22.3							YTC suspension
25	22.5							Initials: GJL
28	22.3							
29	22.3							
42	22.2							
44	22.3							
49	22.3							
51	22.3							
56	22.3							
58	22.3							
69	22.3							
79	22.4							
82	22.3							
101	22.3							
115	22.5							
119	22.2							
126	22.2							
127	22.1							
129	22.3							
131	22.2							
136	22.2							
142	22.2							
150	22.6							
191	22.3							
194	22.3							
195	22.5							
206	22.4							
224	22.5							
235	22.4							
240	22.4							
252	22.4							
								Water changed in all
								beakers.
								Time: 0655
								Initials: GJL
								Water changed in all
								beakers.
								Time: 1700
								Initials: CMM

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 4 (5/2/05) BBP/wrm

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	23.2	6.6		7.7				Each beaker fed 1.0 ml
23	23.4	6.7		7.4				YTC suspension
25	23.8	6.7		7.3				Initials: GJL
28	23.5	7.2		7.3				
29	23.5	7.0		7.3				
42	23.4	7.1		7.3				
44	23.5	7.2		7.3				
49	23.5	7.2		7.3				
51	23.6	7.3		7.3				
56	23.6	7.2		7.3				
58	23.5	7.1		7.2				
69	23.4	6.8		7.4				
79	23.6	7.0		7.3				
82	23.5	7.1		7.2				
101	23.5	7.4		7.2				
115	23.9	7.2		7.2				
119	23.4	7.2		7.2				
126	23.5	7.3		7.3				
127	23.3	6.4		7.1				
129	23.5	6.7		7.1				
131	23.5	7.1		7.2				
136	23.5	7.1		7.1				
142	23.4	7.1		7.1				
150	23.9	6.8		7.0				
191	23.6	6.3		7.3				
194	23.4	6.8		7.1				
195	23.7	6.4		7.0				
206	23.6	7.0		7.3				
224	23.6	7.0		7.1				
235	23.7	6.7		7.1				
240	23.6	6.9		7.3				
252	23.6	7.3		7.2				
								Water changed in all
								beakers.
								Time: 0630
								Initials: MB
								Water changed in all
								beakers.
								Time: 1620
								Initials: BP

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 5 (5/3 05) [illegible]

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	22.7							Each beaker fed 1.0 ml
23	22.8							YTC suspension
25	23.1							Initials: GSL
28	22.9							
29	22.9							
42	22.8							
44	23.0							
49	23.0							
51	23.0							
56	23.0							
58	23.0							
69	22.9							
79	23.1							
82	23.0							
101	23.0							
115	23.2							
119	23.0							
126	23.0							
127	22.9							
129	23.0							
131	23.0							
136	23.0							
142	22.9							
150	23.3							
191	23.1							
194	23.0							
195	23.1							
206	23.1							
224	23.1							
235	23.1							
240	23.0							
252	23.0							
								Water changed in all
								beakers.
								Time: 0630
								Initials: GSL
								Water changed in all
								beakers.
								Time: 1645
								Initials: BBP

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 6 (5/4 10:5) BBP

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond.* (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	23.1	6.7	300	7.4				Each beaker fed 1.0 ml
23	23.2	6.7	285	7.0				YTC suspension
25	23.4	7.0	285	7.0				Initials: GJL
28	23.2	7.4	275	7.0				
29	23.3	7.2	285	6.9				
42	23.1	7.2	275	7.0				
44	23.3	7.3	275	7.0				
49	23.2	7.5	275	7.0				
51	23.2	7.3	285	7.0				
56	23.2	7.2	285	7.1				
58	23.2	7.3	275	7.0				
69	23.2	6.9	290	7.3				
79	23.3	7.0	280	7.1				
82	23.2	7.2	285	7.1				
101	23.2	7.4	275	7.1				
115	23.4	7.2	280	7.1				
119	23.1	7.3	270	7.0				
126	23.1	7.3	275	7.0				
127	23.1	6.3	280	6.9				
129	23.2	6.9	270	6.9				
131	23.3	7.3	275	6.9				
136	23.3	7.2	280	7.0				
142	23.2	7.7	275	7.0				
150	23.5	6.6	275	6.9				
191	23.3	6.0	295	7.1				
194	23.2	7.0	275	7.0				
195	23.3	6.3	280	6.9				
206	23.3	7.1	280	7.1				
224	23.3	6.9	270	7.0				
235	23.4	6.9	280	6.9				
240	23.3	6.9	290	7.1				
252	23.3	7.1	275	7.1				
								Water changed in all
								beakers.
								Time: 0630
								Initials: GJL
								Water changed in all
								beakers.
								Time: 1640
								Initials: AF

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator ______

DAILY RECORD SHEET

Day 7 (5/5 105)am

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	22.9							Each beaker fed 1.0 ml
23	23.1							YTC suspension
25	23.3							Initials: AB
28	23.2							
29	23.2							
42	23.1							
44	23.1							
49	23.2							
51	23.2							
56	23.2							
58	23.2							
69	23.1							
79	23.2							
82	23.2							
101	23.2							
115	23.2							
119	23.1							
126	23.2							
127	23.1							
129	23.1							
131	23.2							
136	23.2							
142	23.2							
150	23.3							
191	23.2							
194	23.2							
195	23.2							
206	23.2							
224	23.3							
235	23.3							
240	23.2							
252	23.3							
								Water changed in all
								beakers.
								Time: 0640
								Initials: AB
								Water changed in all
								beakers.
								Time: 1700
								Initials: [illegible]

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 8 (5 / 6 lost) AF/BBP

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	23.2	6.1		7.3				Each beaker fed 1.0 ml
23	23.3	6.0		7.0				YTC suspension
25	23.6	6.4		6.9				Initials: LTM
28	23.4	6.8		6.9				
29	23.4	6.3		6.9				
42	23.3	6.3		6.9				
44	23.4	6.4		6.9				
49	23.4	6.6		6.9				
51	23.4	6.2		6.9				
56	23.4	6.2		7.0				
58	23.3	6.3		6.9				
69	23.3	5.7		7.3				
79	23.4	6.1		7.0				
82	23.4	6.2		6.9				
101	23.4	6.5		6.9				
115	23.5	6.6		7.0				
119	23.3	6.4		6.9				
126	23.3	6.4		7.0				
127	23.2	3.4		6.8				LARGE EARTHWORM REMOVED FROM BEAKER #127 -LSI
129	23.3	5.9		6.8				
131	23.3	6.1		6.9				
136	23.3	6.1		6.9				
142	23.2	6.2		6.8				
150	23.5	4.9		6.7				
191	23.2	4.4		7.1				
194	23.2	6.1		6.9				
195	23.4	5.5		6.8				
206	23.3	6.4		7.0				
224	23.3	5.6		6.9				
235	23.4	6.2		6.9				
240	23.3	6.1		7.0				
252	23.4	6.3		6.9				
								Water changed in all
								beakers.
								Time: 0630
								Initials: LTM
								Water changed in all
								beakers.
								Time: 1650
								Initials: AF

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator _____

DAILY RECORD SHEET

Day 9 (5/7 lbs) MB

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	23.0							Each beaker fed 1.0 ml
23	23.0							YTC suspension
25	23.2							Initials: MB
28	23.0							
29	23.0							
42	23.0							
44	22.9							
49	23.0							
51	23.0							
56	23.0							
58	23.0							
69	22.9							
79	23.1							
82	23.0							
101	23.0							
115	23.1							
119	22.9							
126	22.9							
127	23.0							
129	22.9							
131	23.0							
136	23.0							
142	23.0							
150	23.1							
191	23.0							
194	23.0							
195	23.1							
206	23.0							
224	23.0							
235	23.1							
240	23.1							
252	23.1							
								Water changed in all
								beakers.
								Time: 0650
								Initials: MB
								Water changed in all
								beakers.
								Time: 1750
								Initials: MB

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator _____

DAILY RECORD SHEET

Day 10 (5/8/05) GJL

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	22.8							Each beaker fed 1.0 ml
23	22.9							YTC suspension
25	23.1							Initials: GJL
28	22.9							
29	22.9							
42	22.9							
44	23.0							
49	23.0							
51	23.0							
56	23.0							
58	22.9							
69	23.0							
79	23.1							
82	23.0							
101	23.0							
115	23.1							
119	22.9							
126	23.0							
127	22.9							
129	23.0							
131	23.0							
136	23.0							
142	22.9							
150	23.2							
191	23.0							
194	23.0							
195	23.1							
206	23.0							
224	23.1							
235	23.1							
240	23.1							
252	23.2							
								Water changed in all
								beakers.
								Time: 0715
								Initials: GJL
								Water changed in all
								beakers.
								Time: 1755
								Initials: BBP

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 11 (5/9 10S)

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	22.4	6.5		7.4				Each beaker fed 1.0 ml
23	22.7	6.5		7.1				YTC suspension
25	22.9	6.8		7.0				Initials: GJL
28	22.7	7.1		7.0				
29	22.8	7.0		7.0				
42	22.7	7.0		7.0				
44	22.8	7.0		7.0				
49	22.8	7.0		7.0				
51	22.8	6.7		7.0				
56	22.8	7.0		7.1				
58	22.8	7.1		7.0				
69	22.7	6.3		7.4				
79	22.8	6.5		7.2				
82	22.8	6.6		7.1				
101	22.8	6.9		7.0				
115	22.9	6.9		7.1				
119	22.7	6.9		7.0				
126	22.8	7.1		7.0				
127	22.7	5.3		7.0				
129	22.8	6.7		7.0				
131	22.8	7.0		6.9				
136	22.8	7.0		7.0				
142	22.8	7.0		7.0				
150	23.0	6.4		6.9				
191	22.8	5.5		7.2				
194	22.7	6.5		7.1				
195	22.9	5.8		6.9				
206	22.9	7.0		7.0				
224	22.8	6.8		7.1				
235	22.9	6.9		7.1				
240	22.8	6.7		7.2				
252	22.8	7.1		7.1				
								Water changed in all
								beakers.
								Time: 0655
								Initials: GJL
								Water changed in all
								beakers.
								Time: 1710
								Initials:

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator _____

DAILY RECORD SHEET

Day 12 (5 / 10 / 05) CBJ

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	22.7							Each beaker fed 1.0 ml
23	22.7							YTC suspension
25	23.0							Initials: CBJ
28	22.8							
29	22.8							
42	22.7							
44	22.7							
49	22.8							
51	22.8							
56	22.8							
58	22.7							
69	22.7							
79	22.8							
82	22.8							
101	22.8							
115	22.9							
119	22.7							
126	22.7							
127	22.7							
129	22.7							
131	22.8							
136	22.8							
142	22.7							
150	22.9							
191	22.8							
194	22.7							
195	22.8							
206	22.8							
224	22.8							
235	22.9							
240	22.8							
252	22.8							
								Water changed in all
								beakers.
								Time: 0650
								Initials: JM
								Water changed in all
								beakers.
								Time: 1745
								Initials: JM

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator _____

DAILY RECORD SHEET

Day 13 (5/11/05) UB/AJ/BBP

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond.* (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	22.8	5.6	310	7.4				Each beaker fed 1.0 ml
23	22.9	5.5	290	7.0				YTC suspension
25	23.1	5.8	290	6.9				Initials: CJJ
28	22.9	6.4	285	7.0				
29	22.9	5.9	290	6.9				
42	22.8	6.1	285	6.9				
44	22.9	6.2	285	7.0				
49	23.0	6.3	285	7.0				
51	22.9	5.8	290	7.0				
56	22.9	6.0	290	7.1				
58	22.9	6.3	285	7.0				
69	22.9	4.5	310	7.6				
79	23.0	5.6	290	7.1				
82	22.9	5.9	290	7.0				
101	22.9	6.2	285	7.0				
115	23.1	6.1	290	7.0				
119	22.9	6.1	285	7.0				
126	23.0	6.2	290	7.0				
127	22.8	3.7	290	6.8				
129	22.9	5.8	285	6.9				
131	22.9	6.2	285	7.0				
136	22.9	6.2	295	7.0				
142	22.9	6.2	285	7.0				
150	23.1	5.2	285	6.8				
191	22.8	4.1	315	7.5				
194	22.8	5.4	285	7.0				
195	22.9	4.7	290	6.9				
206	22.9	6.0	290	7.0				
224	22.9	5.8	290	7.1				
235	22.9	5.9	290	7.0				
240	22.9	5.4	300	7.4				
252	22.9	6.2	285	7.1				
								Water changed in all
								beakers.
								Time: 0640
								Initials: UB
								Water changed in all
								beakers.
								Time: 1650
								Initials: AJ

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES — PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 14 (5/12/05)

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	22.6							Each beaker fed 1.0 ml
23	22.7							YTC suspension
25	22.9							Initials: GJ
28	22.8							
29	22.8							
42	22.8							
44	22.8							
49	22.9							
51	22.9							
56	22.9							
58	22.8							
69	22.8							
79	22.9							
82	22.9							
101	22.9							
115	23.0							
119	22.8							
126	22.9							
127	22.7							
129	22.9							
131	22.9							
136	22.9							
142	22.8							
150	23.1							
191	22.9							
194	22.8							
195	23.0							
206	22.9							
224	22.9							
235	23.0							
240	23.0							
252	22.9							
								Water changed in all
								beakers.
								Time: 0640
								Initials: MB
								Water changed in all
								beakers.
								Time: 1700
								Initials: AJ

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator _____

DAILY RECORD SHEET

Day 15 (5/13/05) WTM

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	22.7	7.0		7.2				Each beaker fed 1.0 ml
23	22.8	6.8		7.0				YTC suspension
25	22.9	7.0		6.9				Initials: JB
28	22.8	7.2		7.0				
29	22.8	6.9		6.9				
42	22.8	6.9		6.9				
44	22.8	7.2		6.9				
49	22.9	7.2		7.0				
51	22.9	6.7		6.9				
56	22.9	7.0		7.0				
58	22.8	7.2		6.9				
69	22.8	6.8		7.4				
79	22.9	6.5		7.0				
82	22.8	6.6		7.0				
101	22.8	7.1		7.0				
115	22.8	6.9		6.9				
119	22.8	6.9		7.0				
126	22.8	7.0		7.0				
127	22.7	4.9		7.8				
129	22.9	7.1		7.0				
131	22.8	6.7		6.9				
136	22.8	6.8		6.9				
142	23.0	6.9		6.9				
150	23.0	6.9		6.9				
191	22.9	5.4		7.3				
194	22.7	6.6		6.9				
195	22.9	5.9		6.8				
206	22.9	6.6		7.0				
224	22.9	6.7		7.0				
235	22.9	6.8		7.0				
240	22.9	6.8		7.4				
252	22.9	7.0		7.0				
								Water changed in all
								beakers.
								Time: 0655
								Initials: GJ
								Water changed in all
								beakers.
								Time: 1700
								Initials: AF

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator _____

DAILY RECORD SHEET

Day 16 (5/14 0S) GJL

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	22.9							Each beaker fed 1.0 ml
23	23.0							YTC suspension
25	23.1							Initials: GJL
28	23.0							
29	23.0							
42	22.9							
44	23.0							
49	23.0							
51	23.0							
56	23.0							
58	23.0							
69	23.0							
79	23.1							
82	23.0							
101	23.0							
115	23.1							
119	22.9							
126	23.0							
127	22.9							
129	23.0							
131	23.0							
136	23.0							
142	22.9							
150	23.2							
191	23.0							
194	22.9							
195	23.1							
206	23.0							
224	23.0							
235	23.0							
240	23.0							
252	23.1							
								Water changed in all
								beakers.
								Time: 0725
								Initials: GJL
								Water changed in all
								beakers.
								Time: 18:00
								Initials: MJC

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator _____

DAILY RECORD SHEET

Day 17 (5/15/05) wpm

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	23.2							Each beaker fed 1.0 ml
23	23.3							YTC suspension
25	23.4							Initials: wpm
28	23.3							
29	23.3							
42	23.3							
44	23.3							
49	23.3							
51	23.3							
56	23.3							
58	23.3							
69	23.3							
79	23.3							
82	23.3							
101	23.3							
115	23.3							
119	23.2							
126	23.2							
127	23.2							
129	23.2							
131	23.2							
136	23.2							
142	23.2							
150	23.3							
191	23.3							
194	23.3							
195	23.3							
206	23.3							
224	23.3							
235	23.3							
240	23.3							
252	23.3							
								Water changed in all
								beakers.
								Time: 0730
								Initials: wpm
								Water changed in all
								beakers.
								Time: 1730
								Initials:

*Water quality measurements to be taken.

Test No. 727-1 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 18 (5/16/05) UB/BBP/[illegible]

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	22.9	6.4		7.0				Each beaker fed 1.0 ml
23	23.0	6.5		6.7				YTC suspension
25	23.1	6.6		6.8				Initials: GJL
28	23.1	7.0		6.7				
29	23.1	6.7		6.8				
42	23.0	6.7		6.8				
44	23.1	6.9		6.8				
49	23.1	6.9		6.8				
51	23.1	6.4		6.8				
56	23.1	6.8		6.9				
58	23.1	6.9		6.8				
69	23.1	6.3		7.2				
79	23.1	6.5		6.9				
82	23.1	6.5		6.8				
101	23.1	6.9		6.8				
115	23.2	7.0		6.8				
119	23.0	6.8		6.8				
126	23.1	6.8		6.8				
127	23.1	4.4		6.7				
129	23.1	6.5		6.8				
131	23.1	6.7		6.8				
136	23.1	6.7		6.9				
142	23.1	6.6		6.8				
150	23.2	6.3		6.7				
191	23.1	5.3		7.0				
194	23.0	6.4		6.8				
195	23.2	5.3		6.6				
206	23.1	6.5		6.9				
224	23.0	6.4		6.9				
235	23.0	6.8		6.9				
240	23.0	6.5		7.0				
252	23.1	6.8		6.9				
								Water changed in all
								beakers.
								Time: 0640
								Initials: UB
								Water changed in all
								beakers.
								Time: 1715
								Initials: AJ

*Water quality measurements to be taken.

Test No. 727-1 Client CH2M Hill Investigator ______

DAILY RECORD SHEET

Day 19 (5/17 05)

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	22.8							Each beaker fed 1.0 ml
23	22.8							YTC suspension
25	22.9							Initials: GwL
28	22.8							
29	22.9							
42	22.8							
44	22.9							
49	22.9							
51	22.9							
56	22.9							
58	22.8							
69	22.8							
79	22.8							
82	22.8							
101	22.9							
115	23.0							
119	22.8							
126	22.8							
127	22.8							
129	22.8							
131	22.9							
136	22.9							
142	22.9							
150	23.0							
191	22.9							
194	22.8							
195	22.9							
206	22.9							
224	22.9							
235	22.9							
240	22.9							
252	22.9							
								Water changed in all
								beakers.
								Time: 0650
								Initials: CAS
								Water changed in all
								beakers.
								Time: 1710
								Initials: SJ

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator _____

DAILY RECORD SHEET

Day 20 (5/18/65) WTW/BBP

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond.* (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	22.7	7.1	310	7.4				Each beaker fed 1.0 ml
23	22.8	6.8	295	6.9				YTC suspension
25	23.0	6.8	295	7.0				Initials: GJL
28	23.0	7.3	290	6.9				
29	22.8	6.6	300	6.9				
42	22.8	6.9	290	7.0				
44	22.8	7.1	290	7.0				
49	22.8	7.1	290	7.0				
51	22.9	7.0	295	7.0				
56	22.9	7.1	295	7.1				
58	22.8	7.2	290	7.0				
69	22.8	6.7	290	7.4				
79	22.9	6.7	290	7.1				
82	22.8	6.5	290	7.0				
101	22.9	7.0	290	6.9				
115	23.0	7.1	295	7.0				
119	22.7	7.0	285	6.9				
126	22.8	7.1	290	7.0				
127	22.7	4.7	290	6.8				
129	22.8	6.6	290	7.0				
131	22.8	6.9	290	6.9				
136	22.9	6.9	295	7.0				
142	22.8	7.0	290	6.9				
150	23.0	6.7	290	6.9				
191	22.9	5.8	310	7.1				
194	22.8	7.0	290	7.0				
195	22.9	6.2	290	6.9				
206	22.9	7.0	295	7.1				
224	22.9	6.8	290	7.0				
235	22.9	7.0	295	7.0				
240	22.8	6.9	300	7.1				
252	22.9	7.1	290	7.0				
								Water changed in all
								beakers.
								Time: 0655
								Initials: GJL
								Water changed in all
								beakers.
								Time: 1700
								Initials: BBP

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 21 (5/19/05)

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	22.9							Each beaker fed 1.0 ml
23	22.9							YTC suspension
25	23.1							Initials: GJ
28	23.0							
29	23.0							
42	22.9							
44	23.0							
49	23.0							
51	23.0							
56	23.0							
58	23.0							
69	22.9							
79	23.0							
82	23.0							
101	23.0							
115	23.1							
119	23.0							
126	23.0							
127	22.9							
129	22.9							
131	23.0							
136	23.0							
142	23.0							
150	23.1							
191	23.0							
194	22.9							
195	23.1							
206	23.0							
224	23.0							
235	23.0							
240	22.9							
252	23.0							
								Water changed in all
								beakers.
								Time: 0655
								Initials: MB
								Water changed in all
								beakers.
								Time: 700
								Initials: BBP

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 22 (5 Dec 05) AM

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	22.7	7.7		7.7				Each beaker fed 1.0 ml
23	22.9	7.7		7.4				YTC suspension
25	23.1	8.0		7.5				Initials: BB
28	23.0	8.3		7.5				
29	23.0	7.9		7.4				
42	23.0	7.5		7.3				
44	23.0	7.5		7.3				
49	23.1	7.4		7.2				
51	23.0	7.0		7.2				
56	23.1	7.2		7.3				
58	23.0	7.3		7.2				
69	22.9	6.6		7.5				
79	23.0	6.8		7.2				
82	22.9	7.0		7.1				
101	23.0	7.0		7.1				
115	23.1	7.2		7.2				
119	23.0	7.4		7.1				
126	23.0	7.4		7.2				
127	22.9	4.1		6.9				
129	23.0	6.6		7.0				
131	23.0	7.1		7.1				
136	23.0	7.1		7.1				
142	23.0	7.3		7.0				
150	23.1	6.4		6.9				
191	23.1	5.8		7.0				
194	23.0	6.9		7.0				
195	23.1	6.1		6.8				
206	23.1	7.1		7.1				
224	23.0	7.1		6.9				
235	23.1	7.1		6.9				
240	23.0	6.8		7.1				
252	23.0	7.1		7.0				
								Water changed in all
								beakers.
								Time: 0655
								Initials: BB
								Water changed in all
								beakers.
								Time: 1720
								Initials:

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator _____

DAILY RECORD SHEET

Day 23 (5/21 1057) VB

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	22.9							Each beaker fed 1.0 ml
23	22.9							YTC suspension
25	23.1							Initials: VB
28	23.0							
29	23.0							
42	23.0							
44	22.9							
49	23.0							
51	23.0							
56	23.0							
58	22.9							
69	22.9							
79	22.9							
82	23.0							
101	~~22.9~~ 23.0 VB 5-21-05							
115	23.1							
119	22.9							
126	22.9							
127	22.9							
129	22.9							
131	22.9							
136	22.9							
142	22.9							
150	23.1							
191	22.9							
194	22.9							
195	23.0							
206	22.9							
224	23.0							
235	23.0							
240	22.9							
252	23.0							
								Water changed in all
								beakers.
								Time: 0715
								Initials: VB
								Water changed in all
								beakers.
								Time: 18:00
								Initials: WPM

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 24 (5/22 05) MB

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	22.9							Each beaker fed 1.0 ml
23	22.9							YTC suspension
25	23.0							Initials: MB
28	22.9							
29	22.9							
42	22.8							
44	22.8							
49	22.9							
51	22.9							
56	22.9							
58	22.8							
69	22.9							
79	22.9							
82	22.9							
101	22.9							
115	23.0							
119	22.8							
126	22.8							
127	22.7							
129	22.9							
131	22.8							
136	22.8							
142	22.8							
150	23.0							
191	22.8							
194	22.8							
195	22.9 23.0							
206	22.9							
224	22.9							
235	23.0							
240	23.0							
252	22.9							
								Water changed in all
								beakers.
								Time: 0720
								Initials: MB
								Water changed in all
								beakers.
								Time: 1805
								Initials: AJ

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 25 (5/23/05)MB/6J1

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	22.7	8.0		7.4				Each beaker fed 1.0 ml
23	22.9	6.6		7.0				YTC suspension
25	23.1	6.5		7.0				Initials: 6J1
28	22.9	6.6		7.0				
29	22.9	6.7		7.0				
42	22.9	6.6		6.9				
44	23.0	6.5		7.0				
49	23.0	6.5		6.8				
51	23.0	6.4		6.9				
56	23.0	7.2		7.0				
58	22.9	7.2		6.8				
69	22.9	6.4		7.4				
79	23.0	6.8		6.8				
82	22.9	6.9		6.9				
101	23.0	7.2		6.8				
115	23.1	7.3		6.9				
119	22.9	7.4		6.8				
126	23.0	7.6		7.0				
127	22.8	4.8		6.7				
129	22.9	6.6		6.8				
131	22.9	7.0		6.7 6.8 05-23-05				
136	22.9	7.0		6.8				
142	22.9	7.2		6.8				
150	23.1	6.6		6.7				
191	23.0	6.9		6.9				
194	22.9	6.8		6.9				
195	23.1	6.2		6.7				
206	23.1	7.4		7.0				
224	23.0	7.6		6.7				
235	23.0	7.4		6.8				
240	23.0	7.4		7.0				
252	23.0	7.4		6.8				
								Water changed in all
								beakers. 0610 @ 05-23-05
								Time: 0750
								Initials: MB
								Water changed in all
								beakers.
								Time: 1700
								Initials:

*Water quality measurements to be taken.

Test No. 727-1 Client CH2M Hill Investigator ______

DAILY RECORD SHEET

Day 26 (5-14/05) VB/GJI

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	22.7							Each beaker fed 1.0 ml
23	22.8							YTC suspension
25	22.9							Initials: GJI
28	22.8							
29	22.8							
42	22.8							
44	22.9							
49	22.8							
51	22.9							
56	22.9							
58	22.8							
69	22.8							
79	22.8							
82	22.8							
101	22.8							
115	22.9							
119	22.7							
126	22.8							
127	22.7							
129	22.8							
131	22.8							
136	22.8							
142	22.8							
150	22.9							
191	22.9							
194	22.8							
195	22.9							
206	22.9							
224	22.8							
235	22.9							
240	22.8							
252	22.9							
								Water changed in all
								beakers.
								Time: 0645
								Initials: VB
								Water changed in all
								beakers.
								Time: 1720
								Initials: AJ

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 27 (5/25/05) BBP/mm

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond.* (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
17	22.8	6.6	320	7.2				Each beaker fed 1.0 ml
23	22.9	5.5	300	6.8				YTC suspension
25	23.0	6.3	300	6.9				Initials: BBP
28	22.9	6.7	290	6.9				
29	23.0	6.2	300	6.9				
42	22.9	6.1	290	6.8				
44	22.9	6.0	290	6.9				
49	23.0	6.2	285	6.8				
51	22.9	5.3	290	6.9				
56	22.9	5.8	290	6.9				
58	22.9	5.5	285	6.8				
69	22.8	4.8	300	7.3				
79	22.9	5.4	285	6.9				
82	22.9	5.2	290	6.9				
101	22.9	5.9	285	6.8				
115	23.0	6.1	285	6.9				
119	22.9	6.0	280	6.8				
126	22.9	6.7	285	7.0				
127	22.9	3.8	285	6.7				
129	22.9	5.2	280	6.8				
131	22.9	5.8	300	6.9				
136	22.9	5.8	290	6.9				
142	22.9	5.7	285	6.8				
150	23.1	4.6	285	6.8				
191	23.0	4.5	320	6.9				
194	22.9	5.6	290	6.8				
195	23.1	4.6	290	6.7				
206	23.0	6.6	290	6.9				
224	23.0	5.1	280	6.7				
235	23.1	5.5	290	6.9				
240	23.0	5.3	285	7.0				
252	23.0	5.7	280	6.9				
								Water changed in all
								beakers.
								Time: 0650
								Initials: BBP
								Water changed in all
								beakers.
								Time: 1720
								Initials: BBP

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator _____

DAILY RECORD SHEET

Day 28 (5 Nw 105) NB/GJ/BBP

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond.* (umhos/cm)	pH*	Hardness* (mg/L)	Alkalinity* (mg/L	NH3* (ppm)	Comments
17	23.4	4.9	325	7.2	103	100		Each beaker fed 1.0 ml
23	23.3	4.6	295	6.7	86	70		YTC suspension
25	23.4	5.3	295	6.6	86	60		Initials: —
28	23.4	6.2	285	6.6	77	60		
29	23.4	4.4	285	6.7	94	80		
42	23.3	5.9	290	6.7	77	70		
44	23.4	5.3	290	6.8	94	80		
49	23.4	5.7	280	6.7	86	60		
51	23.3	4.2	290	7.0	86	80		
56	23.4	4.9	295	6.9	86	80		
58	23.4	5.4	290	6.8	86	60		
69	23.3	3.9	340	7.3	120	90		
79	23.4	4.6	295	6.8	77	70		
82	23.4	4.3	290	6.7	94	70		
101	23.3	4.6	280	6.8	77	60		
115	23.4	5.6	290	6.8	94	70		
119	23.3	5.1	280	6.7	77	70		
126	23.2	5.8	285	6.8	86	70		
127	23.3	4.0	295	6.8	86	70		
129	23.3	4.2	280	6.8	77	70		
131	23.2	5.1	295	6.7	77	70		
136	23.2	4.9	300	6.7	86	80		
142	23.2	5.2	290	6.8	86	60		
150	23.3	3.6	280	6.6	86	70		
191	23.3	3.8	340	6.8	111	100		
194	23.3	5.0	285	6.9	77	60		
195	23.3	3.4	285	6.7	77	60		
206	23.4	5.4	290	6.7	77	60		
224	23.3	4.6	275	6.6	77	60		
235	23.3	4.8	290	6.7	86	70		
240	23.4	4.4	320	6.8	103	90		
252	23.3	5.3	290	6.8	77	60		
								Water changed in all
								beakers.
								Time: 0720
								Initials: NB
								Water changed in all
								beakers.
								Time:
								Initials:

*Water quality measurements to be taken.

Test No. 727-1 Client CH2M Hill Investigator _____

DAY 28 TEST TERMINATION SHEET

Beaker No.	Number of survivors	Initials
1	10	VB
2	9	WPM
3	10	VB
4	9	VB
5	10	VB
6	9	WPM
7	8	GJL
8	10	VB
9	9	VB
10	9	GJL
11	10	WPM
12	9	VB
13	8	GJL
14	9	WPM
15	10	VB
16	9	GJL
17	9	VB
18	10	GJL
19	10	GJL
20	8	WPM
21	10	VB
22	10	GJL
23	10	VB
24	9	GJL
25	10	VB
26	7	GJL
27	10	VB
28	10	WPM
29	7	VB
30	9	GJL
31	10	WPM
32	10	VB
33	10	GJL
34	9	GJL
35	9	WPM
36	9	VB
37	7	GJL
38	9	WPM
39	10	GJL
40	8	VB
41	10	GJL
42	9	VB
43	8	WPM
44	10	GJL
45	10	VB

Beaker No.	Number of survivors	Initials
46	9	GJL
47	9	WPM
48	10	VB
49	10	GJL
50	6	WPM
51	8	GJL
52	9	GJL
53	9	WPM
54	10	GJL
55	10	GJL
56	9	VB
57	10	GJL
58	9	WPM
59	10	VB
60	10	GJL
61	9	VB
62	10	GJL
63	10	WPM
64	8	GJL
65	9	VB
66	10	GJL
67	10	GJL
68	10	WPM
69	10	VB
70	9	WPM
71	8	GJL
72	8	VB
73	10	GJL
74	10	WPM
75	7	VB
76	9	GJL
77	10	WPM
78	10	WPM
79	10	GJL
80	10	VB
81	8	GJL
82	10	VB
83	6	WPM
84	9	GJL
85	10	VB
86	10	GJL
87	8	VB
88	10	WPM
89	9	GJL
90	10	GJL

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator

DAY 28 TEST TERMINATION SHEET

Beaker No.	Number of survivors	Initials
91	10	UB
92	10	GJL
93	9	GJL
94	10	UB
95	8	GJL
96	10	UB
97	9	GJL
98	10	UB
99	9	MRM
100	9	UB
101	6	GJL
102	8	MRM
103	10	UB
104	10	GJL
105	10	UB
106	10	GJL
107	10	MRM
108	10	GJL
109	10	UB
110	8	GJL
111	9	MRM
112	9	UB
113	10	GJL
114	8	GJL
115	8	MRM
116	10	UB
117	9	GJL
118	10	GJL
119	10	MRM
120	9	GJL
121	9	UB
122	10	MRM
123	10	GJL
124	10	MRM
125	7	UB
126	10	GJL
127	9	GJL
128	10	MRM
129	9	GJL
130	7	MRM
131	9	UB
132	10	GJL
133	10	GJL
134	10	MRM
135	10	UB

Beaker No.	Number of survivors	Initials
136	9	GJL
137	10	MRM
138	10	UB
139	10	GJL
140	8	UB
141	8	MRM
142	10	GJL
143	10	GJL
144	9	MRM
145	10	UB
146	9	GJL
147	10	UB
148	9	UB
149	9	GJL
150	9	MRM
151	9	UB
152	10	GJL
153	10	GJL
154	10	UB
155	10	MRM
156	8	UB
157	9	GJL
158	9	UB
159	9	GJL
160	10	UB
161	9	UB
162	10	UB
163	9	UB
164	10	MRM
165	10	UB
166	10	MRM
167	9	UB
168	10	UB
169	10	MRM
170	8	UB
171	7	MRM
172	9	UB
173	9	UB
174	7	MRM
175	10	UB
176	10	UB
177	8	UB
178	7	GJL
179	9	MRM
180	10	UB
181	7	GJL

Test No. 727-1 Client CH2M Hill Investigator ________

DAY 28 TEST TERMINATION SHEET

Beaker No.	Number of survivors	Initials
182	② ~~7~~ 10 5-25 GJL	GJL
183	10	WTM
184	10	UB
185	9	WTM
186	10	GJL
187	9	UB
188	10	GJL
189	9	UB
190	10	GJL
191	10	UB
192	10	GJL
193	9	GJL
194	10	WTM
195	10	WTM
196	10	WTM
197	9	GJL
198	10	GJL
199	10	UB
200	10	WTM
201	9	UB
202	9	GJL
203	10	WTM
204	9	GJL
205	10	UB
206	7	WTM
207	10	GJL
208	8	UB
209	6	GJL
210	10	WTM
211	9	UB
212	10	WTM
213	9	GJL
214	9	UB
215	8	GJL
216	10	UB
217	10	WTM
218	9	UB
219	10	GJL
220	9	WTM
221	10	GJL
222	10	UB
223	8	GJL
224	10	UB
225	10	UB
226	10	WTM
227	10	UB

Beaker No.	Number of survivors	Initials
228	6	WTM
229	10	UB
230	9	UB
231	10	UB
232	5-25 GJL ~~8~~ 9 ② WTM	WTM
233	10	UB
234	10	UB
235	9	GJL
236	10	UB
237	10	GJL
238	10	WTM
239	10	UB
240	10	GJL
241	10	GJL
242	10	UB
243	10	WTM
244	10	GJL
245	9	UB
246	10	GJL
247	9	WTM
248	8	GJL
249	9	UB
250	10	GJL
251	9	UB
252	10	GJL
253	9	WTM
254	10	UB
255	8	GJL
256	9	UB
257		
258		
259		
260		
261		
262		
263		
264		
265		
266		
267		
268		
269		
270		
271		

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator _____

ZERO-TIME WEIGHING DATA SHEET

Tare: Date 4-26-05 Oven temp (C.) 62 Drying time (hr.) 48 Initials GJL
Standard Weights: 10 mg: 10.004 100mg: 100.016

Final: Date 5-2-05 Oven temp (C.) 62 Drying time (hr.) 24 Initials GJL
Standard Weights: 10 mg: 10.006 100mg: 100.018

Equip. used: Oven: BLUE M #1 Balance: SARTORIUS M3P

(Dry overnight at 60-90 degrees C)

Pan #	Tare wt. (mg)	Total wt. (mg)	#weighed	Comments
1	28.546	29.157	20	
2	28.524	29.183	20	
3	28.644	29.296	20	
4	29.251	29.963	20	
5	29.215	29.845	20	

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator

WEIGHING DATA SHEET

Tare: Date 5-25-05 Oven temp (C.) 62 Drying time (hr.) 48 Initials JRF
Standard Weights: 10 mg: 10.005 100mg: 100.014

Final #1: Date 6-2-05 Oven temp (C.) 64 Drying time (hr.) 48 Initials JRF
Standard Weights: 10 mg: 10.008 100mg: 100.014

Final #2: Date 6-6-05 Oven temp (C.) 62 Drying time (hr.) 24 Initials JRF
Standard Weights: 10 mg: 10.004 100mg: 100.012

Equip. used: Oven BLUE M #1 Balance SARTORIUS M3P

(Dry overnight at 60-90 degrees C)

Bkr. #	Pan #	Tare wt. (mg)	Total wt. (mg) 1	Total wt. (mg) 2	no. weighed	put into pans-initials	Comments
1	1	30.551	33.288	33.270	10	MSR	
2	2	29.548	33.702	33.685	9	MSR	
3	3	28.074	32.318	32.300	10	MSR	
4	4	28.616	32.154	32.134	9	MSR	
5	5	26.473	32.500	32.481	10	MSR	
6	6	29.062	33.979	33.955	9	MSR	
7	7	29.965	31.558	31.544	8	MSR	
8	8	30.227	32.430	32.414	10	MSR	
9	9	28.302	32.090	32.066	9	MSR	
10	10	28.226	31.263	31.251	9	MSR	
11	11	25.566	31.097	31.055	10	MSR	
12	12	27.219	30.899	30.879	9	MSR	
13	13	27.118	31.543	31.521	8	MSR	
14	14	28.200	31.916	31.892	9	MSR	
15	15	28.106	30.384	30.375	10	MSR	
16	16	29.390	32.398	32.366	9	MSR	
17	17	29.719	35.070	35.039	9	MSR	
18	18	27.217	30.004	29.984	10	MSR	
19	19	30.161	33.602	33.580	10	MSR	
20	20	27.952	29.417	29.403	8	MSR	
21	21	27.233	31.770	31.732	10	MSR	
22	22	27.288	31.271	31.242	10	MSR	
23	23	27.666	31.178	31.150	10	MSR	
24	24	27.931	31.762	31.743	9	MSR	
25	25	26.816	30.302	30.285	10	MSR	
26	26	29.175	31.902	31.895	7	MSR	
27	27	28.838	32.706	32.678	10	MSR	
28	28	29.403	33.648	33.622	10	MSR	
29	29	28.876	32.373	32.356	7	MSR	
30	30	29.725	31.497	31.482	9	MSR	
31	31	28.566	32.671	32.636	10	MSR	
32	32	28.046	31.183	31.163	10	MSR	
33	33	29.286	33.676	33.649	10	MSR	

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator

WEIGHING DATA SHEET

See page _____ for information on drying times and temperatures, standard weights,etc.

Bkr. #	Pan #	Tare wt. (mg)	Total wt. (mg) 1	Total wt. (mg) 2	no. weighed	put into pans-initials	Comments
34	34	28.250	31.356	31.334	9	MSR	
35	35	28.682	31.832	31.806	9	MSR	
36	36	28.381	30.533	30.513	9	MSR	
37	37	32.941	34.212	34.200	7	MSR	
38	38	27.600	31.175	31.151	9	MSR	
39	39	27.028	29.407	29.385	10	MSR	
40	40	26.832	30.991	30.960	8	MSR	
41	41	29.678	33.763	33.734	10	MSR	
42	42	28.041	30.147	30.125	9	MSR	
43	43	28.294	32.584	32.555	8	MSR	
44	44	28.494	32.213	32.186	10	MSR	
45	45	26.910	33.743	33.703	10	MSR	
46	46	28.633	35.123	35.083	9	MSR	
47	47	28.391	30.944	30.932	9	MSR	
48	48	28.545	32.040	32.015	10	MSR	
49	49	28.161	31.950	31.921	10	MSR	
50	50	29.743	31.311	31.295	6	MSR	
51	51	29.626	36.262	36.225	8	MSR	
52	52	28.323	33.649	33.606	9	MSR	
53	53	27.812	31.019	30.997	9	MSR	
54	54	29.020	37.399	37.360	10	MSR	
55	55	28.608	32.909	32.880	10	MSR	
56	56	29.075	30.335	30.322	9	MSR	
57	57	29.077	32.679	32.652	10	MSR	
58	58	28.152	30.012	29.998	9	MSR	
59	59	29.252	32.947	32.921	10	MSR	
60	60	29.768	34.109	34.085	10	MSR	
61	61	29.171	32.378	32.376	9	BBP	
62	62	27.271	31.246	31.240	10	BBP	
63	63	30.895	35.543	35.533	10	BBP	
64	64	27.104	29.808	29.804	8	BBP	
65	65	28.026	31.662	31.656	9	BBP	
66	66	28.026	32.679	32.677	10	BBP	
67	67	28.546	32.103	32.096	10	BBP	
68	68	29.169	35.714	35.703	10	BBP	
69	69	29.072	34.535	34.520	10	BBP	
70	70	28.813	30.569	30.562	9	BBP	
71	71	27.779	33.206	33.200	8	BBP	
72	72	29.122	32.311	32.304	8	BBP	
73	73	28.450	32.859	32.851	10	BBP	
74	74	29.217	33.147	33.140	10	BBP	
75	75	29.813	32.764	32.757	7	BBP	
76	76	27.451	28.882	28.882	9	BBP	

Test No. 727-1 Client CH2M Hill Investigator ______

WEIGHING DATA SHEET

See page ______ for information on drying times and temperatures, standard weights,etc.

Bkr. #	Pan #	Tare wt. (mg)	Total wt. (mg) 1	Total wt. (mg) 2	no. weighed	put into pans-initials	Comments
77	77	28.108	32.650	32.637	10	BBP	
78	78	31.385	35.989	35.973	10	BBP	
79	79	27.629	31.428	31.417	10	BBP	
80	80	29.660	32.598	32.586	10	BBP	
81	81	27.988	29.075	29.069	8	BBP	
82	82	28.963	36.207	36.190	10	BBP	
83	83	27.861	29.766	29.759	6	BBP	
84	84	29.847	32.887	32.877	9	BBP	
85	85	28.756	32.567	32.556	10	BBP	
86	86	28.843	32.963	32.952	10	BBP	
87	87	29.013	30.190	30.182	8	BBP	
88	88	29.477	32.682	32.671	10	BBP	
89	89	29.700	32.632	32.624	9	BBP	
90	90	27.987	31.449	31.444	10	BBP	
91	91	28.977	34.739	34.733	10	BBP	
92	92	53.837	59.201	59.188	10	BBP	
93	93	30.645	34.583	34.566	9	BBP	
94	94	27.408	33.074	33.056	10	BBP	
95	95	29.279	32.002	31.995	8	BBP	
96	96	29.196	34.082	34.057	~~10~~ 9	BBP	
97	97	28.497	31.575	31.563	9	BBP	
98	98	27.818	32.897	32.882	10	BBP	
99	99	27.840	33.913	33.897	9	BBP	
100	100	28.854	32.942	32.931	9	BBP	
101	101	29.519	30.426	30.419	6	BBP	
102	102	28.628	33.266	33.247	8	BBP	
103	103	30.283	34.747	34.726	10	BBP	
104	104	28.804	33.530	33.513	10	BBP	
105	105	27.999	30.633	30.621	10	BBP	
106	106	28.938	32.784	32.770	10	BBP	
107	107	28.294	33.957	33.938	10	BBP	
108	108	29.268	34.719	34.701	10	BBP	
109	109	30.082	34.510	34.474	10	BBP	
110	110	29.131	32.319	32.295	8	BBP	
111	111	28.883	34.389	34.357	9	BBP	
112	112	29.150	32.060	32.046	9	BBP	
113	113	27.375	29.972	29.960	10	BBP	
114	114	28.182	30.742	30.730	8	BBP	
115	115	29.015	32.219	32.210	8	BBP	
116	116	29.927	33.431	33.421	10	BBP	
117	117	27.274	30.177	30.170	9	BBP	
118	118	28.733	34.580	34.558	10	BBP	
119	119	28.161	33.655	33.624	10	BBP	

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator

WEIGHING DATA SHEET

See page _____ for information on drying times and temperatures, standard weights,etc.

Bkr. #	Pan #	Tare wt. (mg)	Total wt. (mg) 1	Total wt. (mg) 2	no. weighed	put into pans-initials	Comments
120	120	29.363	33.197	33.176	9	BBP	
121	121	29.242	34.874	34.843	9	BBP	
122	122	30.034	33.561	33,551	10	BBP	
123	123	28.104	32.629	32.609	10	BBP	
124	124	27.698	33.246	33.229	10	BBP	
125	125	27.148	28.962	28.957	7	BBP	
126	126	28.530	32.015	31.999	10	BBP	
127	127	29.995	34.001	33.996	8	BBP	
128	128	26.810	29.079	29.074	10	BBP	
129	129	27.725	30.563	30.543	9	BBP	
130	130	29.502	31.777	31.766	7	BBP	
131	131	27.653	29.474	29.467	9	BBP	
132	132	30.367	33.324	33.315	10	BBP	
133	133	27.985	33.188	33.167	10	BBP	
134	134	27.867	30.712	30.697	10	BBP	
135	135	28.702	33.723	33.702	10	BBP	
136	136	27.192	31.403	31.383	9	BBP	
137	137	29.640	32.503	32.492	10	BBP	
138	138	29.065	33.741	33.719	10	BBP	
139	139	29.610	32.629	32.609	10	BBP	
140	140	27.565	28.612	28.610	8	BBP	
141	141	28.194	31.265	31.250	8	BBP	
142	142	29.134	31.969	31.959	10	BBP	
143	143	28.404	31.465	31.448	10	BBP	
144	144	28.418	32.075	32.063	9	BBP	
145	145	28.682	31.042	31.033	10	BBP	
146	146	29.229	35.408	35.388	9	BBP	
147	147	28.706	33.202	33.194	10	BBP	
148	148	26.971	30.105	30.096	9	BBP	
149	149	29.425	32.375	32.359	9	BBP	
150	150	28.318	31.917	31.896	9	BBP	
151	151	28.693	32.413	32.390	9	BBP	
152	152	28.696	31.786	31.775	10	BBP	
153	153	30.393	33.675	33.666	10	BBP	
154	154	27.419	33.451	33.432	10	BBP	
155	155	28.074	30.658	30.655	10	BBP	
156	156	28.041	29.168	29.172	8	BBP	
157	157	28.106	31.008	31.005	9	BBP	
158	158	28.965	32.464	32.457	9	BBP	
159	159	29.573	32.376	32.364	7	BBP	
160	160	28.265	32.082	32.069	10	BBP	
161	161	28.730	32.289	32.279	9	BBP	
162	162	26.886	29.993	29.983	10	BBP	

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator _____

WEIGHING DATA SHEET

See page _____ for information on drying times and temperatures, standard weights,etc.

Bkr. #	Pan #	Tare wt. (mg)	Total wt. (mg) 1	Total wt. (mg) 2	no. weighed	put into pans-initials	Comments
163	163	27.476	31.436	31.415	9	BBP	
164	164	28.842	32.845	32.824	10	BBP	
165	165	29.245	32.462	32.446	10	BBP	
166	166	27.702	30.740	30.724	10	BBP	
167	167	30.495	33.714	33.694	9	BBP	
168	168	27.318	31.118	31.097	10	BBP	
169	169	28.795	31.216	31.220	10	MSR	
170	170	29.680	32.059	32.065	8	MSR	
171	171	30.032	31.059	31.068	7	MSR	
172	172	27.796	33.986	32.987	9	MSR	
173	173	28.640	31.272	31.277	9	MSR	
174	174	29.497	30.934	30.936	7	MSR	
175	175	28.261	33.363	33.368	10	MSR	
176	176	29.118	32.208	32.215	10	MSR	
177	177	28.029	32.322	32.322	8	MSR	
178	178	29.094	31.230	31.230	7	MSR	
179	179	28.222	30.405	30.402	9	MSR	
180	180	27.783	32.997	32.988	10	MSR	
181	181	29.467	32.594	32.601	7	MSR	
182	182	28.374	32.773	32.770	10	MSR	
183	183	27.705	32.168	32.163	10	MSR	
184	184	29.415	33.817	33.809	10	MSR	
185	185	27.948	31.786	31.785	9	MSR	
186	186	28.514	35.330	35.329	10	MSR	
187	187	28.222	30.719	30.723	9	MSR	
188	188	29.900	36.332	36.323	10	MSR	
189	189	27.888	31.571	31.569	9	MSR	
190	190	28.780	33.606	33.602	10	MSR	
191	191	28.244	33.399	33.393	10	MSR	
192	192	27.666	33.581	33.575	10	MSR	
193	193	27.013	30.296	30.293	9	MSR	
194	194	28.753	32.790	32.783	10	MSR	
195	195	29.789	35.609	35.607	10	MSR	
196	196	30.179	34.639	34.830	10	MSR	
197	197	29.604	32.635	32.636	9	MSR	
198	198	26.552	28.445	28.447	10	MSR	
199	199	28.178	31.648	31.647	9	MSR	1 missing
200	200	29.111	30.649	30.655	10	MSR	
201	201	28.307	5 34.33.991	33.976	9	MSR	
202	202	30.608	33.559	33.555	9	MSR	
203	203	26.496	30.717	30.708	10	MSR	
204	204	28.759	32.715	32.719	9	MSR	
205	205	28.701	31.411	31.398	10	MSR	

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator

WEIGHING DATA SHEET

See page _____ for information on drying times and temperatures, standard weights,etc.

Bkr. #	Pan #	Tare wt. (mg)	Total wt. (mg) 1	Total wt. (mg) 2	no. weighed	put into pans-initials	Comments
206	206	28.252	30.923	30.908	7	MSR	
207	207	29.390	33.214	33.196	10	BBP	
208	208	28.708	30.805	30.794	8	BBP	
209	209	28.780	32.163	32.150	6	BBP	
210	210	29.275	32.361	32.348	10	BBP	
211	211	30.274	34.394	34.376	9	BBP	
212	212	29.737	35.751	35.715	10	BBP	
213	213	28.832	31.599	31.579	9	BBP	
214	214	29.389	31.909	31.888	9	BBP	
215	215	27.808	30.884	30.856	8	BBP	
216	216	26.787	32.433	32.402	10	BBP	
217	217	27.439	31.771	31.743	10	BBP	
218	218	30.585	34.524	34.493	9	BBP	
219	219	28.110	31.429	31.405	10	BBP	
220	220	29.217	31.090	31.066	9	BBP	
221	221	29.004	34.814	34.778	10	BBP	
222	222	30.022	33.178	33.151	10	BBP	
223	223	30.294	34.169	34.154	8	BBP	
224	224	28.909	33.053	33.031	10	BBP	
225	225	31.275	34.789	34.781	10	BBP	
226	226	28.650	32.521	32.515	10	BBP	
227	227	28.742	33.454	33.448	10	BBP	
228	228	27.411	28.020	28.011	6	BBP	
229	229	27.653	29.732	29.723	10	BBP	
230	230	28.126	33.004	32.998	9	BBP	
231	231	31.506	34.232	34.224	10	BBP	
232	232	27.949	33.092	33.081	8	BBP	
233	233	29.466	33.256	33.249	10	BBP	
234	234	28.214	33.156	33.147	10	BBP	
235	235	27.589	30.972	30.963	9	BBP	
236	236	26.884	33.153	33.142	10	BBP	
237	237	25.633	31.513	31.505	10	BBP	
238	238	28.270	31.933	31.926	10	BBP	
239	239	29.246	33.016	33.006	10	BBP	
240	240	28.627	32.848	32.840	10	BBP	
241	241	29.949	35.372	35.364	10	BBP	
242	242	31.298	36.431	36.425	10	BBP	
243	243	28.356	31.266	31.263	10	BBP	
244	244	27.371	30.165	30.158	10	BBP	
245	245	27.824	30.484	30.476	9	BBP	
246	246	30.088	34.046	34.039	10	BBP	
247	247	29.608	34.376	34.365	9	BBP	
248	248	29.987	34.473	34.465	8	BBP	
249	249	29.292	32.057	32.048	9	BBP	
250	250	27.415	29.675	29.667	10	BBP	

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-1 Client CH2M Hill Investigator

WEIGHING DATA SHEET

See page _____ for information on drying times and temperatures, standard weights,etc.

Bkr. #	Pan #	Tare wt. (mg)	Total wt. (mg) 1	Total wt. (mg) 2	no. weighed	put into pans-initials	Comments
251	251	28.410	34.572	34.562	9	BBP	
252	252	29.006	31.972	31.965	10	BBP	
253	253	29.521	33.348	33.339	9	BBP	
254	254	28.794	31.474	31.467	10	BBP	
255	255	27.720	29.196	29.185	8	BBP	
256	256	28.355	30.459	30.449	9	BBP	
257	257						
258	258						
259	259						
260	260						
261	261						
262	262						
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264	264						
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270	270						
271	271						
272	272						
273	273						
274	274						
275	275						
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295	295						

Chesapeake Cultures

P.O. Box 507 Hayes, VA 23072 (804) 693-4046 (804)694-4704 fax
www.c-cultures.com
e-mail growfish@c-cultures.com

NAS

Shipment Information

Species *Hyalella azteca* Date *4/25/04*

Age *4-5d on shipt ~1.5mm* P.O. No. *verbal*

Quanitity *3400+* Invoice No. *5014*

Temperature *24°C* Salinity *—* pH *7.96*

Notes *Thank you!*

RECEIVED 4-26-05
-GSI

Biologist *Elizabeth Williams*

✳ *Please inspect shipment and report any problem immediately* ✳

Test Number: P727-1

Freshwater Sediment Test
28-day Hyalella azteca

BKR	NAS SMPL	CLIENT DESCRIP	REPL	
189	9952F	Contol	1	
3	9952F	Contol	2	
60	9952F	Contol	3	
223	9952F	Contol	4	
207	9952F	Contol	5	
59	9952F	Contol	6	
226	9952F	Contol	7	
79	9952F	Contol	8	wq replicate
137	9953F	05164433	1	
21	9953F	05164433	2	
163	9953F	05164433	3	
103	9953F	05164433	4	
153	9953F	05164433	5	
4	9953F	05164433	6	
157	9953F	05164433	7	
194	9953F	05164433	8	wq replicate
1	9954F	05164434	1	
95	9954F	05164434	2	
176	9954F	05164434	3	
165	9954F	05164434	4	
256	9954F	05164434	5	
166	9954F	05164434	6	
250	9954F	05164434	7	
142	9954F	05164434	8	wq replicate
167	9955F	05164435	1	
193	9955F	05164435	2	
64	9955F	05164435	3	
159	9955F	05164435	4	
85	9955F	05164435	5	
130	9955F	05164435	6	
50	9955F	05164435	7	
235	9955F	05164435	8	wq replicate
156	9956F	05164436	1	
140	9956F	05164436	2	
125	9956F	05164436	3	
37	9956F	05164436	4	
171	9956F	05164436	5	
228	9956F	05164436	6	
81	9956F	05164436	7	
42	9956F	05164436	8	wq replicate
211	9957F	05164437	1	
73	9957F	05164437	2	
187	9957F	05164437	3	
148	9957F	05164437	4	
6	9957F	05164437	5	
239	9957F	05164437	6	
217	9957F	05164437	7	
28	9957F	05164437	8	wq replicate
47	9958F	05164440	1	
39	9958F	05164440	2	
132	9958F	05164440	3	
231	9958F	05164440	4	
128	9958F	05164440	5	
26	9958F	05164440	6	
169	9958F	05164440	7	
58	9958F	05164440	8	wq replicate

Test Number: P727-1

Freshwater Sediment Test
28-day Hyalella azteca

BKR	NAS SMPL	CLIENT DESCRIP	REPL	
34	9959F	05164441	1	
161	9959F	05164441	2	
35	9959F	05164441	3	
214	9959F	05164441	4	
204	9959F	05164441	5	
152	9959F	05164441	6	
66	9959F	05164441	7	
44	9959F	05164441	8	wq replicate
244	9960F	05164442	1	
254	9960F	05164442	2	
10	9960F	05164442	3	
48	9960F	05164442	4	
80	9960F	05164442	5	
105	9960F	05164442	6	
110	9960F	05164442	7	
129	9960F	05164442	8	wq replicate
61	9961F	05164443	1	
215	9961F	05164443	2	
7	9961F	05164443	3	
117	9961F	05164443	4	
181	9961F	05164443	5	
178	9961F	05164443	6	
114	9961F	05164443	7	
131	9961F	05164443	8	wq replicate
97	9962F	05164449	1	
31	9962F	05164449	2	
112	9962F	05164449	3	
32	9962F	05164449	4	
90	9962F	05164449	5	
113	9962F	05164449	6	
245	9962F	05164449	7	
150	9962F	05164449	8	wq replicate
233	9966F	05164439	1	
54	9966F	05164439	2	
190	9966F	05164439	3	
107	9966F	05164439	4	
71	9966F	05164439	5	
43	9966F	05164439	6	
46	9966F	05164439	7	
119	9966F	05164439	8	wq replicate
84	9967F	05164450	1	
120	9967F	05164450	2	
141	9967F	05164450	3	
179	9967F	05164450	4	
210	9967F	05164450	5	
116	9967F	05164450	6	
149	9967F	05164450	7	
25	9967F	05164450	8	wq replicate
143	9968F	05164451	1	
255	9968F	05164451	2	
184	9968F	05164451	3	
12	9968F	05164451	4	
8	9968F	05164451	5	
57	9968F	05164451	6	
122	9968F	05164451	7	
126	9968F	05164451	8	wq replicate

Freshwater Sediment Test
28-day Hyalella azteca

BKR	NAS SMPL	CLIENT DESCRIP	REPL	
70	9969F	05164452	1	
202	9969F	05164452	2	
174	9969F	05164452	3	
243	9969F	05164452	4	
18	9969F	05164452	5	
208	9969F	05164452	6	
15	9969F	05164452	7	
115	9969F	05164452	8	wq replicate
102	9970F	05164453	1	
93	9970F	05164453	2	
177	9970F	05164453	3	
98	9970F	05164453	4	
38	9970F	05164453	5	
11	9970F	05164453	6	
236	9970F	05164453	7	
136	9970F	05164453	8	wq replicate
53	9971F	05164454	1	
162	9971F	05164454	2	
134	9971F	05164454	3	
123	9971F	05164454	4	
27	9971F	05164454	5	
249	9971F	05164454	6	
229	9971F	05164454	7	
49	9971F	05164454	8	wq replicate
16	9972F	05164455	1	
89	9972F	05164455	2	
173	9972F	05164455	3	
67	9972F	05164455	4	
213	9972F	05164455	5	
155	9972F	05164455	6	
246	9972F	05164455	7	
252	9972F	05164455	8	wq replicate
170	9973F	05164456	1	
237	9973F	05164456	2	
83	9973F	05164456	3	
88	9973F	05164456	4	
30	9973F	05164456	5	
145	9973F	05164456	6	
203	9973F	05164456	7	
56	9973F	05164456	8	wq replicate
19	9974F	05164457	1	
139	9974F	05164457	2	
72	9974F	05164457	3	
222	9974F	05164457	4	
160	9974F	05164457	5	
197	9974F	05164457	6	
219	9974F	05164457	7	
206	9974F	05164457	8	wq replicate
209	9975F	05164459	1	
40	9975F	05164459	2	
100	9975F	05164459	3	
24	9975F	05164459	4	
75	9975F	05164459	5	
158	9975F	05164459	6	
9	9975F	05164459	7	
29	9975F	05164459	8	wq replicate

Test Number: P727-1

Freshwater Sediment Test
28-day Hyalella azteca

BKR	NAS SMPL	CLIENT DESCRIP	REPL	
196	9976F	05164460	1	
253	9976F	05164460	2	
147	9976F	05164460	3	
227	9976F	05164460	4	
111	9976F	05164460	5	
241	9976F	05164460	6	
182	9976F	05164460	7	
82	9976F	05164460	8	wq replicate
225	9977F	05164461	1	
164	9977F	05164461	2	
205	9977F	05164461	3	
183	9977F	05164461	4	
144	9977F	05164461	5	
106	9977F	05164461	6	
238	9977F	05164461	7	
23	9977F	05164461	8	wq replicate
87	9981F	05164468	1	
20	9981F	05164468	2	
36	9981F	05164468	3	
198	9981F	05164468	4	
220	9981F	05164468	5	
200	9981F	05164468	6	
76	9981F	05164468	7	
101	9981F	05164468	8	wq replicate
185	9982F	05164469	1	
230	9982F	05164469	2	
104	9982F	05164469	3	
13	9982F	05164469	4	
151	9982F	05164469	5	
65	9982F	05164469	6	
199	9982F	05164469	7	
127	9982F	05164469	8	wq replicate
94	9983F	05164470	1	
124	9983F	05164470	2	
121	9983F	05164470	3	
68	9983F	05164470	4	
172	9983F	05164470	5	
175	9983F	05164470	6	
192	9983F	05164470	7	
17	9983F	05164470	8	wq replicate
5	9984F	05164471	1	
154	9984F	05164471	2	
251	9984F	05164471	3	
232	9984F	05164471	4	
186	9984F	05164471	5	
188	9984F	05164471	6	
63	9984F	05164471	7	
51	9984F	05164471	8	wq replicate
92	9989F	05164478	1	
201	9989F	05164478	2	
118	9989F	05164478	3	
52	9989F	05164478	4	
99	9989F	05164478	5	
180	9989F	05164478	6	
96	9989F	05164478	7	
69	9989F	05164478	8	wq replicate

BKR	NAS SMPL	CLIENT DESCRIP	REPL	
55	9990F	05164476	1	
109	9990F	05164476	2	
168	9990F	05164476	3	
86	9990F	05164476	4	
77	9990F	05164476	5	
33	9990F	05164476	6	
234	9990F	05164476	7	
240	9990F	05164476	8	wq replicate
242	9994F	05164486	1	
216	9994F	05164486	2	
108	9994F	05164486	3	
146	9994F	05164486	4	
248	9994F	05164486	5	
221	9994F	05164486	6	
212	9994F	05164486	7	
195	9994F	05164486	8	wq replicate
218	9998F	05164489	1	
22	9998F	05164489	2	
74	9998F	05164489	3	
2	9998F	05164489	4	
14	9998F	05164489	5	
41	9998F	05164489	6	
62	9998F	05164489	7	
224	9998F	05164489	8	wq replicate
135	0002G	05164496	1	
138	0002G	05164496	2	
78	0002G	05164496	3	
91	0002G	05164496	4	
45	0002G	05164496	5	
133	0002G	05164496	6	
247	0002G	05164496	7	
191	0002G	05164496	8	wq replicate

Gerald Irissarri

From: Dennis.Shelton@CH2M.com
Sent: Wednesday, April 27, 2005 9:33 AM
To: Mike.Stanaway@CH2M.com; girissarri@nwaquatic.com
Subject: Hardness at Upper Columbia

rad98FC2(1).xls

Mike and Gerald - Attached are the hardness data I had available for the Upper Columbia. The hardness ranges from 53 to 88 mg/kg as CaCO3. Given that metals are a main focus, we should use similar hardness water for the bioassays. Please use water with hardness of 70 + or - 5 mg/kg as CaCO3. Please disregard my earlier email regarding hardness. Thanks - Dennis

Gerald Irissarri

From: Mike.Stanaway@CH2M.com
Sent: Friday, April 22, 2005 11:28 AM
To: girissarri@nwaquatic.com
Cc: Nahide.Gulensoy@CH2M.com
Subject: RE: Recommended Test Conditions for Conducting a 28-day Sediment Toxicity Test with hyalella

Hi Gerald,

The reference sites (labeled as stations on chain of custody) are:

9983F RM 732R1
9989F RM 726R1 These will be shipped first
9990F RM 721R1

9994F RM 705R1
9998F RM 686R1 These will arrive on Tuesday
10026 RM 685R1

I also need to talk to you about the reconstituted water hardness in the test.

Thanks
Mike

-----Original Message-----
From: Gerald Irissarri [mailto:girissarri@nwaquatic.com]
Sent: Monday, February 28, 2005 9:59 AM
To: Stanaway, Mike/CVO
Subject: RE: Recommended Test Conditions for Conducting a 28-day Sediment Toxicity Test with hyalella

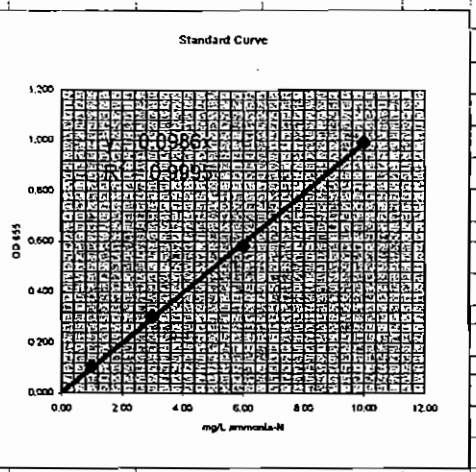
AMMONIA EXPOSURE BENCHSHEETS AND ANALYSIS

Total Ammonia-N in ~~Sediment Pore~~ Water: Computation Worksheet

Salicylate Method (SOP #5492)

Result

	Sample description	Dilution factor	OD_{655}	NH_3-N (mg/L)	pH	Salinity (ppt)
	Blank	-----	-----	-----		
	1.0 mg/L NH_3-N Std.	-----	0.107	1.00		
	3.0 mg/L NH_3-N Std.	-----	0.302	3.00		
	6.0 mg/L NH_3-N Std.	-----	0.581	6.00		
	10.0 mg/L NH_3-N Std.	-----	0.990	10.00		
	3.0 mg/L spike	-----	0.287	2.91		
	3.0 mg/L spike dupl.	-----	0.291	2.95		
	5.0 mg/L 2nd source		0.417	4.23		
1.	17	1	0.043	0.44		
2.	23	1	0.049	0.50		
3.	25	1	0.040	0.41		
4.	28	1	0.004	ND		
5.	29	1	0.029	0.29		
6.	42	1	0.010	0.10		
7.	44	1	0.020	0.20		
8.	49	1	0.010	0.10		
9.	51	1	0.038	0.39		
10.	56	1	0.033	0.33		
11.	58	1	0.048	0.49		
12.	69	1	0.021	0.21		
13.	79	1	0.051	0.52		
14.	82	1	0.026	0.26		
15.	101	1	0.012	0.12		
16.	115	1	0.013	0.13		
17.	119	1	0.020	0.20		
18.	126	1	0.012	0.12		
19.	127	1	0.032	0.32		
20.	129	1	0.053	0.54		
21.	131	1	0.010	0.10		
22.	136	1	0.020	0.20		
23.	142	1	0.034	0.34		
24.	150	1	0.087	0.88		
25.	191	1	0.048	0.49		
26.	194	1	0.028	0.28		
27.	195	1	0.027	0.27		
28.	206	1	0.028	0.28		
29.	224	1	0.032	0.32		
30.	235	1	0.015	0.15		
31.	240	1	0.012	0.12		
32.	252	1	0.011	0.11		
33.						
34.						
35.						
36.						



Reporting limit (mg/L) =	0.1
Recovery (%) =	97.7
Precision (RPD) =	-1.38
2nd source (%) =	84.6
Sample volume (ml):	0.50
Dilution factor	1

Sample Set Description:

Proj. No.: 727-1
Test Day: 0 (4-28-05)
Species: *Hyalella*

Overlying water

Analyst: RSC
Date analysed: 5/9/2005

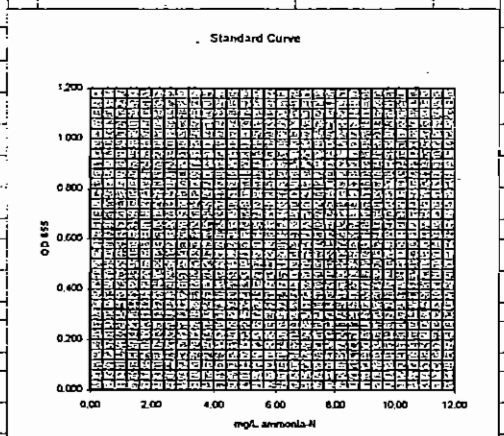
RSC

Total Ammonia-N in ~~Sediment Pore~~ Water: Computation Worksheet

Salicylate Method (SOP #5492)

Result

	Sample description	Dilution factor	OD655	NH3-N (mg/L)	pH	Salinity (ppt)
	Blank	-----	---	---		
	1.0 mg/L NH3-N Std.	-----	.107	1.00		
	3.0 mg/L NH3-N Std.	-----	.302	3.00		
	6.0 mg/L NH3-N Std.	-----	.581	6.00		
	10.0 mg/L NH3-N Std.	-----	.990	10.00		
	3.0 mg/L spike	-----	.287			
	3.0 mg/L spike dupl.	-----	.291			
	5.0 mg/L 2nd source		.417			
1.	17	1	.043			
2.	23	1	.049			
3.	25	1	.040			
4.	28	1	.004			
5.	29	1	.029			
6.	42	1	.010			
7.	44	1	.020			
8.	49	1	.010			
9.	51	1	.038			
10.	56	1	.033			
11.	58	1	.048			
12.	69	1	.021			
13.	79	1	.057			
14.	82	1	.026			
15.	101	1	.012			
16.	115	1	.013			
17.	119	1	.020			
18.	126	1	.012			
19.	127	1	.032			
20.	129	1	.053			
21.	131	1	.010			
22.	136	1	.020			
23.	142	1	.034			
24.	150	1	.067			
25.	191	1	.648			
26.	194	1	.028			
27.	195	1	.027			
28.	206	1	.028			
29.	224	1	.032			
30.	235	1	.015			
31.	240	1	.012			
32.	252	1	.011			
33.						
34.						
35.						
36.						



Reporting limit (mg/L) =	0.1
Recovery (%) =	#VALUE!
Precision (RPD) =	#VALUE!
2nd source (%) =	#VALUE!
Sample volume (ml):	0.50
Dilution factor	1

Sample Set Description:

Proj. No.: 727-1
Test Day: 0 (4-28-05)
Species: *Hyalella*

Overlying water

Analyst: RSC
Date analysed: 5/9/2005

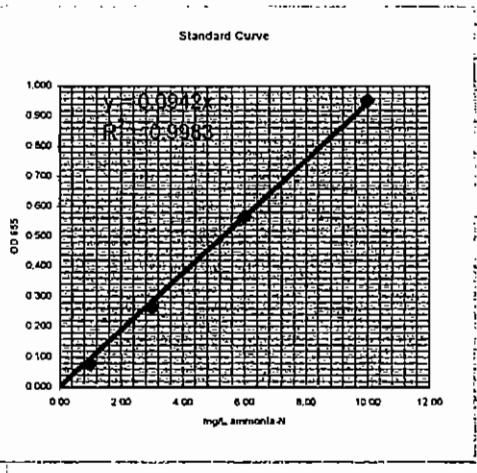
RR

Total Ammonia-N in ~~Sediment Pore~~ Water: Computation Worksheet

Salicylate Method (SOP #5492)

Result

	Sample description	Dilution factor	OD_{655}	NH_3-N (mg/L)	pH	Salinity (ppt)
	Blank	-----	-----	-----		
	1.0 mg/L NH_3-N Std.	-----	0.077	1.00		
	3.0 mg/L NH_3-N Std.	-----	0.263	3.00		
	6.0 mg/L NH_3-N Std.	-----	0.565	6.00		
	10.0 mg/L NH_3-N Std.	-----	0.950	10.00		
	3.0 mg/L spike	-----	0.278	2.95		
	3.0 mg/L spike dupl.	-----	0.278	2.95		
	5.0 mg/L 2nd source		0.390	4.14		
1.	17	1	0.000	ND		
2.	23	1	0.000	ND		
3.	25	1	0.000	ND		
4.	28	1	0.000	ND		
5.	29	1	0.002	ND		
6.	42	1	0.000	ND		
7.	44	1	0.000	ND		
8.	49	1	0.000	ND		
9.	51	1	0.000	ND		
10.	56	1	0.000	ND		
11.	58	1	0.000	ND		
12.	69	1	0.000	ND		
13.	79	1	0.008	ND		
14.	82	1	0.011	0.12		
15.	101	1	0.000	ND		
16.	115	1	0.000	ND		
17.	119	1	0.000	ND		
18.	126	1	0.000	ND		
19.	127	1	0.102	1.08		
20.	129	1	0.007	ND		
21.	131	1	0.000	ND		
22.	136	1	0.000	ND		
23.	142	1	0.000	ND		
24.	150	1	0.007	ND		
25.	191	1	0.000	ND		
26.	194	1	0.000	ND		
27.	195	1	0.002	ND		
28.	206	1	0.000	ND		
29.	224	1	0.000	ND		
30.	235	1	0.049	0.52		
31.	240	1	0.000	ND		
32.	252	1	0.000	ND		
33.						
34.						
35.						
36.						



Reporting limit (mg/L) =	0.1
Recovery (%) =	98.3
Precision (RPD) =	0.00
2nd source (%) =	82.7
Sample volume (ml):	0.50
Dilution factor	1

Sample Set Description:

Proj. No.: 727-1
Test Day: 28 (5-26-05)
Species: *Hyalella*

Overlying water

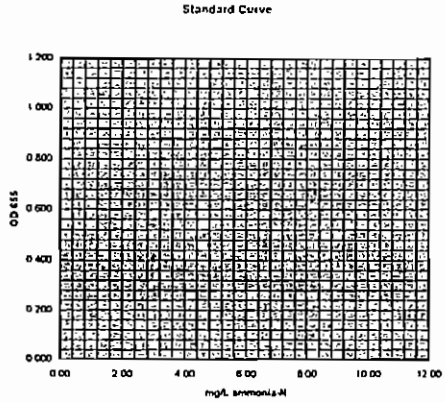
Analyst: RSC
Date analysed: 6/7/2005

Rec

Total Ammonia-N in ~~Sediment Pore~~ Water: Computation Worksheet
Salicylate Method (SOP #5492)

Result

Sample description	Dilution factor	OD_{655}	NH_3-N (mg/L)	pH	Salinity (ppt)
Blank	-----	-----	-----		
1.0 mg/L NH_3-N Std.	-----	.077	1.00	.077	
3.0 mg/L NH_3-N Std.	-----	.240	3.00	.263	
6.0 mg/L NH_3-N Std.	-----	.505	6.00	.565	
10.0 mg/L NH_3-N Std.	-----	.750	10.00	.950	
3.0 mg/L spike	-----	.253		.278	
3.0 mg/L spike dupl.	-----	.253		.278	
5.0 mg/L 2nd source		.355		.390	



	Sample description	Dilution factor	OD_{655}
1.	17	1	.000
2.	23	1	.000
3.	25	1	.000
4.	28	1	.000
5.	29	1	.002
6.	42	1	.000
7.	44	1	.000
8.	49	1	.000
9.	51	1	.000
10.	56	1	.000
11.	58	1	.000
12.	69	1	.000
13.	79	1	.008
14.	82	1	.011
15.	101	1	.000
16.	115	1	.000
17.	119	1	.000
18.	126	1	.000
19.	127	1	.102
20.	129	1	.007
21.	131	1	.000
22.	136	1	.000
23.	142	1	.000
24.	150	1	.007
25.	191	1	.000
26.	194	1	.000
27.	195	1	.002
28.	206	1	.000
29.	224	1	.000
30.	235	1	.049
31.	240	1	.006
32.	252	1	.000
33.			
34.			
35.			
36.			

Reporting limit (mg/L) =	0.1
Recovery (%) =	#VALUE!
Precision (RPD) =	#VALUE!
2nd source (%) =	#VALUE!
Sample volume (ml):	0.50
Dilution factor	1

Sample Set Description:
Proj. No.: 727-1
Test Day: 28 (5-26-05)
Species: *Hyalella*

Overlying water

Analyst: RSC
Date analysed: 6/7/2005

TEST DATA ANALYSIS RECORDS

Test Number: P727-1

Freshwater Sediment Test
28-day Hyalella azteca

Endpoints Data Entry and Calculations File

BKR=beaker number
INIT=initial number
SURV=number survivors
MORT=number dead=INIT-SURV
PSURV=%survival=100(SURV/INIT)
PMORT=%mortality=100(MORT/INIT)

TARE WT= ashed weight of pan used for that replicate at test termination (mg), or dry weight of pan if ash-free dry weight is not an endpoint
WT COUNT= number of test organisms weighed at test end
DRY WT= TARE WT + dry weight of test organisms recovered at test termination (mg)
TWT=total dry weight=DRY WT-TARE WT
WT=average individual dry weight=TWT/WT COUNT

Tare wt, Dry wt & Wt. Count verified 6-13-05 by LKN
Need to verify survival yet

Survival verified 6-17-05 by GJI

INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL		INIT	SURV	MORT	PSURV	PMORT	TARE WT (mg)	WT COUNT	DRY WT (mg)	TWT (mg)	WT (mg)
1	189	9952F	Contol	1		10	9	1	90.0	10.0	27.888	9	31.569	3.68	0.41
2	3	9952F	Contol	2		10	10	0	100.0	0.0	28.074	10	32.300	4.23	0.42
3	60	9952F	Contol	3		10	10	0	100.0	0.0	29.768	10	34.085	4.32	0.43
4	223	9952F	Contol	4		10	8	2	80.0	20.0	30.294	8	34.154	3.86	0.48
5	207	9952F	Contol	5		10	10	0	100.0	0.0	29.390	10	33.196	3.81	0.38
6	59	9952F	Contol	6		10	10	0	100.0	0.0	29.252	10	32.921	3.67	0.37
7	226	9952F	Contol	7		10	10	0	100.0	0.0	28.650	10	32.515	3.87	0.39
8	79	9952F	Contol	8	wq replicate	10	10	0	100.0	0.0	27.629	10	31.417	3.79	0.38
9	137	9953F	05164433	1		10	10	0	100.0	0.0	29.640	10	32.492	2.85	0.29
10	21	9953F	05164433	2		10	10	0	100.0	0.0	27.233	10	31.732	4.50	0.45
11	163	9953F	05164433	3		10	9	1	90.0	10.0	27.476	9	31.415	3.94	0.44
12	103	9953F	05164433	4		10	10	0	100.0	0.0	30.283	10	34.726	4.44	0.44
13	153	9953F	05164433	5		10	10	0	100.0	0.0	30.393	10	33.666	3.27	0.33
14	4	9953F	05164433	6		10	9	1	90.0	10.0	28.616	9	32.134	3.52	0.39
15	157	9953F	05164433	7		10	9	1	90.0	10.0	28.106	9	31.005	2.90	0.32
16	194	9953F	05164433	8	wq replicate	10	10	0	100.0	0.0	28.753	10	32.783	4.03	0.40
17	1	9954F	05164434	1		10	10	0	100.0	0.0	30.551	10	33.270	2.72	0.27
18	95	9954F	05164434	2		10	8	2	80.0	20.0	29.279	8	31.995	2.72	0.34
19	176	9954F	05164434	3		10	10	0	100.0	0.0	29.118	10	32.215	3.10	0.31
20	165	9954F	05164434	4		10	10	0	100.0	0.0	29.245	10	32.446	3.20	0.32
21	256	9954F	05164434	5		10	9	1	90.0	10.0	28.355	9	30.449	2.09	0.23
22	166	9954F	05164434	6		10	10	0	100.0	0.0	27.702	10	30.724	3.02	0.30
23	250	9954F	05164434	7		10	10	0	100.0	0.0	27.415	10	29.667	2.25	0.23
24	142	9954F	05164434	8	wq replicate	10	10	0	100.0	0.0	29.134	10	31.959	2.83	0.28
25	167	9955F	05164435	1		10	9	1	90.0	10.0	30.495	9	33.694	3.20	0.36
26	193	9955F	05164435	2		10	9	1	90.0	10.0	27.013	9	30.293	3.28	0.36
27	64	9955F	05164435	3		10	8	2	80.0	20.0	27.104	8	29.804	2.70	0.34
28	159	9955F	05164435	4		10	9	1	90.0	10.0	29.573	7	32.364	2.79	0.40
29	85	9955F	05164435	5		10	10	0	100.0	0.0	28.756	10	32.558	3.80	0.38
30	130	9955F	05164435	6		10	7	3	70.0	30.0	29.502	7	31.766	2.26	0.32
31	50	9955F	05164435	7		10	6	4	60.0	40.0	29.743	6	31.295	1.55	0.26
32	235	9955F	05164435	8	wq replicate	10	9	1	90.0	10.0	27.589	9	30.963	3.37	0.37

INITIAL WEIGHT

pan #	tare wt (mg)	final wt (mg)	wt count	avg. wt/ organism
1	28.546	29.157	20	0.031
2	28.524	29.183	20	0.033
3	28.644	29.296	20	0.033
4	29.251	29.963	20	0.036
5	29.215	29.845	20	0.032

	SURV	MORT	PSURV	PMORT	WT
Mean	9.6	0.4	96.3	3.8	0.41
SD	0.7	0.7	7.4	7.4	0.04
n	8	8	8	8	8
Mean	9.6	0.4	96.3	3.8	0.38
SD	0.5	0.5	5.2	5.2	0.06
n	8	8	8	8	8
Mean	9.6	0.4	96.3	3.8	0.29
SD	0.7	0.7	7.4	7.4	0.04
n	8	8	8	8	8
Mean	8.4	1.6	83.8	16.3	0.35
SD	1.3	1.3	13.0	13.0	0.04
n	8	8	8	8	8

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Test Number: P727-1

Freshwater Sediment Test
28-day Hyalella azteca

INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL		INIT	SURV	MORT	PSURV	PMORT	TARE WT (mg)	WT COUNT	DRY WT (mg)	TWT (mg)	WT (mg)						
																	SURV	MORT	PSURV	PMORT	WT
33	156	9956F	05164436	1		10	8	2	80.0	20.0	28.041	8	29.172	1.13	0.14						
34	140	9956F	05164436	2		10	8	2	80.0	20.0	27.565	8	28.610	1.05	0.13						
35	125	9956F	05164436	3		10	7	3	70.0	30.0	27.148	7	28.957	1.81	0.26						
36	37	9956F	05164436	4		10	7	3	70.0	30.0	32.941	7	34.200	1.26	0.18						
37	171	9956F	05164436	5		10	7	3	70.0	30.0	30.032	7	31.068	1.04	0.15	Mean	7.5	2.5	75.0	25.0	0.17
38	228	9956F	05164436	6		10	6	4	60.0	40.0	27.411	6	28.011	0.60	0.10	SD	0.9	0.9	9.3	9.3	0.05
39	81	9956F	05164436	7		10	8	2	80.0	20.0	27.988	8	29.069	1.08	0.14	n	8	8	8	8	8
40	42	9956F	05164436	8	wq replicate	10	9	1	90.0	10.0	28.041	9	30.125	2.08	0.23						
41	211	9957F	05164437	1		10	9	1	90.0	10.0	30.274	9	34.376	4.10	0.46						
42	73	9957F	05164437	2		10	10	0	100.0	0.0	28.450	10	32.851	4.40	0.44						
43	187	9957F	05164437	3		10	9	1	90.0	10.0	28.222	9	30.723	2.50	0.28						
44	148	9957F	05164437	4		10	9	1	90.0	10.0	26.971	9	30.096	3.13	0.35						
45	6	9957F	05164437	5		10	9	1	90.0	10.0	29.062	9	33.955	4.89	0.54	Mean	9.5	0.5	95.0	5.0	0.41
46	239	9957F	05164437	6		10	10	0	100.0	0.0	29.246	10	33.006	3.76	0.38	SD	0.5	0.5	5.3	5.3	0.08
47	217	9957F	05164437	7		10	10	0	100.0	0.0	27.439	10	31.743	4.30	0.43	n	8	8	8	8	8
48	28	9957F	05164437	8	wq replicate	10	10	0	100.0	0.0	29.403	10	33.622	4.22	0.42						
49	47	9958F	05164440	1		10	9	1	90.0	10.0	28.391	9	30.932	2.54	0.28						
50	39	9958F	05164440	2		10	10	0	100.0	0.0	27.028	10	29.385	2.36	0.24						
51	132	9958F	05164440	3		10	10	0	100.0	0.0	30.387	10	33.315	2.93	0.29						
52	231	9958F	05164440	4		10	10	0	100.0	0.0	31.506	10	34.224	2.72	0.27						
53	128	9958F	05164440	5		10	10	0	100.0	0.0	26.810	10	29.074	2.26	0.23	Mean	9.4	0.6	93.8	6.3	0.27
54	26	9958F	05164440	6		10	7	3	70.0	30.0	29.175	7	31.885	2.71	0.39	SD	1.1	1.1	10.6	10.6	0.06
55	169	9958F	05164440	7		10	10	0	100.0	0.0	28.795	10	31.220	2.43	0.24	n	8	8	8	8	8
56	58	9958F	05164440	8	wq replicate	10	9	1	90.0	10.0	28.152	9	29.998	1.85	0.21						
57	34	9959F	05164441	1		10	9	1	90.0	10.0	28.250	9	31.334	3.08	0.34						
58	161	9959F	05164441	2		10	9	1	90.0	10.0	28.730	9	32.279	3.55	0.39						
59	35	9959F	05164441	3		10	9	1	90.0	10.0	28.682	9	31.806	3.12	0.35						
60	214	9959F	05164441	4		10	9	1	90.0	10.0	29.389	9	31.888	2.50	0.28						
61	204	9959F	05164441	5		10	9	1	90.0	10.0	28.759	9	32.719	3.96	0.44	Mean	9.4	0.6	93.8	6.3	0.37
62	152	9959F	05164441	6		10	10	0	100.0	0.0	28.696	10	31.775	3.08	0.31	SD	0.5	0.5	5.2	5.2	0.06
63	66	9959F	05164441	7		10	10	0	100.0	0.0	28.026	10	32.677	4.65	0.47	n	8	8	8	8	8
64	44	9959F	05164441	8	wq replicate	10	10	0	100.0	0.0	28.494	10	32.186	3.69	0.37						
65	244	9960F	05164442	1		10	10	0	100.0	0.0	27.371	10	30.158	2.79	0.28						
66	254	9960F	05164442	2		10	10	0	100.0	0.0	28.794	10	31.467	2.67	0.27						
67	10	9960F	05164442	3		10	9	1	90.0	10.0	28.226	9	31.251	3.03	0.34						
68	48	9960F	05164442	4		10	10	0	100.0	0.0	28.545	10	32.015	3.47	0.35						
69	80	9960F	05164442	5		10	10	0	100.0	0.0	29.660	10	32.586	2.93	0.29	Mean	9.5	0.5	95.0	5.0	0.31
70	105	9960F	05164442	6		10	10	0	100.0	0.0	27.999	10	30.621	2.62	0.26	SD	0.8	0.8	7.6	7.6	0.05
71	110	9960F	05164442	7		10	8	2	80.0	20.0	29.131	8	32.295	3.16	0.40	n	8	8	8	8	8
72	129	9960F	05164442	8	wq replicate	10	9	1	90.0	10.0	27.725	9	30.543	2.82	0.31						

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Freshwater Sediment Test
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INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL		INIT	SURV	MORT	PSURV	PMORT	TARE WT (mg)	WT COUNT	DRY WT (mg)	TWT (mg)	WT (mg)						
																	SURV	MORT	PSURV	PMORT	WT
73	61	9961F	05164443	1		10	9	1	90.0	10.0	29.171	9	32.376	3.21	0.36						
74	215	9961F	05164443	2		10	8	2	80.0	20.0	27.808	8	30.856	3.05	0.38						
75	7	9961F	05164443	3		10	8	2	80.0	20.0	29.965	8	31.844	1.88	0.23						
76	117	9961F	05164443	4		10	9	1	90.0	10.0	27.274	9	30.170	2.90	0.32						
77	181	9961F	05164443	5		10	7	3	70.0	30.0	29.467	7	32.601	3.13	0.45	Mean	8.1	1.9	81.3	18.8	0.32
78	178	9961F	05164443	6		10	7	3	70.0	30.0	29.094	7	31.230	2.14	0.31	SD	0.8	0.8	8.3	8.3	0.08
79	114	9961F	05164443	7		10	8	2	80.0	20.0	28.182	8	30.730	2.55	0.32	n	8	8	8	8	8
80	131	9961F	05164443	8	wq replicate	10	9	1	90.0	10.0	27.653	9	29.467	1.81	0.20						
81	97	9962F	05164449	1		10	9	1	90.0	10.0	28.497	9	31.563	3.07	0.34						
82	31	9962F	05164449	2		10	10	0	100.0	0.0	28.566	10	32.636	4.07	0.41						
83	112	9962F	05164449	3		10	9	1	90.0	10.0	29.150	9	32.046	2.90	0.32						
84	32	9962F	05164449	4		10	10	0	100.0	0.0	28.046	10	31.163	3.12	0.31						
85	90	9962F	05164449	5		10	10	0	100.0	0.0	27.987	10	31.444	3.46	0.35	Mean	9.5	0.5	95.0	5.0	0.33
86	113	9962F	05164449	6		10	10	0	100.0	0.0	27.375	10	29.960	2.59	0.26	SD	0.5	0.5	5.3	5.3	0.05
87	245	9962F	05164449	7		10	9	1	90.0	10.0	27.824	9	30.476	2.65	0.29	n	8	8	8	8	8
88	150	9962F	05164449	8	wq replicate	10	9	1	90.0	10.0	28.318	9	31.896	3.58	0.40						
89	233	9966F	05164439	1		10	10	0	100.0	0.0	29.466	10	33.249	3.78	0.38						
90	54	9966F	05164439	2		10	10	0	100.0	0.0	29.020	10	37.360	8.34	0.83						
91	190	9966F	05164439	3		10	10	0	100.0	0.0	28.780	10	33.602	4.82	0.48						
92	107	9966F	05164439	4		10	10	0	100.0	0.0	28.294	10	33.938	5.64	0.56						
93	71	9966F	05164439	5		10	8	2	80.0	20.0	27.779	8	33.200	5.42	0.68	Mean	9.4	0.6	93.8	6.3	0.59
94	43	9966F	05164439	6		10	8	2	80.0	20.0	28.294	8	32.555	4.26	0.53	SD	0.9	0.9	9.2	9.2	0.14
95	46	9966F	05164439	7		10	9	1	90.0	10.0	28.633	9	35.083	6.45	0.72	n	8	8	8	8	8
96	119	9966F	05164439	8	wq replicate	10	10	0	100.0	0.0	28.161	10	33.624	5.46	0.55						
97	84	9967F	05164450	1		10	9	1	90.0	10.0	29.847	9	32.877	3.03	0.34						
98	120	9967F	05164450	2		10	9	1	90.0	10.0	29.363	9	33.176	3.81	0.42						
99	141	9967F	05164450	3		10	8	2	80.0	20.0	28.194	8	31.250	3.06	0.38						
100	179	9967F	05164450	4		10	9	1	90.0	10.0	28.222	9	30.402	2.18	0.24						
101	210	9967F	05164450	5		10	10	0	100.0	0.0	29.275	10	32.348	3.07	0.31	Mean	9.3	0.8	92.5	7.5	0.34
102	116	9967F	05164450	6		10	10	0	100.0	0.0	29.927	10	33.421	3.49	0.35	SD	0.7	0.7	7.1	7.1	0.05
103	149	9967F	05164450	7		10	9	1	90.0	10.0	29.425	9	32.359	2.93	0.33	n	8	8	8	8	8
104	25	9967F	05164450	8	wq replicate	10	10	0	100.0	0.0	26.816	10	30.285	3.47	0.35						
105	143	9968F	05164451	1		10	10	0	100.0	0.0	28.404	10	31.448	3.04	0.30						
106	255	9968F	05164451	2		10	8	2	80.0	20.0	27.720	8	29.185	1.47	0.18						
107	184	9968F	05164451	3		10	10	0	100.0	0.0	29.415	10	33.809	4.39	0.44						
108	12	9968F	05164451	4		10	9	1	90.0	10.0	27.219	9	30.879	3.66	0.41						
109	8	9968F	05164451	5		10	10	0	100.0	0.0	30.227	10	32.414	2.19	0.22	Mean	9.6	0.4	96.3	3.8	0.33
110	57	9968F	05164451	6		10	10	0	100.0	0.0	29.077	10	32.652	3.58	0.36	SD	0.7	0.7	7.4	7.4	0.09
111	122	9968F	05164451	7		10	10	0	100.0	0.0	30.034	10	33.551	3.52	0.35	n	8	8	8	8	8
112	126	9968F	05164451	8	wq replicate	10	10	0	100.0	0.0	28.530	10	31.999	3.47	0.35						

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INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL		INIT	SURV	MORT	PSURV	PMORT	TARE WT (mg)	WT COUNT	DRY WT (mg)	TWT (mg)	WT (mg)		SURV	MORT	PSURV	PMORT	WT
113	70	9969F	05164452	1		10	9	1	90.0	10.0	28.813	9	30.562	1.75	0.19						
114	202	9969F	05164452	2		10	9	1	90.0	10.0	30.608	9	33.555	2.95	0.33						
115	174	9969F	05164452	3		10	7	3	70.0	30.0	29.497	7	30.938	1.44	0.21						
116	243	9969F	05164452	4		10	10	0	100.0	0.0	28.356	10	31.263	2.91	0.29						
117	18	9969F	05164452	5		10	10	0	100.0	0.0	27.217	10	29.984	2.77	0.28	Mean	8.9	1.1	88.8	11.3	0.27
118	208	9969F	05164452	6		10	8	2	80.0	20.0	28.708	8	30.794	2.09	0.26	SD	1.1	1.1	11.3	11.3	0.07
119	15	9969F	05164452	7		10	10	0	100.0	0.0	28.106	10	30.375	2.27	0.23	n	8	8	8	8	8
120	115	9969F	05164452	8	wq replicate	10	8	2	80.0	20.0	29.015	8	32.210	3.20	0.40						
121	102	9970F	05164453	1		10	8	2	80.0	20.0	28.628	8	33.247	4.62	0.58						
122	93	9970F	05164453	2		10	9	1	90.0	10.0	30.645	9	34.566	3.92	0.44						
123	177	9970F	05164453	3		10	8	2	80.0	20.0	28.029	8	32.322	4.29	0.54						
124	98	9970F	05164453	4		10	10	0	100.0	0.0	27.818	10	32.882	5.06	0.51						
125	38	9970F	05164453	5		10	9	1	90.0	10.0	27.600	9	31.151	3.55	0.39	Mean	9.1	0.9	91.3	8.8	0.49
126	11	9970F	05164453	6		10	10	0	100.0	0.0	25.566	10	31.055	5.49	0.55	SD	0.8	0.8	8.3	8.3	0.07
127	236	9970F	05164453	7		10	10	0	100.0	0.0	28.884	10	33.142	4.26	0.43	n	8	8	8	8	8
128	136	9970F	05164453	8	wq replicate	10	9	1	90.0	10.0	27.192	9	31.383	4.19	0.47						
129	53	9971F	05164454	1		10	9	1	90.0	10.0	27.812	9	30.997	3.19	0.35						
130	162	9971F	05164454	2		10	10	0	100.0	0.0	26.886	10	29.983	3.10	0.31						
131	134	9971F	05164454	3		10	10	0	100.0	0.0	27.867	10	30.697	2.83	0.28						
132	123	9971F	05164454	4		10	10	0	100.0	0.0	28.104	10	32.609	4.51	0.45						
133	27	9971F	05164454	5		10	10	0	100.0	0.0	28.838	10	32.678	3.84	0.38	Mean	9.8	0.3	97.5	2.5	0.33
134	249	9971F	05164454	6		10	9	1	90.0	10.0	29.292	9	32.048	2.76	0.31	SD	0.5	0.5	4.6	4.6	0.07
135	229	9971F	05164454	7		10	10	0	100.0	0.0	27.653	10	29.723	2.07	0.21	n	8	8	8	8	8
136	49	9971F	05164454	8	wq replicate	10	10	0	100.0	0.0	28.161	10	31.921	3.76	0.38						
137	16	9972F	05164455	1		10	9	1	90.0	10.0	29.390	9	32.366	2.98	0.33						
138	89	9972F	05164455	2		10	9	1	90.0	10.0	29.700	9	32.624	2.92	0.32						
139	173	9972F	05164455	3		10	9	1	90.0	10.0	28.640	9	31.277	2.64	0.29						
140	67	9972F	05164455	4		10	10	0	100.0	0.0	28.546	10	32.096	3.55	0.36						
141	213	9972F	05164455	5		10	9	1	90.0	10.0	28.832	9	31.579	2.75	0.31	Mean	9.5	0.5	95.0	5.0	0.32
142	155	9972F	05164455	6		10	10	0	100.0	0.0	28.074	10	30.655	2.58	0.26	SD	0.5	0.5	5.3	5.3	0.04
143	246	9972F	05164455	7		10	10	0	100.0	0.0	30.088	10	34.039	3.95	0.40	n	8	8	8	8	8
144	252	9972F	05164455	8	wq replicate	10	10	0	100.0	0.0	29.006	10	31.965	2.96	0.30						
145	170	9973F	05164456	1		10	8	2	80.0	20.0	29.680	8	32.065	2.39	0.30						
146	237	9973F	05164456	2		10	10	0	100.0	0.0	28.633	10	31.505	2.87	0.29						
147	83	9973F	05164456	3		10	6	4	60.0	40.0	27.861	6	29.759	1.90	0.32						
148	88	9973F	05164456	4		10	10	0	100.0	0.0	29.477	10	32.671	3.19	0.32						
149	30	9973F	05164456	5		10	9	1	90.0	10.0	29.725	9	31.482	1.76	0.20	Mean	9.0	1.0	90.0	10.0	0.28
150	145	9973F	05164456	6		10	10	0	100.0	0.0	28.682	10	31.033	2.35	0.24	SD	1.4	1.4	14.1	14.1	0.09
151	203	9973F	05164456	7		10	10	0	100.0	0.0	26.496	10	30.708	4.21	0.42	n	8	8	8	8	8
152	56	9973F	05164456	8	wq replicate	10	9	1	90.0	10.0	29.075	9	30.322	1.25	0.14						

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INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL		INIT	SURV	MORT	PSURV	PMORT	TARE WT (mg)	WT COUNT	DRY WT (mg)	TWT (mg)	WT (mg)		SURV	MORT	PSURV	PMORT	WT
153	19	9974F	05164457	1		10	10	0	100.0	0.0	30.161	10	33.580	3.42	0.34						
154	139	9974F	05164457	2		10	10	0	100.0	0.0	29.610	10	32.609	3.00	0.30						
155	72	9974F	05164457	3		10	8	2	80.0	20.0	29.122	8	32.304	3.18	0.40						
156	222	9974F	05164457	4		10	10	0	100.0	0.0	30.022	10	33.151	3.13	0.31						
157	160	9974F	05164457	5		10	10	0	100.0	0.0	28.265	10	32.069	3.80	0.38	Mean	9.3	0.8	92.5	7.5	0.35
158	197	9974F	05164457	6		10	9	1	90.0	10.0	29.604	9	32.636	3.03	0.34	SD	1.2	1.2	11.6	11.6	0.03
159	219	9974F	05164457	7		10	10	0	100.0	0.0	28.110	10	31.405	3.30	0.33	n	8	8	8	8	8
160	206	9974F	05164457	8	wq replicate	10	7	3	70.0	30.0	28.252	7	30.908	2.66	0.38						
161	209	9975F	05164459	1		10	6	4	60.0	40.0	28.780	6	32.150	3.37	0.56						
162	40	9975F	05164459	2		10	8	2	80.0	20.0	26.832	8	30.960	4.13	0.52						
163	100	9975F	05164459	3		10	9	1	90.0	10.0	28.854	9	32.931	4.08	0.45						
164	24	9975F	05164459	4		10	9	1	90.0	10.0	27.931	9	31.743	3.81	0.42						
165	75	9975F	05164459	5		10	7	3	70.0	30.0	29.813	7	32.757	2.94	0.42	Mean	8.0	2.0	80.0	20.0	0.46
166	158	9975F	05164459	6		10	9	1	90.0	10.0	28.965	9	32.457	3.49	0.39	SD	1.2	1.2	12.0	12.0	0.06
167	9	9975F	05164459	7		10	9	1	90.0	10.0	28.302	9	32.066	3.76	0.42	n	8	8	8	8	8
168	29	9975F	05164459	8	wq replicate	10	7	3	70.0	30.0	28.876	7	32.356	3.48	0.50						
169	196	9976F	05164460	1		10	10	0	100.0	0.0	30.179	10	34.830	4.65	0.47						
170	253	9976F	05164460	2		10	9	1	90.0	10.0	29.521	9	33.339	3.82	0.42						
171	147	9976F	05164460	3		10	10	0	100.0	0.0	28.706	10	33.194	4.49	0.45						
172	227	9976F	05164460	4		10	10	0	100.0	0.0	28.742	10	33.448	4.71	0.47						
173	111	9976F	05164460	5		10	9	1	90.0	10.0	28.883	9	34.357	5.47	0.61	Mean	9.8	0.3	97.5	2.5	0.51
174	241	9976F	05164460	6		10	10	0	100.0	0.0	29.949	10	35.364	5.42	0.54	SD	0.5	0.5	4.6	4.6	0.10
175	182	9976F	05164460	7		10	10	0	100.0	0.0	28.374	10	32.770	4.40	0.44	n	8	8	8	8	8
176	82	9976F	05164460	8	wq replicate	10	10	0	100.0	0.0	28.983	10	36.190	7.21	0.72						
177	225	9977F	05164461	1		10	10	0	100.0	0.0	31.275	10	34.781	3.51	0.35						
178	164	9977F	05164461	2		10	10	0	100.0	0.0	28.842	10	32.829	3.99	0.40						
179	205	9977F	05164461	3		10	10	0	100.0	0.0	28.701	10	31.398	2.70	0.27						
180	183	9977F	05164461	4		10	10	0	100.0	0.0	27.705	10	32.163	4.46	0.45						
181	144	9977F	05164461	5		10	9	1	90.0	10.0	28.418	9	32.063	3.65	0.41	Mean	9.9	0.1	98.8	1.3	0.37
182	106	9977F	05164461	6		10	10	0	100.0	0.0	28.938	10	32.770	3.83	0.38	SD	0.4	0.4	3.5	3.5	0.05
183	238	9977F	05164461	7		10	10	0	100.0	0.0	28.270	10	31.926	3.66	0.37	n	8	8	8	8	8
184	23	9977F	05164461	8	wq replicate	10	10	0	100.0	0.0	27.686	10	31.150	3.46	0.35						
185	87	9981F	05164468	1		10	8	2	80.0	20.0	29.013	8	30.182	1.17	0.15						
186	20	9981F	05164468	2		10	8	2	80.0	20.0	27.952	8	29.403	1.45	0.18						
187	36	9981F	05164468	3		10	9	1	90.0	10.0	28.381	9	30.513	2.13	0.24						
188	198	9981F	05164468	4		10	10	0	100.0	0.0	26.552	10	28.447	1.90	0.19						
189	220	9981F	05164468	5		10	9	1	90.0	10.0	29.217	9	31.068	1.85	0.21	Mean	8.6	1.4	86.3	13.8	0.18
190	200	9981F	05164468	6		10	10	0	100.0	0.0	29.111	10	30.655	1.54	0.15	SD	1.3	1.3	13.0	13.0	0.03
191	76	9981F	05164468	7		10	9	1	90.0	10.0	27.451	9	28.882	1.43	0.16	n	8	8	8	8	8
192	101	9981F	05164468	8	wq replicate	10	6	4	60.0	40.0	29.519	6	30.419	0.90	0.15						

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Test Number: P727-1

Freshwater Sediment Test
28-day Hyalella azteca

INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL		INIT	SURV	MORT	PSURV	PMORT	TARE WT (mg)	WT COUNT	DRY WT (mg)	TWT (mg)	WT (mg)							
																	SURV	MORT	PSURV	PMORT	WT	
193	185	9982F	05164469	1		10	9	1	90.0	10.0	27.948	9	31.785	3.84	0.43							
194	230	9982F	05164469	2		10	9	1	90.0	10.0	28.126	9	32.998	4.87	0.54							
195	104	9982F	05164469	3		10	10	0	100.0	0.0	28.804	10	33.513	4.71	0.47							
196	13	9982F	05164469	4		10	8	2	80.0	20.0	27.118	8	31.521	4.40	0.55							
197	151	9982F	05164469	5		10	9	1	90.0	10.0	28.693	9	32.390	3.70	0.41	Mean	9.1	0.9	91.3	8.8	0.46	
198	65	9982F	05164469	6		10	9	1	90.0	10.0	28.026	9	31.656	3.63	0.40	SD	0.6	0.6	6.4	6.4	0.06	
199	199	9982F	05164469	7		10	10	0	100.0	0.0	28.178	9	31.647	3.47	0.39	n	8	8	8	8	8	
200	127	9982F	05164469	8	wq replicate	10	9	1	90.0	10.0	29.995	8	33.996	4.00	0.50							
201	94	9983F	05164470	1		10	10	0	100.0	0.0	27.408	10	33.056	5.65	0.56							
202	124	9983F	05164470	2		10	10	0	100.0	0.0	27.698	10	33.229	5.53	0.55							
203	121	9983F	05164470	3		10	9	1	90.0	10.0	29.242	9	34.843	5.60	0.62							
204	68	9983F	05164470	4		10	10	0	100.0	0.0	29.169	10	35.703	6.53	0.65							
205	172	9983F	05164470	5		10	9	1	90.0	10.0	27.796	9	32.987	5.19	0.58	Mean	9.6	0.4	96.3	3.8	0.58	
206	175	9983F	05164470	6		10	10	0	100.0	0.0	28.261	10	33.368	5.11	0.51	SD	0.5	0.5	5.2	5.2	0.04	
207	192	9983F	05164470	7		10	10	0	100.0	0.0	27.666	10	33.575	5.91	0.59	n	8	8	8	8	8	
208	17	9983F	05164470	8	wq replicate	10	9	1	90.0	10.0	29.719	9	35.039	5.32	0.59							
209	5	9984F	05164471	1		10	10	0	100.0	0.0	26.473	10	32.481	6.01	0.60							
210	154	9984F	05164471	2		10	10	0	100.0	0.0	27.419	10	33.432	6.01	0.60							
211	251	9984F	05164471	3		10	9	1	90.0	10.0	28.410	9	34.562	6.15	0.68							
212	232	9984F	05164471	4		10	9	1	90.0	10.0	27.949	8	33.081	5.13	0.64							
213	186	9984F	05164471	5		10	10	0	100.0	0.0	28.514	10	35.329	6.82	0.68	Mean	9.5	0.5	95.0	5.0	0.64	
214	188	9984F	05164471	6		10	10	0	100.0	0.0	29.900	10	36.323	6.42	0.64	SD	0.8	0.8	7.6	7.6	0.10	
215	63	9984F	05164471	7		10	10	0	100.0	0.0	30.895	10	35.533	4.64	0.46	n	8	8	8	8	8	
216	51	9984F	05164471	8	wq replicate	10	8	2	80.0	20.0	29.628	8	36.225	6.60	0.82							
217	92	9989F	05164478	1		10	10	0	100.0	0.0	53.837	10	59.188	5.35	0.54							
218	201	9989F	05164478	2		10	9	1	90.0	10.0	28.307	9	33.976	5.67	0.63							
219	118	9989F	05164478	3		10	10	0	100.0	0.0	28.733	10	34.558	5.83	0.58							
220	52	9989F	05164478	4		10	9	1	90.0	10.0	28.323	9	33.606	5.28	0.59							
221	99	9989F	05164478	5		10	9	1	90.0	10.0	27.840	9	33.897	6.06	0.67	Mean	9.6	0.4	96.3	3.8	0.58	
222	180	9989F	05164478	6		10	10	0	100.0	0.0	27.783	10	32.988	5.21	0.52	SD	0.5	0.5	5.2	5.2	0.05	
223	96	9989F	05164478	7		10	10	0	100.0	0.0	29.196	9	34.057	4.86	0.54	n	8	8	8	8	8	
224	69	9989F	05164478	8	wq replicate	10	10	0	100.0	0.0	29.072	10	34.520	5.45	0.54							
225	55	9990F	05164476	1		10	10	0	100.0	0.0	28.608	10	32.880	4.27	0.43							
226	109	9990F	05164476	2		10	10	0	100.0	0.0	30.082	10	34.474	4.39	0.44							
227	168	9990F	05164476	3		10	10	0	100.0	0.0	27.318	10	31.097	3.78	0.38							
228	86	9990F	05164476	4		10	10	0	100.0	0.0	28.843	10	32.952	4.11	0.41							
229	77	9990F	05164476	5		10	10	0	100.0	0.0	28.108	10	32.637	4.53	0.45	Mean	10.0	0.0	100.0	0.0	0.43	
230	33	9990F	05164476	6		10	10	0	100.0	0.0	29.286	10	33.649	4.36	0.44	SD	0.0	0.0	0.0	0.0	0.03	
231	234	9990F	05164476	7		10	10	0	100.0	0.0	28.214	10	33.147	4.93	0.49	n	8	8	8	8	8	
232	240	9990F	05164476	8	wq replicate	10	10	0	100.0	0.0	28.627	10	32.840	4.21	0.42							

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Test Number: P727-1

Freshwater Sediment Test
28-day Hyalella azteca

INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL		INIT	SURV	MORT	PSURV	PMORT	TARE WT (mg)	WT COUNT	DRY WT (mg)	TWT (mg)	WT (mg)			SURV	MORT	PSURV	PMORT	WT
233	242	9994F	05164486	1		10	10	0	100.0	0.0	31.298	10	36.425	5.13	0.51							
234	216	9994F	05164486	2		10	10	0	100.0	0.0	26.787	10	32.402	5.62	0.56							
235	108	9994F	05164486	3		10	10	0	100.0	0.0	29.265	10	34.701	5.44	0.54							
236	146	9994F	05164486	4		10	9	1	90.0	10.0	29.229	9	35.388	6.16	0.68							
237	248	9994F	05164486	5		10	8	2	80.0	20.0	29.987	8	34.465	4.48	0.56	Mean		9.6	0.4	96.3	3.8	0.58
238	221	9994F	05164486	6		10	10	0	100.0	0.0	29.004	10	34.778	5.77	0.58	SD		0.7	0.7	7.4	7.4	0.05
239	212	9994F	05164486	7		10	10	0	100.0	0.0	29.737	10	35.715	5.98	0.60	n		8	8	8	8	8
240	195	9994F	05164486	8	wq replicate	10	10	0	100.0	0.0	29.789	10	35.607	5.82	0.58							
241	218	9998F	05164489	1		10	9	1	90.0	10.0	30.585	9	34.493	3.91	0.43							
242	22	9998F	05164489	2		10	10	0	100.0	0.0	27.288	10	31.242	3.95	0.40							
243	74	9998F	05164489	3		10	10	0	100.0	0.0	29.217	10	33.140	3.92	0.39							
244	2	9998F	05164489	4		10	9	1	90.0	10.0	29.548	9	33.685	4.14	0.46							
245	14	9998F	05164489	5		10	9	1	90.0	10.0	28.200	9	31.892	3.69	0.41	Mean		9.6	0.4	96.3	3.8	0.41
246	41	9998F	05164489	6		10	10	0	100.0	0.0	29.678	10	33.734	4.06	0.41	SD		0.5	0.5	5.2	5.2	0.02
247	62	9998F	05164489	7		10	10	0	100.0	0.0	27.271	10	31.240	3.97	0.40	n		8	8	8	8	8
248	224	9998F	05164489	8	wq replicate	10	10	0	100.0	0.0	28.909	10	33.039	4.13	0.41							
249	135	0002G	05164496	1		10	10	0	100.0	0.0	28.702	10	33.702	5.00	0.50							
250	138	0002G	05164496	2		10	10	0	100.0	0.0	29.065	10	33.719	4.65	0.47							
251	78	0002G	05164496	3		10	10	0	100.0	0.0	31.385	10	35.973	4.59	0.46							
252	91	0002G	05164496	4		10	10	0	100.0	0.0	28.977	10	34.733	5.76	0.58							
253	45	0002G	05164496	5		10	10	0	100.0	0.0	26.910	10	33.703	6.79	0.68	Mean		9.9	0.1	98.8	1.3	0.53
254	133	0002G	05164496	6		10	10	0	100.0	0.0	27.985	10	33.167	5.18	0.52	SD		0.4	0.4	3.5	3.5	0.07
255	247	0002G	05164496	7		10	9	1	90.0	10.0	29.608	9	34.365	4.76	0.53	n		8	8	8	8	8
256	191	0002G	05164496	8	wq replicate	10	10	0	100.0	0.0	28.244	10	33.393	5.15	0.51							

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Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164433
Alias:	NAS# 9953F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.641	Statistic:	Mann-Whitney
Residual SD:	8.19	Test Residual SD:	2.385	Balanced Design:	Yes
SS:	1274.422	Ref. Residual Mean:	8.641	Transformation:	rank-order
K:	8	Ref. Residual SD:	2.385		
b:	28.128	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6208	Calculated Value:	0	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	32
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	0	5.5	6.913	6.913	0		-6.913
2	0	5.5	0	5.5	6.913	6.913	0		-6.913
3	10	13.5	10	13.5	11.522	11.522	0		-6.913
4	0	5.5	0	5.5	6.913	6.913	0		-6.913
5	0	5.5	10	13.5	6.913	11.522	0		-6.913
6	10	13.5	0	5.5	11.522	6.913	0		-6.913
7	10	13.5	0	5.5	11.522	6.913	0		-6.913
8	0	5.5	10	13.5	6.913	11.522	0		-6.913
9							0		-6.913
10							0		-6.913
11							18.435		11.522
12							18.435		11.522
13							18.435		11.522
14							18.435		11.522
15							18.435		11.522
16							18.435		11.522

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164434
Alias:	NAS# 9954F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	8.674
SS:	1429.631
K:	8
b:	31.461
Alpha Level:	0.05
Calculated Value:	0.6923
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	8.437
Test Residual SD:	5.643
Ref. Residual Mean:	8.641
Ref. Residual SD:	2.385
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.0941
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	29.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	5.625	6.913	0		-6.913
2	20	16	0	6	20.94	6.913	0		-6.913
3	0	6	10	13.5	5.625	11.522	0		-6.913
4	0	6	0	6	5.625	6.913	0		-6.913
5	10	13.5	10	13.5	12.81	11.522	0		-6.913
6	0	6	0	6	5.625	6.913	0		-5.625
7	0	6	0	6	5.625	6.913	0		-5.625
8	0	6	10	13.5	5.625	11.522	0		-5.625
9							0		-5.625
10							0		-5.625
11							0		-5.625
12							18.435		11.522
13							18.435		11.522
14							18.435		11.522
15							18.435		12.81
16							26.565		20.94

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164435
Alias:	NAS# 9955F
Replicates:	8
Mean:	16.25
SD:	13.025
Tr Mean:	21.593
Trans SD:	11.814

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	9.217
SS:	1614.172
K:	8
b:	38.016
Alpha Level:	0.05
Calculated Value:	0.8953
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	8.557
Test Residual SD:	7.476
Ref. Residual Mean:	8.641
Ref. Residual SD:	2.385
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.0305
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	ArcSin
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	2.7343
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	0	0	3.158	6.913			-21.593
2	10	18.435	0	0	3.158	6.913			-6.913
3	20	26.565	10	18.435	4.972	11.522			-6.913
4	10	18.435	0	0	3.158	6.913			-6.913
5	0	0	10	18.435	21.593	11.522			-6.913
6	30	33.211	0	0	11.617	6.913			-6.913
7	40	39.231	0	0	17.638	6.913			-3.158
8	10	18.435	10	18.435	3.158	11.522			-3.158
9									-3.158
10									-3.158
11									4.972
12									11.522
13									11.522
14									11.522
15									11.617
16									17.638

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164436
Alias:	NAS# 9956F
Replicates:	8
Mean:	25
SD:	9.258
Tr Mean:	25
Trans SD:	9.258

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	6.438
SS:	787.5
K:	8
b:	26.551
Alpha Level:	0.05
Calculated Value:	0.8952
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	7.5
Test Residual SD:	4.629
Ref. Residual Mean:	4.688
Ref. Residual SD:	1.294
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.655
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	5.6667
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	20	0	0	5	3.75			-15
2	20	20	0	0	5	3.75			-5
3	30	30	10	10	5	6.25			-5
4	30	30	0	0	5	3.75			-5
5	30	30	10	10	5	6.25			-3.75
6	40	40	0	0	15	3.75			-3.75
7	20	20	0	0	5	3.75			-3.75
8	10	10	10	10	15	6.25			-3.75
9									-3.75
10									5
11									5
12									5
13									6.25
14									6.25
15									6.25
16									15

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164437
Alias:	NAS# 9957F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	5
Trans SD:	5.345

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	5	Statistic:	Mann-Whitney
Residual SD:	4.516	Test Residual SD:	0	Balanced Design:	Yes
SS:	387.5	Ref. Residual Mean:	4.688	Transformation:	rank-order
K:	8	Ref. Residual SD:	1.294		
b:	16.829	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7309	Calculated Value:	0.6831	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	36
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	13	0	5	5	3.75	0		-5
2	0	5	0	5	5	3.75	0		-5
3	10	13	10	13	5	6.25	0		-5
4	10	13	0	5	5	3.75	0		-5
5	10	13	10	13	5	6.25	0		-3.75
6	0	5	0	5	5	3.75	0		-3.75
7	0	5	0	5	5	3.75	0		-3.75
8	0	5	10	13	5	6.25	0		-3.75
9							0		-3.75
10							10		5
11							10		5
12							10		5
13							10		5
14							10		6.25
15							10		6.25
16							10		6.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164440
Alias:	NAS# 9958F
Replicates:	8
Mean:	6.25
SD:	10.607
Tr Mean:	6.25
Trans SD:	10.607

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	7.164
SS:	975
K:	8
b:	27.056
Alpha Level:	0.05
Calculated Value:	0.7508
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	7.813
Test Residual SD:	6.538
Ref. Residual Mean:	4.688
Ref. Residual SD:	1.294
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.3262
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	33.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	13	0	5.5	3.75	3.75	0		-6.25
2	0	5.5	0	5.5	6.25	3.75	0		-6.25
3	0	5.5	10	13	6.25	6.25	0		-6.25
4	0	5.5	0	5.5	6.25	3.75	0		-6.25
5	0	5.5	10	13	6.25	6.25	0		-6.25
6	30	16	0	5.5	23.75	3.75	0		-3.75
7	0	5.5	0	5.5	6.25	3.75	0		-3.75
8	10	13	10	13	3.75	6.25	0		-3.75
9							0		-3.75
10							0		-3.75
11							10		3.75
12							10		3.75
13							10		6.25
14							10		6.25
15							10		6.25
16							30		23.75

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164441
Alias:	NAS# 9959F
Replicates:	8
Mean:	6.25
SD:	5.175
Tr Mean:	6.25
Trans SD:	5.175

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	4.688	Statistic:	Mann-Whitney
Residual SD:	4.443	Test Residual SD:	1.294	Balanced Design:	Yes
SS:	375	Ref. Residual Mean:	4.688	Transformation:	rank-order
K:	8	Ref. Residual SD:	1.294		
b:	17.469	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8138	Calculated Value:	0	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	40
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	12.5	0	4.5	3.75	3.75	0		-6.25
2	10	12.5	0	4.5	3.75	3.75	0		-6.25
3	10	12.5	10	12.5	3.75	6.25	0		-6.25
4	10	12.5	0	4.5	3.75	3.75	0		-3.75
5	10	12.5	10	12.5	3.75	6.25	0		-3.75
6	0	4.5	0	4.5	6.25	3.75	0		-3.75
7	0	4.5	0	4.5	6.25	3.75	0		-3.75
8	0	4.5	10	12.5	6.25	6.25	0		-3.75
9							10		3.75
10							10		3.75
11							10		3.75
12							10		3.75
13							10		3.75
14							10		6.25
15							10		6.25
16							10		6.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164442
Alias:	NAS# 9960F
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	5
Trans SD:	7.559

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	6.25	Statistic:	Mann-Whitney
Residual SD:	5.561	Test Residual SD:	3.536	Balanced Design:	Yes
SS:	587.5	Ref. Residual Mean:	4.688	Transformation:	rank-order
K:	8	Ref. Residual SD:	1.294		
b:	21.157	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7619	Calculated Value:	1.1739	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	33.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	0	5.5	5	3.75	0		-5
2	0	5.5	0	5.5	5	3.75	0		-5
3	10	13	10	13	5	6.25	0		-5
4	0	5.5	0	5.5	5	3.75	0		-5
5	0	5.5	10	13	5	6.25	0		-5
6	0	5.5	0	5.5	5	3.75	0		-3.75
7	20	16	0	5.5	15	3.75	0		-3.75
8	10	13	10	13	5	6.25	0		-3.75
9							0		-3.75
10							0		-3.75
11							10		5
12							10		5
13							10		6.25
14							10		6.25
15							10		6.25
16							20		15

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164443
Alias:	NAS# 9961F
Replicates:	8
Mean:	18.75
SD:	8.345
Tr Mean:	18.75
Trans SD:	8.345

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	6.563	Statistic:	Student's t
Residual SD:	5.96	Test Residual SD:	4.519	Balanced Design:	Yes
SS:	675	Ref. Residual Mean:	4.688	Transformation:	No Transformation
K:	8	Ref. Residual SD:	1.294		
b:	24.757	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.908	Calculated Value:	1.1282	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	4.3205
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	10	0	0	8.75	3.75			-8.75
2	20	20	0	0	1.25	3.75			-8.75
3	20	20	10	10	1.25	6.25			-8.75
4	10	10	0	0	8.75	3.75			-3.75
5	30	30	10	10	11.25	6.25			-3.75
6	30	30	0	0	11.25	3.75			-3.75
7	20	20	0	0	1.25	3.75			-3.75
8	10	10	10	10	8.75	6.25			-3.75
9									1.25
10									1.25
11									1.25
12									6.25
13									6.25
14									6.25
15									11.25
16									11.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164449
Alias:	NAS# 9962F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	5
Trans SD:	5.345

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	4.516
SS:	387.5
K:	8
b:	16.829
Alpha Level:	0.05
Calculated Value:	0.7309
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	5
Test Residual SD:	0
Ref. Residual Mean:	4.688
Ref. Residual SD:	1.294
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.6831
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	36
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	13	0	5	5	3.75	0		-5
2	0	5	0	5	5	3.75	0		-5
3	10	13	10	13	5	6.25	0		-5
4	0	5	0	5	5	3.75	0		-5
5	0	5	10	13	5	6.25	0		-3.75
6	0	5	0	5	5	3.75	0		-3.75
7	10	13	0	5	5	3.75	0		-3.75
8	10	13	10	13	5	6.25	0		-3.75
9							0		-3.75
10							10		5
11							10		5
12							10		5
13							10		5
14							10		6.25
15							10		6.25
16							10		6.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164439
Alias:	NAS# 9966F
Replicates:	8
Mean:	6.25
SD:	9.161
Tr Mean:	0.106
Trans SD:	0.978

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	-0.106
Trans SD:	0.65

Shapiro-Wilk Results:

Residual Mean:	
Residual SD:	
SS:	
K:	
b:	
Alpha Level:	N/A
Calculated Value:	N/A
Critical Value:	N/A
Normally Distributed:	N/A
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.853
Test Residual SD:	0.352
Ref. Residual Mean:	0.589
Ref. Residual SD:	0.163
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.9298
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	Rankits
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	12
Experimental Alpha Level:	0.05
Calculated Value:	0.5093
Critical Value:	>= 1.782
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.577	0	-0.577	0.683	0.471		0	
2	0	-0.577	0	-0.577	0.683	0.471		0	
3	0	-0.577	10	0.68	0.683	0.785		0	
4	0	-0.577	0	-0.577	0.683	0.471		0	
5	20	1.526	10	0.68	1.42	0.785		0	
6	20	1.526	0	-0.577	1.42	0.471		0	
7	10	0.68	0	-0.577	0.574	0.471		0	
8	0	-0.577	10	0.68	0.683	0.785		0	
9								0	
10								0	
11								10	
12								10	
13								10	
14								10	
15								20	
16								20	

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164450
Alias:	NAS# 9967F
Replicates:	8
Mean:	7.5
SD:	7.071
Tr Mean:	7.5
Trans SD:	7.071

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	5.319
SS:	537.5
K:	8
b:	22.067
Alpha Level:	0.05
Calculated Value:	0.9059
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	5.625
Test Residual SD:	3.72
Ref. Residual Mean:	4.688
Ref. Residual SD:	1.294
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.6732
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	1.2104
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	10	0	0	2.5	3.75			-7.5
2	10	10	0	0	2.5	3.75			-7.5
3	20	20	10	10	12.5	6.25			-7.5
4	10	10	0	0	2.5	3.75			-3.75
5	0	0	10	10	7.5	6.25			-3.75
6	0	0	0	0	7.5	3.75			-3.75
7	10	10	0	0	2.5	3.75			-3.75
8	0	0	10	10	7.5	6.25			-3.75
9									2.5
10									2.5
11									2.5
12									2.5
13									6.25
14									6.25
15									6.25
16									12.5

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164451
Alias:	NAS# 9968F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	3.75
Trans SD:	7.44

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	5.625	Statistic:	Mann-Whitney
Residual SD:	5.501	Test Residual SD:	4.381	Balanced Design:	Yes
SS:	575	Ref. Residual Mean:	4.688	Transformation:	rank-order
K:	8	Ref. Residual SD:	1.294		
b:	19.309	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6484	Calculated Value:	0.5804	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	29.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	3.75	3.75	0		-3.75
2	20	16	0	6	16.25	3.75	0		-3.75
3	0	6	10	13.5	3.75	6.25	0		-3.75
4	10	13.5	0	6	6.25	3.75	0		-3.75
5	0	6	10	13.5	3.75	6.25	0		-3.75
6	0	6	0	6	3.75	3.75	0		-3.75
7	0	6	0	6	3.75	3.75	0		-3.75
8	0	6	10	13.5	3.75	6.25	0		-3.75
9							0		-3.75
10							0		-3.75
11							0		-3.75
12							10		6.25
13							10		6.25
14							10		6.25
15							10		6.25
16							20		16.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164452
Alias:	NAS# 9969F
Replicates:	8
Mean:	11.25
SD:	11.26
Tr Mean:	11.25
Trans SD:	11.26

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.063	Statistic:	Approximate t
Residual SD:	7.522	Test Residual SD:	5.738	Balanced Design:	Yes
SS:	1075	Ref. Residual Mean:	4.688	Transformation:	No Transformation
K:	8	Ref. Residual SD:	1.294		
b:	31.378	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.9159	Calculated Value:	2.1038	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	10
				Experimental Alpha Level:	0.05
				Calculated Value:	1.7118
Override Option:	N/A			Critical Value:	>= 1.812
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	10	0	0	1.25	3.75			-11.25
2	10	10	0	0	1.25	3.75			-11.25
3	30	30	10	10	18.75	6.25			-11.25
4	0	0	0	0	11.25	3.75			-3.75
5	0	0	10	10	11.25	6.25			-3.75
6	20	20	0	0	8.75	3.75			-3.75
7	0	0	0	0	11.25	3.75			-3.75
8	20	20	10	10	8.75	6.25			-3.75
9									-1.25
10									-1.25
11									6.25
12									6.25
13									6.25
14									8.75
15									8.75
16									18.75

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164453
Alias:	NAS# 9970F
Replicates:	8
Mean:	8.75
SD:	8.345
Tr Mean:	8.75
Trans SD:	8.345

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	5.96
SS:	675
K:	8
b:	24.757
Alpha Level:	0.05
Calculated Value:	0.908
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	6.563
Test Residual SD:	4.519
Ref. Residual Mean:	4.688
Ref. Residual SD:	1.294
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.1282
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	1.4402
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	20	0	0	11.25	3.75			-8.75
2	10	10	0	0	1.25	3.75			-8.75
3	20	20	10	10	11.25	6.25			-8.75
4	0	0	0	0	8.75	3.75			-3.75
5	10	10	10	10	1.25	6.25			-3.75
6	0	0	0	0	8.75	3.75			-3.75
7	0	0	0	0	8.75	3.75			-3.75
8	10	10	10	10	1.25	6.25			-3.75
9									1.25
10									1.25
11									1.25
12									6.25
13									6.25
14									6.25
15									11.25
16									11.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164454
Alias:	NAS# 9971F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	2.5
Trans SD:	4.629

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	4.215
SS:	337.5
K:	8
b:	15.296
Alpha Level:	0.05
Calculated Value:	0.6933
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	3.75
Test Residual SD:	2.315
Ref. Residual Mean:	4.688
Ref. Residual SD:	1.294
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	28
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	14	0	6	7.5	3.75	0		-3.75
2	0	6	0	6	2.5	3.75	0		-3.75
3	0	6	10	14	2.5	6.25	0		-3.75
4	0	6	0	6	2.5	3.75	0		-3.75
5	0	6	10	14	2.5	6.25	0		-3.75
6	10	14	0	6	7.5	3.75	0		-2.5
7	0	6	0	6	2.5	3.75	0		-2.5
8	0	6	10	14	2.5	6.25	0		-2.5
9							0		-2.5
10							0		-2.5
11							0		-2.5
12							10		6.25
13							10		6.25
14							10		6.25
15							10		7.5
16							10		7.5

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164455
Alias:	NAS# 9972F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	5
Trans SD:	5.345

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	5	Statistic:	Mann-Whitney
Residual SD:	4.516	Test Residual SD:	0	Balanced Design:	Yes
SS:	387.5	Ref. Residual Mean:	4.688	Transformation:	rank-order
K:	8	Ref. Residual SD:	1.294		
b:	16.829	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7309	Calculated Value:	0.6831	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	36
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	13	0	5	5	3.75	0		-5
2	10	13	0	5	5	3.75	0		-5
3	10	13	10	13	5	6.25	0		-5
4	0	5	0	5	5	3.75	0		-5
5	10	13	10	13	5	6.25	0		-3.75
6	0	5	0	5	5	3.75	0		-3.75
7	0	5	0	5	5	3.75	0		-3.75
8	0	5	10	13	5	6.25	0		-3.75
9							0		-3.75
10							10		5
11							10		5
12							10		5
13							10		5
14							10		6.25
15							10		6.25
16							10		6.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164456
Alias:	NAS# 9973F
Replicates:	8
Mean:	10
SD:	14.142
Tr Mean:	10
Trans SD:	14.142

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	10	Statistic:	Mann-Whitney
Residual SD:	9.141	Test Residual SD:	9.258	Balanced Design:	Yes
SS:	1587.5	Ref. Residual Mean:	4.688	Transformation:	rank-order
K:	8	Ref. Residual SD:	1.294		
b:	36.098	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8208	Calculated Value:	1.6074	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	39
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	15	0	5	10	3.75	0		-10
2	0	5	0	5	10	3.75	0		-10
3	40	16	10	12	30	6.25	0		-10
4	0	5	0	5	10	3.75	0		-10
5	10	12	10	12	0	6.25	0		-3.75
6	0	5	0	5	10	3.75	0		-3.75
7	0	5	0	5	10	3.75	0		-3.75
8	10	12	10	12	0	6.25	0		-3.75
9							0		-3.75
10							10		0
11							10		0
12							10		6.25
13							10		6.25
14							10		6.25
15							20		10
16							40		30

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164457
Alias:	NAS# 9974F
Replicates:	8
Mean:	7.5
SD:	11.65
Tr Mean:	0.106
Trans SD:	0.986

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	-0.106
Trans SD:	0.65

Shapiro-Wilk Results:

Residual Mean:	
Residual SD:	
SS:	
K:	
b:	
Alpha Level:	N/A
Calculated Value:	N/A
Critical Value:	N/A
Normally Distributed:	N/A
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.853
Test Residual SD:	0.374
Ref. Residual Mean:	0.589
Ref. Residual SD:	0.163
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.8316
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	Rankits

Experimental Hypothesis

Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	12
Experimental Alpha Level:	0.05
Calculated Value:	0.5062
Critical Value:	>= 1.782
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.577	0	-0.577	0.683	0.471		0	
2	0	-0.577	0	-0.577	0.683	0.471		0	
3	20	1.285	10	0.68	1.179	0.785		0	
4	0	-0.577	0	-0.577	0.683	0.471		0	
5	0	-0.577	10	0.68	0.683	0.785		0	
6	10	0.68	0	-0.577	0.574	0.471		0	
7	0	-0.577	0	-0.577	0.683	0.471		0	
8	30	1.766	10	0.68	1.66	0.785		0	
9								0	
10								0	
11								10	
12								10	
13								10	
14								10	
15								20	
16								30	

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164459
Alias:	NAS# 9975F
Replicates:	8
Mean:	20
SD:	11.952
Tr Mean:	20
Trans SD:	11.952

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	10	Statistic:	Approximate t
Residual SD:	7.906	Test Residual SD:	5.345	Balanced Design:	Yes
SS:	1187.5	Ref. Residual Mean:	4.688	Transformation:	No Transformation
K:	8	Ref. Residual SD:	1.294		
b:	32.615	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8958	Calculated Value:	2.7322	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	10
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	3.5288
				Critical Value:	>= 1.812
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	40	40	0	0	20	3.75			-10
2	20	20	0	0	0	3.75			-10
3	10	10	10	10	10	6.25			-10
4	10	10	0	0	10	3.75			-10
5	30	30	10	10	10	6.25			-3.75
6	10	10	0	0	10	3.75			-3.75
7	10	10	0	0	10	3.75			-3.75
8	30	30	10	10	10	6.25			-3.75
9									-3.75
10									0
11									6.25
12									6.25
13									6.25
14									10
15									10
16									20

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164460
Alias:	NAS# 9976F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	2.5
Trans SD:	4.629

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	3.75	Statistic:	Mann-Whitney
Residual SD:	4.215	Test Residual SD:	2.315	Balanced Design:	Yes
SS:	337.5	Ref. Residual Mean:	4.688	Transformation:	rank-order
K:	8	Ref. Residual SD:	1.294		
b:	15.296	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6933	Calculated Value:	1	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	28
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	2.5	3.75	0		-3.75
2	10	14	0	6	7.5	3.75	0		-3.75
3	0	6	10	14	2.5	6.25	0		-3.75
4	0	6	0	6	2.5	3.75	0		-3.75
5	10	14	10	14	7.5	6.25	0		-3.75
6	0	6	0	6	2.5	3.75	0		-2.5
7	0	6	0	6	2.5	3.75	0		-2.5
8	0	6	10	14	2.5	6.25	0		-2.5
9							0		-2.5
10							0		-2.5
11							0		-2.5
12							10		6.25
13							10		6.25
14							10		6.25
15							10		7.5
16							10		7.5

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164461
Alias:	NAS# 9977F
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	-0.2
Trans SD:	0.566

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	0.2
Trans SD:	0.829

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.35	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.425	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.751	Transformation:	Rankits
K:		Ref. Residual SD:	0.207		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	2.3966	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally Distributed:	N/A	Variances Homogeneous:	No	Degrees of Freedom:	12
				Experimental Alpha Level:	0.05
				Calculated Value:	-1.1282
Override Option:	Not Invoked			Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.4	0	-0.4	0.2	0.601		0	
2	0	-0.4	0	-0.4	0.2	0.601		0	
3	0	-0.4	10	1.201	0.2	1.001		0	
4	0	-0.4	0	-0.4	0.2	0.601		0	
5	10	1.201	10	1.201	1.401	1.001		0	
6	0	-0.4	0	-0.4	0.2	0.601		0	
7	0	-0.4	0	-0.4	0.2	0.601		0	
8	0	-0.4	10	1.201	0.2	1.001		0	
9								0	
10								0	
11								0	
12								0	
13								10	
14								10	
15								10	
16								10	

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164468
Alias:	NAS# 9981F
Replicates:	8
Mean:	13.75
SD:	13.025
Tr Mean:	0.413
Trans SD:	0.936

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	-0.413
Trans SD:	0.613

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.7	Statistic:	Student's t
Residual SD:		Test Residual SD:	0.562	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.555	Transformation:	Rankits
K:		Ref. Residual SD:	0.153		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	0.7033	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally Distributed:	N/A	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	2.0899
Override Option:	Not Invoked			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	1.138	0	-0.858	0.724	0.444		0	
2	20	1.138	0	-0.858	0.724	0.444		0	
3	10	0.327	10	0.327	0.086	0.741		0	
4	0	-0.858	0	-0.858	1.271	0.444		0	
5	10	0.327	10	0.327	0.086	0.741		0	
6	0	-0.858	0	-0.858	1.271	0.444		0	
7	10	0.327	0	-0.858	0.086	0.444		0	
8	40	1.766	10	0.327	1.353	0.741		10	
9								10	
10								10	
11								10	
12								10	
13								10	
14								20	
15								20	
16								40	

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164469
Alias:	NAS# 9982F
Replicates:	8
Mean:	8.75
SD:	6.409
Tr Mean:	8.75
Trans SD:	6.409

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	4.375	Statistic:	Student's t
Residual SD:	5	Test Residual SD:	4.381	Balanced Design:	Yes
SS:	475	Ref. Residual Mean:	4.688	Transformation:	No Transformation
K:	8	Ref. Residual SD:	1.294		
b:	21.03	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.931	Calculated Value:	0.1935	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	1.7168
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	10	0	0	1.25	3.75			-8.75
2	10	10	0	0	1.25	3.75			-8.75
3	0	0	10	10	8.75	6.25			-3.75
4	20	20	0	0	11.25	3.75			-3.75
5	10	10	10	10	1.25	6.25			-3.75
6	10	10	0	0	1.25	3.75			-3.75
7	0	0	0	0	8.75	3.75			-3.75
8	10	10	10	10	1.25	6.25			1.25
9									1.25
10									1.25
11									1.25
12									1.25
13									6.25
14									6.25
15									6.25
16									11.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164471
Alias:	NAS# 9984F
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	5
Trans SD:	7.559

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	5.561
SS:	587.5
K:	8
b:	21.157
Alpha Level:	0.05
Calculated Value:	0.7619
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	6.25
Test Residual SD:	3.536
Ref. Residual Mean:	4.688
Ref. Residual SD:	1.294
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.1739
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	33.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	0	5.5	5	3.75	0		-5
2	0	5.5	0	5.5	5	3.75	0		-5
3	10	13	10	13	5	6.25	0		-5
4	10	13	0	5.5	5	3.75	0		-5
5	0	5.5	10	13	5	6.25	0		-5
6	0	5.5	0	5.5	5	3.75	0		-3.75
7	0	5.5	0	5.5	5	3.75	0		-3.75
8	20	16	10	13	15	6.25	0		-3.75
9							0		-3.75
10							0		-3.75
11							10		5
12							10		5
13							10		6.25
14							10		6.25
15							10		6.25
16							20		15

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164433
Alias:	NAS# 9953F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	4.688	Statistic:	Mann-Whitney
Residual SD:	4.443	Test Residual SD:	1.294	Balanced Design:	Yes
SS:	375	Ref. Residual Mean:	4.688	Transformation:	rank-order
K:	8	Ref. Residual SD:	1.294		
b:	15.258	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6208	Calculated Value:	0	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	32
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	0	5.5	3.75	3.75	0		-3.75
2	0	5.5	10	13.5	3.75	6.25	0		-3.75
3	10	13.5	0	5.5	6.25	3.75	0		-3.75
4	0	5.5	10	13.5	3.75	6.25	0		-3.75
5	0	5.5	10	13.5	3.75	6.25	0		-3.75
6	10	13.5	0	5.5	6.25	3.75	0		-3.75
7	10	13.5	0	5.5	6.25	3.75	0		-3.75
8	0	5.5	0	5.5	3.75	3.75	0		-3.75
9							0		-3.75
10							0		-3.75
11							10		6.25
12							10		6.25
13							10		6.25
14							10		6.25
15							10		6.25
16							10		6.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164434
Alias:	NAS# 9954F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	3.75
Trans SD:	7.44

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	5.625	Statistic:	Mann-Whitney
Residual SD:	5.501	Test Residual SD:	4.381	Balanced Design:	Yes
SS:	575	Ref. Residual Mean:	4.688	Transformation:	rank-order
K:	8	Ref. Residual SD:	1.294		
b:	19.309	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6484	Calculated Value:	0.5804	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	29.5
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	3.75	3.75	0		-3.75
2	20	16	10	13.5	16.25	6.25	0		-3.75
3	0	6	0	6	3.75	3.75	0		-3.75
4	0	6	10	13.5	3.75	6.25	0		-3.75
5	10	13.5	10	13.5	6.25	6.25	0		-3.75
6	0	6	0	6	3.75	3.75	0		-3.75
7	0	6	0	6	3.75	3.75	0		-3.75
8	0	6	0	6	3.75	3.75	0		-3.75
9							0		-3.75
10							0		-3.75
11							0		-3.75
12							10		6.25
13							10		6.25
14							10		6.25
15							10		6.25
16							20		16.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164435
Alias:	NAS# 9955F
Replicates:	8
Mean:	16.25
SD:	13.025
Tr Mean:	16.25
Trans SD:	13.025

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	8.507
SS:	1375
K:	8
b:	34.942
Alpha Level:	0.05
Calculated Value:	0.8879
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	10.313
Test Residual SD:	6.936
Ref. Residual Mean:	4.688
Ref. Residual SD:	1.294
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.255
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	9
Experimental Alpha Level:	0.05
Calculated Value:	2.5226
Critical Value:	>= 1.833
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	10	0	0	6.25	3.75			-16.25
2	10	10	10	10	6.25	6.25			-6.25
3	20	20	0	0	3.75	3.75			-6.25
4	10	10	10	10	6.25	6.25			-6.25
5	0	0	10	10	16.25	6.25			-6.25
6	30	30	0	0	13.75	3.75			-3.75
7	40	40	0	0	23.75	3.75			-3.75
8	10	10	0	0	6.25	3.75			-3.75
9									-3.75
10									-3.75
11									3.75
12									6.25
13									6.25
14									6.25
15									13.75
16									23.75

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164436
Alias:	NAS# 9956F
Replicates:	8
Mean:	25
SD:	9.258
Tr Mean:	25
Trans SD:	9.258

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	7.5	Statistic:	Student's t
Residual SD:	6.438	Test Residual SD:	4.629	Balanced Design:	Yes
SS:	787.5	Ref. Residual Mean:	4.688	Transformation:	No Transformation
K:	8	Ref. Residual SD:	1.294		
b:	26.551	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8952	Calculated Value:	1.655	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	5.6667
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	20	0	0	5	3.75			-15
2	20	20	10	10	5	6.25			-5
3	30	30	0	0	5	3.75			-5
4	30	30	10	10	5	6.25			-5
5	30	30	10	10	5	6.25			-3.75
6	40	40	0	0	15	3.75			-3.75
7	20	20	0	0	5	3.75			-3.75
8	10	10	0	0	15	3.75			-3.75
9									-3.75
10									5
11									5
12									5
13									6.25
14									6.25
15									6.25
16									15

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164437
Alias:	NAS# 9957F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	5
Trans SD:	5.345

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	5	Statistic:	Mann-Whitney
Residual SD:	4.516	Test Residual SD:	0	Balanced Design:	Yes
SS:	387.5	Ref. Residual Mean:	4.688	Transformation:	rank-order
K:	8	Ref. Residual SD:	1.294		
b:	16.829	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7309	Calculated Value:	0.6831	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	36
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	13	0	5	5	3.75	0		-5
2	0	5	10	13	5	6.25	0		-5
3	10	13	0	5	5	3.75	0		-5
4	10	13	10	13	5	6.25	0		-5
5	10	13	10	13	5	6.25	0		-3.75
6	0	5	0	5	5	3.75	0		-3.75
7	0	5	0	5	5	3.75	0		-3.75
8	0	5	0	5	5	3.75	0		-3.75
9							0		-3.75
10							10		5
11							10		5
12							10		5
13							10		5
14							10		6.25
15							10		6.25
16							10		6.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164440
Alias:	NAS# 9958F
Replicates:	8
Mean:	6.25
SD:	10.607
Tr Mean:	6.25
Trans SD:	10.607

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	7.164
SS:	975
K:	8
b:	27.056
Alpha Level:	0.05
Calculated Value:	0.7508
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	7.813
Test Residual SD:	6.538
Ref. Residual Mean:	4.688
Ref. Residual SD:	1.294
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.3262
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	33.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	13	0	5.5	3.75	3.75	0		-6.25
2	0	5.5	10	13	6.25	6.25	0		-6.25
3	0	5.5	0	5.5	6.25	3.75	0		-6.25
4	0	5.5	10	13	6.25	6.25	0		-6.25
5	0	5.5	10	13	6.25	6.25	0		-6.25
6	30	16	0	5.5	23.75	3.75	0		-3.75
7	0	5.5	0	5.5	6.25	3.75	0		-3.75
8	10	13	0	5.5	3.75	3.75	0		-3.75
9							0		-3.75
10							0		-3.75
11							10		3.75
12							10		3.75
13							10		6.25
14							10		6.25
15							10		6.25
16							30		23.75

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164441
Alias:	NAS# 9959F
Replicates:	8
Mean:	6.25
SD:	5.175
Tr Mean:	6.25
Trans SD:	5.175

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	4.688	Statistic:	Mann-Whitney
Residual SD:	4.443	Test Residual SD:	1.294	Balanced Design:	Yes
SS:	375	Ref. Residual Mean:	4.688	Transformation:	rank-order
K:	8	Ref. Residual SD:	1.294		
b:	17.469	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8138	Calculated Value:	0	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	40
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	12.5	0	4.5	3.75	3.75	0		-6.25
2	10	12.5	10	12.5	3.75	6.25	0		-6.25
3	10	12.5	0	4.5	3.75	3.75	0		-6.25
4	10	12.5	10	12.5	3.75	6.25	0		-3.75
5	10	12.5	10	12.5	3.75	6.25	0		-3.75
6	0	4.5	0	4.5	6.25	3.75	0		-3.75
7	0	4.5	0	4.5	6.25	3.75	0		-3.75
8	0	4.5	0	4.5	6.25	3.75	0		-3.75
9							10		3.75
10							10		3.75
11							10		3.75
12							10		3.75
13							10		3.75
14							10		6.25
15							10		6.25
16							10		6.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164442
Alias:	NAS# 9960F
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	5
Trans SD:	7.559

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	6.25	Statistic:	Mann-Whitney
Residual SD:	5.561	Test Residual SD:	3.536	Balanced Design:	Yes
SS:	587.5	Ref. Residual Mean:	4.688	Transformation:	rank-order
K:	8	Ref. Residual SD:	1.294		
b:	21.157	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7619	Calculated Value:	1.1739	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	33.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	0	5.5	5	3.75	0		-5
2	0	5.5	10	13	5	6.25	0		-5
3	10	13	0	5.5	5	3.75	0		-5
4	0	5.5	10	13	5	6.25	0		-5
5	0	5.5	10	13	5	6.25	0		-5
6	0	5.5	0	5.5	5	3.75	0		-3.75
7	20	16	0	5.5	15	3.75	0		-3.75
8	10	13	0	5.5	5	3.75	0		-3.75
9							0		-3.75
10							0		-3.75
11							10		5
12							10		5
13							10		6.25
14							10		6.25
15							10		6.25
16							20		15

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164443
Alias:	NAS# 9961F
Replicates:	8
Mean:	18.75
SD:	8.345
Tr Mean:	18.75
Trans SD:	8.345

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	6.563	Statistic:	Student's t
Residual SD:	5.96	Test Residual SD:	4.519	Balanced Design:	Yes
SS:	675	Ref. Residual Mean:	4.688	Transformation:	No Transformation
K:	8	Ref. Residual SD:	1.294		
b:	24.757	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.908	Calculated Value:	1.1282	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	4.3205
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	10	0	0	8.75	3.75			-8.75
2	20	20	10	10	1.25	6.25			-8.75
3	20	20	0	0	1.25	3.75			-8.75
4	10	10	10	10	8.75	6.25			-3.75
5	30	30	10	10	11.25	6.25			-3.75
6	30	30	0	0	11.25	3.75			-3.75
7	20	20	0	0	1.25	3.75			-3.75
8	10	10	0	0	8.75	3.75			-3.75
9									1.25
10									1.25
11									1.25
12									6.25
13									6.25
14									6.25
15									11.25
16									11.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164449
Alias:	NAS# 9962F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	5
Trans SD:	5.345

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	5	Statistic:	Mann-Whitney
Residual SD:	4.516	Test Residual SD:	0	Balanced Design:	Yes
SS:	387.5	Ref. Residual Mean:	4.688	Transformation:	rank-order
K:	8	Ref. Residual SD:	1.294		
b:	16.829	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7309	Calculated Value:	0.6831	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	36
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	13	0	5	5	3.75	0		-5
2	0	5	10	13	5	6.25	0		-5
3	10	13	0	5	5	3.75	0		-5
4	0	5	10	13	5	6.25	0		-5
5	0	5	10	13	5	6.25	0		-3.75
6	0	5	0	5	5	3.75	0		-3.75
7	10	13	0	5	5	3.75	0		-3.75
8	10	13	0	5	5	3.75	0		-3.75
9							0		-3.75
10							10		5
11							10		5
12							10		5
13							10		5
14							10		6.25
15							10		6.25
16							10		6.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164439
Alias:	NAS# 9966F
Replicates:	8
Mean:	6.25
SD:	9.161
Tr Mean:	0.106
Trans SD:	0.978

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	-0.106
Trans SD:	0.65

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.853	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.352	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.589	Transformation:	Rankits
K:		Ref. Residual SD:	0.163		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	1.9298	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally Distributed:	N/A	Variances Homogeneous:	No	Degrees of Freedom:	12
				Experimental Alpha Level:	0.05
				Calculated Value:	0.5093
Override Option:	Not Invoked			Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.577	0	-0.577	0.683	0.471		0	
2	0	-0.577	10	0.68	0.683	0.785		0	
3	0	-0.577	0	-0.577	0.683	0.471		0	
4	0	-0.577	10	0.68	0.683	0.785		0	
5	20	1.526	10	0.68	1.42	0.785		0	
6	20	1.526	0	-0.577	1.42	0.471		0	
7	10	0.68	0	-0.577	0.574	0.471		0	
8	0	-0.577	0	-0.577	0.683	0.471		0	
9								0	
10								0	
11								10	
12								10	
13								10	
14								10	
15								20	
16								20	

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164450
Alias:	NAS# 9967F
Replicates:	8
Mean:	7.5
SD:	7.071
Tr Mean:	7.5
Trans SD:	7.071

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	5.319
SS:	537.5
K:	8
b:	22.067
Alpha Level:	0.05
Calculated Value:	0.9059
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	5.625
Test Residual SD:	3.72
Ref. Residual Mean:	4.688
Ref. Residual SD:	1.294
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.6732
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	1.2104
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	10	0	0	2.5	3.75			-7.5
2	10	10	10	10	2.5	6.25			-7.5
3	20	20	0	0	12.5	3.75			-7.5
4	10	10	10	10	2.5	6.25			-3.75
5	0	0	10	10	7.5	6.25			-3.75
6	0	0	0	0	7.5	3.75			-3.75
7	10	10	0	0	2.5	3.75			-3.75
8	0	0	0	0	7.5	3.75			-3.75
9									2.5
10									2.5
11									2.5
12									2.5
13									6.25
14									6.25
15									6.25
16									12.5

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164451
Alias:	NAS# 9968F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	3.75
Trans SD:	7.44

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	5.625	Statistic:	Mann-Whitney
Residual SD:	5.501	Test Residual SD:	4.381	Balanced Design:	Yes
SS:	575	Ref. Residual Mean:	4.688	Transformation:	rank-order
K:	8	Ref. Residual SD:	1.294		
b:	19.309	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6484	Calculated Value:	0.5804	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	29.5
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	3.75	3.75	0		-3.75
2	20	16	10	13.5	16.25	6.25	0		-3.75
3	0	6	0	6	3.75	3.75	0		-3.75
4	10	13.5	10	13.5	6.25	6.25	0		-3.75
5	0	6	10	13.5	3.75	6.25	0		-3.75
6	0	6	0	6	3.75	3.75	0		-3.75
7	0	6	0	6	3.75	3.75	0		-3.75
8	0	6	0	6	3.75	3.75	0		-3.75
9							0		-3.75
10							0		-3.75
11							0		-3.75
12							10		6.25
13							10		6.25
14							10		6.25
15							10		6.25
16							20		16.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164452
Alias:	NAS# 9969F
Replicates:	8
Mean:	11.25
SD:	11.26
Tr Mean:	11.25
Trans SD:	11.26

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	7.522
SS:	1075
K:	8
b:	31.378
Alpha Level:	0.05
Calculated Value:	0.9159
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	9.063
Test Residual SD:	5.738
Ref. Residual Mean:	4.688
Ref. Residual SD:	1.294
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.1038
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	10
Experimental Alpha Level:	0.05
Calculated Value:	1.7118
Critical Value:	>= 1.812
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	10	0	0	1.25	3.75			-11.25
2	10	10	10	10	1.25	6.25			-11.25
3	30	30	0	0	18.75	3.75			-11.25
4	0	0	10	10	11.25	6.25			-3.75
5	0	0	10	10	11.25	6.25			-3.75
6	20	20	0	0	8.75	3.75			-3.75
7	0	0	0	0	11.25	3.75			-3.75
8	20	20	0	0	8.75	3.75			-3.75
9									-1.25
10									-1.25
11									6.25
12									6.25
13									6.25
14									8.75
15									8.75
16									18.75

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164453
Alias:	NAS# 9970F
Replicates:	8
Mean:	8.75
SD:	8.345
Tr Mean:	8.75
Trans SD:	8.345

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	5.96
SS:	675
K:	8
b:	24.757
Alpha Level:	0.05
Calculated Value:	0.908
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	6.563
Test Residual SD:	4.519
Ref. Residual Mean:	4.688
Ref. Residual SD:	1.294
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.1282
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	1.4402
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	20	0	0	11.25	3.75			-8.75
2	10	10	10	10	1.25	6.25			-8.75
3	20	20	0	0	11.25	3.75			-8.75
4	0	0	10	10	8.75	6.25			-3.75
5	10	10	10	10	1.25	6.25			-3.75
6	0	0	0	0	8.75	3.75			-3.75
7	0	0	0	0	8.75	3.75			-3.75
8	10	10	0	0	1.25	3.75			-3.75
9									1.25
10									1.25
11									1.25
12									6.25
13									6.25
14									6.25
15									11.25
16									11.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164454
Alias:	NAS# 9971F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	2.5
Trans SD:	4.629

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	3.75	Statistic:	Mann-Whitney
Residual SD:	4.215	Test Residual SD:	2.315	Balanced Design:	Yes
SS:	337.5	Ref. Residual Mean:	4.688	Transformation:	rank-order
K:	8	Ref. Residual SD:	1.294		
b:	15.296	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6933	Calculated Value:	1	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	28
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	14	0	6	7.5	3.75	0		-3.75
2	0	6	10	14	2.5	6.25	0		-3.75
3	0	6	0	6	2.5	3.75	0		-3.75
4	0	6	10	14	2.5	6.25	0		-3.75
5	0	6	10	14	2.5	6.25	0		-3.75
6	10	14	0	6	7.5	3.75	0		-2.5
7	0	6	0	6	2.5	3.75	0		-2.5
8	0	6	0	6	2.5	3.75	0		-2.5
9							0		-2.5
10							0		-2.5
11							0		-2.5
12							10		6.25
13							10		6.25
14							10		6.25
15							10		7.5
16							10		7.5

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164455
Alias:	NAS# 9972F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	5
Trans SD:	5.345

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	5	Statistic:	Mann-Whitney
Residual SD:	4.516	Test Residual SD:	0	Balanced Design:	Yes
SS:	387.5	Ref. Residual Mean:	4.688	Transformation:	rank-order
K:	8	Ref. Residual SD:	1.294		
b:	16.829	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7309	Calculated Value:	0.6831	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	36
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	13	0	5	5	3.75	0		-5
2	10	13	10	13	5	6.25	0		-5
3	10	13	0	5	5	3.75	0		-5
4	0	5	10	13	5	6.25	0		-5
5	10	13	10	13	5	6.25	0		-3.75
6	0	5	0	5	5	3.75	0		-3.75
7	0	5	0	5	5	3.75	0		-3.75
8	0	5	0	5	5	3.75	0		-3.75
9							0		-3.75
10							10		5
11							10		5
12							10		5
13							10		5
14							10		6.25
15							10		6.25
16							10		6.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164456
Alias:	NAS# 9973F
Replicates:	8
Mean:	10
SD:	14.142
Tr Mean:	10
Trans SD:	14.142

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	10	Statistic:	Mann-Whitney
Residual SD:	9.141	Test Residual SD:	9.258	Balanced Design:	Yes
SS:	1587.5	Ref. Residual Mean:	4.688	Transformation:	rank-order
K:	8	Ref. Residual SD:	1.294		
b:	36.098	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8208	Calculated Value:	1.6074	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	39
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	15	0	5	10	3.75	0		-10
2	0	5	10	12	10	6.25	0		-10
3	40	16	0	5	30	3.75	0		-10
4	0	5	10	12	10	6.25	0		-10
5	10	12	10	12	0	6.25	0		-3.75
6	0	5	0	5	10	3.75	0		-3.75
7	0	5	0	5	10	3.75	0		-3.75
8	10	12	0	5	0	3.75	0		-3.75
9							0		-3.75
10							10		0
11							10		0
12							10		6.25
13							10		6.25
14							10		6.25
15							20		10
16							40		30

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164457
Alias:	NAS# 9974F
Replicates:	8
Mean:	7.5
SD:	11.65
Tr Mean:	0.106
Trans SD:	0.986

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	-0.106
Trans SD:	0.65

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.853	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.374	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.589	Transformation:	Rankits
K:		Ref. Residual SD:	0.163		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	1.8316	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally Distributed:	N/A	Variances Homogeneous:	No	Degrees of Freedom:	12
				Experimental Alpha Level:	0.05
				Calculated Value:	0.5062
Override Option:	Not Invoked			Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.577	0	-0.577	0.683	0.471		0	
2	0	-0.577	10	0.68	0.683	0.785		0	
3	20	1.285	0	-0.577	1.179	0.471		0	
4	0	-0.577	10	0.68	0.683	0.785		0	
5	0	-0.577	10	0.68	0.683	0.785		0	
6	10	0.68	0	-0.577	0.574	0.471		0	
7	0	-0.577	0	-0.577	0.683	0.471		0	
8	30	1.766	0	-0.577	1.66	0.471		0	
9								0	
10								0	
11								10	
12								10	
13								10	
14								10	
15								20	
16								30	

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164459
Alias:	NAS# 9975F
Replicates:	8
Mean:	20
SD:	11.952
Tr Mean:	20
Trans SD:	11.952

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	10	Statistic:	Approximate t
Residual SD:	7.906	Test Residual SD:	5.345	Balanced Design:	Yes
SS:	1187.5	Ref. Residual Mean:	4.688	Transformation:	No Transformation
K:	8	Ref. Residual SD:	1.294		
b:	32.615	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8958	Calculated Value:	2.7322	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	10
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	3.5288
				Critical Value:	>= 1.812
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	40	40	0	0	20	3.75			-10
2	20	20	10	10	0	6.25			-10
3	10	10	0	0	10	3.75			-10
4	10	10	10	10	10	6.25			-10
5	30	30	10	10	10	6.25			-3.75
6	10	10	0	0	10	3.75			-3.75
7	10	10	0	0	10	3.75			-3.75
8	30	30	0	0	10	3.75			-3.75
9									-3.75
10									0
11									6.25
12									6.25
13									6.25
14									10
15									10
16									20

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164460
Alias:	NAS# 9976F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	2.5
Trans SD:	4.629

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	3.75	Statistic:	Mann-Whitney
Residual SD:	4.215	Test Residual SD:	2.315	Balanced Design:	Yes
SS:	337.5	Ref. Residual Mean:	4.688	Transformation:	rank-order
K:	8	Ref. Residual SD:	1.294		
b:	15.296	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6933	Calculated Value:	1	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	28
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	2.5	3.75	0		-3.75
2	10	14	10	14	7.5	6.25	0		-3.75
3	0	6	0	6	2.5	3.75	0		-3.75
4	0	6	10	14	2.5	6.25	0		-3.75
5	10	14	10	14	7.5	6.25	0		-3.75
6	0	6	0	6	2.5	3.75	0		-2.5
7	0	6	0	6	2.5	3.75	0		-2.5
8	0	6	0	6	2.5	3.75	0		-2.5
9							0		-2.5
10							0		-2.5
11							0		-2.5
12							10		6.25
13							10		6.25
14							10		6.25
15							10		7.5
16							10		7.5

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164461
Alias:	NAS# 9977F
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	-0.2
Trans SD:	0.566

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	0.2
Trans SD:	0.829

Shapiro-Wilk Results:

Residual Mean:	
Residual SD:	
SS:	
K:	
b:	
Alpha Level:	N/A
Calculated Value:	N/A
Critical Value:	N/A
Normally Distributed:	N/A
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.35
Test Residual SD:	0.425
Ref. Residual Mean:	0.751
Ref. Residual SD:	0.207
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.3966
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	Rankits
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	12
Experimental Alpha Level:	0.05
Calculated Value:	-1.1282
Critical Value:	>= 1.782
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.4	0	-0.4	0.2	0.601		0	
2	0	-0.4	10	1.201	0.2	1.001		0	
3	0	-0.4	0	-0.4	0.2	0.601		0	
4	0	-0.4	10	1.201	0.2	1.001		0	
5	10	1.201	10	1.201	1.401	1.001		0	
6	0	-0.4	0	-0.4	0.2	0.601		0	
7	0	-0.4	0	-0.4	0.2	0.601		0	
8	0	-0.4	0	-0.4	0.2	0.601		0	
9								0	
10								0	
11								0	
12								0	
13								10	
14								10	
15								10	
16								10	

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164468
Alias:	NAS# 9981F
Replicates:	8
Mean:	13.75
SD:	13.025
Tr Mean:	0.413
Trans SD:	0.936

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	-0.413
Trans SD:	0.613

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.7	Statistic:	Student's t
Residual SD:		Test Residual SD:	0.562	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.555	Transformation:	Rankits
K:		Ref. Residual SD:	0.153		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	0.7033	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally Distributed:	N/A	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	2.0899
Override Option:	Not Invoked			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	1.138	0	-0.858	0.724	0.444		0	
2	20	1.138	10	0.327	0.724	0.741		0	
3	10	0.327	0	-0.858	0.086	0.444		0	
4	0	-0.858	10	0.327	1.271	0.741		0	
5	10	0.327	10	0.327	0.086	0.741		0	
6	0	-0.858	0	-0.858	1.271	0.444		0	
7	10	0.327	0	-0.858	0.086	0.444		0	
8	40	1.766	0	-0.858	1.353	0.444		10	
9								10	
10								10	
11								10	
12								10	
13								10	
14								20	
15								20	
16								40	

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164469
Alias:	NAS# 9982F
Replicates:	8
Mean:	8.75
SD:	6.409
Tr Mean:	8.75
Trans SD:	6.409

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	5
SS:	475
K:	8
b:	21.03
Alpha Level:	0.05
Calculated Value:	0.931
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	4.375
Test Residual SD:	4.381
Ref. Residual Mean:	4.688
Ref. Residual SD:	1.294
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.1935
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	1.7168
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	10	0	0	1.25	3.75			-8.75
2	10	10	10	10	1.25	6.25			-8.75
3	0	0	0	0	8.75	3.75			-3.75
4	20	20	10	10	11.25	6.25			-3.75
5	10	10	10	10	1.25	6.25			-3.75
6	10	10	0	0	1.25	3.75			-3.75
7	0	0	0	0	8.75	3.75			-3.75
8	10	10	0	0	1.25	3.75			1.25
9									1.25
10									1.25
11									1.25
12									1.25
13									6.25
14									6.25
15									6.25
16									11.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164471
Alias:	NAS# 9984F
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	5
Trans SD:	7.559

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	6.25	Statistic:	Mann-Whitney
Residual SD:	5.561	Test Residual SD:	3.536	Balanced Design:	Yes
SS:	587.5	Ref. Residual Mean:	4.688	Transformation:	rank-order
K:	8	Ref. Residual SD:	1.294		
b:	21.157	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7619	Calculated Value:	1.1739	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	33.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	0	5.5	5	3.75	0		-5
2	0	5.5	10	13	5	6.25	0		-5
3	10	13	0	5.5	5	3.75	0		-5
4	10	13	10	13	5	6.25	0		-5
5	0	5.5	10	13	5	6.25	0		-5
6	0	5.5	0	5.5	5	3.75	0		-3.75
7	0	5.5	0	5.5	5	3.75	0		-3.75
8	20	16	0	5.5	15	3.75	0		-3.75
9							0		-3.75
10							0		-3.75
11							10		5
12							10		5
13							10		6.25
14							10		6.25
15							10		6.25
16							20		15

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164433
Alias:	NAS# 9953F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0
SS:	0
K:	0
b:	0
Alpha Level:	N/A
Calculated Value:	N/A
Critical Value:	N/A
Normally Distributed:	N/A
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0
Test Residual SD:	0
Ref. Residual Mean:	0
Ref. Residual SD:	0
Deg. of Freedom:	N/A
Alpha Level:	N/A
Calculated Value:	N/A
Critical Value:	N/A
Variances Homogeneous:	N/A

Test Results:

Statistic:	1-Sample t-Test
Balanced Design:	Yes
Transformation:	ArcSin
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	7
Experimental Alpha Level:	0.05
Calculated Value:	2.0494
Critical Value:	>= 1.895
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	0	0	0					
2	0	0	0	0					
3	10	18.435	0	0					
4	0	0	0	0					
5	0	0	0	0					
6	10	18.435	0	0					
7	10	18.435	0	0					
8	0	0	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164434
Alias:	NAS# 9954F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0	Statistic:	1-Sample t-Test
Residual SD:	0	Test Residual SD:	0	Balanced Design:	Yes
SS:	0	Ref. Residual Mean:	0	Transformation:	ArcSin
K:	0	Ref. Residual SD:	0		
b:	0	Deg. of Freedom:	N/A		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	N/A	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	N/A	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	N/A		
Normally Distributed:	N/A	Variances Homogeneous:	N/A	Degrees of Freedom:	7
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	1.4953
				Critical Value:	>= 1.895
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	0	0	0					
2	20	26.565	0	0					
3	0	0	0	0					
4	0	0	0	0					
5	10	18.435	0	0					
6	0	0	0	0					
7	0	0	0	0					
8	0	0	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164435
Alias:	NAS# 9955F
Replicates:	8
Mean:	16.25
SD:	13.025
Tr Mean:	21.593
Trans SD:	11.814

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0	Statistic:	1-Sample t-Test
Residual SD:	0	Test Residual SD:	0	Balanced Design:	Yes
SS:	0	Ref. Residual Mean:	0	Transformation:	ArcSin
K:	0	Ref. Residual SD:	0		
b:	0	Deg. of Freedom:	N/A		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	N/A	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	N/A	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	N/A		
Normally Distributed:	N/A	Variances Homogeneous:	N/A	Degrees of Freedom:	7
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	5.1698
				Critical Value:	>= 1.895
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	0	0					
2	10	18.435	0	0					
3	20	26.565	0	0					
4	10	18.435	0	0					
5	0	0	0	0					
6	30	33.211	0	0					
7	40	39.231	0	0					
8	10	18.435	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164436
Alias:	NAS# 9956F
Replicates:	8
Mean:	25
SD:	9.258
Tr Mean:	29.624
Trans SD:	6.371

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0	Statistic:	1-Sample t-Test
Residual SD:	0	Test Residual SD:	0	Balanced Design:	Yes
SS:	0	Ref. Residual Mean:	0	Transformation:	ArcSin
K:	0	Ref. Residual SD:	0		
b:	0	Deg. of Freedom:	N/A		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	N/A	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	N/A	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	N/A		
Normally Distributed:	N/A	Variances Homogeneous:	N/A	Degrees of Freedom:	7
				Experimental Alpha Level:	0.05
				Calculated Value:	13.1509
Override Option:	N/A			Critical Value:	>= 1.895
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	26.565	0	0					
2	20	26.565	0	0					
3	30	33.211	0	0					
4	30	33.211	0	0					
5	30	33.211	0	0					
6	40	39.231	0	0					
7	20	26.565	0	0					
8	10	18.435	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164437
Alias:	NAS# 9957F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0	Statistic:	1-Sample t-Test
Residual SD:	0	Test Residual SD:	0	Balanced Design:	Yes
SS:	0	Ref. Residual Mean:	0	Transformation:	ArcSin
K:	0	Ref. Residual SD:	0		
b:	0	Deg. of Freedom:	N/A		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	N/A	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	N/A	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	N/A		
Normally Distributed:	N/A	Variances Homogeneous:	N/A	Degrees of Freedom:	7
				Experimental Alpha Level:	0.05
				Calculated Value:	2.6458
Override Option:	N/A			Critical Value:	>= 1.895
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	0	0					
2	0	0	0	0					
3	10	18.435	0	0					
4	10	18.435	0	0					
5	10	18.435	0	0					
6	0	0	0	0					
7	0	0	0	0					
8	0	0	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164440
Alias:	NAS# 9958F
Replicates:	8
Mean:	6.25
SD:	10.607
Tr Mean:	8.76
Trans SD:	12.921

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0	Statistic:	1-Sample t-Test
Residual SD:	0	Test Residual SD:	0	Balanced Design:	Yes
SS:	0	Ref. Residual Mean:	0	Transformation:	ArcSin
K:	0	Ref. Residual SD:	0		
b:	0	Deg. of Freedom:	N/A		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	N/A	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	N/A	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	N/A		
Normally Distributed:	N/A	Variances Homogeneous:	N/A	Degrees of Freedom:	7
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	1.9175
				Critical Value:	>= 1.895
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	0	0					
2	0	0	0	0					
3	0	0	0	0					
4	0	0	0	0					
5	0	0	0	0					
6	30	33.211	0	0					
7	0	0	0	0					
8	10	18.435	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164441
Alias:	NAS# 9959F
Replicates:	8
Mean:	6.25
SD:	5.175
Tr Mean:	11.522
Trans SD:	9.541

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0
SS:	0
K:	0
b:	0
Alpha Level:	N/A
Calculated Value:	N/A
Critical Value:	N/A
Normally Distributed:	N/A
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0
Test Residual SD:	0
Ref. Residual Mean:	0
Ref. Residual SD:	0
Deg. of Freedom:	N/A
Alpha Level:	N/A
Calculated Value:	N/A
Critical Value:	N/A
Variances Homogeneous:	N/A

Test Results:

Statistic:	1-Sample t-Test
Balanced Design:	Yes
Transformation:	ArcSin
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	7
Experimental Alpha Level:	0.05
Calculated Value:	3.4157
Critical Value:	>= 1.895
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	0	0					
2	10	18.435	0	0					
3	10	18.435	0	0					
4	10	18.435	0	0					
5	10	18.435	0	0					
6	0	0	0	0					
7	0	0	0	0					
8	0	0	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164442
Alias:	NAS# 9960F
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0
SS:	0
K:	0
b:	0
Alpha Level:	N/A
Calculated Value:	N/A
Critical Value:	N/A
Normally Distributed:	N/A
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0
Test Residual SD:	0
Ref. Residual Mean:	0
Ref. Residual SD:	0
Deg. of Freedom:	N/A
Alpha Level:	N/A
Calculated Value:	N/A
Critical Value:	N/A
Variances Homogeneous:	N/A

Test Results:

Statistic:	1-Sample t-Test
Balanced Design:	Yes
Transformation:	ArcSin
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	7
Experimental Alpha Level:	0.05
Calculated Value:	1.9976
Critical Value:	>= 1.895
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	0	0	0					
2	0	0	0	0					
3	10	18.435	0	0					
4	0	0	0	0					
5	0	0	0	0					
6	0	0	0	0					
7	20	26.565	0	0					
8	10	18.435	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164443
Alias:	NAS# 9961F
Replicates:	8
Mean:	18.75
SD:	8.345
Tr Mean:	25.178
Trans SD:	6.225

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0	Statistic:	1-Sample t-Test
Residual SD:	0	Test Residual SD:	0	Balanced Design:	Yes
SS:	0	Ref. Residual Mean:	0	Transformation:	ArcSin
K:	0	Ref. Residual SD:	0		
b:	0	Deg. of Freedom:	N/A		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	N/A	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	N/A	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	N/A		
Normally Distributed:	N/A	Variances Homogeneous:	N/A	Degrees of Freedom:	7
				Experimental Alpha Level:	0.05
				Calculated Value:	11.4403
Override Option:	N/A			Critical Value:	>= 1.895
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	0	0					
2	20	26.565	0	0					
3	20	26.565	0	0					
4	10	18.435	0	0					
5	30	33.211	0	0					
6	30	33.211	0	0					
7	20	26.565	0	0					
8	10	18.435	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164449
Alias:	NAS# 9962F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0	Statistic:	1-Sample t-Test
Residual SD:	0	Test Residual SD:	0	Balanced Design:	Yes
SS:	0	Ref. Residual Mean:	0	Transformation:	ArcSin
K:	0	Ref. Residual SD:	0		
b:	0	Deg. of Freedom:	N/A		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	N/A	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	N/A	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	N/A		
Normally		Variances		Degrees of Freedom:	7
Distributed:	N/A	Homogeneous:	N/A	Experimental Alpha Level:	0.05
				Calculated Value:	2.6458
Override Option:	N/A			Critical Value:	>= 1.895
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	0	0					
2	0	0	0	0					
3	10	18.435	0	0					
4	0	0	0	0					
5	0	0	0	0					
6	0	0	0	0					
7	10	18.435	0	0					
8	10	18.435	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164439
Alias:	NAS# 9966F
Replicates:	8
Mean:	6.25
SD:	9.161
Tr Mean:	8.946
Trans SD:	12.598

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0	Statistic:	1-Sample t-Test
Residual SD:	0	Test Residual SD:	0	Balanced Design:	Yes
SS:	0	Ref. Residual Mean:	0	Transformation:	ArcSin
K:	0	Ref. Residual SD:	0		
b:	0	Deg. of Freedom:	N/A		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	N/A	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	N/A	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	N/A		
Normally Distributed:	N/A	Variances Homogeneous:	N/A	Degrees of Freedom:	7
				Experimental Alpha Level:	0.05
				Calculated Value:	2.0083
Override Option:	N/A			Critical Value:	>= 1.895
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	0	0	0					
2	0	0	0	0					
3	0	0	0	0					
4	0	0	0	0					
5	20	26.565	0	0					
6	20	26.565	0	0					
7	10	18.435	0	0					
8	0	0	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164450
Alias:	NAS# 9967F
Replicates:	8
Mean:	7.5
SD:	7.071
Tr Mean:	12.538
Trans SD:	10.74

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0	Statistic:	1-Sample t-Test
Residual SD:	0	Test Residual SD:	0	Balanced Design:	Yes
SS:	0	Ref. Residual Mean:	0	Transformation:	ArcSin
K:	0	Ref. Residual SD:	0		
b:	0	Deg. of Freedom:	N/A		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	N/A	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	N/A	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	N/A		
Normally		Variances		Degrees of Freedom:	7
Distributed:	N/A	Homogeneous:	N/A	Experimental Alpha Level:	0.05
				Calculated Value:	3.3019
Override Option:	N/A			Critical Value:	>= 1.895
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	0	0					
2	10	18.435	0	0					
3	20	26.565	0	0					
4	10	18.435	0	0					
5	0	0	0	0					
6	0	0	0	0					
7	10	18.435	0	0					
8	0	0	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164451
Alias:	NAS# 9968F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0	Statistic:	1-Sample t-Test
Residual SD:	0	Test Residual SD:	0	Balanced Design:	Yes
SS:	0	Ref. Residual Mean:	0	Transformation:	ArcSin
K:	0	Ref. Residual SD:	0		
b:	0	Deg. of Freedom:	N/A		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	N/A	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	N/A	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	N/A		
Normally Distributed:	N/A	Variances Homogeneous:	N/A	Degrees of Freedom:	7
				Experimental Alpha Level:	0.05
				Calculated Value:	1.4953
Override Option:	N/A			Critical Value:	>= 1.895
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	0	0	0					
2	20	26.565	0	0					
3	0	0	0	0					
4	10	18.435	0	0					
5	0	0	0	0					
6	0	0	0	0					
7	0	0	0	0					
8	0	0	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164452
Alias:	NAS# 9969F
Replicates:	8
Mean:	11.25
SD:	11.26
Tr Mean:	15.401
Trans SD:	13.609

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0	Statistic:	1-Sample t-Test
Residual SD:	0	Test Residual SD:	0	Balanced Design:	Yes
SS:	0	Ref. Residual Mean:	0	Transformation:	ArcSin
K:	0	Ref. Residual SD:	0		
b:	0	Deg. of Freedom:	N/A		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	N/A	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	N/A	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	N/A		
Normally Distributed:	N/A	Variances Homogeneous:	N/A	Degrees of Freedom:	7
				Experimental Alpha Level:	0.05
				Calculated Value:	3.2009
Override Option:	N/A			Critical Value:	>= 1.895
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	0	0					
2	10	18.435	0	0					
3	30	33.211	0	0					
4	0	0	0	0					
5	0	0	0	0					
6	20	26.565	0	0					
7	0	0	0	0					
8	20	26.565	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164453
Alias:	NAS# 9970F
Replicates:	8
Mean:	8.75
SD:	8.345
Tr Mean:	13.554
Trans SD:	11.718

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0	Statistic:	1-Sample t-Test
Residual SD:	0	Test Residual SD:	0	Balanced Design:	Yes
SS:	0	Ref. Residual Mean:	0	Transformation:	ArcSin
K:	0	Ref. Residual SD:	0		
b:	0	Deg. of Freedom:	N/A		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	N/A	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	N/A	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	N/A		
Normally Distributed:	N/A	Variances Homogeneous:	N/A	Degrees of Freedom:	7
				Experimental Alpha Level:	0.05
				Calculated Value:	3.2717
Override Option:	N/A			Critical Value:	>= 1.895
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	26.565	0	0					
2	10	18.435	0	0					
3	20	26.565	0	0					
4	0	0	0	0					
5	10	18.435	0	0					
6	0	0	0	0					
7	0	0	0	0					
8	10	18.435	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164454
Alias:	NAS# 9971F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0
SS:	0
K:	0
b:	0
Alpha Level:	N/A
Calculated Value:	N/A
Critical Value:	N/A
Normally Distributed:	N/A
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0
Test Residual SD:	0
Ref. Residual Mean:	0
Ref. Residual SD:	0
Deg. of Freedom:	N/A
Alpha Level:	N/A
Calculated Value:	N/A
Critical Value:	N/A
Variances Homogeneous:	N/A

Test Results:

Statistic:	1-Sample t-Test
Balanced Design:	Yes
Transformation:	ArcSin
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	7
Experimental Alpha Level:	0.05
Calculated Value:	1.5275
Critical Value:	>= 1.895
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	0	0					
2	0	0	0	0					
3	0	0	0	0					
4	0	0	0	0					
5	0	0	0	0					
6	10	18.435	0	0					
7	0	0	0	0					
8	0	0	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164455
Alias:	NAS# 9972F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0	Statistic:	1-Sample t-Test
Residual SD:	0	Test Residual SD:	0	Balanced Design:	Yes
SS:	0	Ref. Residual Mean:	0	Transformation:	ArcSin
K:	0	Ref. Residual SD:	0		
b:	0	Deg. of Freedom:	N/A		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	N/A	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	N/A	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	N/A		
Normally Distributed:	N/A	Variances Homogeneous:	N/A	Degrees of Freedom:	7
				Experimental Alpha Level:	0.05
				Calculated Value:	2.6458
Override Option:	N/A			Critical Value:	>= 1.895
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	0	0					
2	10	18.435	0	0					
3	10	18.435	0	0					
4	0	0	0	0					
5	10	18.435	0	0					
6	0	0	0	0					
7	0	0	0	0					
8	0	0	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164456
Alias:	NAS# 9973F
Replicates:	8
Mean:	10
SD:	14.142
Tr Mean:	12.833
Trans SD:	15.151

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0	Statistic:	1-Sample t-Test
Residual SD:	0	Test Residual SD:	0	Balanced Design:	Yes
SS:	0	Ref. Residual Mean:	0	Transformation:	ArcSin
K:	0	Ref. Residual SD:	0		
b:	0	Deg. of Freedom:	N/A		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	N/A	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	N/A	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	N/A		
Normally		Variances		Degrees of Freedom:	7
Distributed:	N/A	Homogeneous:	N/A	Experimental Alpha Level:	0.05
				Calculated Value:	2.3957
Override Option:	N/A			Critical Value:	>= 1.895
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	26.565	0	0					
2	0	0	0	0					
3	40	39.231	0	0					
4	0	0	0	0					
5	10	18.435	0	0					
6	0	0	0	0					
7	0	0	0	0					
8	10	18.435	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164457
Alias:	NAS# 9974F
Replicates:	8
Mean:	7.5
SD:	11.65
Tr Mean:	9.776
Trans SD:	14.061

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0	Statistic:	1-Sample t-Test
Residual SD:	0	Test Residual SD:	0	Balanced Design:	Yes
SS:	0	Ref. Residual Mean:	0	Transformation:	ArcSin
K:	0	Ref. Residual SD:	0		
b:	0	Deg. of Freedom:	N/A		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	N/A	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	N/A	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	N/A		
Normally Distributed:	N/A	Variances Homogeneous:	N/A	Degrees of Freedom:	7
				Experimental Alpha Level:	0.05
				Calculated Value:	1.9666
Override Option:	N/A			Critical Value:	>= 1.895
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	0	0	0					
2	0	0	0	0					
3	20	26.565	0	0					
4	0	0	0	0					
5	0	0	0	0					
6	10	18.435	0	0					
7	0	0	0	0					
8	30	33.211	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164459
Alias:	NAS# 9975F
Replicates:	8
Mean:	20
SD:	11.952
Tr Mean:	25.745
Trans SD:	8.517

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0	Statistic:	1-Sample t-Test
Residual SD:	0	Test Residual SD:	0	Balanced Design:	Yes
SS:	0	Ref. Residual Mean:	0	Transformation:	ArcSin
K:	0	Ref. Residual SD:	0		
b:	0	Deg. of Freedom:	N/A		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	N/A	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	N/A	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	N/A		
Normally Distributed:	N/A	Variances Homogeneous:	N/A	Degrees of Freedom:	7
				Experimental Alpha Level:	0.05
				Calculated Value:	8.5495
Override Option:	N/A			Critical Value:	>= 1.895
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	40	39.231	0	0					
2	20	26.565	0	0					
3	10	18.435	0	0					
4	10	18.435	0	0					
5	30	33.211	0	0					
6	10	18.435	0	0					
7	10	18.435	0	0					
8	30	33.211	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164460
Alias:	NAS# 9976F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0	Statistic:	1-Sample t-Test
Residual SD:	0	Test Residual SD:	0	Balanced Design:	Yes
SS:	0	Ref. Residual Mean:	0	Transformation:	ArcSin
K:	0	Ref. Residual SD:	0		
b:	0	Deg. of Freedom:	N/A		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	N/A	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	N/A	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	N/A		
Normally Distributed:	N/A	Variances Homogeneous:	N/A	Degrees of Freedom:	7
				Experimental Alpha Level:	0.05
				Calculated Value:	1.5275
Override Option:	N/A			Critical Value:	>= 1.895
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	0	0	0					
2	10	18.435	0	0					
3	0	0	0	0					
4	0	0	0	0					
5	10	18.435	0	0					
6	0	0	0	0					
7	0	0	0	0					
8	0	0	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164461
Alias:	NAS# 9977F
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	2.304
Trans SD:	6.518

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0	Statistic:	1-Sample t-Test
Residual SD:	0	Test Residual SD:	0	Balanced Design:	Yes
SS:	0	Ref. Residual Mean:	0	Transformation:	ArcSin
K:	0	Ref. Residual SD:	0		
b:	0	Deg. of Freedom:	N/A		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	N/A	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	N/A	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	N/A		
Normally Distributed:	N/A	Variances Homogeneous:	N/A	Degrees of Freedom:	7
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	1
				Critical Value:	>= 1.895
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	0	0	0					
2	0	0	0	0					
3	0	0	0	0					
4	0	0	0	0					
5	10	18.435	0	0					
6	0	0	0	0					
7	0	0	0	0					
8	0	0	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164468
Alias:	NAS# 9981F
Replicates:	8
Mean:	13.75
SD:	13.025
Tr Mean:	18.458
Trans SD:	13.333

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0	Statistic:	1-Sample t-Test
Residual SD:	0	Test Residual SD:	0	Balanced Design:	Yes
SS:	0	Ref. Residual Mean:	0	Transformation:	ArcSin
K:	0	Ref. Residual SD:	0		
b:	0	Deg. of Freedom:	N/A		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	N/A	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	N/A	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	N/A		
Normally Distributed:	N/A	Variances Homogeneous:	N/A	Degrees of Freedom:	7
				Experimental Alpha Level:	0.05
				Calculated Value:	3.9157
Override Option:	N/A			Critical Value:	>= 1.895
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	26.565	0	0					
2	20	26.565	0	0					
3	10	18.435	0	0					
4	0	0	0	0					
5	10	18.435	0	0					
6	0	0	0	0					
7	10	18.435	0	0					
8	40	39.231	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164469
Alias:	NAS# 9982F
Replicates:	8
Mean:	8.75
SD:	6.409
Tr Mean:	14.842
Trans SD:	9.581

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0
SS:	0
K:	0
b:	0
Alpha Level:	N/A
Calculated Value:	N/A
Critical Value:	N/A
Normally Distributed:	N/A
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0
Test Residual SD:	0
Ref. Residual Mean:	0
Ref. Residual SD:	0
Deg. of Freedom:	N/A
Alpha Level:	N/A
Calculated Value:	N/A
Critical Value:	N/A
Variances Homogeneous:	N/A

Test Results:

Statistic:	1-Sample t-Test
Balanced Design:	Yes
Transformation:	ArcSin
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	7
Experimental Alpha Level:	0.05
Calculated Value:	4.3818
Critical Value:	>= 1.895
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	0	0					
2	10	18.435	0	0					
3	0	0	0	0					
4	20	26.565	0	0					
5	10	18.435	0	0					
6	10	18.435	0	0					
7	0	0	0	0					
8	10	18.435	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164471
Alias:	NAS# 9984F
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0	Statistic:	1-Sample t-Test
Residual SD:	0	Test Residual SD:	0	Balanced Design:	Yes
SS:	0	Ref. Residual Mean:	0	Transformation:	ArcSin
K:	0	Ref. Residual SD:	0		
b:	0	Deg. of Freedom:	N/A		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	N/A	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	N/A	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	N/A		
Normally Distributed:	N/A	Variances Homogeneous:	N/A	Degrees of Freedom:	7
				Experimental Alpha Level:	0.05
				Calculated Value:	1.9976
Override Option:	N/A			Critical Value:	>= 1.895
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	0	0	0					
2	0	0	0	0					
3	10	18.435	0	0					
4	10	18.435	0	0					
5	0	0	0	0					
6	0	0	0	0					
7	0	0	0	0					
8	20	26.565	0	0					
9									
10									
11									
12									
13									
14									
15									
16									

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164433
Alias:	NAS# 9953F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	3.75
Trans SD:	7.44

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	4.688	Statistic:	Mann-Whitney
Residual SD:	5.501	Test Residual SD:	1.294	Balanced Design:	Yes
SS:	575	Ref. Residual Mean:	5.625	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.381		
b:	19.309	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6484	Calculated Value:	0.5804	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	34.5
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	3.75	3.75	0		-3.75
2	0	6	0	6	3.75	3.75	0		-3.75
3	10	13.5	0	6	6.25	3.75	0		-3.75
4	0	6	10	13.5	3.75	6.25	0		-3.75
5	0	6	20	16	3.75	16.25	0		-3.75
6	10	13.5	0	6	6.25	3.75	0		-3.75
7	10	13.5	0	6	6.25	3.75	0		-3.75
8	0	6	0	6	3.75	3.75	0		-3.75
9							0		-3.75
10							0		-3.75
11							0		-3.75
12							10		6.25
13							10		6.25
14							10		6.25
15							10		6.25
16							20		16.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164434
Alias:	NAS# 9954F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	3.75
Trans SD:	7.44

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	3.75
Trans SD:	7.44

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	5.625	Statistic:	Mann-Whitney
Residual SD:	6.387	Test Residual SD:	4.381	Balanced Design:	Yes
SS:	775	Ref. Residual Mean:	5.625	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.381		
b:	21.152	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.5773	Calculated Value:	0	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	32
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	3.75	3.75	0		-3.75
2	20	15.5	0	6.5	16.25	3.75	0		-3.75
3	0	6.5	0	6.5	3.75	3.75	0		-3.75
4	0	6.5	10	13.5	3.75	6.25	0		-3.75
5	10	13.5	20	15.5	6.25	16.25	0		-3.75
6	0	6.5	0	6.5	3.75	3.75	0		-3.75
7	0	6.5	0	6.5	3.75	3.75	0		-3.75
8	0	6.5	0	6.5	3.75	3.75	0		-3.75
9							0		-3.75
10							0		-3.75
11							0		-3.75
12							0		-3.75
13							10		6.25
14							10		6.25
15							20		16.25
16							20		16.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164435
Alias:	NAS# 9955F
Replicates:	8
Mean:	16.25
SD:	13.025
Tr Mean:	16.25
Trans SD:	13.025

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	3.75
Trans SD:	7.44

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	9.105
SS:	1575
K:	8
b:	36.539
Alpha Level:	0.05
Calculated Value:	0.8477
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	10.313
Test Residual SD:	6.936
Ref. Residual Mean:	5.625
Ref. Residual SD:	4.381
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.6161
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	52.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	10	0	4	6.25	3.75	0		-16.25
2	10	10	0	4	6.25	3.75	0		-6.25
3	20	13.5	0	4	3.75	3.75	0		-6.25
4	10	10	10	10	6.25	6.25	0		-6.25
5	0	4	20	13.5	16.25	16.25	0		-6.25
6	30	15	0	4	13.75	3.75	0		-3.75
7	40	16	0	4	23.75	3.75	0		-3.75
8	10	10	0	4	6.25	3.75	10		-3.75
9							10		-3.75
10							10		-3.75
11							10		-3.75
12							10		3.75
13							20		6.25
14							20		13.75
15							30		16.25
16							40		23.75

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164436
Alias:	NAS# 9956F
Replicates:	8
Mean:	25
SD:	9.258
Tr Mean:	25
Trans SD:	9.258

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	3.75
Trans SD:	7.44

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	7.209
SS:	987.5
K:	8
b:	29.301
Alpha Level:	0.05
Calculated Value:	0.8694
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	7.5
Test Residual SD:	4.629
Ref. Residual Mean:	5.625
Ref. Residual SD:	4.381
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.8321
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	61
Critical Value:	>= 49.0
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	10.5	0	3.5	5	3.75	0		-15
2	20	10.5	0	3.5	5	3.75	0		-5
3	30	14	0	3.5	5	3.75	0		-5
4	30	14	10	7.5	5	6.25	0		-5
5	30	14	20	10.5	5	16.25	0		-3.75
6	40	16	0	3.5	15	3.75	0		-3.75
7	20	10.5	0	3.5	5	3.75	10		-3.75
8	10	7.5	0	3.5	15	3.75	10		-3.75
9							20		-3.75
10							20		-3.75
11							20		5
12							20		5
13							30		5
14							30		6.25
15							30		15
16							40		16.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164437
Alias:	NAS# 9957F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	5
Trans SD:	5.345

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	3.75
Trans SD:	7.44

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	5	Statistic:	Mann-Whitney
Residual SD:	5.561	Test Residual SD:	0	Balanced Design:	Yes
SS:	587.5	Ref. Residual Mean:	5.625	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.381		
b:	21.051	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7543	Calculated Value:	0.4035	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	38
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	13	0	5.5	5	3.75	0		-5
2	0	5.5	0	5.5	5	3.75	0		-5
3	10	13	0	5.5	5	3.75	0		-5
4	10	13	10	13	5	6.25	0		-5
5	10	13	20	16	5	16.25	0		-3.75
6	0	5.5	0	5.5	5	3.75	0		-3.75
7	0	5.5	0	5.5	5	3.75	0		-3.75
8	0	5.5	0	5.5	5	3.75	0		-3.75
9							0		-3.75
10							0		-3.75
11							10		5
12							10		5
13							10		5
14							10		5
15							10		6.25
16							20		16.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164440
Alias:	NAS# 9958F
Replicates:	8
Mean:	6.25
SD:	10.607
Tr Mean:	6.25
Trans SD:	10.607

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	3.75
Trans SD:	7.44

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	7.864
SS:	1175
K:	8
b:	29.108
Alpha Level:	0.05
Calculated Value:	0.7211
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	7.813
Test Residual SD:	6.538
Ref. Residual Mean:	5.625
Ref. Residual SD:	4.381
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.7861
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	36
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	13	0	6	3.75	3.75	0		-6.25
2	0	6	0	6	6.25	3.75	0		-6.25
3	0	6	0	6	6.25	3.75	0		-6.25
4	0	6	10	13	6.25	6.25	0		-6.25
5	0	6	20	15	6.25	16.25	0		-6.25
6	30	16	0	6	23.75	3.75	0		-3.75
7	0	6	0	6	6.25	3.75	0		-3.75
8	10	13	0	6	3.75	3.75	0		-3.75
9							0		-3.75
10							0		-3.75
11							0		-3.75
12							10		3.75
13							10		3.75
14							10		6.25
15							20		16.25
16							30		23.75

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164441
Alias:	NAS# 9959F
Replicates:	8
Mean:	6.25
SD:	5.175
Tr Mean:	6.25
Trans SD:	5.175

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	3.75
Trans SD:	7.44

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	5.501
SS:	575
K:	8
b:	21.748
Alpha Level:	0.05
Calculated Value:	0.8225
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	4.688
Test Residual SD:	1.294
Ref. Residual Mean:	5.625
Ref. Residual SD:	4.381
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.5804
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	41.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	12.5	0	5	3.75	3.75	0		-6.25
2	10	12.5	0	5	3.75	3.75	0		-6.25
3	10	12.5	0	5	3.75	3.75	0		-6.25
4	10	12.5	10	12.5	3.75	6.25	0		-3.75
5	10	12.5	20	16	3.75	16.25	0		-3.75
6	0	5	0	5	6.25	3.75	0		-3.75
7	0	5	0	5	6.25	3.75	0		-3.75
8	0	5	0	5	6.25	3.75	0		-3.75
9							0		-3.75
10							10		3.75
11							10		3.75
12							10		3.75
13							10		3.75
14							10		3.75
15							10		6.25
16							20		16.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164442
Alias:	NAS# 9960F
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	5
Trans SD:	7.559

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	3.75
Trans SD:	7.44

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	6.438
SS:	787.5
K:	8
b:	23.546
Alpha Level:	0.05
Calculated Value:	0.704
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	6.25
Test Residual SD:	3.536
Ref. Residual Mean:	5.625
Ref. Residual SD:	4.381
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.314
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	35.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	5	3.75	0		-5
2	0	6	0	6	5	3.75	0		-5
3	10	13	0	6	5	3.75	0		-5
4	0	6	10	13	5	6.25	0		-5
5	0	6	20	15.5	5	16.25	0		-5
6	0	6	0	6	5	3.75	0		-3.75
7	20	15.5	0	6	15	3.75	0		-3.75
8	10	13	0	6	5	3.75	0		-3.75
9							0		-3.75
10							0		-3.75
11							0		-3.75
12							10		5
13							10		5
14							10		6.25
15							20		15
16							20		16.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164443
Alias:	NAS# 9961F
Replicates:	8
Mean:	18.75
SD:	8.345
Tr Mean:	18.75
Trans SD:	8.345

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	3.75
Trans SD:	7.44

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	6.786
SS:	875
K:	8
b:	27.724
Alpha Level:	0.05
Calculated Value:	0.8784
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	6.563
Test Residual SD:	4.519
Ref. Residual Mean:	5.625
Ref. Residual SD:	4.381
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.4213
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	58
Critical Value:	>= 49.0
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	8.5	0	3.5	8.75	3.75	0		-8.75
2	20	12.5	0	3.5	1.25	3.75	0		-8.75
3	20	12.5	0	3.5	1.25	3.75	0		-8.75
4	10	8.5	10	8.5	8.75	6.25	0		-3.75
5	30	15.5	20	12.5	11.25	16.25	0		-3.75
6	30	15.5	0	3.5	11.25	3.75	0		-3.75
7	20	12.5	0	3.5	1.25	3.75	10		-3.75
8	10	8.5	0	3.5	8.75	3.75	10		-3.75
9							10		-3.75
10							10		1.25
11							20		1.25
12							20		1.25
13							20		6.25
14							20		11.25
15							30		11.25
16							30		16.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164449
Alias:	NAS# 9962F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	5
Trans SD:	5.345

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	3.75
Trans SD:	7.44

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	5	Statistic:	Mann-Whitney
Residual SD:	5.561	Test Residual SD:	0	Balanced Design:	Yes
SS:	587.5	Ref. Residual Mean:	5.625	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.381		
b:	21.051	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7543	Calculated Value:	0.4035	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	38
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	13	0	5.5	5	3.75	0		-5
2	0	5.5	0	5.5	5	3.75	0		-5
3	10	13	0	5.5	5	3.75	0		-5
4	0	5.5	10	13	5	6.25	0		-5
5	0	5.5	20	16	5	16.25	0		-3.75
6	0	5.5	0	5.5	5	3.75	0		-3.75
7	10	13	0	5.5	5	3.75	0		-3.75
8	10	13	0	5.5	5	3.75	0		-3.75
9							0		-3.75
10							0		-3.75
11							10		5
12							10		5
13							10		5
14							10		5
15							10		6.25
16							20		16.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164439
Alias:	NAS# 9966F
Replicates:	8
Mean:	6.25
SD:	9.161
Tr Mean:	6.25
Trans SD:	9.161

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	3.75
Trans SD:	7.44

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	7.164
SS:	975
K:	8
b:	26.869
Alpha Level:	0.05
Calculated Value:	0.7404
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	7.813
Test Residual SD:	3.765
Ref. Residual Mean:	5.625
Ref. Residual SD:	4.381
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.0711
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	36.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	6.25	3.75	0		-6.25
2	0	6	0	6	6.25	3.75	0		-6.25
3	0	6	0	6	6.25	3.75	0		-6.25
4	0	6	10	12.5	6.25	6.25	0		-6.25
5	20	15	20	15	13.75	16.25	0		-6.25
6	20	15	0	6	13.75	3.75	0		-3.75
7	10	12.5	0	6	3.75	3.75	0		-3.75
8	0	6	0	6	6.25	3.75	0		-3.75
9							0		-3.75
10							0		-3.75
11							0		-3.75
12							10		3.75
13							10		6.25
14							20		13.75
15							20		13.75
16							20		16.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164450
Alias:	NAS# 9967F
Replicates:	8
Mean:	7.5
SD:	7.071
Tr Mean:	7.5
Trans SD:	7.071

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	3.75
Trans SD:	7.44

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	6.23
SS:	737.5
K:	8
b:	25.169
Alpha Level:	0.05
Calculated Value:	0.859
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	5.625
Test Residual SD:	3.72
Ref. Residual Mean:	5.625
Ref. Residual SD:	4.381
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	42.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	12	0	5	2.5	3.75	0		-7.5
2	10	12	0	5	2.5	3.75	0		-7.5
3	20	15.5	0	5	12.5	3.75	0		-7.5
4	10	12	10	12	2.5	6.25	0		-3.75
5	0	5	20	15.5	7.5	16.25	0		-3.75
6	0	5	0	5	7.5	3.75	0		-3.75
7	10	12	0	5	2.5	3.75	0		-3.75
8	0	5	0	5	7.5	3.75	0		-3.75
9							0		-3.75
10							10		2.5
11							10		2.5
12							10		2.5
13							10		2.5
14							10		6.25
15							20		12.5
16							20		16.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164451
Alias:	NAS# 9968F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	3.75
Trans SD:	7.44

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	3.75
Trans SD:	7.44

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	5.625	Statistic:	Mann-Whitney
Residual SD:	6.387	Test Residual SD:	4.381	Balanced Design:	Yes
SS:	775	Ref. Residual Mean:	5.625	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.381		
b:	21.152	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.5773	Calculated Value:	0	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	32
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	3.75	3.75	0		-3.75
2	20	15.5	0	6.5	16.25	3.75	0		-3.75
3	0	6.5	0	6.5	3.75	3.75	0		-3.75
4	10	13.5	10	13.5	6.25	6.25	0		-3.75
5	0	6.5	20	15.5	3.75	16.25	0		-3.75
6	0	6.5	0	6.5	3.75	3.75	0		-3.75
7	0	6.5	0	6.5	3.75	3.75	0		-3.75
8	0	6.5	0	6.5	3.75	3.75	0		-3.75
9							0		-3.75
10							0		-3.75
11							0		-3.75
12							0		-3.75
13							10		6.25
14							10		6.25
15							20		16.25
16							20		16.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164452
Alias:	NAS# 9969F
Replicates:	8
Mean:	11.25
SD:	11.26
Tr Mean:	15.401
Trans SD:	13.609

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	11.551	Statistic:	Student's t
Residual SD:	10.485	Test Residual SD:	5.72	Balanced Design:	Yes
SS:	2088.862	Ref. Residual Mean:	8.437	Transformation:	ArcSin
K:	8	Ref. Residual SD:	5.643		
b:	43.481	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.9051	Calculated Value:	1.096	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	1.6007
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	0	0	3.034	5.625			-15.401
2	10	18.435	0	0	3.034	5.625			-15.401
3	30	33.211	0	0	17.81	5.625			-15.401
4	0	0	10	18.435	15.401	12.81			-5.625
5	0	0	20	26.565	15.401	20.94			-5.625
6	20	26.565	0	0	11.164	5.625			-5.625
7	0	0	0	0	15.401	5.625			-5.625
8	20	26.565	0	0	11.164	5.625			-5.625
9									-5.625
10									3.034
11									3.034
12									11.164
13									11.164
14									12.81
15									17.81
16									20.94

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164453
Alias:	NAS# 9970F
Replicates:	8
Mean:	8.75
SD:	8.345
Tr Mean:	13.554
Trans SD:	11.718

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	10.166	Statistic:	Student's t
Residual SD:	9.607	Test Residual SD:	4.382	Balanced Design:	Yes
SS:	1753.595	Ref. Residual Mean:	8.437	Transformation:	ArcSin
K:	8	Ref. Residual SD:	5.643		
b:	39.651	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8965	Calculated Value:	0.6842	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	1.417
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	26.565	0	0	13.011	5.625			-13.554
2	10	18.435	0	0	4.881	5.625			-13.554
3	20	26.565	0	0	13.011	5.625			-13.554
4	0	0	10	18.435	13.554	12.81			-5.625
5	10	18.435	20	26.565	4.881	20.94			-5.625
6	0	0	0	0	13.554	5.625			-5.625
7	0	0	0	0	13.554	5.625			-5.625
8	10	18.435	0	0	4.881	5.625			-5.625
9									-5.625
10									4.881
11									4.881
12									4.881
13									12.81
14									13.011
15									13.011
16									20.94

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164454
Alias:	NAS# 9971F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	8.279
SS:	1302.189
K:	8
b:	28.558
Alpha Level:	0.05
Calculated Value:	0.6263
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	6.913
Test Residual SD:	4.267
Ref. Residual Mean:	8.437
Ref. Residual SD:	5.643
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.6095
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	31
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	14	0	6.5	13.826	5.625	0		-5.625
2	0	6.5	0	6.5	4.609	5.625	0		-5.625
3	0	6.5	0	6.5	4.609	5.625	0		-5.625
4	0	6.5	10	14	4.609	12.81	0		-5.625
5	0	6.5	20	16	4.609	20.94	0		-5.625
6	10	14	0	6.5	13.826	5.625	0		-5.625
7	0	6.5	0	6.5	4.609	5.625	0		-4.609
8	0	6.5	0	6.5	4.609	5.625	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		12.81
14							18.435		13.826
15							18.435		13.826
16							26.565		20.94

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164455
Alias:	NAS# 9972F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.217	Statistic:	Mann-Whitney
Residual SD:	8.802	Test Residual SD:	0	Balanced Design:	Yes
SS:	1472.112	Ref. Residual Mean:	8.437	Transformation:	rank-order
K:	8	Ref. Residual SD:	5.643		
b:	34.356	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8018	Calculated Value:	0.391	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	38
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	13	0	5.5	9.217	5.625	0		-9.217
2	10	13	0	5.5	9.217	5.625	0		-9.217
3	10	13	0	5.5	9.217	5.625	0		-9.217
4	0	5.5	10	13	9.217	12.81	0		-9.217
5	10	13	20	16	9.217	20.94	0		-5.625
6	0	5.5	0	5.5	9.217	5.625	0		-5.625
7	0	5.5	0	5.5	9.217	5.625	0		-5.625
8	0	5.5	0	5.5	9.217	5.625	0		-5.625
9							0		-5.625
10							0		-5.625
11							18.435		9.217
12							18.435		9.217
13							18.435		9.217
14							18.435		9.217
15							18.435		12.81
16							26.565		20.94

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164456
Alias:	NAS# 9973F
Replicates:	8
Mean:	10
SD:	14.142
Tr Mean:	12.833
Trans SD:	15.151

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	11.238
SS:	2399.371
K:	8
b:	45.369
Alpha Level:	0.05
Calculated Value:	0.8579
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	12.833
Test Residual SD:	6.43
Ref. Residual Mean:	8.437
Ref. Residual SD:	5.643
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.4534
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	40.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	14.5	0	5.5	13.732	5.625	0		-12.833
2	0	5.5	0	5.5	12.833	5.625	0		-12.833
3	40	16	0	5.5	26.398	5.625	0		-12.833
4	0	5.5	10	12	12.833	12.81	0		-12.833
5	10	12	20	14.5	5.602	20.94	0		-5.625
6	0	5.5	0	5.5	12.833	5.625	0		-5.625
7	0	5.5	0	5.5	12.833	5.625	0		-5.625
8	10	12	0	5.5	5.602	5.625	0		-5.625
9							0		-5.625
10							0		-5.625
11							18.435		5.602
12							18.435		5.602
13							18.435		12.81
14							26.565		13.732
15							26.565		20.94
16							39.231		26.398

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164457
Alias:	NAS# 9974F
Replicates:	8
Mean:	7.5
SD:	11.65
Tr Mean:	7.5
Trans SD:	11.65

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	3.75
Trans SD:	7.44

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	8.39
SS:	1337.5
K:	8
b:	32.137
Alpha Level:	0.05
Calculated Value:	0.7722
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	9.375
Test Residual SD:	5.939
Ref. Residual Mean:	5.625
Ref. Residual SD:	4.381
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.4372
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	37
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	7.5	3.75	0		-7.5
2	0	6	0	6	7.5	3.75	0		-7.5
3	20	14.5	0	6	12.5	3.75	0		-7.5
4	0	6	10	12.5	7.5	6.25	0		-7.5
5	0	6	20	14.5	7.5	16.25	0		-7.5
6	10	12.5	0	6	2.5	3.75	0		-3.75
7	0	6	0	6	7.5	3.75	0		-3.75
8	30	16	0	6	22.5	3.75	0		-3.75
9							0		-3.75
10							0		-3.75
11							0		-3.75
12							10		2.5
13							10		6.25
14							20		12.5
15							20		16.25
16							30		22.5

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164459
Alias:	NAS# 9975F
Replicates:	8
Mean:	20
SD:	11.952
Tr Mean:	0.628
Trans SD:	0.657

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	-0.628
Trans SD:	0.637

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.549	Statistic:	Student's t
Residual SD:		Test Residual SD:	0.295	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.5	Transformation:	Rankits
K:		Ref. Residual SD:	0.346		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	0.3006	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally Distributed:	N/A	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	3.8815
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	40	1.766	0	-0.962	1.138	0.334		0	
2	20	0.667	0	-0.962	0.038	0.334		0	
3	10	0.079	0	-0.962	0.549	0.334		0	
4	10	0.079	10	0.079	0.549	0.707		0	
5	30	1.138	20	0.667	0.509	1.295		0	
6	10	0.079	0	-0.962	0.549	0.334		0	
7	10	0.079	0	-0.962	0.549	0.334		10	
8	30	1.138	0	-0.962	0.509	0.334		10	
9								10	
10								10	
11								10	
12								20	
13								20	
14								30	
15								30	
16								40	

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164460
Alias:	NAS# 9976F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	2.5
Trans SD:	4.629

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	3.75
Trans SD:	7.44

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	3.75	Statistic:	Mann-Whitney
Residual SD:	5.319	Test Residual SD:	2.315	Balanced Design:	Yes
SS:	537.5	Ref. Residual Mean:	5.625	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.381		
b:	18.895	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6642	Calculated Value:	1.0703	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	31
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	2.5	3.75	0		-3.75
2	10	14	0	6.5	7.5	3.75	0		-3.75
3	0	6.5	0	6.5	2.5	3.75	0		-3.75
4	0	6.5	10	14	2.5	6.25	0		-3.75
5	10	14	20	16	7.5	16.25	0		-3.75
6	0	6.5	0	6.5	2.5	3.75	0		-3.75
7	0	6.5	0	6.5	2.5	3.75	0		-2.5
8	0	6.5	0	6.5	2.5	3.75	0		-2.5
9							0		-2.5
10							0		-2.5
11							0		-2.5
12							0		-2.5
13							10		6.25
14							10		7.5
15							10		7.5
16							20		16.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164461
Alias:	NAS# 9977F
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	-0.13
Trans SD:	0.512

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	0.13
Trans SD:	0.833

Shapiro-Wilk Results:

Residual Mean:	
Residual SD:	
SS:	
K:	
b:	
Alpha Level:	N/A
Calculated Value:	N/A
Critical Value:	N/A
Normally Distributed:	N/A
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.317
Test Residual SD:	0.384
Ref. Residual Mean:	0.661
Ref. Residual SD:	0.441
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.6641
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	Rankits
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	-0.7509
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.311	0	-0.311	0.181	0.441		0	
2	0	-0.311	0	-0.311	0.181	0.441		0	
3	0	-0.311	0	-0.311	0.181	0.441		0	
4	0	-0.311	10	1.138	0.181	1.008		0	
5	10	1.138	20	1.766	1.267	1.636		0	
6	0	-0.311	0	-0.311	0.181	0.441		0	
7	0	-0.311	0	-0.311	0.181	0.441		0	
8	0	-0.311	0	-0.311	0.181	0.441		0	
9								0	
10								0	
11								0	
12								0	
13								0	
14								10	
15								10	
16								20	

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164468
Alias:	NAS# 9981F
Replicates:	8
Mean:	13.75
SD:	13.025
Tr Mean:	13.75
Trans SD:	13.025

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	3.75
Trans SD:	7.44

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	9.105
SS:	1575
K:	8
b:	36.001
Alpha Level:	0.05
Calculated Value:	0.8229
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	9.688
Test Residual SD:	7.899
Ref. Residual Mean:	5.625
Ref. Residual SD:	4.381
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.2721
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	48.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	14	0	4.5	6.25	3.75	0		-13.75
2	20	14	0	4.5	6.25	3.75	0		-13.75
3	10	10.5	0	4.5	3.75	3.75	0		-3.75
4	0	4.5	10	10.5	13.75	6.25	0		-3.75
5	10	10.5	20	14	3.75	16.25	0		-3.75
6	0	4.5	0	4.5	13.75	3.75	0		-3.75
7	10	10.5	0	4.5	3.75	3.75	0		-3.75
8	40	16	0	4.5	26.25	3.75	0		-3.75
9							10		-3.75
10							10		-3.75
11							10		-3.75
12							10		6.25
13							20		6.25
14							20		6.25
15							20		16.25
16							40		26.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164469
Alias:	NAS# 9982F
Replicates:	8
Mean:	8.75
SD:	6.409
Tr Mean:	8.75
Trans SD:	6.409

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	3.75
Trans SD:	7.44

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	4.375	Statistic:	Mann-Whitney
Residual SD:	5.96	Test Residual SD:	4.381	Balanced Design:	Yes
SS:	675	Ref. Residual Mean:	5.625	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.381		
b:	24.331	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.877	Calculated Value:	0.5706	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	46
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	11.5	0	4.5	1.25	3.75	0		-8.75
2	10	11.5	0	4.5	1.25	3.75	0		-8.75
3	0	4.5	0	4.5	8.75	3.75	0		-3.75
4	20	15.5	10	11.5	11.25	6.25	0		-3.75
5	10	11.5	20	15.5	1.25	16.25	0		-3.75
6	10	11.5	0	4.5	1.25	3.75	0		-3.75
7	0	4.5	0	4.5	8.75	3.75	0		-3.75
8	10	11.5	0	4.5	1.25	3.75	0		-3.75
9							10		1.25
10							10		1.25
11							10		1.25
12							10		1.25
13							10		1.25
14							10		6.25
15							20		11.25
16							20		16.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164471
Alias:	NAS# 9984F
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	5
Trans SD:	7.559

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	3.75
Trans SD:	7.44

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	6.438
SS:	787.5
K:	8
b:	23.546
Alpha Level:	0.05
Calculated Value:	0.704
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	6.25
Test Residual SD:	3.536
Ref. Residual Mean:	5.625
Ref. Residual SD:	4.381
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.314
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	35.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	5	3.75	0		-5
2	0	6	0	6	5	3.75	0		-5
3	10	13	0	6	5	3.75	0		-5
4	10	13	10	13	5	6.25	0		-5
5	0	6	20	15.5	5	16.25	0		-5
6	0	6	0	6	5	3.75	0		-3.75
7	0	6	0	6	5	3.75	0		-3.75
8	20	15.5	0	6	15	3.75	0		-3.75
9							0		-3.75
10							0		-3.75
11							0		-3.75
12							10		5
13							10		5
14							10		6.25
15							20		15
16							20		16.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164433
Alias:	NAS# 9953F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	8.19
SS:	1274.422
K:	8
b:	28.128
Alpha Level:	0.05
Calculated Value:	0.6208
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	8.641
Test Residual SD:	2.385
Ref. Residual Mean:	8.641
Ref. Residual SD:	2.385
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	32
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	10	13.5	6.913	11.522	0		-6.913
2	0	5.5	0	5.5	6.913	6.913	0		-6.913
3	10	13.5	0	5.5	11.522	6.913	0		-6.913
4	0	5.5	10	13.5	6.913	11.522	0		-6.913
5	0	5.5	10	13.5	6.913	11.522	0		-6.913
6	10	13.5	0	5.5	11.522	6.913	0		-6.913
7	10	13.5	0	5.5	11.522	6.913	0		-6.913
8	0	5.5	0	5.5	6.913	6.913	0		-6.913
9							0		-6.913
10							0		-6.913
11							18.435		11.522
12							18.435		11.522
13							18.435		11.522
14							18.435		11.522
15							18.435		11.522
16							18.435		11.522

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164434
Alias:	NAS# 9954F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.437	Statistic:	Mann-Whitney
Residual SD:	8.674	Test Residual SD:	5.643	Balanced Design:	Yes
SS:	1429.631	Ref. Residual Mean:	8.641	Transformation:	rank-order
K:	8	Ref. Residual SD:	2.385		
b:	31.461	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6923	Calculated Value:	0.0941	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	29.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	10	13.5	5.625	11.522	0		-6.913
2	20	16	0	6	20.94	6.913	0		-6.913
3	0	6	0	6	5.625	6.913	0		-6.913
4	0	6	10	13.5	5.625	11.522	0		-6.913
5	10	13.5	10	13.5	12.81	11.522	0		-6.913
6	0	6	0	6	5.625	6.913	0		-5.625
7	0	6	0	6	5.625	6.913	0		-5.625
8	0	6	0	6	5.625	6.913	0		-5.625
9							0		-5.625
10							0		-5.625
11							0		-5.625
12							18.435		11.522
13							18.435		11.522
14							18.435		11.522
15							18.435		12.81
16							26.565		20.94

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164435
Alias:	NAS# 9955F
Replicates:	8
Mean:	16.25
SD:	13.025
Tr Mean:	21.593
Trans SD:	11.814

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	9.217
SS:	1614.172
K:	8
b:	38.016
Alpha Level:	0.05
Calculated Value:	0.8953
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	8.557
Test Residual SD:	7.476
Ref. Residual Mean:	8.641
Ref. Residual SD:	2.385
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.0305
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	ArcSin
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	2.7343
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	10	18.435	3.158	11.522			-21.593
2	10	18.435	0	0	3.158	6.913			-6.913
3	20	26.565	0	0	4.972	6.913			-6.913
4	10	18.435	10	18.435	3.158	11.522			-6.913
5	0	0	10	18.435	21.593	11.522			-6.913
6	30	33.211	0	0	11.617	6.913			-6.913
7	40	39.231	0	0	17.638	6.913			-3.158
8	10	18.435	0	0	3.158	6.913			-3.158
9									-3.158
10									-3.158
11									4.972
12									11.522
13									11.522
14									11.522
15									11.617
16									17.638

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164436
Alias:	NAS# 9956F
Replicates:	8
Mean:	25
SD:	9.258
Tr Mean:	25
Trans SD:	9.258

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	7.5	Statistic:	Student's t
Residual SD:	6.438	Test Residual SD:	4.629	Balanced Design:	Yes
SS:	787.5	Ref. Residual Mean:	4.688	Transformation:	No Transformation
K:	8	Ref. Residual SD:	1.294		
b:	26.551	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8952	Calculated Value:	1.655	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	5.6667
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	20	10	10	5	6.25			-15
2	20	20	0	0	5	3.75			-5
3	30	30	0	0	5	3.75			-5
4	30	30	10	10	5	6.25			-5
5	30	30	10	10	5	6.25			-3.75
6	40	40	0	0	15	3.75			-3.75
7	20	20	0	0	5	3.75			-3.75
8	10	10	0	0	15	3.75			-3.75
9									-3.75
10									5
11									5
12									5
13									6.25
14									6.25
15									6.25
16									15

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164437
Alias:	NAS# 9957F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	8.325
SS:	1316.902
K:	8
b:	31.024
Alpha Level:	0.05
Calculated Value:	0.7309
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	9.217
Test Residual SD:	0
Ref. Residual Mean:	8.641
Ref. Residual SD:	2.385
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.6831
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	36
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	13	10	13	9.217	11.522	0		-9.217
2	0	5	0	5	9.217	6.913	0		-9.217
3	10	13	0	5	9.217	6.913	0		-9.217
4	10	13	10	13	9.217	11.522	0		-9.217
5	10	13	10	13	9.217	11.522	0		-6.913
6	0	5	0	5	9.217	6.913	0		-6.913
7	0	5	0	5	9.217	6.913	0		-6.913
8	0	5	0	5	9.217	6.913	0		-6.913
9							0		-6.913
10							18.435		9.217
11							18.435		9.217
12							18.435		9.217
13							18.435		9.217
14							18.435		11.522
15							18.435		11.522
16							18.435		11.522

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164440
Alias:	NAS# 9958F
Replicates:	8
Mean:	6.25
SD:	10.607
Tr Mean:	8.76
Trans SD:	12.921

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	10.95	Statistic:	Mann-Whitney
Residual SD:	9.749	Test Residual SD:	5.471	Balanced Design:	Yes
SS:	1805.95	Ref. Residual Mean:	8.641	Transformation:	rank-order
K:	8	Ref. Residual SD:	2.385		
b:	36.844	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7517	Calculated Value:	1.0942	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	33.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	13	10	13	9.675	11.522	0		-8.76
2	0	5.5	0	5.5	8.76	6.913	0		-8.76
3	0	5.5	0	5.5	8.76	6.913	0		-8.76
4	0	5.5	10	13	8.76	11.522	0		-8.76
5	0	5.5	10	13	8.76	11.522	0		-8.76
6	30	16	0	5.5	24.451	6.913	0		-6.913
7	0	5.5	0	5.5	8.76	6.913	0		-6.913
8	10	13	0	5.5	9.675	6.913	0		-6.913
9							0		-6.913
10							0		-6.913
11							18.435		9.675
12							18.435		9.675
13							18.435		11.522
14							18.435		11.522
15							18.435		11.522
16							33.211		24.451

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164441
Alias:	NAS# 9959F
Replicates:	8
Mean:	6.25
SD:	5.175
Tr Mean:	11.522
Trans SD:	9.541

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	8.19
SS:	1274.422
K:	8
b:	32.203
Alpha Level:	0.05
Calculated Value:	0.8138
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	8.641
Test Residual SD:	2.385
Ref. Residual Mean:	8.641
Ref. Residual SD:	2.385
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	40
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	12.5	10	12.5	6.913	11.522	0		-11.522
2	10	12.5	0	4.5	6.913	6.913	0		-11.522
3	10	12.5	0	4.5	6.913	6.913	0		-11.522
4	10	12.5	10	12.5	6.913	11.522	0		-6.913
5	10	12.5	10	12.5	6.913	11.522	0		-6.913
6	0	4.5	0	4.5	11.522	6.913	0		-6.913
7	0	4.5	0	4.5	11.522	6.913	0		-6.913
8	0	4.5	0	4.5	11.522	6.913	0		-6.913
9							18.435		6.913
10							18.435		6.913
11							18.435		6.913
12							18.435		6.913
13							18.435		6.913
14							18.435		11.522
15							18.435		11.522
16							18.435		11.522

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164442
Alias:	NAS# 9960F
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	8.943
SS:	1519.604
K:	8
b:	32.924
Alpha Level:	0.05
Calculated Value:	0.7133
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	9.912
Test Residual SD:	3.712
Ref. Residual Mean:	8.641
Ref. Residual SD:	2.385
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.8143
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	33.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	10	13	7.929	11.522	0		-7.929
2	0	5.5	0	5.5	7.929	6.913	0		-7.929
3	10	13	0	5.5	10.506	6.913	0		-7.929
4	0	5.5	10	13	7.929	11.522	0		-7.929
5	0	5.5	10	13	7.929	11.522	0		-7.929
6	0	5.5	0	5.5	7.929	6.913	0		-6.913
7	20	16	0	5.5	18.636	6.913	0		-6.913
8	10	13	0	5.5	10.506	6.913	0		-6.913
9							0		-6.913
10							0		-6.913
11							18.435		10.506
12							18.435		10.506
13							18.435		11.522
14							18.435		11.522
15							18.435		11.522
16							26.565		18.636

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164443
Alias:	NAS# 9961F
Replicates:	8
Mean:	18.75
SD:	8.345
Tr Mean:	18.75
Trans SD:	8.345

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	3.75
Trans SD:	5.175

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	5.96
SS:	675
K:	8
b:	24.757
Alpha Level:	0.05
Calculated Value:	0.908
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	6.563
Test Residual SD:	4.519
Ref. Residual Mean:	4.688
Ref. Residual SD:	1.294
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.1282
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	4.3205
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	10	10	10	8.75	6.25			-8.75
2	20	20	0	0	1.25	3.75			-8.75
3	20	20	0	0	1.25	3.75			-8.75
4	10	10	10	10	8.75	6.25			-3.75
5	30	30	10	10	11.25	6.25			-3.75
6	30	30	0	0	11.25	3.75			-3.75
7	20	20	0	0	1.25	3.75			-3.75
8	10	10	0	0	8.75	3.75			-3.75
9									1.25
10									1.25
11									1.25
12									6.25
13									6.25
14									6.25
15									11.25
16									11.25

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164449
Alias:	NAS# 9962F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.217	Statistic:	Mann-Whitney
Residual SD:	8.325	Test Residual SD:	0	Balanced Design:	Yes
SS:	1316.902	Ref. Residual Mean:	8.641	Transformation:	rank-order
K:	8	Ref. Residual SD:	2.385		
b:	31.024	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7309	Calculated Value:	0.6831	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	36
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	13	10	13	9.217	11.522	0		-9.217
2	0	5	0	5	9.217	6.913	0		-9.217
3	10	13	0	5	9.217	6.913	0		-9.217
4	0	5	10	13	9.217	11.522	0		-9.217
5	0	5	10	13	9.217	11.522	0		-6.913
6	0	5	0	5	9.217	6.913	0		-6.913
7	10	13	0	5	9.217	6.913	0		-6.913
8	10	13	0	5	9.217	6.913	0		-6.913
9							0		-6.913
10							18.435		9.217
11							18.435		9.217
12							18.435		9.217
13							18.435		9.217
14							18.435		11.522
15							18.435		11.522
16							18.435		11.522

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164439
Alias:	NAS# 9966F
Replicates:	8
Mean:	6.25
SD:	9.161
Tr Mean:	8.946
Trans SD:	12.598

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	9.592
SS:	1748.262
K:	8
b:	35.91
Alpha Level:	0.05
Calculated Value:	0.7376
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	11.182
Test Residual SD:	3.978
Ref. Residual Mean:	8.641
Ref. Residual SD:	2.385
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.5494
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	35
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	10	12.5	8.946	11.522	0		-8.946
2	0	5.5	0	5.5	8.946	6.913	0		-8.946
3	0	5.5	0	5.5	8.946	6.913	0		-8.946
4	0	5.5	10	12.5	8.946	11.522	0		-8.946
5	20	15.5	10	12.5	17.619	11.522	0		-8.946
6	20	15.5	0	5.5	17.619	6.913	0		-6.913
7	10	12.5	0	5.5	9.489	6.913	0		-6.913
8	0	5.5	0	5.5	8.946	6.913	0		-6.913
9							0		-6.913
10							0		-6.913
11							18.435		9.489
12							18.435		11.522
13							18.435		11.522
14							18.435		11.522
15							26.565		17.619
16							26.565		17.619

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164450
Alias:	NAS# 9967F
Replicates:	8
Mean:	7.5
SD:	7.071
Tr Mean:	12.538
Trans SD:	10.74

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.404	Statistic:	Mann-Whitney
Residual SD:	8.72	Test Residual SD:	3.78	Balanced Design:	Yes
SS:	1444.666	Ref. Residual Mean:	8.641	Transformation:	rank-order
K:	8	Ref. Residual SD:	2.385		
b:	35.139	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8547	Calculated Value:	0.4823	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	41.5
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	12	10	12	5.897	11.522	0		-12.538
2	10	12	0	4.5	5.897	6.913	0		-12.538
3	20	16	0	4.5	14.027	6.913	0		-12.538
4	10	12	10	12	5.897	11.522	0		-6.913
5	0	4.5	10	12	12.538	11.522	0		-6.913
6	0	4.5	0	4.5	12.538	6.913	0		-6.913
7	10	12	0	4.5	5.897	6.913	0		-6.913
8	0	4.5	0	4.5	12.538	6.913	0		-6.913
9							18.435		5.897
10							18.435		5.897
11							18.435		5.897
12							18.435		5.897
13							18.435		11.522
14							18.435		11.522
15							18.435		11.522
16							26.565		14.027

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164451
Alias:	NAS# 9968F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	8.674
SS:	1429.631
K:	8
b:	31.461
Alpha Level:	0.05
Calculated Value:	0.6923
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	8.437
Test Residual SD:	5.643
Ref. Residual Mean:	8.641
Ref. Residual SD:	2.385
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.0941
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	29.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	10	13.5	5.625	11.522	0		-6.913
2	20	16	0	6	20.94	6.913	0		-6.913
3	0	6	0	6	5.625	6.913	0		-6.913
4	10	13.5	10	13.5	12.81	11.522	0		-6.913
5	0	6	10	13.5	5.625	11.522	0		-6.913
6	0	6	0	6	5.625	6.913	0		-5.625
7	0	6	0	6	5.625	6.913	0		-5.625
8	0	6	0	6	5.625	6.913	0		-5.625
9							0		-5.625
10							0		-5.625
11							0		-5.625
12							18.435		11.522
13							18.435		11.522
14							18.435		11.522
15							18.435		12.81
16							26.565		20.94

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164452
Alias:	NAS# 9969F
Replicates:	8
Mean:	11.25
SD:	11.26
Tr Mean:	15.401
Trans SD:	13.609

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	11.551	Statistic:	Mann-Whitney
Residual SD:	10.088	Test Residual SD:	5.72	Balanced Design:	Yes
SS:	1933.652	Ref. Residual Mean:	8.641	Transformation:	rank-order
K:	8	Ref. Residual SD:	2.385		
b:	41.228	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.879	Calculated Value:	1.3279	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	44.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	11	10	11	3.034	11.522	0		-15.401
2	10	11	0	4.5	3.034	6.913	0		-15.401
3	30	16	0	4.5	17.81	6.913	0		-15.401
4	0	4.5	10	11	15.401	11.522	0		-6.913
5	0	4.5	10	11	15.401	11.522	0		-6.913
6	20	14.5	0	4.5	11.164	6.913	0		-6.913
7	0	4.5	0	4.5	15.401	6.913	0		-6.913
8	20	14.5	0	4.5	11.164	6.913	0		-6.913
9							18.435		3.034
10							18.435		3.034
11							18.435		11.164
12							18.435		11.164
13							18.435		11.522
14							26.565		11.522
15							26.565		11.522
16							33.211		17.81

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164453
Alias:	NAS# 9970F
Replicates:	8
Mean:	8.75
SD:	8.345
Tr Mean:	13.554
Trans SD:	11.718

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	9.172
SS:	1598.385
K:	8
b:	36.851
Alpha Level:	0.05
Calculated Value:	0.8496
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	10.166
Test Residual SD:	4.382
Ref. Residual Mean:	8.641
Ref. Residual SD:	2.385
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.8642
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	43
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	15.5	10	11.5	13.011	11.522	0		-13.554
2	10	11.5	0	4.5	4.881	6.913	0		-13.554
3	20	15.5	0	4.5	13.011	6.913	0		-13.554
4	0	4.5	10	11.5	13.554	11.522	0		-6.913
5	10	11.5	10	11.5	4.881	11.522	0		-6.913
6	0	4.5	0	4.5	13.554	6.913	0		-6.913
7	0	4.5	0	4.5	13.554	6.913	0		-6.913
8	10	11.5	0	4.5	4.881	6.913	0		-6.913
9							18.435		4.881
10							18.435		4.881
11							18.435		4.881
12							18.435		11.522
13							18.435		11.522
14							18.435		11.522
15							26.565		13.011
16							26.565		13.011

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164454
Alias:	NAS# 9971F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	6.913	Statistic:	Mann-Whitney
Residual SD:	7.77	Test Residual SD:	4.267	Balanced Design:	Yes
SS:	1146.979	Ref. Residual Mean:	8.641	Transformation:	rank-order
K:	8	Ref. Residual SD:	2.385		
b:	28.198	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6933	Calculated Value:	1	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	28
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	14	10	14	13.826	11.522	0		-6.913
2	0	6	0	6	4.609	6.913	0		-6.913
3	0	6	0	6	4.609	6.913	0		-6.913
4	0	6	10	14	4.609	11.522	0		-6.913
5	0	6	10	14	4.609	11.522	0		-6.913
6	10	14	0	6	13.826	6.913	0		-4.609
7	0	6	0	6	4.609	6.913	0		-4.609
8	0	6	0	6	4.609	6.913	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							18.435		11.522
13							18.435		11.522
14							18.435		11.522
15							18.435		13.826
16							18.435		13.826

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164455
Alias:	NAS# 9972F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.217	Statistic:	Mann-Whitney
Residual SD:	8.325	Test Residual SD:	0	Balanced Design:	Yes
SS:	1316.902	Ref. Residual Mean:	8.641	Transformation:	rank-order
K:	8	Ref. Residual SD:	2.385		
b:	31.024	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7309	Calculated Value:	0.6831	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	36
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	13	10	13	9.217	11.522	0		-9.217
2	10	13	0	5	9.217	6.913	0		-9.217
3	10	13	0	5	9.217	6.913	0		-9.217
4	0	5	10	13	9.217	11.522	0		-9.217
5	10	13	10	13	9.217	11.522	0		-6.913
6	0	5	0	5	9.217	6.913	0		-6.913
7	0	5	0	5	9.217	6.913	0		-6.913
8	0	5	0	5	9.217	6.913	0		-6.913
9							0		-6.913
10							18.435		9.217
11							18.435		9.217
12							18.435		9.217
13							18.435		9.217
14							18.435		11.522
15							18.435		11.522
16							18.435		11.522

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164456
Alias:	NAS# 9973F
Replicates:	8
Mean:	10
SD:	14.142
Tr Mean:	12.833
Trans SD:	15.151

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	10.868
SS:	2244.162
K:	8
b:	44.105
Alpha Level:	0.05
Calculated Value:	0.8668
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	12.833
Test Residual SD:	6.43
Ref. Residual Mean:	8.641
Ref. Residual SD:	2.385
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.7288
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	39
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	15	10	12	13.732	11.522	0		-12.833
2	0	5	0	5	12.833	6.913	0		-12.833
3	40	16	0	5	26.398	6.913	0		-12.833
4	0	5	10	12	12.833	11.522	0		-12.833
5	10	12	10	12	5.602	11.522	0		-6.913
6	0	5	0	5	12.833	6.913	0		-6.913
7	0	5	0	5	12.833	6.913	0		-6.913
8	10	12	0	5	5.602	6.913	0		-6.913
9							0		-6.913
10							18.435		5.602
11							18.435		5.602
12							18.435		11.522
13							18.435		11.522
14							18.435		11.522
15							26.565		13.732
16							39.231		26.398

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164457
Alias:	NAS# 9974F
Replicates:	8
Mean:	7.5
SD:	11.65
Tr Mean:	0.106
Trans SD:	0.986

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	-0.106
Trans SD:	0.65

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.853	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.374	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.589	Transformation:	Rankits
K:		Ref. Residual SD:	0.163		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	1.8316	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally Distributed:	N/A	Variances Homogeneous:	No	Degrees of Freedom:	12
				Experimental Alpha Level:	0.05
				Calculated Value:	0.5062
Override Option:	Not Invoked			Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.577	10	0.68	0.683	0.785		0	
2	0	-0.577	0	-0.577	0.683	0.471		0	
3	20	1.285	0	-0.577	1.179	0.471		0	
4	0	-0.577	10	0.68	0.683	0.785		0	
5	0	-0.577	10	0.68	0.683	0.785		0	
6	10	0.68	0	-0.577	0.574	0.471		0	
7	0	-0.577	0	-0.577	0.683	0.471		0	
8	30	1.766	0	-0.577	1.66	0.471		0	
9								0	
10								0	
11								10	
12								10	
13								10	
14								10	
15								20	
16								30	

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164459
Alias:	NAS# 9975F
Replicates:	8
Mean:	20
SD:	11.952
Tr Mean:	25.745
Trans SD:	8.517

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	7.31	Statistic:	Mann-Whitney
Residual SD:	7.763	Test Residual SD:	3.387	Balanced Design:	Yes
SS:	1144.994	Ref. Residual Mean:	8.641	Transformation:	rank-order
K:	8	Ref. Residual SD:	2.385		
b:	29.094	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7393	Calculated Value:	0.9091	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	58
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	40	16	10	9	13.487	11.522	0		-7.31
2	20	13	0	3	0.82	6.913	0		-7.31
3	10	9	0	3	7.31	6.913	0		-7.31
4	10	9	10	9	7.31	11.522	0		-7.31
5	30	14.5	10	9	7.466	11.522	0		-6.913
6	10	9	0	3	7.31	6.913	18.435		-6.913
7	10	9	0	3	7.31	6.913	18.435		-6.913
8	30	14.5	0	3	7.466	6.913	18.435		-6.913
9							18.435		-6.913
10							18.435		0.82
11							18.435		7.466
12							18.435		7.466
13							26.565		11.522
14							33.211		11.522
15							33.211		11.522
16							39.231		13.487

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164460
Alias:	NAS# 9976F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	7.77
SS:	1146.979
K:	8
b:	28.198
Alpha Level:	0.05
Calculated Value:	0.6933
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	6.913
Test Residual SD:	4.267
Ref. Residual Mean:	8.641
Ref. Residual SD:	2.385
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	28
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	10	14	4.609	11.522	0		-6.913
2	10	14	0	6	13.826	6.913	0		-6.913
3	0	6	0	6	4.609	6.913	0		-6.913
4	0	6	10	14	4.609	11.522	0		-6.913
5	10	14	10	14	13.826	11.522	0		-6.913
6	0	6	0	6	4.609	6.913	0		-4.609
7	0	6	0	6	4.609	6.913	0		-4.609
8	0	6	0	6	4.609	6.913	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							18.435		11.522
13							18.435		11.522
14							18.435		11.522
15							18.435		13.826
16							18.435		13.826

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164461
Alias:	NAS# 9977F
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	-0.2
Trans SD:	0.566

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	0.2
Trans SD:	0.829

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.35	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.425	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.751	Transformation:	Rankits
K:		Ref. Residual SD:	0.207		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	2.3966	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally Distributed:	N/A	Variances Homogeneous:	No	Degrees of Freedom:	12
				Experimental Alpha Level:	0.05
				Calculated Value:	-1.1282
Override Option:	Not Invoked			Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.4	10	1.201	0.2	1.001		0	
2	0	-0.4	0	-0.4	0.2	0.601		0	
3	0	-0.4	0	-0.4	0.2	0.601		0	
4	0	-0.4	10	1.201	0.2	1.001		0	
5	10	1.201	10	1.201	1.401	1.001		0	
6	0	-0.4	0	-0.4	0.2	0.601		0	
7	0	-0.4	0	-0.4	0.2	0.601		0	
8	0	-0.4	0	-0.4	0.2	0.601		0	
9								0	
10								0	
11								0	
12								0	
13								10	
14								10	
15								10	
16								10	

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164468
Alias:	NAS# 9981F
Replicates:	8
Mean:	13.75
SD:	13.025
Tr Mean:	18.458
Trans SD:	13.333

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	9.951
SS:	1881.59
K:	8
b:	42.012
Alpha Level:	0.05
Calculated Value:	0.9381
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	9.247
Test Residual SD:	8.947
Ref. Residual Mean:	8.641
Ref. Residual SD:	2.385
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.1849
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	ArcSin
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	1.9917
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	26.565	10	18.435	8.107	11.522			-18.458
2	20	26.565	0	0	8.107	6.913			-18.458
3	10	18.435	0	0	0.023	6.913			-6.913
4	0	0	10	18.435	18.458	11.522			-6.913
5	10	18.435	10	18.435	0.023	11.522			-6.913
6	0	0	0	0	18.458	6.913			-6.913
7	10	18.435	0	0	0.023	6.913			-6.913
8	40	39.231	0	0	20.773	6.913			-0.023
9									-0.023
10									-0.023
11									8.107
12									8.107
13									11.522
14									11.522
15									11.522
16									20.773

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164469
Alias:	NAS# 9982F
Replicates:	8
Mean:	8.75
SD:	6.409
Tr Mean:	14.842
Trans SD:	9.581

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	8.207
SS:	1279.754
K:	8
b:	33.526
Alpha Level:	0.05
Calculated Value:	0.8783
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	7.421
Test Residual SD:	5.371
Ref. Residual Mean:	8.641
Ref. Residual SD:	2.385
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.5872
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	45.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	11.5	10	11.5	3.592	11.522	0		-14.842
2	10	11.5	0	4	3.592	6.913	0		-14.842
3	0	4	0	4	14.842	6.913	0		-6.913
4	20	16	10	11.5	11.723	11.522	0		-6.913
5	10	11.5	10	11.5	3.592	11.522	0		-6.913
6	10	11.5	0	4	3.592	6.913	0		-6.913
7	0	4	0	4	14.842	6.913	0		-6.913
8	10	11.5	0	4	3.592	6.913	18.435		3.592
9							18.435		3.592
10							18.435		3.592
11							18.435		3.592
12							18.435		3.592
13							18.435		11.522
14							18.435		11.522
15							18.435		11.522
16							26.565		11.723

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164471
Alias:	NAS# 9984F
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.912	Statistic:	Mann-Whitney
Residual SD:	8.943	Test Residual SD:	3.712	Balanced Design:	Yes
SS:	1519.604	Ref. Residual Mean:	8.641	Transformation:	rank-order
K:	8	Ref. Residual SD:	2.385		
b:	32.924	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7133	Calculated Value:	0.8143	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	33.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	10	13	7.929	11.522	0		-7.929
2	0	5.5	0	5.5	7.929	6.913	0		-7.929
3	10	13	0	5.5	10.506	6.913	0		-7.929
4	10	13	10	13	10.506	11.522	0		-7.929
5	0	5.5	10	13	7.929	11.522	0		-7.929
6	0	5.5	0	5.5	7.929	6.913	0		-6.913
7	0	5.5	0	5.5	7.929	6.913	0		-6.913
8	20	16	0	5.5	18.636	6.913	0		-6.913
9							0		-6.913
10							0		-6.913
11							18.435		10.506
12							18.435		10.506
13							18.435		11.522
14							18.435		11.522
15							18.435		11.522
16							26.565		18.636

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164433
Alias:	NAS# 9953F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	0.2
Trans SD:	0.829

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	-0.2
Trans SD:	0.566

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.751	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.207	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.35	Transformation:	Rankits
K:		Ref. Residual SD:	0.425		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	2.3966	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally		Variances		Degrees of Freedom:	12
Distributed:	N/A	Homogeneous:	No	Experimental Alpha Level:	0.05
				Calculated Value:	1.1282
Override Option:	Not Invoked			Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.4	0	-0.4	0.601	0.2		0	
2	0	-0.4	0	-0.4	0.601	0.2		0	
3	10	1.201	0	-0.4	1.001	0.2		0	
4	0	-0.4	0	-0.4	0.601	0.2		0	
5	0	-0.4	0	-0.4	0.601	0.2		0	
6	10	1.201	0	-0.4	1.001	0.2		0	
7	10	1.201	10	1.201	1.001	1.401		0	
8	0	-0.4	0	-0.4	0.601	0.2		0	
9								0	
10								0	
11								0	
12								0	
13								10	
14								10	
15								10	
16								10	

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164434
Alias:	NAS# 9954F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	2.304
Trans SD:	6.518

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	7.573
SS:	1089.786
K:	8
b:	26.694
Alpha Level:	0.05
Calculated Value:	0.6539
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	8.437
Test Residual SD:	5.643
Ref. Residual Mean:	4.033
Ref. Residual SD:	4.888
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.6688
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	36.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	7	0	7	5.625	2.304	0		-5.625
2	20	16	0	7	20.94	2.304	0		-5.625
3	0	7	0	7	5.625	2.304	0		-5.625
4	0	7	0	7	5.625	2.304	0		-5.625
5	10	14.5	0	7	12.81	2.304	0		-5.625
6	0	7	0	7	5.625	2.304	0		-5.625
7	0	7	10	14.5	5.625	16.131	0		-2.304
8	0	7	0	7	5.625	2.304	0		-2.304
9							0		-2.304
10							0		-2.304
11							0		-2.304
12							0		-2.304
13							0		-2.304
14							18.435		12.81
15							18.435		16.131
16							26.565		20.94

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164435
Alias:	NAS# 9955F
Replicates:	8
Mean:	16.25
SD:	13.025
Tr Mean:	21.593
Trans SD:	11.814

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	2.304
Trans SD:	6.518

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	8.19
SS:	1274.326
K:	8
b:	31.607
Alpha Level:	0.05
Calculated Value:	0.7839
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	8.557
Test Residual SD:	7.476
Ref. Residual Mean:	4.033
Ref. Residual SD:	4.888
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.4326
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	57.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	11	0	4.5	3.158	2.304	0		-21.593
2	10	11	0	4.5	3.158	2.304	0		-3.158
3	20	14	0	4.5	4.972	2.304	0		-3.158
4	10	11	0	4.5	3.158	2.304	0		-3.158
5	0	4.5	0	4.5	21.593	2.304	0		-3.158
6	30	15	0	4.5	11.617	2.304	0		-2.304
7	40	16	10	11	17.638	16.131	0		-2.304
8	10	11	0	4.5	3.158	2.304	0		-2.304
9							18.435		-2.304
10							18.435		-2.304
11							18.435		-2.304
12							18.435		-2.304
13							18.435		4.972
14							26.565		11.617
15							33.211		16.131
16							39.231		17.638

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164436
Alias:	NAS# 9956F
Replicates:	8
Mean:	25
SD:	9.258
Tr Mean:	29.624
Trans SD:	6.371

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	2.304
Trans SD:	6.518

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	5.092	Statistic:	Mann-Whitney
Residual SD:	5.532	Test Residual SD:	3.311	Balanced Design:	Yes
SS:	581.532	Ref. Residual Mean:	4.033	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.888		
b:	21.797	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.817	Calculated Value:	0.5074	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	63.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	11	0	4	3.059	2.304	0		-11.189
2	20	11	0	4	3.059	2.304	0		-3.059
3	30	14	0	4	3.587	2.304	0		-3.059
4	30	14	0	4	3.587	2.304	0		-3.059
5	30	14	0	4	3.587	2.304	0		-2.304
6	40	16	0	4	9.607	2.304	0		-2.304
7	20	11	10	8.5	3.059	16.131	0		-2.304
8	10	8.5	0	4	11.189	2.304	18.435		-2.304
9							18.435		-2.304
10							26.565		-2.304
11							26.565		-2.304
12							26.565		3.587
13							33.211		3.587
14							33.211		3.587
15							33.211		9.607
16							39.231		16.131

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164437
Alias:	NAS# 9957F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	0.293
Trans SD:	0.836

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	-0.293
Trans SD:	0.553

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.782	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.342	Transformation:	Rankits
K:		Ref. Residual SD:	0.415		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	3	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally Distributed:	N/A	Variances Homogeneous:	No	Degrees of Freedom:	12
				Experimental Alpha Level:	0.05
				Calculated Value:	1.655
Override Option:	Not Invoked			Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	1.075	0	-0.489	0.782	0.195		0	
2	0	-0.489	0	-0.489	0.782	0.195		0	
3	10	1.075	0	-0.489	0.782	0.195		0	
4	10	1.075	0	-0.489	0.782	0.195		0	
5	10	1.075	0	-0.489	0.782	0.195		0	
6	0	-0.489	0	-0.489	0.782	0.195		0	
7	0	-0.489	10	1.075	0.782	1.368		0	
8	0	-0.489	0	-0.489	0.782	0.195		0	
9								0	
10								0	
11								0	
12								10	
13								10	
14								10	
15								10	
16								10	

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164440
Alias:	NAS# 9958F
Replicates:	8
Mean:	6.25
SD:	10.607
Tr Mean:	0.224
Trans SD:	0.892

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	-0.224
Trans SD:	0.5

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.78	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.317	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.309	Transformation:	Rankits
K:		Ref. Residual SD:	0.375		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	2.7146	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally		Variances		Degrees of Freedom:	11
Distributed:	N/A	Homogeneous:	No	Experimental Alpha Level:	0.05
				Calculated Value:	1.2377
Override Option:	Not Invoked			Critical Value:	>= 1.796
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	1.013	0	-0.4	0.789	0.177		0	
2	0	-0.4	0	-0.4	0.624	0.177		0	
3	0	-0.4	0	-0.4	0.624	0.177		0	
4	0	-0.4	0	-0.4	0.624	0.177		0	
5	0	-0.4	0	-0.4	0.624	0.177		0	
6	30	1.766	0	-0.4	1.542	0.177		0	
7	0	-0.4	10	1.013	0.624	1.236		0	
8	10	1.013	0	-0.4	0.789	0.177		0	
9								0	
10								0	
11								0	
12								0	
13								10	
14								10	
15								10	
16								30	

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164441
Alias:	NAS# 9959F
Replicates:	8
Mean:	6.25
SD:	5.175
Tr Mean:	0.385
Trans SD:	0.796

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	-0.385
Trans SD:	0.544

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.721	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.199	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.337	Transformation:	Rankits
K:		Ref. Residual SD:	0.408		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	2.3966	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally		Variances		Degrees of Freedom:	12
Distributed:	N/A	Homogeneous:	No	Experimental Alpha Level:	0.05
				Calculated Value:	2.2563
Override Option:	Not Invoked			Critical Value:	>= 1.782
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	0.962	0	-0.577	0.577	0.192		0	
2	10	0.962	0	-0.577	0.577	0.192		0	
3	10	0.962	0	-0.577	0.577	0.192		0	
4	10	0.962	0	-0.577	0.577	0.192		0	
5	10	0.962	0	-0.577	0.577	0.192		0	
6	0	-0.577	0	-0.577	0.962	0.192		0	
7	0	-0.577	10	0.962	0.962	1.346		0	
8	0	-0.577	0	-0.577	0.962	0.192		0	
9								0	
10								0	
11								10	
12								10	
13								10	
14								10	
15								10	
16								10	

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164442
Alias:	NAS# 9960F
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	0.224
Trans SD:	0.892

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	-0.224
Trans SD:	0.5

Shapiro-Wilk Results:

Residual Mean:	
Residual SD:	
SS:	
K:	
b:	
Alpha Level:	N/A
Calculated Value:	N/A
Critical Value:	N/A
Normally Distributed:	N/A
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.78
Test Residual SD:	0.317
Ref. Residual Mean:	0.309
Ref. Residual SD:	0.375
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.7146
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	Rankits
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	11
Experimental Alpha Level:	0.05
Calculated Value:	1.2377
Critical Value:	>= 1.796
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.4	0	-0.4	0.624	0.177		0	
2	0	-0.4	0	-0.4	0.624	0.177		0	
3	10	1.013	0	-0.4	0.789	0.177		0	
4	0	-0.4	0	-0.4	0.624	0.177		0	
5	0	-0.4	0	-0.4	0.624	0.177		0	
6	0	-0.4	0	-0.4	0.624	0.177		0	
7	20	1.766	10	1.013	1.542	1.236		0	
8	10	1.013	0	-0.4	0.789	0.177		0	
9								0	
10								0	
11								0	
12								0	
13								10	
14								10	
15								10	
16								20	

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164443
Alias:	NAS# 9961F
Replicates:	8
Mean:	18.75
SD:	8.345
Tr Mean:	25.178
Trans SD:	6.225

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	2.304
Trans SD:	6.518

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	5.057	Statistic:	Mann-Whitney
Residual SD:	5.47	Test Residual SD:	3.085	Balanced Design:	Yes
SS:	568.597	Ref. Residual Mean:	4.033	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.888		
b:	21.772	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8337	Calculated Value:	0.5013	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	62.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	9.5	0	4	6.743	2.304	0		-6.743
2	20	13	0	4	1.387	2.304	0		-6.743
3	20	13	0	4	1.387	2.304	0		-6.743
4	10	9.5	0	4	6.743	2.304	0		-2.304
5	30	15.5	0	4	8.033	2.304	0		-2.304
6	30	15.5	0	4	8.033	2.304	0		-2.304
7	20	13	10	9.5	1.387	16.131	0		-2.304
8	10	9.5	0	4	6.743	2.304	18.435		-2.304
9							18.435		-2.304
10							18.435		-2.304
11							18.435		1.387
12							26.565		1.387
13							26.565		1.387
14							26.565		8.033
15							33.211		8.033
16							33.211		16.131

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164449
Alias:	NAS# 9962F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	0.293
Trans SD:	0.836

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	-0.293
Trans SD:	0.553

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.782	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.342	Transformation:	Rankits
K:		Ref. Residual SD:	0.415		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	3	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally Distributed:	N/A	Variances Homogeneous:	No	Degrees of Freedom:	12
				Experimental Alpha Level:	0.05
				Calculated Value:	1.655
Override Option:	Not Invoked			Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	1.075	0	-0.489	0.782	0.195		0	
2	0	-0.489	0	-0.489	0.782	0.195		0	
3	10	1.075	0	-0.489	0.782	0.195		0	
4	0	-0.489	0	-0.489	0.782	0.195		0	
5	0	-0.489	0	-0.489	0.782	0.195		0	
6	0	-0.489	0	-0.489	0.782	0.195		0	
7	10	1.075	10	1.075	0.782	1.368		0	
8	10	1.075	0	-0.489	0.782	0.195		0	
9								0	
10								0	
11								0	
12								10	
13								10	
14								10	
15								10	
16								10	

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164439
Alias:	NAS# 9966F
Replicates:	8
Mean:	6.25
SD:	9.161
Tr Mean:	0.241
Trans SD:	0.907

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	-0.241
Trans SD:	0.451

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.801	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.298	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.279	Transformation:	Rankits
K:		Ref. Residual SD:	0.339		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	3.2717	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally		Variances		Degrees of Freedom:	10
Distributed:	N/A	Homogeneous:	No	Experimental Alpha Level:	0.05
				Calculated Value:	1.344
Override Option:	Not Invoked			Critical Value:	>= 1.812
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.4	0	-0.4	0.641	0.16		0	
2	0	-0.4	0	-0.4	0.641	0.16		0	
3	0	-0.4	0	-0.4	0.641	0.16		0	
4	0	-0.4	0	-0.4	0.641	0.16		0	
5	20	1.526	0	-0.4	1.285	0.16		0	
6	20	1.526	0	-0.4	1.285	0.16		0	
7	10	0.877	10	0.877	0.636	1.117		0	
8	0	-0.4	0	-0.4	0.641	0.16		0	
9								0	
10								0	
11								0	
12								0	
13								10	
14								10	
15								20	
16								20	

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164450
Alias:	NAS# 9967F
Replicates:	8
Mean:	7.5
SD:	7.071
Tr Mean:	12.538
Trans SD:	10.74

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	2.304
Trans SD:	6.518

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.404	Statistic:	Approximate t
Residual SD:	7.626	Test Residual SD:	3.78	Balanced Design:	Yes
SS:	1104.82	Ref. Residual Mean:	4.033	Transformation:	ArcSin
K:	8	Ref. Residual SD:	4.888		
b:	31.483	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8972	Calculated Value:	2.4583	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	12
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	2.304
				Critical Value:	>= 1.782
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	0	0	5.897	2.304			-12.538
2	10	18.435	0	0	5.897	2.304			-12.538
3	20	26.565	0	0	14.027	2.304			-12.538
4	10	18.435	0	0	5.897	2.304			-2.304
5	0	0	0	0	12.538	2.304			-2.304
6	0	0	0	0	12.538	2.304			-2.304
7	10	18.435	10	18.435	5.897	16.131			-2.304
8	0	0	0	0	12.538	2.304			-2.304
9									-2.304
10									-2.304
11									5.897
12									5.897
13									5.897
14									5.897
15									14.027
16									16.131

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164451
Alias:	NAS# 9968F
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	2.304
Trans SD:	6.518

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.437	Statistic:	Mann-Whitney
Residual SD:	7.573	Test Residual SD:	5.643	Balanced Design:	Yes
SS:	1089.786	Ref. Residual Mean:	4.033	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.888		
b:	26.694	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6539	Calculated Value:	1.6688	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	36.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	7	0	7	5.625	2.304	0		-5.625
2	20	16	0	7	20.94	2.304	0		-5.625
3	0	7	0	7	5.625	2.304	0		-5.625
4	10	14.5	0	7	12.81	2.304	0		-5.625
5	0	7	0	7	5.625	2.304	0		-5.625
6	0	7	0	7	5.625	2.304	0		-5.625
7	0	7	10	14.5	5.625	16.131	0		-2.304
8	0	7	0	7	5.625	2.304	0		-2.304
9							0		-2.304
10							0		-2.304
11							0		-2.304
12							0		-2.304
13							0		-2.304
14							18.435		12.81
15							18.435		16.131
16							26.565		20.94

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164452
Alias:	NAS# 9969F
Replicates:	8
Mean:	11.25
SD:	11.26
Tr Mean:	15.401
Trans SD:	13.609

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	2.304
Trans SD:	6.518

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	11.551	Statistic:	Approximate t
Residual SD:	9.159	Test Residual SD:	5.72	Balanced Design:	Yes
SS:	1593.806	Ref. Residual Mean:	4.033	Transformation:	ArcSin
K:	8	Ref. Residual SD:	4.888		
b:	37.783	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8957	Calculated Value:	2.8262	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	10
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	2.455
				Critical Value:	>= 1.812
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	0	0	3.034	2.304			-15.401
2	10	18.435	0	0	3.034	2.304			-15.401
3	30	33.211	0	0	17.81	2.304			-15.401
4	0	0	0	0	15.401	2.304			-2.304
5	0	0	0	0	15.401	2.304			-2.304
6	20	26.565	0	0	11.164	2.304			-2.304
7	0	0	10	18.435	15.401	16.131			-2.304
8	20	26.565	0	0	11.164	2.304			-2.304
9									-2.304
10									-2.304
11									3.034
12									3.034
13									11.164
14									11.164
15									16.131
16									17.81

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164453
Alias:	NAS# 9970F
Replicates:	8
Mean:	8.75
SD:	8.345
Tr Mean:	13.554
Trans SD:	11.718

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	2.304
Trans SD:	6.518

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	8.139
SS:	1258.539
K:	8
b:	33.6
Alpha Level:	0.05
Calculated Value:	0.8971
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	10.166
Test Residual SD:	4.382
Ref. Residual Mean:	4.033
Ref. Residual SD:	4.888
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.6423
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	ArcSin
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	11
Experimental Alpha Level:	0.05
Calculated Value:	2.3731
Critical Value:	>= 1.796
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	26.565	0	0	13.011	2.304			-13.554
2	10	18.435	0	0	4.881	2.304			-13.554
3	20	26.565	0	0	13.011	2.304			-13.554
4	0	0	0	0	13.554	2.304			-2.304
5	10	18.435	0	0	4.881	2.304			-2.304
6	0	0	0	0	13.554	2.304			-2.304
7	0	0	10	18.435	13.554	16.131			-2.304
8	10	18.435	0	0	4.881	2.304			-2.304
9									-2.304
10									-2.304
11									4.881
12									4.881
13									4.881
14									13.011
15									13.011
16									16.131

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164454
Alias:	NAS# 9971F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	2.304
Trans SD:	6.518

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	6.913	Statistic:	Mann-Whitney
Residual SD:	6.518	Test Residual SD:	4.267	Balanced Design:	Yes
SS:	807.134	Ref. Residual Mean:	4.033	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.888		
b:	22.21	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6112	Calculated Value:	1.2556	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	36
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	15	0	7	13.826	2.304	0		-4.609
2	0	7	0	7	4.609	2.304	0		-4.609
3	0	7	0	7	4.609	2.304	0		-4.609
4	0	7	0	7	4.609	2.304	0		-4.609
5	0	7	0	7	4.609	2.304	0		-4.609
6	10	15	0	7	13.826	2.304	0		-4.609
7	0	7	10	15	4.609	16.131	0		-2.304
8	0	7	0	7	4.609	2.304	0		-2.304
9							0		-2.304
10							0		-2.304
11							0		-2.304
12							0		-2.304
13							0		-2.304
14							18.435		13.826
15							18.435		13.826
16							18.435		16.131

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164455
Alias:	NAS# 9972F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	0.293
Trans SD:	0.836

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	-0.293
Trans SD:	0.553

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.782	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.342	Transformation:	Rankits
K:		Ref. Residual SD:	0.415		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	3	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally Distributed:	N/A	Variances Homogeneous:	No	Degrees of Freedom:	12
				Experimental Alpha Level:	0.05
				Calculated Value:	1.655
Override Option:	Not Invoked			Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	1.075	0	-0.489	0.782	0.195		0	
2	10	1.075	0	-0.489	0.782	0.195		0	
3	10	1.075	0	-0.489	0.782	0.195		0	
4	0	-0.489	0	-0.489	0.782	0.195		0	
5	10	1.075	0	-0.489	0.782	0.195		0	
6	0	-0.489	0	-0.489	0.782	0.195		0	
7	0	-0.489	10	1.075	0.782	1.368		0	
8	0	-0.489	0	-0.489	0.782	0.195		0	
9								0	
10								0	
11								0	
12								10	
13								10	
14								10	
15								10	
16								10	

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164456
Alias:	NAS# 9973F
Replicates:	8
Mean:	10
SD:	14.142
Tr Mean:	0.331
Trans SD:	0.93

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	-0.331
Trans SD:	0.446

Shapiro-Wilk Results:

Residual Mean:	
Residual SD:	
SS:	
K:	
b:	
Alpha Level:	N/A
Calculated Value:	N/A
Critical Value:	N/A
Normally Distributed:	N/A
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.819
Test Residual SD:	0.312
Ref. Residual Mean:	0.276
Ref. Residual SD:	0.335
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	3.3571
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	Rankits
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	10
Experimental Alpha Level:	0.05
Calculated Value:	1.8139
Critical Value:	>= 1.812
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	1.285	0	-0.489	0.954	0.158		0	
2	0	-0.489	0	-0.489	0.819	0.158		0	
3	40	1.766	0	-0.489	1.435	0.158		0	
4	0	-0.489	0	-0.489	0.819	0.158		0	
5	10	0.774	0	-0.489	0.444	0.158		0	
6	0	-0.489	0	-0.489	0.819	0.158		0	
7	0	-0.489	10	0.774	0.819	1.105		0	
8	10	0.774	0	-0.489	0.444	0.158		0	
9								0	
10								0	
11								0	
12								10	
13								10	
14								10	
15								20	
16								40	

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164457
Alias:	NAS# 9974F
Replicates:	8
Mean:	7.5
SD:	11.65
Tr Mean:	0.241
Trans SD:	0.916

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	-0.241
Trans SD:	0.451

Shapiro-Wilk Results:

Residual Mean:	
Residual SD:	
SS:	
K:	
b:	
Alpha Level:	N/A
Calculated Value:	N/A
Critical Value:	N/A
Normally Distributed:	N/A
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.801
Test Residual SD:	0.325
Ref. Residual Mean:	0.279
Ref. Residual SD:	0.339
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	3.1465
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	Rankits
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	10
Experimental Alpha Level:	0.05
Calculated Value:	1.3333
Critical Value:	>= 1.812
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.4	0	-0.4	0.641	0.16		0	
2	0	-0.4	0	-0.4	0.641	0.16		0	
3	20	1.285	0	-0.4	1.044	0.16		0	
4	0	-0.4	0	-0.4	0.641	0.16		0	
5	0	-0.4	0	-0.4	0.641	0.16		0	
6	10	0.877	0	-0.4	0.636	0.16		0	
7	0	-0.4	10	0.877	0.641	1.117		0	
8	30	1.766	0	-0.4	1.525	0.16		0	
9								0	
10								0	
11								0	
12								0	
13								10	
14								10	
15								20	
16								30	

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164459
Alias:	NAS# 9975F
Replicates:	8
Mean:	20
SD:	11.952
Tr Mean:	25.745
Trans SD:	8.517

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	2.304
Trans SD:	6.518

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	7.31	Statistic:	Mann-Whitney
Residual SD:	6.51	Test Residual SD:	3.387	Balanced Design:	Yes
SS:	805.148	Ref. Residual Mean:	4.033	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.888		
b:	25.736	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8226	Calculated Value:	1.5586	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	62
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	40	16	0	4	13.487	2.304	0		-7.31
2	20	13	0	4	0.82	2.304	0		-7.31
3	10	10	0	4	7.31	2.304	0		-7.31
4	10	10	0	4	7.31	2.304	0		-7.31
5	30	14.5	0	4	7.466	2.304	0		-2.304
6	10	10	0	4	7.31	2.304	0		-2.304
7	10	10	10	10	7.31	16.131	0		-2.304
8	30	14.5	0	4	7.466	2.304	18.435		-2.304
9							18.435		-2.304
10							18.435		-2.304
11							18.435		-2.304
12							18.435		0.82
13							26.565		7.466
14							33.211		7.466
15							33.211		13.487
16							39.231		16.131

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164460
Alias:	NAS# 9976F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	2.304
Trans SD:	6.518

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	6.518
SS:	807.134
K:	8
b:	22.21
Alpha Level:	0.05
Calculated Value:	0.6112
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	6.913
Test Residual SD:	4.267
Ref. Residual Mean:	4.033
Ref. Residual SD:	4.888
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.2556
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	36
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	7	0	7	4.609	2.304	0		-4.609
2	10	15	0	7	13.826	2.304	0		-4.609
3	0	7	0	7	4.609	2.304	0		-4.609
4	0	7	0	7	4.609	2.304	0		-4.609
5	10	15	0	7	13.826	2.304	0		-4.609
6	0	7	0	7	4.609	2.304	0		-4.609
7	0	7	10	15	4.609	16.131	0		-2.304
8	0	7	0	7	4.609	2.304	0		-2.304
9							0		-2.304
10							0		-2.304
11							0		-2.304
12							0		-2.304
13							0		-2.304
14							18.435		13.826
15							18.435		13.826
16							18.435		16.131

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164461
Alias:	NAS# 9977F
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	2.304
Trans SD:	6.518

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	2.304
Trans SD:	6.518

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	4.033	Statistic:	Mann-Whitney
Residual SD:	5.595	Test Residual SD:	4.888	Balanced Design:	Yes
SS:	594.73	Ref. Residual Mean:	4.033	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.888		
b:	15.386	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.398	Calculated Value:	0	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	32
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	7.5	0	7.5	2.304	2.304	0		-2.304
2	0	7.5	0	7.5	2.304	2.304	0		-2.304
3	0	7.5	0	7.5	2.304	2.304	0		-2.304
4	0	7.5	0	7.5	2.304	2.304	0		-2.304
5	10	15.5	0	7.5	16.131	2.304	0		-2.304
6	0	7.5	0	7.5	2.304	2.304	0		-2.304
7	0	7.5	10	15.5	2.304	16.131	0		-2.304
8	0	7.5	0	7.5	2.304	2.304	0		-2.304
9							0		-2.304
10							0		-2.304
11							0		-2.304
12							0		-2.304
13							0		-2.304
14							0		-2.304
15							18.435		16.131
16							18.435		16.131

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164468
Alias:	NAS# 9981F
Replicates:	8
Mean:	13.75
SD:	13.025
Tr Mean:	18.458
Trans SD:	13.333

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	2.304
Trans SD:	6.518

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.247	Statistic:	Mann-Whitney
Residual SD:	9.008	Test Residual SD:	8.947	Balanced Design:	Yes
SS:	1541.744	Ref. Residual Mean:	4.033	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.888		
b:	36.553	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8666	Calculated Value:	1.4465	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	53.5
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	14.5	0	5	8.107	2.304	0		-18.458
2	20	14.5	0	5	8.107	2.304	0		-18.458
3	10	11.5	0	5	0.023	2.304	0		-2.304
4	0	5	0	5	18.458	2.304	0		-2.304
5	10	11.5	0	5	0.023	2.304	0		-2.304
6	0	5	0	5	18.458	2.304	0		-2.304
7	10	11.5	10	11.5	0.023	16.131	0		-2.304
8	40	16	0	5	20.773	2.304	0		-2.304
9							0		-2.304
10							18.435		-0.023
11							18.435		-0.023
12							18.435		-0.023
13							18.435		8.107
14							26.565		8.107
15							26.565		16.131
16							39.231		20.773

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164469
Alias:	NAS# 9982F
Replicates:	8
Mean:	8.75
SD:	6.409
Tr Mean:	14.842
Trans SD:	9.581

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	2.304
Trans SD:	6.518

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	7.033
SS:	939.908
K:	8
b:	28.825
Alpha Level:	0.05
Calculated Value:	0.884
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	7.421
Test Residual SD:	5.371
Ref. Residual Mean:	4.033
Ref. Residual SD:	4.888
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.3197
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	52.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	12.5	0	5	3.592	2.304	0		-14.842
2	10	12.5	0	5	3.592	2.304	0		-14.842
3	0	5	0	5	14.842	2.304	0		-2.304
4	20	16	0	5	11.723	2.304	0		-2.304
5	10	12.5	0	5	3.592	2.304	0		-2.304
6	10	12.5	0	5	3.592	2.304	0		-2.304
7	0	5	10	12.5	14.842	16.131	0		-2.304
8	10	12.5	0	5	3.592	2.304	0		-2.304
9							0		-2.304
10							18.435		3.592
11							18.435		3.592
12							18.435		3.592
13							18.435		3.592
14							18.435		3.592
15							18.435		11.723
16							26.565		16.131

Project Name: P727-1 Hyalella 28-day % Mortality

Sample:	x1
Samp ID:	5164471
Alias:	NAS# 9984F
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	0.224
Trans SD:	0.892

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	-0.224
Trans SD:	0.5

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.78	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.317	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.309	Transformation:	Rankits
K:		Ref. Residual SD:	0.375		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	2.7146	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally Distributed:	N/A	Variances Homogeneous:	No	Degrees of Freedom:	11
				Experimental Alpha Level:	0.05
				Calculated Value:	1.2377
Override Option:	Not Invoked			Critical Value:	>= 1.796
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.4	0	-0.4	0.624	0.177		0	
2	0	-0.4	0	-0.4	0.624	0.177		0	
3	10	1.013	0	-0.4	0.789	0.177		0	
4	10	1.013	0	-0.4	0.789	0.177		0	
5	0	-0.4	0	-0.4	0.624	0.177		0	
6	0	-0.4	0	-0.4	0.624	0.177		0	
7	0	-0.4	10	1.013	0.624	1.236		0	
8	20	1.766	0	-0.4	1.542	0.177		0	
9								0	
10								0	
11								0	
12								0	
13								10	
14								10	
15								10	
16								20	

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164433
Alias:	NAS# 9953F
Replicates:	8
Mean:	0.383
SD:	0.062
Tr Mean:	0.383
Trans SD:	0.062

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.052	Statistic:	Student's t
Residual SD:	0.046	Test Residual SD:	0.027	Balanced Design:	Yes
SS:	0.04	Ref. Residual Mean:	0.031	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.027		
b:	0.193	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9436	Calculated Value:	1.521	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	7.4705
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.29	0.29	0.56	0.56	0.093	0.021			-0.093
2	0.45	0.45	0.55	0.55	0.068	0.031			-0.071
3	0.44	0.44	0.62	0.62	0.058	0.039			-0.063
4	0.44	0.44	0.65	0.65	0.058	0.069			-0.053
5	0.33	0.33	0.58	0.58	0.053	0.001			-0.031
6	0.39	0.39	0.51	0.51	0.008	0.071			-0.021
7	0.32	0.32	0.59	0.59	0.063	0.009			-0.001
8	0.4	0.4	0.59	0.59	0.018	0.009			0.008
9									0.009
10									0.009
11									0.018
12									0.039
13									0.058
14									0.058
15									0.068
16									0.069

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164434
Alias:	NAS# 9954F
Replicates:	8
Mean:	0.285
SD:	0.04
Tr Mean:	0.285
Trans SD:	0.04

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.033	Statistic:	Student's t
Residual SD:	0.036	Test Residual SD:	0.021	Balanced Design:	Yes
SS:	0.024	Ref. Residual Mean:	0.031	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.027		
b:	0.154	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9787	Calculated Value:	0.1044	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	14.2253
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.27	0.27	0.56	0.56	0.015	0.021			-0.071
2	0.34	0.34	0.55	0.55	0.055	0.031			-0.055
3	0.31	0.31	0.62	0.62	0.025	0.039			-0.055
4	0.32	0.32	0.65	0.65	0.035	0.069			-0.031
5	0.23	0.23	0.58	0.58	0.055	0.001			-0.021
6	0.3	0.3	0.51	0.51	0.015	0.071			-0.015
7	0.23	0.23	0.59	0.59	0.055	0.009			-0.005
8	0.28	0.28	0.59	0.59	0.005	0.009			-0.001
9									0.009
10									0.009
11									0.015
12									0.025
13									0.035
14									0.039
15									0.055
16									0.069

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164435
Alias:	NAS# 9955F
Replicates:	8
Mean:	0.349
SD:	0.043
Tr Mean:	0.349
Trans SD:	0.043

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.037
SS:	0.026
K:	8
b:	0.158
Alpha Level:	0.05
Calculated Value:	0.9625
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.032
Test Residual SD:	0.027
Ref. Residual Mean:	0.031
Ref. Residual SD:	0.027
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.0232
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	10.7954
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.36	0.36	0.56	0.56	0.011	0.021			-0.089
2	0.36	0.36	0.55	0.55	0.011	0.031			-0.071
3	0.34	0.34	0.62	0.62	0.009	0.039			-0.031
4	0.4	0.4	0.65	0.65	0.051	0.069			-0.029
5	0.38	0.38	0.58	0.58	0.031	0.001			-0.021
6	0.32	0.32	0.51	0.51	0.029	0.071			-0.009
7	0.26	0.26	0.59	0.59	0.089	0.009			-0.001
8	0.37	0.37	0.59	0.59	0.021	0.009			0.009
9									0.009
10									0.011
11									0.011
12									0.021
13									0.031
14									0.039
15									0.051
16									0.069

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164436
Alias:	NAS# 9956F
Replicates:	8
Mean:	0.166
SD:	0.054
Tr Mean:	0.166
Trans SD:	0.054

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.042
SS:	0.033
K:	8
b:	0.178
Alpha Level:	0.05
Calculated Value:	0.9522
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.043
Test Residual SD:	0.029
Ref. Residual Mean:	0.031
Ref. Residual SD:	0.027
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.8326
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	17.0248
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.14	0.14	0.56	0.56	0.026	0.021			-0.071
2	0.13	0.13	0.55	0.55	0.036	0.031			-0.066
3	0.26	0.26	0.62	0.62	0.094	0.039			-0.036
4	0.18	0.18	0.65	0.65	0.014	0.069			-0.031
5	0.15	0.15	0.58	0.58	0.016	0.001			-0.026
6	0.1	0.1	0.51	0.51	0.066	0.071			-0.026
7	0.14	0.14	0.59	0.59	0.026	0.009			-0.021
8	0.23	0.23	0.59	0.59	0.064	0.009			-0.016
9									-0.001
10									0.009
11									0.009
12									0.014
13									0.039
14									0.064
15									0.069
16									0.094

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164437
Alias:	NAS# 9957F
Replicates:	8
Mean:	0.413
SD:	0.078
Tr Mean:	0.413
Trans SD:	0.078

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.054
SS:	0.055
K:	8
b:	0.232
Alpha Level:	0.05
Calculated Value:	0.9786
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.057
Test Residual SD:	0.048
Ref. Residual Mean:	0.031
Ref. Residual SD:	0.027
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.3125
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	5.3828
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.46	0.46	0.56	0.56	0.048	0.021			-0.133
2	0.44	0.44	0.55	0.55	0.028	0.031			-0.071
3	0.28	0.28	0.62	0.62	0.133	0.039			-0.063
4	0.35	0.35	0.65	0.65	0.063	0.069			-0.033
5	0.54	0.54	0.58	0.58	0.128	0.001			-0.031
6	0.38	0.38	0.51	0.51	0.033	0.071			-0.021
7	0.43	0.43	0.59	0.59	0.018	0.009			-0.001
8	0.42	0.42	0.59	0.59	0.008	0.009			0.008
9									0.009
10									0.009
11									0.018
12									0.028
13									0.039
14									0.048
15									0.069
16									0.128

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164440
Alias:	NAS# 9958F
Replicates:	8
Mean:	0.269
SD:	0.056
Tr Mean:	0.269
Trans SD:	0.056

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.039	Statistic:	Student's t
Residual SD:	0.043	Test Residual SD:	0.038	Balanced Design:	Yes
SS:	0.035	Ref. Residual Mean:	0.031	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.027		
b:	0.18	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9356	Calculated Value:	0.459	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	12.5404
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.28	0.28	0.56	0.56	0.011	0.021			-0.071
2	0.24	0.24	0.55	0.55	0.029	0.031			-0.059
3	0.29	0.29	0.62	0.62	0.021	0.039			-0.039
4	0.27	0.27	0.65	0.65	0.001	0.069			-0.031
5	0.23	0.23	0.58	0.58	0.039	0.001			-0.029
6	0.39	0.39	0.51	0.51	0.121	0.071			-0.029
7	0.24	0.24	0.59	0.59	0.029	0.009			-0.021
8	0.21	0.21	0.59	0.59	0.059	0.009			-0.001
9									0.001
10									0.009
11									0.009
12									0.011
13									0.021
14									0.039
15									0.069
16									0.121

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164441
Alias:	NAS# 9959F
Replicates:	8
Mean:	0.369
SD:	0.064
Tr Mean:	0.369
Trans SD:	0.064

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.047
SS:	0.041
K:	8
b:	0.201
Alpha Level:	0.05
Calculated Value:	0.9772
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.049
Test Residual SD:	0.036
Ref. Residual Mean:	0.031
Ref. Residual SD:	0.027
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.0932
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	7.8368
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.56	0.56	0.029	0.021			-0.089
2	0.39	0.39	0.55	0.55	0.021	0.031			-0.071
3	0.35	0.35	0.62	0.62	0.019	0.039			-0.059
4	0.28	0.28	0.65	0.65	0.089	0.069			-0.031
5	0.44	0.44	0.58	0.58	0.071	0.001			-0.029
6	0.31	0.31	0.51	0.51	0.059	0.071			-0.021
7	0.47	0.47	0.59	0.59	0.101	0.009			-0.019
8	0.37	0.37	0.59	0.59	0.001	0.009			-0.001
9									0.001
10									0.009
11									0.009
12									0.021
13									0.039
14									0.069
15									0.071
16									0.101

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164442
Alias:	NAS# 9960F
Replicates:	8
Mean:	0.313
SD:	0.048
Tr Mean:	0.313
Trans SD:	0.048

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.038	Statistic:	Student's t
Residual SD:	0.039	Test Residual SD:	0.025	Balanced Design:	Yes
SS:	0.029	Ref. Residual Mean:	0.031	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.027		
b:	0.168	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9747	Calculated Value:	0.5307	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	11.8431
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.28	0.28	0.56	0.56	0.033	0.021			-0.071
2	0.27	0.27	0.55	0.55	0.043	0.031			-0.053
3	0.34	0.34	0.62	0.62	0.028	0.039			-0.043
4	0.35	0.35	0.65	0.65	0.038	0.069			-0.033
5	0.29	0.29	0.58	0.58	0.023	0.001			-0.031
6	0.26	0.26	0.51	0.51	0.053	0.071			-0.023
7	0.4	0.4	0.59	0.59	0.088	0.009			-0.021
8	0.31	0.31	0.59	0.59	0.003	0.009			-0.003
9									-0.001
10									0.009
11									0.009
12									0.028
13									0.038
14									0.039
15									0.069
16									0.088

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164443
Alias:	NAS# 9961F
Replicates:	8
Mean:	0.321
SD:	0.08
Tr Mean:	0.321
Trans SD:	0.08

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.057	Statistic:	Student's t
Residual SD:	0.055	Test Residual SD:	0.052	Balanced Design:	Yes
SS:	0.058	Ref. Residual Mean:	0.031	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.027		
b:	0.237	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9729	Calculated Value:	1.2185	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	8.1087
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.36	0.36	0.56	0.56	0.039	0.021			-0.121
2	0.38	0.38	0.55	0.55	0.059	0.031			-0.091
3	0.23	0.23	0.62	0.62	0.091	0.039			-0.071
4	0.32	0.32	0.65	0.65	0.001	0.069			-0.031
5	0.45	0.45	0.58	0.58	0.129	0.001			-0.021
6	0.31	0.31	0.51	0.51	0.011	0.071			-0.011
7	0.32	0.32	0.59	0.59	0.001	0.009			-0.001
8	0.2	0.2	0.59	0.59	0.121	0.009			-0.001
9									-0.001
10									0.009
11									0.009
12									0.039
13									0.039
14									0.059
15									0.069
16									0.129

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164449
Alias:	NAS# 9962F
Replicates:	8
Mean:	0.335
SD:	0.052
Tr Mean:	0.335
Trans SD:	0.052

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.041
SS:	0.031
K:	8
b:	0.174
Alpha Level:	0.05
Calculated Value:	0.9564
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.04
Test Residual SD:	0.029
Ref. Residual Mean:	0.031
Ref. Residual SD:	0.027
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.6279
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	10.3849
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.56	0.56	0.005	0.021			-0.075
2	0.41	0.41	0.55	0.55	0.075	0.031			-0.071
3	0.32	0.32	0.62	0.62	0.015	0.039			-0.045
4	0.31	0.31	0.65	0.65	0.025	0.069			-0.031
5	0.35	0.35	0.58	0.58	0.015	0.001			-0.025
6	0.26	0.26	0.51	0.51	0.075	0.071			-0.021
7	0.29	0.29	0.59	0.59	0.045	0.009			-0.015
8	0.4	0.4	0.59	0.59	0.065	0.009			-0.001
9									0.005
10									0.009
11									0.009
12									0.015
13									0.039
14									0.065
15									0.069
16									0.075

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164439
Alias:	NAS# 9966F
Replicates:	8
Mean:	0.591
SD:	0.144
Tr Mean:	0.591
Trans SD:	0.144

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.091
SS:	0.158
K:	8
b:	0.39
Alpha Level:	0.05
Calculated Value:	0.9659
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.114
Test Residual SD:	0.076
Ref. Residual Mean:	0.031
Ref. Residual SD:	0.027
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.8932
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	-0.1884
Critical Value:	>= 1.86
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.38	0.38	0.56	0.56	0.211	0.021			-0.211
2	0.83	0.83	0.55	0.55	0.239	0.031			-0.111
3	0.48	0.48	0.62	0.62	0.111	0.039			-0.071
4	0.56	0.56	0.65	0.65	0.031	0.069			-0.061
5	0.68	0.68	0.58	0.58	0.089	0.001			-0.041
6	0.53	0.53	0.51	0.51	0.061	0.071			-0.031
7	0.72	0.72	0.59	0.59	0.129	0.009			-0.031
8	0.55	0.55	0.59	0.59	0.041	0.009			-0.021
9									-0.001
10									0.009
11									0.009
12									0.039
13									0.069
14									0.089
15									0.129
16									0.239

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164450
Alias:	NAS# 9967F
Replicates:	8
Mean:	0.34
SD:	0.052
Tr Mean:	0.34
Trans SD:	0.052

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.041
SS:	0.032
K:	8
b:	0.176
Alpha Level:	0.05
Calculated Value:	0.9616
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.035
Test Residual SD:	0.037
Ref. Residual Mean:	0.031
Ref. Residual SD:	0.027
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.2332
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	10.0784
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.56	0.56	0	0.021			-0.1
2	0.42	0.42	0.55	0.55	0.08	0.031			-0.071
3	0.38	0.38	0.62	0.62	0.04	0.039			-0.031
4	0.24	0.24	0.65	0.65	0.1	0.069			-0.03
5	0.31	0.31	0.58	0.58	0.03	0.001			-0.021
6	0.35	0.35	0.51	0.51	0.01	0.071			-0.01
7	0.33	0.33	0.59	0.59	0.01	0.009			-0.001
8	0.35	0.35	0.59	0.59	0.01	0.009			0
9									0.009
10									0.009
11									0.01
12									0.01
13									0.039
14									0.04
15									0.069
16									0.08

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164451
Alias:	NAS# 9968F
Replicates:	8
Mean:	0.326
SD:	0.089
Tr Mean:	0.326
Trans SD:	0.089

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.06
SS:	0.068
K:	8
b:	0.258
Alpha Level:	0.05
Calculated Value:	0.9685
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.07
Test Residual SD:	0.049
Ref. Residual Mean:	0.031
Ref. Residual SD:	0.027
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.9476
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	10
Experimental Alpha Level:	0.05
Calculated Value:	7.2924
Critical Value:	>= 1.812
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.3	0.3	0.56	0.56	0.026	0.021			-0.146
2	0.18	0.18	0.55	0.55	0.146	0.031			-0.106
3	0.44	0.44	0.62	0.62	0.114	0.039			-0.071
4	0.41	0.41	0.65	0.65	0.084	0.069			-0.031
5	0.22	0.22	0.58	0.58	0.106	0.001			-0.026
6	0.36	0.36	0.51	0.51	-0.034	0.071			-0.021
7	0.35	0.35	0.59	0.59	0.024	0.009			-0.001
8	0.35	0.35	0.59	0.59	0.024	0.009			0.009
9									0.009
10									0.024
11									0.024
12									0.034
13									0.039
14									0.069
15									0.084
16									0.114

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164452
Alias:	NAS# 9969F
Replicates:	8
Mean:	0.274
SD:	0.068
Tr Mean:	0.274
Trans SD:	0.068

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.049
SS:	0.045
K:	8
b:	0.21
Alpha Level:	0.05
Calculated Value:	0.9684
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.051
Test Residual SD:	0.041
Ref. Residual Mean:	0.031
Ref. Residual SD:	0.027
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.1599
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	10.7908
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.19	0.19	0.56	0.56	0.084	0.021			-0.084
2	0.33	0.33	0.55	0.55	0.056	0.031			-0.071
3	0.21	0.21	0.62	0.62	0.064	0.039			-0.064
4	0.29	0.29	0.65	0.65	0.016	0.069			-0.044
5	0.28	0.28	0.58	0.58	0.006	0.001			-0.031
6	0.26	0.26	0.51	0.51	0.014	0.071			-0.021
7	0.23	0.23	0.59	0.59	0.044	0.009			-0.014
8	0.4	0.4	0.59	0.59	0.126	0.009			-0.001
9									0.006
10									0.009
11									0.009
12									0.016
13									0.039
14									0.056
15									0.069
16									0.126

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164453
Alias:	NAS# 9970F
Replicates:	8
Mean:	0.489
SD:	0.067
Tr Mean:	0.489
Trans SD:	0.067

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.048
SS:	0.044
K:	8
b:	0.208
Alpha Level:	0.05
Calculated Value:	0.9838
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.056
Test Residual SD:	0.029
Ref. Residual Mean:	0.031
Ref. Residual SD:	0.027
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.7961
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	12
Experimental Alpha Level:	0.05
Calculated Value:	3.3009
Critical Value:	>= 1.782
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.58	0.58	0.56	0.56	0.091	0.021			-0.099
2	0.44	0.44	0.55	0.55	0.049	0.031			-0.071
3	0.54	0.54	0.62	0.62	0.051	0.039			-0.059
4	0.51	0.51	0.65	0.65	0.021	0.069			-0.049
5	0.39	0.39	0.58	0.58	0.099	0.001			-0.031
6	0.55	0.55	0.51	0.51	0.061	0.071			-0.021
7	0.43	0.43	0.59	0.59	0.059	0.009			-0.019
8	0.47	0.47	0.59	0.59	0.019	0.009			-0.001
9									0.009
10									0.009
11									0.021
12									0.039
13									0.051
14									0.061
15									0.069
16									0.091

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164454
Alias:	NAS# 9971F
Replicates:	8
Mean:	0.334
SD:	0.073
Tr Mean:	0.334
Trans SD:	0.073

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.056	Statistic:	Student's t
Residual SD:	0.051	Test Residual SD:	0.042	Balanced Design:	Yes
SS:	0.05	Ref. Residual Mean:	0.031	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.027		
b:	0.223	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9863	Calculated Value:	1.4286	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	8.2602
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.35	0.35	0.56	0.56	0.016	0.021			-0.124
2	0.31	0.31	0.55	0.55	0.024	0.031			-0.071
3	0.28	0.28	0.62	0.62	0.054	0.039			-0.054
4	0.45	0.45	0.65	0.65	0.116	0.069			-0.031
5	0.38	0.38	0.58	0.58	0.046	0.001			-0.024
6	0.31	0.31	0.51	0.51	0.024	0.071			-0.024
7	0.21	0.21	0.59	0.59	0.124	0.009			-0.021
8	0.38	0.38	0.59	0.59	0.046	0.009			-0.001
9									0.009
10									0.009
11									0.016
12									0.039
13									0.046
14									0.046
15									0.069
16									0.116

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164455
Alias:	NAS# 9972F
Replicates:	8
Mean:	0.321
SD:	0.043
Tr Mean:	0.321
Trans SD:	0.043

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.032	Statistic:	Student's t
Residual SD:	0.037	Test Residual SD:	0.027	Balanced Design:	Yes
SS:	0.026	Ref. Residual Mean:	0.031	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.027		
b:	0.158	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9656	Calculated Value:	0.0232	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	12.0723
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.33	0.33	0.56	0.56	0.009	0.021			-0.071
2	0.32	0.32	0.55	0.55	0.001	0.031			-0.061
3	0.29	0.29	0.62	0.62	0.031	0.039			-0.031
4	0.36	0.36	0.65	0.65	0.039	0.069			-0.031
5	0.31	0.31	0.58	0.58	0.011	0.001			-0.021
6	0.26	0.26	0.51	0.51	0.061	0.071			-0.021
7	0.4	0.4	0.59	0.59	0.079	0.009			-0.011
8	0.3	0.3	0.59	0.59	0.021	0.009			-0.001
9									-0.001
10									0.009
11									0.009
12									0.009
13									0.039
14									0.039
15									0.069
16									0.079

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164456
Alias:	NAS# 9973F
Replicates:	8
Mean:	0.279
SD:	0.085
Tr Mean:	0.279
Trans SD:	0.085

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.064	Statistic:	Student's t
Residual SD:	0.058	Test Residual SD:	0.051	Balanced Design:	Yes
SS:	0.064	Ref. Residual Mean:	0.031	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.027		
b:	0.249	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.973	Calculated Value:	1.6145	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	8.9638
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.3	0.3	0.56	0.56	0.021	0.021			-0.139
2	0.29	0.29	0.55	0.55	0.011	0.031			-0.079
3	0.32	0.32	0.62	0.62	0.041	0.039			-0.071
4	0.32	0.32	0.65	0.65	0.041	0.069			-0.039
5	0.2	0.2	0.58	0.58	0.079	0.001			-0.031
6	0.24	0.24	0.51	0.51	0.039	0.071			-0.021
7	0.42	0.42	0.59	0.59	0.141	0.009			-0.001
8	0.14	0.14	0.59	0.59	0.139	0.009			0.009
9									0.009
10									0.011
11									0.021
12									0.039
13									0.041
14									0.041
15									0.069
16									0.141

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164457
Alias:	NAS# 9974F
Replicates:	8
Mean:	0.348
SD:	0.036
Tr Mean:	0.348
Trans SD:	0.036

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.029	Statistic:	Student's t
Residual SD:	0.034	Test Residual SD:	0.017	Balanced Design:	Yes
SS:	0.022	Ref. Residual Mean:	0.031	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.027		
b:	0.147	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9864	Calculated Value:	0.1663	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	11.8371
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.56	0.56	0.008	0.021			-0.071
2	0.3	0.3	0.55	0.55	0.048	0.031			-0.048
3	0.4	0.4	0.62	0.62	0.053	0.039			-0.038
4	0.31	0.31	0.65	0.65	0.038	0.069			-0.031
5	0.38	0.38	0.58	0.58	0.033	0.001			-0.021
6	0.34	0.34	0.51	0.51	0.008	0.071			-0.018
7	0.33	0.33	0.59	0.59	0.018	0.009			-0.008
8	0.38	0.38	0.59	0.59	0.033	0.009			-0.008
9									-0.001
10									0.009
11									0.009
12									0.033
13									0.033
14									0.039
15									0.053
16									0.069

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164459
Alias:	NAS# 9975F
Replicates:	8
Mean:	0.46
SD:	0.06
Tr Mean:	0.46
Trans SD:	0.06

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.05	Statistic:	Student's t
Residual SD:	0.045	Test Residual SD:	0.027	Balanced Design:	Yes
SS:	0.038	Ref. Residual Mean:	0.031	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.027		
b:	0.19	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.956	Calculated Value:	1.3979	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	4.6615
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.56	0.56	0.56	0.56	0.1	0.021			-0.071
2	0.52	0.52	0.55	0.55	0.06	0.031			-0.07
3	0.45	0.45	0.62	0.62	0.01	0.039			-0.04
4	0.42	0.42	0.65	0.65	0.04	0.069			-0.04
5	0.42	0.42	0.58	0.58	0.04	0.001			-0.04
6	0.39	0.39	0.51	0.51	0.07	0.071			-0.031
7	0.42	0.42	0.59	0.59	0.04	0.009			-0.021
8	0.5	0.5	0.59	0.59	0.04	0.009			-0.01
9									-0.001
10									0.009
11									0.009
12									0.039
13									0.04
14									0.06
15									0.069
16									0.1

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164460
Alias:	NAS# 9976F
Replicates:	8
Mean:	0.515
SD:	0.103
Tr Mean:	0.515
Trans SD:	0.103

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.068
SS:	0.087
K:	8
b:	0.281
Alpha Level:	0.05
Calculated Value:	0.9046
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.081
Test Residual SD:	0.056
Ref. Residual Mean:	0.031
Ref. Residual SD:	0.027
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.2829
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	9
Experimental Alpha Level:	0.05
Calculated Value:	1.6761
Critical Value:	>= 1.833
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.47	0.47	0.56	0.56	0.045	0.021			-0.095
2	0.42	0.42	0.55	0.55	0.095	0.031			-0.075
3	0.45	0.45	0.62	0.62	0.065	0.039			-0.071
4	0.47	0.47	0.65	0.65	0.045	0.069			-0.065
5	0.61	0.61	0.58	0.58	0.095	0.001			-0.045
6	0.54	0.54	0.51	0.51	0.025	0.071			-0.045
7	0.44	0.44	0.59	0.59	0.075	0.009			-0.031
8	0.72	0.72	0.59	0.59	0.205	0.009			-0.021
9									-0.001
10									0.009
11									0.009
12									0.025
13									0.039
14									0.069
15									0.095
16									0.205

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164461
Alias:	NAS# 9977F
Replicates:	8
Mean:	0.373
SD:	0.053
Tr Mean:	0.373
Trans SD:	0.053

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.041
SS:	0.033
K:	8
b:	0.177
Alpha Level:	0.05
Calculated Value:	0.9647
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.038
Test Residual SD:	0.035
Ref. Residual Mean:	0.031
Ref. Residual SD:	0.027
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.4014
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	8.6469
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.35	0.35	0.56	0.56	0.023	0.021			-0.103
2	0.4	0.4	0.55	0.55	0.028	0.031			-0.071
3	0.27	0.27	0.62	0.62	0.103	0.039			-0.031
4	0.45	0.45	0.65	0.65	0.078	0.069			-0.023
5	0.41	0.41	0.58	0.58	0.038	0.001			-0.023
6	0.38	0.38	0.51	0.51	0.008	0.071			-0.021
7	0.37	0.37	0.59	0.59	0.003	0.009			-0.003
8	0.35	0.35	0.59	0.59	0.023	0.009			-0.001
9									0.008
10									0.009
11									0.009
12									0.028
13									0.038
14									0.039
15									0.069
16									0.078

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164468
Alias:	NAS# 9981F
Replicates:	8
Mean:	0.179
SD:	0.033
Tr Mean:	0.179
Trans SD:	0.033

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.033
SS:	0.021
K:	8
b:	0.14
Alpha Level:	0.05
Calculated Value:	0.9574
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.026
Test Residual SD:	0.018
Ref. Residual Mean:	0.031
Ref. Residual SD:	0.027
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.4394
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	20.9986
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.15	0.15	0.56	0.56	0.029	0.021			-0.071
2	0.18	0.18	0.55	0.55	0.001	0.031			-0.031
3	0.24	0.24	0.62	0.62	0.061	0.039			-0.029
4	0.19	0.19	0.65	0.65	0.011	0.069			-0.029
5	0.21	0.21	0.58	0.58	0.031	0.001			-0.029
6	0.15	0.15	0.51	0.51	0.029	0.071			-0.021
7	0.16	0.16	0.59	0.59	0.019	0.009			-0.019
8	0.15	0.15	0.59	0.59	0.029	0.009			-0.001
9									0.001
10									0.009
11									0.009
12									0.011
13									0.031
14									0.039
15									0.061
16									0.069

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164469
Alias:	NAS# 9982F
Replicates:	8
Mean:	0.461
SD:	0.063
Tr Mean:	0.461
Trans SD:	0.063

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.046
SS:	0.041
K:	8
b:	0.197
Alpha Level:	0.05
Calculated Value:	0.9432
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.054
Test Residual SD:	0.027
Ref. Residual Mean:	0.031
Ref. Residual SD:	0.027
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.6796
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	4.4362
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.43	0.43	0.56	0.56	0.031	0.021			-0.071
2	0.54	0.54	0.55	0.55	0.079	0.031			-0.071
3	0.47	0.47	0.62	0.62	0.009	0.039			-0.061
4	0.55	0.55	0.65	0.65	0.089	0.069			-0.051
5	0.41	0.41	0.58	0.58	0.051	0.001			-0.031
6	0.4	0.4	0.51	0.51	0.061	0.071			-0.031
7	0.39	0.39	0.59	0.59	0.071	0.009			-0.021
8	0.5	0.5	0.59	0.59	0.039	0.009			-0.001
9									0.009
10									0.009
11									0.009
12									0.039
13									0.039
14									0.069
15									0.079
16									0.089

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164471
Alias:	NAS# 9984F
Replicates:	8
Mean:	0.64
SD:	0.101
Tr Mean:	0.64
Trans SD:	0.101

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.581
SD:	0.043
Tr Mean:	0.581
Trans SD:	0.043

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.065	Statistic:	Student's t
Residual SD:	0.067	Test Residual SD:	0.073	Balanced Design:	Yes
SS:	0.084	Ref. Residual Mean:	0.031	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.027		
b:	0.277	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9157	Calculated Value:	1.2255	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	-1.5161
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.6	0.6	0.56	0.56	0.04	0.021			-0.18
2	0.6	0.6	0.55	0.55	0.04	0.031			-0.071
3	0.68	0.68	0.62	0.62	0.04	0.039			-0.04
4	0.64	0.64	0.65	0.65	0	0.069			-0.04
5	0.68	0.68	0.58	0.58	0.04	0.001			-0.031
6	0.64	0.64	0.51	0.51	0	0.071			-0.021
7	0.46	0.46	0.59	0.59	0.18	0.009			-0.001
8	0.82	0.82	0.59	0.59	0.18	0.009			0
9									0
10									0.009
11									0.009
12									0.039
13									0.04
14									0.04
15									0.069
16									0.18

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164433
Alias:	NAS# 9953F
Replicates:	8
Mean:	0.383
SD:	0.062
Tr Mean:	0.383
Trans SD:	0.062

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.052	Statistic:	Student's t
Residual SD:	0.049	Test Residual SD:	0.027	Balanced Design:	Yes
SS:	0.046	Ref. Residual Mean:	0.041	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.028		
b:	0.208	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9496	Calculated Value:	0.7724	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	6.7795
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.29	0.29	0.54	0.54	0.093	0.036			-0.093
2	0.45	0.45	0.63	0.63	0.068	0.054			-0.063
3	0.44	0.44	0.58	0.58	0.058	0.004			-0.056
4	0.44	0.44	0.59	0.59	0.058	0.014			-0.053
5	0.33	0.33	0.67	0.67	0.053	0.094			-0.036
6	0.39	0.39	0.52	0.52	0.008	0.056			-0.036
7	0.32	0.32	0.54	0.54	0.063	0.036			-0.036
8	0.4	0.4	0.54	0.54	0.018	0.036			0.004
9									0.008
10									0.014
11									0.018
12									0.054
13									0.058
14									0.058
15									0.068
16									0.094

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164434
Alias:	NAS# 9954F
Replicates:	8
Mean:	0.285
SD:	0.04
Tr Mean:	0.285
Trans SD:	0.04

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.033	Statistic:	Student's t
Residual SD:	0.04	Test Residual SD:	0.021	Balanced Design:	Yes
SS:	0.03	Ref. Residual Mean:	0.041	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.028		
b:	0.169	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9416	Calculated Value:	0.7176	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	12.5029
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.27	0.27	0.54	0.54	0.015	0.036			-0.056
2	0.34	0.34	0.63	0.63	0.055	0.054			-0.055
3	0.31	0.31	0.58	0.58	0.025	0.004			-0.055
4	0.32	0.32	0.59	0.59	0.035	0.014			-0.036
5	0.23	0.23	0.67	0.67	0.055	0.094			-0.036
6	0.3	0.3	0.52	0.52	0.015	0.056			-0.036
7	0.23	0.23	0.54	0.54	0.055	0.036			-0.015
8	0.28	0.28	0.54	0.54	0.005	0.036			-0.005
9									0.004
10									0.014
11									0.015
12									0.025
13									0.035
14									0.054
15									0.055
16									0.094

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164435
Alias:	NAS# 9955F
Replicates:	8
Mean:	0.349
SD:	0.043
Tr Mean:	0.349
Trans SD:	0.043

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.032	Statistic:	Student's t
Residual SD:	0.041	Test Residual SD:	0.027	Balanced Design:	Yes
SS:	0.032	Ref. Residual Mean:	0.041	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.028		
b:	0.178	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9826	Calculated Value:	0.7077	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	9.5059
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.36	0.36	0.54	0.54	0.011	0.036			-0.089
2	0.36	0.36	0.63	0.63	0.011	0.054			-0.056
3	0.34	0.34	0.58	0.58	0.009	0.004			-0.036
4	0.4	0.4	0.59	0.59	0.051	0.014			-0.036
5	0.38	0.38	0.67	0.67	0.031	0.094			-0.036
6	0.32	0.32	0.52	0.52	0.029	0.056			-0.029
7	0.26	0.26	0.54	0.54	0.089	0.036			-0.009
8	0.37	0.37	0.54	0.54	0.021	0.036			0.004
9									0.011
10									0.011
11									0.014
12									0.021
13									0.031
14									0.051
15									0.054
16									0.094

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164436
Alias:	NAS# 9956F
Replicates:	8
Mean:	0.166
SD:	0.054
Tr Mean:	0.166
Trans SD:	0.054

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.043	Statistic:	Student's t
Residual SD:	0.046	Test Residual SD:	0.029	Balanced Design:	Yes
SS:	0.039	Ref. Residual Mean:	0.041	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.028		
b:	0.187	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.8895	Calculated Value:	0.111	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	15.4621
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.14	0.14	0.54	0.54	0.026	0.036			-0.066
2	0.13	0.13	0.63	0.63	0.036	0.054			-0.056
3	0.26	0.26	0.58	0.58	0.094	0.004			-0.036
4	0.18	0.18	0.59	0.59	0.014	0.014			-0.036
5	0.15	0.15	0.67	0.67	0.016	0.094			-0.036
6	0.1	0.1	0.52	0.52	0.066	0.056			-0.036
7	0.14	0.14	0.54	0.54	0.026	0.036			-0.026
8	0.23	0.23	0.54	0.54	0.064	0.036			-0.026
9									-0.016
10									0.004
11									0.014
12									0.014
13									0.054
14									0.064
15									0.094
16									0.094

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164437
Alias:	NAS# 9957F
Replicates:	8
Mean:	0.413
SD:	0.078
Tr Mean:	0.413
Trans SD:	0.078

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.057
SS:	0.061
K:	8
b:	0.244
Alpha Level:	0.05
Calculated Value:	0.976
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.057
Test Residual SD:	0.048
Ref. Residual Mean:	0.041
Ref. Residual SD:	0.028
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.7947
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	4.9559
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.46	0.46	0.54	0.54	0.048	0.036			-0.133
2	0.44	0.44	0.63	0.63	0.028	0.054			-0.063
3	0.28	0.28	0.58	0.58	0.133	0.004			-0.056
4	0.35	0.35	0.59	0.59	0.063	0.014			-0.036
5	0.54	0.54	0.67	0.67	0.128	0.094			-0.036
6	0.38	0.38	0.52	0.52	0.033	0.056			-0.036
7	0.43	0.43	0.54	0.54	0.018	0.036			-0.033
8	0.42	0.42	0.54	0.54	0.008	0.036			0.004
9									0.008
10									0.014
11									0.018
12									0.028
13									0.048
14									0.054
15									0.094
16									0.128

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164440
Alias:	NAS# 9958F
Replicates:	8
Mean:	0.269
SD:	0.056
Tr Mean:	0.269
Trans SD:	0.056

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.039	Statistic:	Mann-Whitney
Residual SD:	0.046	Test Residual SD:	0.038	Balanced Design:	Yes
SS:	0.041	Ref. Residual Mean:	0.041	Transformation:	rank-order
K:	8	Ref. Residual SD:	0.028		
b:	0.189	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.8772	Calculated Value:	0.1515	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	64
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.28	6	0.54	11	0.011	0.036	0.21		-0.059
2	0.24	3.5	0.63	15	0.029	0.054	0.23		-0.056
3	0.29	7	0.58	13	0.021	0.004	0.24		-0.039
4	0.27	5	0.59	14	0.001	0.014	0.24		-0.036
5	0.23	2	0.67	16	0.039	0.094	0.27		-0.036
6	0.39	8	0.52	9	0.121	0.056	0.28		-0.036
7	0.24	3.5	0.54	11	0.029	0.036	0.29		-0.029
8	0.21	1	0.54	11	0.059	0.036	0.39		-0.029
9							0.52		0.001
10							0.54		0.004
11							0.54		0.011
12							0.54		0.014
13							0.58		0.021
14							0.59		0.054
15							0.63		0.094
16							0.67		0.121

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164441
Alias:	NAS# 9959F
Replicates:	8
Mean:	0.369
SD:	0.064
Tr Mean:	0.369
Trans SD:	0.064

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.049	Statistic:	Student's t
Residual SD:	0.05	Test Residual SD:	0.036	Balanced Design:	Yes
SS:	0.047	Ref. Residual Mean:	0.041	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.028		
b:	0.211	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9462	Calculated Value:	0.4637	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	7.1416
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.54	0.54	0.029	0.036			-0.089
2	0.39	0.39	0.63	0.63	0.021	0.054			-0.059
3	0.35	0.35	0.58	0.58	0.019	0.004			-0.056
4	0.28	0.28	0.59	0.59	0.089	0.014			-0.036
5	0.44	0.44	0.67	0.67	0.071	0.094			-0.036
6	0.31	0.31	0.52	0.52	0.059	0.056			-0.036
7	0.47	0.47	0.54	0.54	0.101	0.036			-0.029
8	0.37	0.37	0.54	0.54	0.001	0.036			-0.019
9									0.001
10									0.004
11									0.014
12									0.021
13									0.054
14									0.071
15									0.094
16									0.101

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164442
Alias:	NAS# 9960F
Replicates:	8
Mean:	0.313
SD:	0.048
Tr Mean:	0.313
Trans SD:	0.048

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.043
SS:	0.035
K:	8
b:	0.177
Alpha Level:	0.05
Calculated Value:	0.8993
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.038
Test Residual SD:	0.025
Ref. Residual Mean:	0.041
Ref. Residual SD:	0.028
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.2375
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	10.5594
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.28	0.28	0.54	0.54	0.033	0.036			-0.056
2	0.27	0.27	0.63	0.63	0.043	0.054			-0.053
3	0.34	0.34	0.58	0.58	0.028	0.004			-0.043
4	0.35	0.35	0.59	0.59	0.038	0.014			-0.036
5	0.29	0.29	0.67	0.67	0.023	0.094			-0.036
6	0.26	0.26	0.52	0.52	0.053	0.056			-0.036
7	0.4	0.4	0.54	0.54	0.088	0.036			-0.033
8	0.31	0.31	0.54	0.54	0.003	0.036			-0.023
9									-0.003
10									0.004
11									0.014
12									0.028
13									0.038
14									0.054
15									0.088
16									0.094

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164443
Alias:	NAS# 9961F
Replicates:	8
Mean:	0.321
SD:	0.08
Tr Mean:	0.321
Trans SD:	0.08

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.057	Statistic:	Student's t
Residual SD:	0.058	Test Residual SD:	0.052	Balanced Design:	Yes
SS:	0.064	Ref. Residual Mean:	0.041	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.028		
b:	0.25	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9853	Calculated Value:	0.7326	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	7.5622
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.36	0.36	0.54	0.54	0.039	0.036			-0.121
2	0.38	0.38	0.63	0.63	0.059	0.054			-0.091
3	0.23	0.23	0.58	0.58	0.091	0.004			-0.056
4	0.32	0.32	0.59	0.59	0.001	0.014			-0.036
5	0.45	0.45	0.67	0.67	0.129	0.094			-0.036
6	0.31	0.31	0.52	0.52	0.011	0.056			-0.036
7	0.32	0.32	0.54	0.54	0.001	0.036			-0.011
8	0.2	0.2	0.54	0.54	0.121	0.036			-0.001
9									-0.001
10									0.004
11									0.014
12									0.039
13									0.054
14									0.059
15									0.094
16									0.129

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164449
Alias:	NAS# 9962F
Replicates:	8
Mean:	0.335
SD:	0.052
Tr Mean:	0.335
Trans SD:	0.052

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.04	Statistic:	Student's t
Residual SD:	0.044	Test Residual SD:	0.029	Balanced Design:	Yes
SS:	0.038	Ref. Residual Mean:	0.041	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.028		
b:	0.188	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.943	Calculated Value:	0.0885	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	9.3119
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.54	0.54	0.005	0.036			-0.075
2	0.41	0.41	0.63	0.63	0.075	0.054			-0.056
3	0.32	0.32	0.58	0.58	0.015	0.004			-0.045
4	0.31	0.31	0.59	0.59	0.025	0.014			-0.036
5	0.35	0.35	0.67	0.67	0.015	0.094			-0.036
6	0.26	0.26	0.52	0.52	0.075	0.056			-0.036
7	0.29	0.29	0.54	0.54	0.045	0.036			-0.025
8	0.4	0.4	0.54	0.54	0.065	0.036			-0.015
9									0.004
10									0.005
11									0.014
12									0.015
13									0.054
14									0.065
15									0.075
16									0.094

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164439
Alias:	NAS# 9966F
Replicates:	8
Mean:	0.591
SD:	0.144
Tr Mean:	0.591
Trans SD:	0.144

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.114	Statistic:	Approximate t
Residual SD:	0.093	Test Residual SD:	0.076	Balanced Design:	Yes
SS:	0.164	Ref. Residual Mean:	0.041	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.028		
b:	0.395	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9517	Calculated Value:	2.5355	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	9
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	-0.2773
				Critical Value:	>= 1.833
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.38	0.38	0.54	0.54	0.211	0.036			-0.211
2	0.83	0.83	0.63	0.63	0.239	0.054			-0.111
3	0.48	0.48	0.58	0.58	0.111	0.004			-0.061
4	0.56	0.56	0.59	0.59	0.031	0.014			-0.056
5	0.68	0.68	0.67	0.67	0.089	0.094			-0.041
6	0.53	0.53	0.52	0.52	0.061	0.056			-0.036
7	0.72	0.72	0.54	0.54	0.129	0.036			-0.036
8	0.55	0.55	0.54	0.54	0.041	0.036			-0.036
9									-0.031
10									0.004
11									0.014
12									0.054
13									0.089
14									0.094
15									0.129
16									0.239

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164450
Alias:	NAS# 9967F
Replicates:	8
Mean:	0.34
SD:	0.052
Tr Mean:	0.34
Trans SD:	0.052

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.045
SS:	0.038
K:	8
b:	0.193
Alpha Level:	0.05
Calculated Value:	0.9731
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.035
Test Residual SD:	0.037
Ref. Residual Mean:	0.041
Ref. Residual SD:	0.028
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.3848
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	9.047
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.54	0.54	0	0.036			-0.1
2	0.42	0.42	0.63	0.63	0.08	0.054			-0.056
3	0.38	0.38	0.58	0.58	0.04	0.004			-0.036
4	0.24	0.24	0.59	0.59	0.1	0.014			-0.036
5	0.31	0.31	0.67	0.67	0.03	0.094			-0.036
6	0.35	0.35	0.52	0.52	0.01	0.056			-0.03
7	0.33	0.33	0.54	0.54	0.01	0.036			-0.01
8	0.35	0.35	0.54	0.54	0.01	0.036			0
9									0.004
10									0.01
11									0.01
12									0.014
13									0.04
14									0.054
15									0.08
16									0.094

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164451
Alias:	NAS# 9968F
Replicates:	8
Mean:	0.326
SD:	0.089
Tr Mean:	0.326
Trans SD:	0.089

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.07	Statistic:	Student's t
Residual SD:	0.063	Test Residual SD:	0.049	Balanced Design:	Yes
SS:	0.075	Ref. Residual Mean:	0.041	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.028		
b:	0.269	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9726	Calculated Value:	1.4311	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	6.8507
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.3	0.3	0.54	0.54	0.026	0.036			-0.146
2	0.18	0.18	0.63	0.63	0.146	0.054			-0.106
3	0.44	0.44	0.58	0.58	0.114	0.004			-0.056
4	0.41	0.41	0.59	0.59	0.084	0.014			-0.036
5	0.22	0.22	0.67	0.67	0.106	0.094			-0.036
6	0.36	0.36	0.52	0.52	0.034	0.056			-0.036
7	0.35	0.35	0.54	0.54	0.024	0.036			-0.026
8	0.35	0.35	0.54	0.54	0.024	0.036			0.004
9									0.014
10									0.024
11									0.024
12									0.034
13									0.054
14									0.084
15									0.094
16									0.114

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164452
Alias:	NAS# 9969F
Replicates:	8
Mean:	0.274
SD:	0.068
Tr Mean:	0.274
Trans SD:	0.068

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.051	Statistic:	Student's t
Residual SD:	0.052	Test Residual SD:	0.041	Balanced Design:	Yes
SS:	0.052	Ref. Residual Mean:	0.041	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.028		
b:	0.221	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9448	Calculated Value:	0.5748	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	9.9678
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.19	0.19	0.54	0.54	0.084	0.036			-0.084
2	0.33	0.33	0.63	0.63	0.056	0.054			-0.064
3	0.21	0.21	0.58	0.58	0.064	0.004			-0.056
4	0.29	0.29	0.59	0.59	0.016	0.014			-0.044
5	0.28	0.28	0.67	0.67	0.006	0.094			-0.036
6	0.26	0.26	0.52	0.52	0.014	0.056			-0.036
7	0.23	0.23	0.54	0.54	0.044	0.036			-0.036
8	0.4	0.4	0.54	0.54	0.126	0.036			-0.014
9									0.004
10									0.006
11									0.014
12									0.016
13									0.054
14									0.056
15									0.094
16									0.126

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164453
Alias:	NAS# 9970F
Replicates:	8
Mean:	0.489
SD:	0.067
Tr Mean:	0.489
Trans SD:	0.067

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.051
SS:	0.05
K:	8
b:	0.218
Alpha Level:	0.05
Calculated Value:	0.9492
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.056
Test Residual SD:	0.029
Ref. Residual Mean:	0.041
Ref. Residual SD:	0.028
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.063
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	2.9261
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.58	0.58	0.54	0.54	0.091	0.036			-0.099
2	0.44	0.44	0.63	0.63	0.049	0.054			-0.059
3	0.54	0.54	0.58	0.58	0.051	0.004			-0.056
4	0.51	0.51	0.59	0.59	0.021	0.014			-0.049
5	0.39	0.39	0.67	0.67	0.099	0.094			-0.036
6	0.55	0.55	0.52	0.52	0.061	0.056			-0.036
7	0.43	0.43	0.54	0.54	0.059	0.036			-0.036
8	0.47	0.47	0.54	0.54	0.019	0.036			-0.019
9									0.004
10									0.014
11									0.021
12									0.051
13									0.054
14									0.061
15									0.091
16									0.094

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164454
Alias:	NAS# 9971F
Replicates:	8
Mean:	0.334
SD:	0.073
Tr Mean:	0.334
Trans SD:	0.073

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.056	Statistic:	Student's t
Residual SD:	0.054	Test Residual SD:	0.042	Balanced Design:	Yes
SS:	0.056	Ref. Residual Mean:	0.041	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.028		
b:	0.234	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9694	Calculated Value:	0.8497	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	7.643
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.35	0.35	0.54	0.54	0.016	0.036			-0.124
2	0.31	0.31	0.63	0.63	0.024	0.054			-0.056
3	0.28	0.28	0.58	0.58	0.054	0.004			-0.054
4	0.45	0.45	0.59	0.59	0.116	0.014			-0.036
5	0.38	0.38	0.67	0.67	0.046	0.094			-0.036
6	0.31	0.31	0.52	0.52	0.024	0.056			-0.036
7	0.21	0.21	0.54	0.54	0.124	0.036			-0.024
8	0.38	0.38	0.54	0.54	0.046	0.036			-0.024
9									0.004
10									0.014
11									0.016
12									0.046
13									0.046
14									0.054
15									0.094
16									0.116

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164455
Alias:	NAS# 9972F
Replicates:	8
Mean:	0.321
SD:	0.043
Tr Mean:	0.321
Trans SD:	0.043

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.032	Statistic:	Student's t
Residual SD:	0.041	Test Residual SD:	0.027	Balanced Design:	Yes
SS:	0.032	Ref. Residual Mean:	0.041	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.028		
b:	0.173	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9325	Calculated Value:	0.7077	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	10.6549
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.33	0.33	0.54	0.54	0.009	0.036			-0.061
2	0.32	0.32	0.63	0.63	0.001	0.054			-0.056
3	0.29	0.29	0.58	0.58	0.031	0.004			-0.036
4	0.36	0.36	0.59	0.59	0.039	0.014			-0.036
5	0.31	0.31	0.67	0.67	0.011	0.094			-0.036
6	0.26	0.26	0.52	0.52	0.061	0.056			-0.031
7	0.4	0.4	0.54	0.54	0.079	0.036			-0.021
8	0.3	0.3	0.54	0.54	0.021	0.036			-0.011
9									-0.001
10									0.004
11									0.009
12									0.014
13									0.039
14									0.054
15									0.079
16									0.094

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164456
Alias:	NAS# 9973F
Replicates:	8
Mean:	0.279
SD:	0.085
Tr Mean:	0.279
Trans SD:	0.085

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.061
SS:	0.07
K:	8
b:	0.262
Alpha Level:	0.05
Calculated Value:	0.9799
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.064
Test Residual SD:	0.051
Ref. Residual Mean:	0.041
Ref. Residual SD:	0.028
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.1153
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	8.4221
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.3	0.3	0.54	0.54	0.021	0.036			-0.139
2	0.29	0.29	0.63	0.63	0.011	0.054			-0.079
3	0.32	0.32	0.58	0.58	0.041	0.004			-0.056
4	0.32	0.32	0.59	0.59	0.041	0.014			-0.039
5	0.2	0.2	0.67	0.67	0.079	0.094			-0.036
6	0.24	0.24	0.52	0.52	0.039	0.056			-0.036
7	0.42	0.42	0.54	0.54	0.141	0.036			-0.036
8	0.14	0.14	0.54	0.54	0.139	0.036			0.004
9									0.011
10									0.014
11									0.021
12									0.041
13									0.041
14									0.054
15									0.094
16									0.141

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164457
Alias:	NAS# 9974F
Replicates:	8
Mean:	0.348
SD:	0.036
Tr Mean:	0.348
Trans SD:	0.036

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.029	Statistic:	Student's t
Residual SD:	0.038	Test Residual SD:	0.017	Balanced Design:	Yes
SS:	0.028	Ref. Residual Mean:	0.041	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.028		
b:	0.161	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9325	Calculated Value:	1.0315	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	10.2414
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.54	0.54	0.008	0.036			-0.056
2	0.3	0.3	0.63	0.63	0.048	0.054			-0.048
3	0.4	0.4	0.58	0.58	0.053	0.004			-0.038
4	0.31	0.31	0.59	0.59	0.038	0.014			-0.036
5	0.38	0.38	0.67	0.67	0.033	0.094			-0.036
6	0.34	0.34	0.52	0.52	0.008	0.056			-0.036
7	0.33	0.33	0.54	0.54	0.018	0.036			-0.018
8	0.38	0.38	0.54	0.54	0.033	0.036			-0.008
9									-0.008
10									0.004
11									0.014
12									0.033
13									0.033
14									0.053
15									0.054
16									0.094

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164459
Alias:	NAS# 9975F
Replicates:	8
Mean:	0.46
SD:	0.06
Tr Mean:	0.46
Trans SD:	0.06

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.05	Statistic:	Student's t
Residual SD:	0.048	Test Residual SD:	0.027	Balanced Design:	Yes
SS:	0.044	Ref. Residual Mean:	0.041	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.028		
b:	0.198	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.8929	Calculated Value:	0.6428	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	4.1478
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.56	0.56	0.54	0.54	0.1	0.036			-0.07
2	0.52	0.52	0.63	0.63	0.06	0.054			-0.056
3	0.45	0.45	0.58	0.58	0.01	0.004			-0.04
4	0.42	0.42	0.59	0.59	0.04	0.014			-0.04
5	0.42	0.42	0.67	0.67	0.04	0.094			-0.04
6	0.39	0.39	0.52	0.52	0.07	0.056			-0.036
7	0.42	0.42	0.54	0.54	0.04	0.036			-0.036
8	0.5	0.5	0.54	0.54	0.04	0.036			-0.036
9									-0.01
10									0.004
11									0.014
12									0.04
13									0.054
14									0.06
15									0.094
16									0.1

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164460
Alias:	NAS# 9976F
Replicates:	8
Mean:	0.515
SD:	0.103
Tr Mean:	-0.356
Trans SD:	1.154

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.356
Trans SD:	0.568

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.899	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.639	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.455	Transformation:	Rankits
K:		Ref. Residual SD:	0.294		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	N/A	Calculated Value:	1.7858	Alternate:	x1 < x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally Distributed:	N/A	Variances Homogeneous:	No	Degrees of Freedom:	10
				Experimental Alpha Level:	0.05
				Calculated Value:	1.5637
Override Option:	Not Invoked			Critical Value:	>= 1.812
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.47	-0.667	0.54	0	0.311	0.356		0.42	
2	0.42	-1.766	0.63	0.99	1.41	0.634		0.44	
3	0.45	-0.99	0.58	0.396	0.634	0.04		0.45	
4	0.47	-0.667	0.59	0.57	0.311	0.214		0.47	
5	0.61	0.763	0.67	1.285	1.119	0.929		0.47	
6	0.54	0	0.52	-0.396	0.356	0.752		0.52	
7	0.44	-1.285	0.54	0	0.929	0.356		0.54	
8	0.72	1.766	0.54	0	2.122	0.356		0.54	
9								0.54	
10								0.54	
11								0.58	
12								0.59	
13								0.61	
14								0.63	
15								0.67	
16								0.72	

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164461
Alias:	NAS# 9977F
Replicates:	8
Mean:	0.373
SD:	0.053
Tr Mean:	0.373
Trans SD:	0.053

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.045
SS:	0.039
K:	8
b:	0.195
Alpha Level:	0.05
Calculated Value:	0.9815
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.038
Test Residual SD:	0.035
Ref. Residual Mean:	0.041
Ref. Residual SD:	0.028
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.2382
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	7.7469
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.35	0.35	0.54	0.54	0.023	0.036			-0.103
2	0.4	0.4	0.63	0.63	0.028	0.054			-0.056
3	0.27	0.27	0.58	0.58	0.103	0.004			-0.036
4	0.45	0.45	0.59	0.59	0.078	0.014			-0.036
5	0.41	0.41	0.67	0.67	0.038	0.094			-0.036
6	0.38	0.38	0.52	0.52	0.008	0.056			-0.023
7	0.37	0.37	0.54	0.54	0.003	0.036			-0.023
8	0.35	0.35	0.54	0.54	0.023	0.036			-0.003
9									0.004
10									0.008
11									0.014
12									0.028
13									0.038
14									0.054
15									0.078
16									0.094

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164468
Alias:	NAS# 9981F
Replicates:	8
Mean:	0.179
SD:	0.033
Tr Mean:	0.179
Trans SD:	0.033

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.026	Statistic:	Student's t
Residual SD:	0.037	Test Residual SD:	0.018	Balanced Design:	Yes
SS:	0.027	Ref. Residual Mean:	0.041	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.028		
b:	0.156	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9145	Calculated Value:	1.2918	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	18.2129
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.15	0.15	0.54	0.54	0.029	0.036			-0.056
2	0.18	0.18	0.63	0.63	0.001	0.054			-0.036
3	0.24	0.24	0.58	0.58	0.061	0.004			-0.036
4	0.19	0.19	0.59	0.59	0.011	0.014			-0.036
5	0.21	0.21	0.67	0.67	0.031	0.094			-0.029
6	0.15	0.15	0.52	0.52	0.029	0.056			-0.029
7	0.16	0.16	0.54	0.54	0.019	0.036			-0.029
8	0.15	0.15	0.54	0.54	0.029	0.036			-0.019
9									0.001
10									0.004
11									0.011
12									0.014
13									0.031
14									0.054
15									0.061
16									0.094

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164469
Alias:	NAS# 9982F
Replicates:	8
Mean:	0.461
SD:	0.063
Tr Mean:	0.461
Trans SD:	0.063

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.054	Statistic:	Student's t
Residual SD:	0.05	Test Residual SD:	0.027	Balanced Design:	Yes
SS:	0.047	Ref. Residual Mean:	0.041	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.028		
b:	0.206	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.905	Calculated Value:	0.9195	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	3.9664
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.43	0.43	0.54	0.54	0.031	0.036			-0.071
2	0.54	0.54	0.63	0.63	0.079	0.054			-0.061
3	0.47	0.47	0.58	0.58	0.009	0.004			-0.056
4	0.55	0.55	0.59	0.59	0.089	0.014			-0.051
5	0.41	0.41	0.67	0.67	0.051	0.094			-0.036
6	0.4	0.4	0.52	0.52	0.061	0.056			-0.036
7	0.39	0.39	0.54	0.54	0.071	0.036			-0.036
8	0.5	0.5	0.54	0.54	0.039	0.036			-0.031
9									0.004
10									0.009
11									0.014
12									0.039
13									0.054
14									0.079
15									0.089
16									0.094

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164471
Alias:	NAS# 9984F
Replicates:	8
Mean:	0.64
SD:	0.101
Tr Mean:	0.64
Trans SD:	0.101

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.576
SD:	0.052
Tr Mean:	0.576
Trans SD:	0.052

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.065	Statistic:	Student's t
Residual SD:	0.069	Test Residual SD:	0.073	Balanced Design:	Yes
SS:	0.09	Ref. Residual Mean:	0.041	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.028		
b:	0.289	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9257	Calculated Value:	0.8593	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	-1.5886
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.6	0.6	0.54	0.54	0.04	0.036			-0.18
2	0.6	0.6	0.63	0.63	0.04	0.054			-0.056
3	0.68	0.68	0.58	0.58	0.04	0.004			-0.04
4	0.64	0.64	0.59	0.59	0	0.014			-0.04
5	0.68	0.68	0.67	0.67	0.04	0.094			-0.036
6	0.64	0.64	0.52	0.52	0	0.056			-0.036
7	0.46	0.46	0.54	0.54	0.18	0.036			-0.036
8	0.82	0.82	0.54	0.54	0.18	0.036			0
9									0
10									0.004
11									0.014
12									0.04
13									0.04
14									0.054
15									0.094
16									0.18

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164433
Alias:	NAS# 9953F
Replicates:	8
Mean:	0.383
SD:	0.062
Tr Mean:	0.383
Trans SD:	0.062

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.042
SS:	0.034
K:	8
b:	0.179
Alpha Level:	0.05
Calculated Value:	0.9434
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.052
Test Residual SD:	0.027
Ref. Residual Mean:	0.023
Ref. Residual SD:	0.021
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.4097
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	10
Experimental Alpha Level:	0.05
Calculated Value:	2.0322
Critical Value:	>= 1.812
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.29	0.29	0.43	0.43	0.093	0.003			-0.093
2	0.45	0.45	0.44	0.44	0.068	0.008			-0.063
3	0.44	0.44	0.38	0.38	0.058	0.053			-0.053
4	0.44	0.44	0.41	0.41	0.058	0.023			-0.053
5	0.33	0.33	0.45	0.45	0.053	0.018			-0.023
6	0.39	0.39	0.44	0.44	0.008	0.008			-0.013
7	0.32	0.32	0.49	0.49	0.063	0.058			-0.003
8	0.4	0.4	0.42	0.42	0.018	0.013			0.008
9									0.008
10									0.008
11									0.018
12									0.018
13									0.058
14									0.058
15									0.058
16									0.068

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164434
Alias:	NAS# 9954F
Replicates:	8
Mean:	0.285
SD:	0.04
Tr Mean:	0.285
Trans SD:	0.04

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.031
SS:	0.019
K:	8
b:	0.133
Alpha Level:	0.05
Calculated Value:	0.9499
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.033
Test Residual SD:	0.021
Ref. Residual Mean:	0.023
Ref. Residual SD:	0.021
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.9621
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	8.1043
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.27	0.27	0.43	0.43	0.015	0.003			-0.055
2	0.34	0.34	0.44	0.44	0.055	0.008			-0.055
3	0.31	0.31	0.38	0.38	0.025	0.053			-0.053
4	0.32	0.32	0.41	0.41	0.035	0.023			-0.023
5	0.23	0.23	0.45	0.45	0.055	0.018			-0.015
6	0.3	0.3	0.44	0.44	0.015	0.008			-0.013
7	0.23	0.23	0.49	0.49	0.055	0.058			-0.005
8	0.28	0.28	0.42	0.42	0.005	0.013			-0.003
9									0.008
10									0.008
11									0.015
12									0.018
13									0.025
14									0.035
15									0.055
16									0.058

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164435
Alias:	NAS# 9955F
Replicates:	8
Mean:	0.349
SD:	0.043
Tr Mean:	0.349
Trans SD:	0.043

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.032	Statistic:	Student's t
Residual SD:	0.033	Test Residual SD:	0.027	Balanced Design:	Yes
SS:	0.02	Ref. Residual Mean:	0.023	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.021		
b:	0.139	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9527	Calculated Value:	0.7481	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	4.4056
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.36	0.36	0.43	0.43	0.011	0.003			-0.089
2	0.36	0.36	0.44	0.44	0.011	0.008			-0.053
3	0.34	0.34	0.38	0.38	0.009	0.053			-0.029
4	0.4	0.4	0.41	0.41	0.051	0.023			-0.023
5	0.38	0.38	0.45	0.45	0.031	0.018			-0.013
6	0.32	0.32	0.44	0.44	0.029	0.008			-0.009
7	0.26	0.26	0.49	0.49	0.089	0.058			-0.003
8	0.37	0.37	0.42	0.42	0.021	0.013			0.008
9									0.008
10									0.011
11									0.011
12									0.018
13									0.021
14									0.031
15									0.051
16									0.058

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164436
Alias:	NAS# 9956F
Replicates:	8
Mean:	0.166
SD:	0.054
Tr Mean:	0.166
Trans SD:	0.054

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.043	Statistic:	Student's t
Residual SD:	0.038	Test Residual SD:	0.029	Balanced Design:	Yes
SS:	0.028	Ref. Residual Mean:	0.023	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.021		
b:	0.162	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9491	Calculated Value:	1.6182	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	12.0066
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.14	0.14	0.43	0.43	0.026	0.003			-0.066
2	0.13	0.13	0.44	0.44	0.036	0.008			-0.053
3	0.26	0.26	0.38	0.38	0.094	0.053			-0.036
4	0.18	0.18	0.41	0.41	0.014	0.023			-0.026
5	0.15	0.15	0.45	0.45	0.016	0.018			-0.026
6	0.1	0.1	0.44	0.44	0.066	0.008			-0.023
7	0.14	0.14	0.49	0.49	0.026	0.058			-0.016
8	0.23	0.23	0.42	0.42	0.064	0.013			-0.013
9									-0.003
10									0.008
11									0.008
12									0.014
13									0.018
14									0.058
15									0.064
16									0.094

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164437
Alias:	NAS# 9957F
Replicates:	8
Mean:	0.413
SD:	0.078
Tr Mean:	0.413
Trans SD:	0.078

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.051
SS:	0.049
K:	8
b:	0.217
Alpha Level:	0.05
Calculated Value:	0.9567
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.057
Test Residual SD:	0.048
Ref. Residual Mean:	0.023
Ref. Residual SD:	0.021
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.8482
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	9
Experimental Alpha Level:	0.05
Calculated Value:	0.6741
Critical Value:	>= 1.833
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.46	0.46	0.43	0.43	0.048	0.003			-0.133
2	0.44	0.44	0.44	0.44	0.028	0.008			-0.063
3	0.28	0.28	0.38	0.38	0.133	0.053			-0.053
4	0.35	0.35	0.41	0.41	0.063	0.023			-0.033
5	0.54	0.54	0.45	0.45	0.128	0.018			-0.023
6	0.38	0.38	0.44	0.44	0.033	0.008			-0.013
7	0.43	0.43	0.49	0.49	0.018	0.058			-0.003
8	0.42	0.42	0.42	0.42	0.008	0.013			0.008
9									0.008
10									0.008
11									0.018
12									0.018
13									0.028
14									0.048
15									0.058
16									0.128

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164440
Alias:	NAS# 9958F
Replicates:	8
Mean:	0.269
SD:	0.056
Tr Mean:	0.269
Trans SD:	0.056

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.039
SS:	0.029
K:	8
b:	0.161
Alpha Level:	0.05
Calculated Value:	0.8966
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.039
Test Residual SD:	0.038
Ref. Residual Mean:	0.023
Ref. Residual SD:	0.021
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.0676
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	7.1911
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.28	0.28	0.43	0.43	0.011	0.003			-0.059
2	0.24	0.24	0.44	0.44	0.029	0.008			-0.053
3	0.29	0.29	0.38	0.38	0.021	0.053			-0.039
4	0.27	0.27	0.41	0.41	0.001	0.023			-0.029
5	0.23	0.23	0.45	0.45	0.039	0.018			-0.029
6	0.39	0.39	0.44	0.44	0.121	0.008			-0.023
7	0.24	0.24	0.49	0.49	0.029	0.058			-0.013
8	0.21	0.21	0.42	0.42	0.059	0.013			-0.003
9									0.001
10									0.008
11									0.008
12									0.011
13									0.018
14									0.021
15									0.058
16									0.121

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164441
Alias:	NAS# 9959F
Replicates:	8
Mean:	0.369
SD:	0.064
Tr Mean:	0.369
Trans SD:	0.064

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.043
SS:	0.035
K:	8
b:	0.186
Alpha Level:	0.05
Calculated Value:	0.9757
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.049
Test Residual SD:	0.036
Ref. Residual Mean:	0.023
Ref. Residual SD:	0.021
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.7658
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	10
Experimental Alpha Level:	0.05
Calculated Value:	2.5342
Critical Value:	>= 1.812
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.43	0.43	0.029	0.003			-0.089
2	0.39	0.39	0.44	0.44	0.021	0.008			-0.059
3	0.35	0.35	0.38	0.38	0.019	0.053			-0.053
4	0.28	0.28	0.41	0.41	0.089	0.023			-0.029
5	0.44	0.44	0.45	0.45	0.071	0.018			-0.023
6	0.31	0.31	0.44	0.44	0.059	0.008			-0.019
7	0.47	0.47	0.49	0.49	0.101	0.058			-0.013
8	0.37	0.37	0.42	0.42	0.001	0.013			-0.003
9									0.001
10									0.008
11									0.008
12									0.018
13									0.021
14									0.058
15									0.071
16									0.101

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164442
Alias:	NAS# 9960F
Replicates:	8
Mean:	0.313
SD:	0.048
Tr Mean:	0.313
Trans SD:	0.048

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.038	Statistic:	Student's t
Residual SD:	0.035	Test Residual SD:	0.025	Balanced Design:	Yes
SS:	0.023	Ref. Residual Mean:	0.023	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.021		
b:	0.149	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9581	Calculated Value:	1.3572	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	5.9084
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.28	0.28	0.43	0.43	0.033	0.003			-0.053
2	0.27	0.27	0.44	0.44	0.043	0.008			-0.053
3	0.34	0.34	0.38	0.38	0.028	0.053			-0.043
4	0.35	0.35	0.41	0.41	0.038	0.023			-0.033
5	0.29	0.29	0.45	0.45	0.023	0.018			-0.023
6	0.26	0.26	0.44	0.44	0.053	0.008			-0.023
7	0.4	0.4	0.49	0.49	0.088	0.058			-0.013
8	0.31	0.31	0.42	0.42	0.003	0.013			-0.003
9									-0.003
10									0.008
11									0.008
12									0.018
13									0.028
14									0.038
15									0.058
16									0.088

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164443
Alias:	NAS# 9961F
Replicates:	8
Mean:	0.321
SD:	0.08
Tr Mean:	0.321
Trans SD:	0.08

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.052
SS:	0.052
K:	8
b:	0.222
Alpha Level:	0.05
Calculated Value:	0.9522
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.057
Test Residual SD:	0.052
Ref. Residual Mean:	0.023
Ref. Residual SD:	0.021
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.7111
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	3.6566
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.36	0.36	0.43	0.43	0.039	0.003			-0.121
2	0.38	0.38	0.44	0.44	0.059	0.008			-0.091
3	0.23	0.23	0.38	0.38	0.091	0.053			-0.053
4	0.32	0.32	0.41	0.41	0.001	0.023			-0.023
5	0.45	0.45	0.45	0.45	0.129	0.018			-0.013
6	0.31	0.31	0.44	0.44	0.011	0.008			-0.011
7	0.32	0.32	0.49	0.49	0.001	0.058			-0.003
8	0.2	0.2	0.42	0.42	0.121	0.013			-0.001
9									-0.001
10									0.008
11									0.008
12									0.018
13									0.039
14									0.058
15									0.059
16									0.129

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164449
Alias:	NAS# 9962F
Replicates:	8
Mean:	0.335
SD:	0.052
Tr Mean:	0.335
Trans SD:	0.052

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.037
SS:	0.026
K:	8
b:	0.158
Alpha Level:	0.05
Calculated Value:	0.9646
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.04
Test Residual SD:	0.029
Ref. Residual Mean:	0.023
Ref. Residual SD:	0.021
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.3882
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	4.5468
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.43	0.43	0.005	0.003			-0.075
2	0.41	0.41	0.44	0.44	0.075	0.008			-0.053
3	0.32	0.32	0.38	0.38	0.015	0.053			-0.045
4	0.31	0.31	0.41	0.41	0.025	0.023			-0.025
5	0.35	0.35	0.45	0.45	0.015	0.018			-0.023
6	0.26	0.26	0.44	0.44	0.075	0.008			-0.015
7	0.29	0.29	0.49	0.49	0.045	0.058			-0.013
8	0.4	0.4	0.42	0.42	0.065	0.013			-0.003
9									0.005
10									0.008
11									0.008
12									0.015
13									0.018
14									0.058
15									0.065
16									0.075

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164439
Alias:	NAS# 9966F
Replicates:	8
Mean:	0.591
SD:	0.144
Tr Mean:	0.591
Trans SD:	0.144

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.089
SS:	0.152
K:	8
b:	0.38
Alpha Level:	0.05
Calculated Value:	0.9497
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.114
Test Residual SD:	0.076
Ref. Residual Mean:	0.023
Ref. Residual SD:	0.021
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	3.27
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	-3.0467
Critical Value:	>= 1.86
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.38	0.38	0.43	0.43	0.211	0.003			-0.211
2	0.83	0.83	0.44	0.44	0.239	0.008			-0.111
3	0.48	0.48	0.38	0.38	0.111	0.053			-0.061
4	0.56	0.56	0.41	0.41	0.031	0.023			-0.053
5	0.68	0.68	0.45	0.45	0.089	0.018			-0.041
6	0.53	0.53	0.44	0.44	0.061	0.008			-0.031
7	0.72	0.72	0.49	0.49	0.129	0.058			-0.023
8	0.55	0.55	0.42	0.42	0.041	0.013			-0.013
9									-0.003
10									0.008
11									0.008
12									0.018
13									0.058
14									0.089
15									0.129
16									0.239

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164450
Alias:	NAS# 9967F
Replicates:	8
Mean:	0.34
SD:	0.052
Tr Mean:	0.34
Trans SD:	0.052

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.037
SS:	0.026
K:	8
b:	0.159
Alpha Level:	0.05
Calculated Value:	0.9547
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.035
Test Residual SD:	0.037
Ref. Residual Mean:	0.023
Ref. Residual SD:	0.021
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.8367
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	4.2643
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.43	0.43	0	0.003			-0.1
2	0.42	0.42	0.44	0.44	0.08	0.008			-0.053
3	0.38	0.38	0.38	0.38	0.04	0.053			-0.03
4	0.24	0.24	0.41	0.41	0.1	0.023			-0.023
5	0.31	0.31	0.45	0.45	0.03	0.018			-0.013
6	0.35	0.35	0.44	0.44	0.01	0.008			-0.01
7	0.33	0.33	0.49	0.49	0.01	0.058			-0.003
8	0.35	0.35	0.42	0.42	0.01	0.013			0
9									0.008
10									0.008
11									0.01
12									0.01
13									0.018
14									0.04
15									0.058
16									0.08

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164451
Alias:	NAS# 9968F
Replicates:	8
Mean:	0.326
SD:	0.089
Tr Mean:	0.326
Trans SD:	0.089

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.057
SS:	0.063
K:	8
b:	0.245
Alpha Level:	0.05
Calculated Value:	0.9556
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.07
Test Residual SD:	0.049
Ref. Residual Mean:	0.023
Ref. Residual SD:	0.021
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.5072
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	9
Experimental Alpha Level:	0.05
Calculated Value:	3.1744
Critical Value:	>= 1.833
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.3	0.3	0.43	0.43	0.026	0.003			-0.146
2	0.18	0.18	0.44	0.44	0.146	0.008			-0.106
3	0.44	0.44	0.38	0.38	0.114	0.053			-0.053
4	0.41	0.41	0.41	0.41	0.084	0.023			-0.026
5	0.22	0.22	0.45	0.45	0.106	0.018			-0.023
6	0.36	0.36	0.44	0.44	0.034	0.008			-0.013
7	0.35	0.35	0.49	0.49	0.024	0.058			-0.003
8	0.35	0.35	0.42	0.42	0.024	0.013			0.008
9									0.008
10									0.018
11									0.024
12									0.024
13									0.034
14									0.058
15									0.084
16									0.114

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164452
Alias:	NAS# 9969F
Replicates:	8
Mean:	0.274
SD:	0.068
Tr Mean:	0.274
Trans SD:	0.068

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.051	Statistic:	Approximate t
Residual SD:	0.046	Test Residual SD:	0.041	Balanced Design:	Yes
SS:	0.04	Ref. Residual Mean:	0.023	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.021		
b:	0.194	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9516	Calculated Value:	1.776	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	10
				Experimental Alpha Level:	0.05
				Calculated Value:	5.9595
Override Option:	N/A			Critical Value:	>= 1.812
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.19	0.19	0.43	0.43	0.084	0.003			-0.084
2	0.33	0.33	0.44	0.44	0.056	0.008			-0.064
3	0.21	0.21	0.38	0.38	0.064	0.053			-0.053
4	0.29	0.29	0.41	0.41	0.016	0.023			-0.044
5	0.28	0.28	0.45	0.45	0.006	0.018			-0.023
6	0.26	0.26	0.44	0.44	0.014	0.008			-0.014
7	0.23	0.23	0.49	0.49	0.044	0.058			-0.013
8	0.4	0.4	0.42	0.42	0.126	0.013			-0.003
9									0.006
10									0.008
11									0.008
12									0.016
13									0.018
14									0.056
15									0.058
16									0.126

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164453
Alias:	NAS# 9970F
Replicates:	8
Mean:	0.489
SD:	0.067
Tr Mean:	0.489
Trans SD:	0.067

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.045
SS:	0.038
K:	8
b:	0.194
Alpha Level:	0.05
Calculated Value:	0.9845
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.056
Test Residual SD:	0.029
Ref. Residual Mean:	0.023
Ref. Residual SD:	0.021
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.6809
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	10
Experimental Alpha Level:	0.05
Calculated Value:	-2.1526
Critical Value:	>= 1.812
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.58	0.58	0.43	0.43	0.091	0.003			-0.099
2	0.44	0.44	0.44	0.44	0.049	0.008			-0.059
3	0.54	0.54	0.38	0.38	0.051	0.053			-0.053
4	0.51	0.51	0.41	0.41	0.021	0.023			-0.049
5	0.39	0.39	0.45	0.45	0.099	0.018			-0.023
6	0.55	0.55	0.44	0.44	0.061	0.008			-0.019
7	0.43	0.43	0.49	0.49	0.059	0.058			-0.013
8	0.47	0.47	0.42	0.42	0.019	0.013			-0.003
9									0.008
10									0.008
11									0.018
12									0.021
13									0.051
14									0.058
15									0.061
16									0.091

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164454
Alias:	NAS# 9971F
Replicates:	8
Mean:	0.334
SD:	0.073
Tr Mean:	0.334
Trans SD:	0.073

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.056	Statistic:	Approximate t
Residual SD:	0.048	Test Residual SD:	0.042	Balanced Design:	Yes
SS:	0.045	Ref. Residual Mean:	0.023	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.021		
b:	0.208	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9682	Calculated Value:	2.0502	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	10
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	3.5016
				Critical Value:	>= 1.812
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.35	0.35	0.43	0.43	0.016	0.003			-0.124
2	0.31	0.31	0.44	0.44	0.024	0.008			-0.054
3	0.28	0.28	0.38	0.38	0.054	0.053			-0.053
4	0.45	0.45	0.41	0.41	0.116	0.023			-0.024
5	0.38	0.38	0.45	0.45	0.046	0.018			-0.024
6	0.31	0.31	0.44	0.44	0.024	0.008			-0.023
7	0.21	0.21	0.49	0.49	0.124	0.058			-0.013
8	0.38	0.38	0.42	0.42	0.046	0.013			-0.003
9									0.008
10									0.008
11									0.016
12									0.018
13									0.046
14									0.046
15									0.058
16									0.116

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164455
Alias:	NAS# 9972F
Replicates:	8
Mean:	0.321
SD:	0.043
Tr Mean:	0.321
Trans SD:	0.043

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.032	Statistic:	Student's t
Residual SD:	0.033	Test Residual SD:	0.027	Balanced Design:	Yes
SS:	0.02	Ref. Residual Mean:	0.023	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.021		
b:	0.14	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9666	Calculated Value:	0.7481	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	5.8522
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.33	0.33	0.43	0.43	0.009	0.003			-0.061
2	0.32	0.32	0.44	0.44	0.001	0.008			-0.053
3	0.29	0.29	0.38	0.38	0.031	0.053			-0.031
4	0.36	0.36	0.41	0.41	0.039	0.023			-0.023
5	0.31	0.31	0.45	0.45	0.011	0.018			-0.021
6	0.26	0.26	0.44	0.44	0.061	0.008			-0.013
7	0.4	0.4	0.49	0.49	0.079	0.058			-0.011
8	0.3	0.3	0.42	0.42	0.021	0.013			-0.003
9									-0.001
10									0.008
11									0.008
12									0.009
13									0.018
14									0.039
15									0.058
16									0.079

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164456
Alias:	NAS# 9973F
Replicates:	8
Mean:	0.279
SD:	0.085
Tr Mean:	0.279
Trans SD:	0.085

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.055
SS:	0.058
K:	8
b:	0.236
Alpha Level:	0.05
Calculated Value:	0.9572
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.064
Test Residual SD:	0.051
Ref. Residual Mean:	0.023
Ref. Residual SD:	0.021
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.1384
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	9
Experimental Alpha Level:	0.05
Calculated Value:	4.7759
Critical Value:	>= 1.833
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.3	0.3	0.43	0.43	0.021	0.003			-0.139
2	0.29	0.29	0.44	0.44	0.011	0.008			-0.079
3	0.32	0.32	0.38	0.38	0.041	0.053			-0.053
4	0.32	0.32	0.41	0.41	0.041	0.023			-0.039
5	0.2	0.2	0.45	0.45	0.079	0.018			-0.023
6	0.24	0.24	0.44	0.44	0.039	0.008			-0.013
7	0.42	0.42	0.49	0.49	0.141	0.058			-0.003
8	0.14	0.14	0.42	0.42	0.139	0.013			0.008
9									0.008
10									0.011
11									0.018
12									0.021
13									0.041
14									0.041
15									0.058
16									0.141

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164457
Alias:	NAS# 9974F
Replicates:	8
Mean:	0.348
SD:	0.036
Tr Mean:	0.348
Trans SD:	0.036

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.029
SS:	0.016
K:	8
b:	0.125
Alpha Level:	0.05
Calculated Value:	0.9688
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.029
Test Residual SD:	0.017
Ref. Residual Mean:	0.023
Ref. Residual SD:	0.021
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.7171
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	5.013
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.43	0.43	0.008	0.003			-0.053
2	0.3	0.3	0.44	0.44	0.048	0.008			-0.048
3	0.4	0.4	0.38	0.38	0.053	0.053			-0.038
4	0.31	0.31	0.41	0.41	0.038	0.023			-0.023
5	0.38	0.38	0.45	0.45	0.033	0.018			-0.018
6	0.34	0.34	0.44	0.44	0.008	0.008			-0.013
7	0.33	0.33	0.49	0.49	0.018	0.058			-0.008
8	0.38	0.38	0.42	0.42	0.033	0.013			-0.008
9									-0.003
10									0.008
11									0.008
12									0.018
13									0.033
14									0.033
15									0.053
16									0.058

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164459
Alias:	NAS# 9975F
Replicates:	8
Mean:	0.46
SD:	0.06
Tr Mean:	0.46
Trans SD:	0.06

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.05	Statistic:	Approximate t
Residual SD:	0.041	Test Residual SD:	0.027	Balanced Design:	Yes
SS:	0.032	Ref. Residual Mean:	0.023	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.021		
b:	0.176	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9605	Calculated Value:	2.2866	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	11
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	-1.1477
				Critical Value:	>= 1.796
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.56	0.56	0.43	0.43	0.1	0.003			-0.07
2	0.52	0.52	0.44	0.44	0.06	0.008			-0.053
3	0.45	0.45	0.38	0.38	0.01	0.053			-0.04
4	0.42	0.42	0.41	0.41	0.04	0.023			-0.04
5	0.42	0.42	0.45	0.45	0.04	0.018			-0.04
6	0.39	0.39	0.44	0.44	0.07	0.008			-0.023
7	0.42	0.42	0.49	0.49	0.04	0.058			-0.013
8	0.5	0.5	0.42	0.42	0.04	0.013			-0.01
9									-0.003
10									0.008
11									0.008
12									0.018
13									0.04
14									0.058
15									0.06
16									0.1

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164460
Alias:	NAS# 9976F
Replicates:	8
Mean:	0.515
SD:	0.103
Tr Mean:	0.515
Trans SD:	0.103

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.066
SS:	0.082
K:	8
b:	0.27
Alpha Level:	0.05
Calculated Value:	0.8905
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.081
Test Residual SD:	0.056
Ref. Residual Mean:	0.023
Ref. Residual SD:	0.021
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.7868
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	-2.1593
Critical Value:	>= 1.86
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.47	0.47	0.43	0.43	0.045	0.003			-0.095
2	0.42	0.42	0.44	0.44	0.095	0.008			-0.075
3	0.45	0.45	0.38	0.38	0.065	0.053			-0.065
4	0.47	0.47	0.41	0.41	0.045	0.023			-0.053
5	0.61	0.61	0.45	0.45	0.095	0.018			-0.045
6	0.54	0.54	0.44	0.44	0.025	0.008			-0.045
7	0.44	0.44	0.49	0.49	0.075	0.058			-0.023
8	0.72	0.72	0.42	0.42	0.205	0.013			-0.013
9									-0.003
10									0.008
11									0.008
12									0.018
13									0.025
14									0.058
15									0.095
16									0.205

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164461
Alias:	NAS# 9977F
Replicates:	8
Mean:	0.373
SD:	0.053
Tr Mean:	0.373
Trans SD:	0.053

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.038
SS:	0.027
K:	8
b:	0.161
Alpha Level:	0.05
Calculated Value:	0.9589
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.038
Test Residual SD:	0.035
Ref. Residual Mean:	0.023
Ref. Residual SD:	0.021
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.0422
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	2.7376
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.35	0.35	0.43	0.43	0.023	0.003			-0.103
2	0.4	0.4	0.44	0.44	0.028	0.008			-0.053
3	0.27	0.27	0.38	0.38	0.103	0.053			-0.023
4	0.45	0.45	0.41	0.41	0.078	0.023			-0.023
5	0.41	0.41	0.45	0.45	0.038	0.018			-0.023
6	0.38	0.38	0.44	0.44	0.008	0.008			-0.013
7	0.37	0.37	0.49	0.49	0.003	0.058			-0.003
8	0.35	0.35	0.42	0.42	0.023	0.013			-0.003
9									0.008
10									0.008
11									0.008
12									0.018
13									0.028
14									0.038
15									0.058
16									0.078

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164468
Alias:	NAS# 9981F
Replicates:	8
Mean:	0.179
SD:	0.033
Tr Mean:	0.179
Trans SD:	0.033

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.028
SS:	0.015
K:	8
b:	0.119
Alpha Level:	0.05
Calculated Value:	0.9506
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.026
Test Residual SD:	0.018
Ref. Residual Mean:	0.023
Ref. Residual SD:	0.021
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.3864
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	15.5891
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.15	0.15	0.43	0.43	0.029	0.003			-0.053
2	0.18	0.18	0.44	0.44	0.001	0.008			-0.029
3	0.24	0.24	0.38	0.38	0.061	0.053			-0.029
4	0.19	0.19	0.41	0.41	0.011	0.023			-0.029
5	0.21	0.21	0.45	0.45	0.031	0.018			-0.023
6	0.15	0.15	0.44	0.44	0.029	0.008			-0.019
7	0.16	0.16	0.49	0.49	0.019	0.058			-0.013
8	0.15	0.15	0.42	0.42	0.029	0.013			-0.003
9									0.001
10									0.008
11									0.008
12									0.011
13									0.018
14									0.031
15									0.058
16									0.061

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164469
Alias:	NAS# 9982F
Replicates:	8
Mean:	0.461
SD:	0.063
Tr Mean:	0.461
Trans SD:	0.063

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.054	Statistic:	Approximate t
Residual SD:	0.043	Test Residual SD:	0.027	Balanced Design:	Yes
SS:	0.035	Ref. Residual Mean:	0.023	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.021		
b:	0.184	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9578	Calculated Value:	2.6024	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	10
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	-1.1461
				Critical Value:	>= 1.812
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.43	0.43	0.43	0.43	0.031	0.003			-0.071
2	0.54	0.54	0.44	0.44	0.079	0.008			-0.061
3	0.47	0.47	0.38	0.38	0.009	0.053			-0.053
4	0.55	0.55	0.41	0.41	0.089	0.023			-0.051
5	0.41	0.41	0.45	0.45	0.051	0.018			-0.031
6	0.4	0.4	0.44	0.44	0.061	0.008			-0.023
7	0.39	0.39	0.49	0.49	0.071	0.058			-0.013
8	0.5	0.5	0.42	0.42	0.039	0.013			-0.003
9									0.008
10									0.008
11									0.009
12									0.018
13									0.039
14									0.058
15									0.079
16									0.089

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164471
Alias:	NAS# 9984F
Replicates:	8
Mean:	0.64
SD:	0.101
Tr Mean:	0.64
Trans SD:	0.101

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.433
SD:	0.032
Tr Mean:	0.433
Trans SD:	0.032

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.065	Statistic:	Mann-Whitney
Residual SD:	0.064	Test Residual SD:	0.073	Balanced Design:	Yes
SS:	0.078	Ref. Residual Mean:	0.023	Transformation:	rank-order
K:	8	Ref. Residual SD:	0.021		
b:	0.262	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.878	Calculated Value:	1.5804	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	1
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.6	10.5	0.43	4	0.04	0.003	0.38		-0.18
2	0.6	10.5	0.44	5.5	0.04	0.008	0.41		-0.053
3	0.68	14.5	0.38	1	0.04	0.053	0.42		-0.04
4	0.64	12.5	0.41	2	0	0.023	0.43		-0.04
5	0.68	14.5	0.45	7	0.04	0.018	0.44		-0.023
6	0.64	12.5	0.44	5.5	0	0.008	0.44		-0.013
7	0.46	8	0.49	9	0.18	0.058	0.45		-0.003
8	0.82	16	0.42	3	0.18	0.013	0.46		0
9							0.49		0
10							0.6		0.008
11							0.6		0.008
12							0.64		0.018
13							0.64		0.04
14							0.68		0.04
15							0.68		0.058
16							0.82		0.18

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164433
Alias:	NAS# 9953F
Replicates:	8
Mean:	0.383
SD:	0.062
Tr Mean:	0.383
Trans SD:	0.062

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.052	Statistic:	Student's t
Residual SD:	0.048	Test Residual SD:	0.027	Balanced Design:	Yes
SS:	0.044	Ref. Residual Mean:	0.034	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.035		
b:	0.208	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9785	Calculated Value:	1.1589	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	6.8857
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.29	0.29	0.51	0.51	0.093	0.066			-0.093
2	0.45	0.45	0.56	0.56	0.068	0.016			-0.066
3	0.44	0.44	0.54	0.54	0.058	0.036			-0.063
4	0.44	0.44	0.68	0.68	0.058	0.104			-0.053
5	0.33	0.33	0.56	0.56	0.053	0.016			-0.036
6	0.39	0.39	0.58	0.58	0.008	0.004			-0.016
7	0.32	0.32	0.6	0.6	0.063	0.024			-0.016
8	0.4	0.4	0.58	0.58	0.018	0.004			0.004
9									0.004
10									0.008
11									0.018
12									0.024
13									0.058
14									0.058
15									0.068
16									0.104

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164434
Alias:	NAS# 9954F
Replicates:	8
Mean:	0.285
SD:	0.04
Tr Mean:	0.285
Trans SD:	0.04

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.039
SS:	0.029
K:	8
b:	0.167
Alpha Level:	0.05
Calculated Value:	0.9612
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.033
Test Residual SD:	0.021
Ref. Residual Mean:	0.034
Ref. Residual SD:	0.035
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.0875
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	12.8013
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.27	0.27	0.51	0.51	0.015	0.066			-0.066
2	0.34	0.34	0.56	0.56	0.055	0.016			-0.055
3	0.31	0.31	0.54	0.54	0.025	0.036			-0.055
4	0.32	0.32	0.68	0.68	0.035	0.104			-0.036
5	0.23	0.23	0.56	0.56	0.055	0.016			-0.016
6	0.3	0.3	0.58	0.58	0.015	0.004			-0.016
7	0.23	0.23	0.6	0.6	0.055	0.024			-0.015
8	0.28	0.28	0.58	0.58	0.005	0.004			-0.005
9									0.004
10									0.004
11									0.015
12									0.024
13									0.025
14									0.035
15									0.055
16									0.104

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164435
Alias:	NAS# 9955F
Replicates:	8
Mean:	0.349
SD:	0.043
Tr Mean:	0.349
Trans SD:	0.043

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.04
SS:	0.031
K:	8
b:	0.173
Alpha Level:	0.05
Calculated Value:	0.9707
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.032
Test Residual SD:	0.027
Ref. Residual Mean:	0.034
Ref. Residual SD:	0.035
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.1404
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	9.7204
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.36	0.36	0.51	0.51	0.011	0.066			-0.089
2	0.36	0.36	0.56	0.56	0.011	0.016			-0.066
3	0.34	0.34	0.54	0.54	0.009	0.036			-0.036
4	0.4	0.4	0.68	0.68	0.051	0.104			-0.029
5	0.38	0.38	0.56	0.56	0.031	0.016			-0.016
6	0.32	0.32	0.58	0.58	0.029	0.004			-0.016
7	0.26	0.26	0.6	0.6	0.089	0.024			-0.009
8	0.37	0.37	0.58	0.58	0.021	0.004			0.004
9									0.004
10									0.011
11									0.011
12									0.021
13									0.024
14									0.031
15									0.051
16									0.104

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164436
Alias:	NAS# 9956F
Replicates:	8
Mean:	0.166
SD:	0.054
Tr Mean:	0.166
Trans SD:	0.054

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.043	Statistic:	Student's t
Residual SD:	0.045	Test Residual SD:	0.029	Balanced Design:	Yes
SS:	0.038	Ref. Residual Mean:	0.034	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.035		
b:	0.185	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9054	Calculated Value:	0.5691	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	15.7445
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.14	0.14	0.51	0.51	0.026	0.066			-0.066
2	0.13	0.13	0.56	0.56	0.036	0.016			-0.066
3	0.26	0.26	0.54	0.54	0.094	0.036			-0.036
4	0.18	0.18	0.68	0.68	0.014	0.104			-0.036
5	0.15	0.15	0.56	0.56	0.016	0.016			-0.026
6	0.1	0.1	0.58	0.58	0.066	0.004			-0.026
7	0.14	0.14	0.6	0.6	0.026	0.024			-0.016
8	0.23	0.23	0.58	0.58	0.064	0.004			-0.016
9									-0.016
10									0.004
11									0.004
12									0.014
13									0.024
14									0.064
15									0.094
16									0.104

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164437
Alias:	NAS# 9957F
Replicates:	8
Mean:	0.413
SD:	0.078
Tr Mean:	0.413
Trans SD:	0.078

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.057	Statistic:	Student's t
Residual SD:	0.056	Test Residual SD:	0.048	Balanced Design:	Yes
SS:	0.06	Ref. Residual Mean:	0.034	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.035		
b:	0.24	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9676	Calculated Value:	1.1001	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	5.0136
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.46	0.46	0.51	0.51	0.048	0.066			-0.133
2	0.44	0.44	0.56	0.56	0.028	0.016			-0.066
3	0.28	0.28	0.54	0.54	0.133	0.036			-0.063
4	0.35	0.35	0.68	0.68	0.063	0.104			-0.036
5	0.54	0.54	0.56	0.56	0.128	0.016			-0.033
6	0.38	0.38	0.58	0.58	0.033	0.004			-0.016
7	0.43	0.43	0.6	0.6	0.018	0.024			-0.016
8	0.42	0.42	0.58	0.58	0.008	0.004			0.004
9									0.004
10									0.008
11									0.018
12									0.024
13									0.028
14									0.048
15									0.104
16									0.128

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164440
Alias:	NAS# 9958F
Replicates:	8
Mean:	0.269
SD:	0.056
Tr Mean:	0.269
Trans SD:	0.056

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.039	Statistic:	Mann-Whitney
Residual SD:	0.046	Test Residual SD:	0.038	Balanced Design:	Yes
SS:	0.039	Ref. Residual Mean:	0.034	Transformation:	rank-order
K:	8	Ref. Residual SD:	0.035		
b:	0.186	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.8741	Calculated Value:	0.2762	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	64
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.28	6	0.51	9	0.011	0.066	0.21		-0.066
2	0.24	3.5	0.56	11.5	0.029	0.016	0.23		-0.059
3	0.29	7	0.54	10	0.021	0.036	0.24		-0.039
4	0.27	5	0.68	16	0.001	0.104	0.24		-0.036
5	0.23	2	0.56	11.5	0.039	0.016	0.27		-0.029
6	0.39	8	0.58	13.5	0.121	0.004	0.28		-0.029
7	0.24	3.5	0.6	15	0.029	0.024	0.29		-0.016
8	0.21	1	0.58	13.5	0.059	0.004	0.39		-0.016
9							0.51		0.001
10							0.54		0.004
11							0.56		0.004
12							0.56		0.011
13							0.58		0.021
14							0.58		0.024
15							0.6		0.104
16							0.68		0.121

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164441
Alias:	NAS# 9959F
Replicates:	8
Mean:	0.369
SD:	0.064
Tr Mean:	0.369
Trans SD:	0.064

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.049	Statistic:	Student's t
Residual SD:	0.049	Test Residual SD:	0.036	Balanced Design:	Yes
SS:	0.046	Ref. Residual Mean:	0.034	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.035		
b:	0.208	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9419	Calculated Value:	0.8425	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	7.2498
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.51	0.51	0.029	0.066			-0.089
2	0.39	0.39	0.56	0.56	0.021	0.016			-0.066
3	0.35	0.35	0.54	0.54	0.019	0.036			-0.059
4	0.28	0.28	0.68	0.68	0.089	0.104			-0.036
5	0.44	0.44	0.56	0.56	0.071	0.016			-0.029
6	0.31	0.31	0.58	0.58	0.059	0.004			-0.019
7	0.47	0.47	0.6	0.6	0.101	0.024			-0.016
8	0.37	0.37	0.58	0.58	0.001	0.004			-0.016
9									0.001
10									0.004
11									0.004
12									0.021
13									0.024
14									0.071
15									0.101
16									0.104

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164442
Alias:	NAS# 9960F
Replicates:	8
Mean:	0.313
SD:	0.048
Tr Mean:	0.313
Trans SD:	0.048

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.038	Statistic:	Student's t
Residual SD:	0.042	Test Residual SD:	0.025	Balanced Design:	Yes
SS:	0.034	Ref. Residual Mean:	0.034	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.035		
b:	0.177	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9318	Calculated Value:	0.2894	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	10.7776
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.28	0.28	0.51	0.51	0.033	0.066			-0.066
2	0.27	0.27	0.56	0.56	0.043	0.016			-0.053
3	0.34	0.34	0.54	0.54	0.028	0.036			-0.043
4	0.35	0.35	0.68	0.68	0.038	0.104			-0.036
5	0.29	0.29	0.56	0.56	0.023	0.016			-0.033
6	0.26	0.26	0.58	0.58	0.053	0.004			-0.023
7	0.4	0.4	0.6	0.6	0.088	0.024			-0.016
8	0.31	0.31	0.58	0.58	0.003	0.004			-0.016
9									-0.003
10									0.004
11									0.004
12									0.024
13									0.028
14									0.038
15									0.088
16									0.104

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164443
Alias:	NAS# 9961F
Replicates:	8
Mean:	0.321
SD:	0.08
Tr Mean:	0.321
Trans SD:	0.08

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.057	Statistic:	Student's t
Residual SD:	0.057	Test Residual SD:	0.052	Balanced Design:	Yes
SS:	0.062	Ref. Residual Mean:	0.034	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.035		
b:	0.245	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9662	Calculated Value:	1.0282	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	7.6468
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.36	0.36	0.51	0.51	0.039	0.066			-0.121
2	0.38	0.38	0.56	0.56	0.059	0.016			-0.091
3	0.23	0.23	0.54	0.54	0.091	0.036			-0.066
4	0.32	0.32	0.68	0.68	0.001	0.104			-0.036
5	0.45	0.45	0.56	0.56	0.129	0.016			-0.016
6	0.31	0.31	0.58	0.58	0.011	0.004			-0.016
7	0.32	0.32	0.6	0.6	0.001	0.024			-0.011
8	0.2	0.2	0.58	0.58	0.121	0.004			-0.001
9									-0.001
10									0.004
11									0.004
12									0.024
13									0.039
14									0.059
15									0.104
16									0.129

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164449
Alias:	NAS# 9962F
Replicates:	8
Mean:	0.335
SD:	0.052
Tr Mean:	0.335
Trans SD:	0.052

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.044
SS:	0.036
K:	8
b:	0.186
Alpha Level:	0.05
Calculated Value:	0.9528
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.04
Test Residual SD:	0.029
Ref. Residual Mean:	0.034
Ref. Residual SD:	0.035
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.3915
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	9.4903
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.51	0.51	0.005	0.066			-0.075
2	0.41	0.41	0.56	0.56	0.075	0.016			-0.066
3	0.32	0.32	0.54	0.54	0.015	0.036			-0.045
4	0.31	0.31	0.68	0.68	0.025	0.104			-0.036
5	0.35	0.35	0.56	0.56	0.015	0.016			-0.025
6	0.26	0.26	0.58	0.58	0.075	0.004			-0.016
7	0.29	0.29	0.6	0.6	0.045	0.024			-0.016
8	0.4	0.4	0.58	0.58	0.065	0.004			-0.015
9									0.004
10									0.004
11									0.005
12									0.015
13									0.024
14									0.065
15									0.075
16									0.104

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164439
Alias:	NAS# 9966F
Replicates:	8
Mean:	0.591
SD:	0.144
Tr Mean:	0.591
Trans SD:	0.144

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.114	Statistic:	Approximate t
Residual SD:	0.092	Test Residual SD:	0.076	Balanced Design:	Yes
SS:	0.162	Ref. Residual Mean:	0.034	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.035		
b:	0.394	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9551	Calculated Value:	2.7073	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	9
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	-0.2785
				Critical Value:	>= 1.833
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.38	0.38	0.51	0.51	0.211	0.066			-0.211
2	0.83	0.83	0.56	0.56	0.239	0.016			-0.111
3	0.48	0.48	0.54	0.54	0.111	0.036			-0.066
4	0.56	0.56	0.68	0.68	0.031	0.104			-0.061
5	0.68	0.68	0.56	0.56	0.089	0.016			-0.041
6	0.53	0.53	0.58	0.58	0.061	0.004			-0.036
7	0.72	0.72	0.6	0.6	0.129	0.024			-0.031
8	0.55	0.55	0.58	0.58	0.041	0.004			-0.016
9									-0.016
10									0.004
11									0.004
12									0.024
13									0.089
14									0.104
15									0.129
16									0.239

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164450
Alias:	NAS# 9967F
Replicates:	8
Mean:	0.34
SD:	0.052
Tr Mean:	0.34
Trans SD:	0.052

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.035	Statistic:	Student's t
Residual SD:	0.044	Test Residual SD:	0.037	Balanced Design:	Yes
SS:	0.037	Ref. Residual Mean:	0.034	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.035		
b:	0.188	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9618	Calculated Value:	0.07	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	9.2176
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.51	0.51	0	0.066			-0.1
2	0.42	0.42	0.56	0.56	0.08	0.016			-0.066
3	0.38	0.38	0.54	0.54	0.04	0.036			-0.036
4	0.24	0.24	0.68	0.68	0.1	0.104			-0.03
5	0.31	0.31	0.56	0.56	0.03	0.016			-0.016
6	0.35	0.35	0.58	0.58	0.01	0.004			-0.016
7	0.33	0.33	0.6	0.6	0.01	0.024			-0.01
8	0.35	0.35	0.58	0.58	0.01	0.004			0
9									0.004
10									0.004
11									0.01
12									0.01
13									0.024
14									0.04
15									0.08
16									0.104

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164451
Alias:	NAS# 9968F
Replicates:	8
Mean:	0.326
SD:	0.089
Tr Mean:	0.326
Trans SD:	0.089

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.062
SS:	0.073
K:	8
b:	0.266
Alpha Level:	0.05
Calculated Value:	0.9638
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.07
Test Residual SD:	0.049
Ref. Residual Mean:	0.034
Ref. Residual SD:	0.035
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.6937
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	6.916
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.3	0.3	0.51	0.51	0.026	0.066			-0.146
2	0.18	0.18	0.56	0.56	0.146	0.016			-0.106
3	0.44	0.44	0.54	0.54	0.114	0.036			-0.066
4	0.41	0.41	0.68	0.68	0.084	0.104			-0.036
5	0.22	0.22	0.56	0.56	0.106	0.016			-0.026
6	0.36	0.36	0.58	0.58	0.034	0.004			-0.016
7	0.35	0.35	0.6	0.6	0.024	0.024			-0.016
8	0.35	0.35	0.58	0.58	0.024	0.004			0.004
9									0.004
10									0.024
11									0.024
12									0.024
13									0.034
14									0.084
15									0.104
16									0.114

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164452
Alias:	NAS# 9969F
Replicates:	8
Mean:	0.274
SD:	0.068
Tr Mean:	0.274
Trans SD:	0.068

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.051
SS:	0.05
K:	8
b:	0.217
Alpha Level:	0.05
Calculated Value:	0.9371
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.051
Test Residual SD:	0.041
Ref. Residual Mean:	0.034
Ref. Residual SD:	0.035
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.9249
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	10.1059
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.19	0.19	0.51	0.51	0.084	0.066			-0.084
2	0.33	0.33	0.56	0.56	0.056	0.016			-0.066
3	0.21	0.21	0.54	0.54	0.064	0.036			-0.064
4	0.29	0.29	0.68	0.68	0.016	0.104			-0.044
5	0.28	0.28	0.56	0.56	0.006	0.016			-0.036
6	0.26	0.26	0.58	0.58	0.014	0.004			-0.016
7	0.23	0.23	0.6	0.6	0.044	0.024			-0.016
8	0.4	0.4	0.58	0.58	0.126	0.004			-0.014
9									0.004
10									0.004
11									0.006
12									0.016
13									0.024
14									0.056
15									0.104
16									0.126

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164453
Alias:	NAS# 9970F
Replicates:	8
Mean:	0.489
SD:	0.067
Tr Mean:	0.489
Trans SD:	0.067

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.056	Statistic:	Student's t
Residual SD:	0.051	Test Residual SD:	0.029	Balanced Design:	Yes
SS:	0.049	Ref. Residual Mean:	0.034	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.035		
b:	0.218	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9775	Calculated Value:	1.4105	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	2.9679
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.58	0.58	0.51	0.51	0.091	0.066			-0.099
2	0.44	0.44	0.56	0.56	0.049	0.016			-0.066
3	0.54	0.54	0.54	0.54	0.051	0.036			-0.059
4	0.51	0.51	0.68	0.68	0.021	0.104			-0.049
5	0.39	0.39	0.56	0.56	0.099	0.016			-0.036
6	0.55	0.55	0.58	0.58	0.061	0.004			-0.019
7	0.43	0.43	0.6	0.6	0.059	0.024			-0.016
8	0.47	0.47	0.58	0.58	0.019	0.004			-0.016
9									0.004
10									0.004
11									0.021
12									0.024
13									0.051
14									0.061
15									0.091
16									0.104

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164454
Alias:	NAS# 9971F
Replicates:	8
Mean:	0.334
SD:	0.073
Tr Mean:	0.334
Trans SD:	0.073

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.054
SS:	0.055
K:	8
b:	0.231
Alpha Level:	0.05
Calculated Value:	0.9702
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.056
Test Residual SD:	0.042
Ref. Residual Mean:	0.034
Ref. Residual SD:	0.035
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.1745
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	7.7397
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.35	0.35	0.51	0.51	0.016	0.066			-0.124
2	0.31	0.31	0.56	0.56	0.024	0.016			-0.066
3	0.28	0.28	0.54	0.54	0.054	0.036			-0.054
4	0.45	0.45	0.68	0.68	0.116	0.104			-0.036
5	0.38	0.38	0.56	0.56	0.046	0.016			-0.024
6	0.31	0.31	0.58	0.58	0.024	0.004			-0.024
7	0.21	0.21	0.6	0.6	0.124	0.024			-0.016
8	0.38	0.38	0.58	0.58	0.046	0.004			-0.016
9									0.004
10									0.004
11									0.016
12									0.024
13									0.046
14									0.046
15									0.104
16									0.116

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164455
Alias:	NAS# 9972F
Replicates:	8
Mean:	0.321
SD:	0.043
Tr Mean:	0.321
Trans SD:	0.043

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.032	Statistic:	Student's t
Residual SD:	0.04	Test Residual SD:	0.027	Balanced Design:	Yes
SS:	0.021	Ref. Residual Mean:	0.034	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.035		
b:	0.169	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9346	Calculated Value:	0.1404	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	10.8954
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.33	0.33	0.51	0.51	0.009	0.066			-0.066
2	0.32	0.32	0.56	0.56	0.001	0.016			-0.061
3	0.29	0.29	0.54	0.54	0.031	0.036			-0.036
4	0.36	0.36	0.68	0.68	0.039	0.104			-0.031
5	0.31	0.31	0.56	0.56	0.011	0.016			-0.021
6	0.26	0.26	0.58	0.58	0.061	0.004			-0.016
7	0.4	0.4	0.6	0.6	0.079	0.024			-0.016
8	0.3	0.3	0.58	0.58	0.021	0.004			-0.011
9									-0.001
10									0.004
11									0.004
12									0.009
13									0.024
14									0.039
15									0.079
16									0.104

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164456
Alias:	NAS# 9973F
Replicates:	8
Mean:	0.279
SD:	0.085
Tr Mean:	0.279
Trans SD:	0.085

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.06
SS:	0.068
K:	8
b:	0.258
Alpha Level:	0.05
Calculated Value:	0.9744
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.064
Test Residual SD:	0.051
Ref. Residual Mean:	0.034
Ref. Residual SD:	0.035
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.3927
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	8.5078
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.3	0.3	0.51	0.51	0.021	0.066			-0.139
2	0.29	0.29	0.56	0.56	0.011	0.016			-0.079
3	0.32	0.32	0.54	0.54	0.041	0.036			-0.066
4	0.32	0.32	0.68	0.68	0.041	0.104			-0.039
5	0.2	0.2	0.56	0.56	0.079	0.016			-0.036
6	0.24	0.24	0.58	0.58	0.039	0.004			-0.016
7	0.42	0.42	0.6	0.6	0.141	0.024			-0.016
8	0.14	0.14	0.58	0.58	0.139	0.004			0.004
9									0.004
10									0.011
11									0.021
12									0.024
13									0.041
14									0.041
15									0.104
16									0.141

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164457
Alias:	NAS# 9974F
Replicates:	8
Mean:	0.348
SD:	0.036
Tr Mean:	0.348
Trans SD:	0.036

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.037
SS:	0.027
K:	8
b:	0.159
Alpha Level:	0.05
Calculated Value:	0.9526
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.029
Test Residual SD:	0.017
Ref. Residual Mean:	0.034
Ref. Residual SD:	0.035
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.3192
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	10.5081
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.51	0.51	0.008	0.066			-0.066
2	0.3	0.3	0.56	0.56	0.048	0.016			-0.048
3	0.4	0.4	0.54	0.54	0.053	0.036			-0.038
4	0.31	0.31	0.68	0.68	0.038	0.104			-0.036
5	0.38	0.38	0.56	0.56	0.033	0.016			-0.018
6	0.34	0.34	0.58	0.58	0.008	0.004			-0.016
7	0.33	0.33	0.6	0.6	0.018	0.024			-0.016
8	0.38	0.38	0.58	0.58	0.033	0.004			-0.008
9									-0.008
10									0.004
11									0.004
12									0.024
13									0.033
14									0.033
15									0.053
16									0.104

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164459
Alias:	NAS# 9975F
Replicates:	8
Mean:	0.46
SD:	0.06
Tr Mean:	0.46
Trans SD:	0.06

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.05	Statistic:	Student's t
Residual SD:	0.047	Test Residual SD:	0.027	Balanced Design:	Yes
SS:	0.043	Ref. Residual Mean:	0.034	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.035		
b:	0.198	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9189	Calculated Value:	1.0476	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	4.2155
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.56	0.56	0.51	0.51	0.1	0.066			-0.07
2	0.52	0.52	0.56	0.56	0.06	0.016			-0.066
3	0.45	0.45	0.54	0.54	0.01	0.036			-0.04
4	0.42	0.42	0.68	0.68	0.04	0.104			-0.04
5	0.42	0.42	0.56	0.56	0.04	0.016			-0.04
6	0.39	0.39	0.58	0.58	0.07	0.004			-0.036
7	0.42	0.42	0.6	0.6	0.04	0.024			-0.016
8	0.5	0.5	0.58	0.58	0.04	0.004			-0.016
9									-0.01
10									0.004
11									0.004
12									0.024
13									0.04
14									0.06
15									0.1
16									0.104

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164460
Alias:	NAS# 9976F
Replicates:	8
Mean:	0.515
SD:	0.103
Tr Mean:	-0.347
Trans SD:	1.183

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.347
Trans SD:	0.53

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.91	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.673	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.407	Transformation:	Rankits
K:		Ref. Residual SD:	0.303		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	N/A	Calculated Value:	1.9279	Alternate:	x1 < x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally		Variances		Degrees of Freedom:	10
Distributed:	N/A	Homogeneous:	No	Experimental Alpha Level:	0.05
				Calculated Value:	1.5126
Override Option:	Not Invoked			Critical Value:	>= 1.812
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.47	-0.667	0.51	-0.396	0.32	0.743		0.42	
2	0.42	-1.766	0.56	0.156	1.419	0.191		0.44	
3	0.45	-0.99	0.54	-0.156	0.643	0.502		0.45	
4	0.47	-0.667	0.68	1.285	0.32	0.938		0.47	
5	0.61	0.99	0.56	0.156	1.337	0.191		0.47	
6	0.54	-0.156	0.58	0.483	0.191	0.136		0.51	
7	0.44	-1.285	0.6	0.763	0.938	0.416		0.54	
8	0.72	1.766	0.58	0.483	2.113	0.136		0.54	
9								0.56	
10								0.56	
11								0.58	
12								0.58	
13								0.6	
14								0.61	
15								0.68	
16								0.72	

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164461
Alias:	NAS# 9977F
Replicates:	8
Mean:	0.373
SD:	0.053
Tr Mean:	0.373
Trans SD:	0.053

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.038	Statistic:	Student's t
Residual SD:	0.044	Test Residual SD:	0.035	Balanced Design:	Yes
SS:	0.037	Ref. Residual Mean:	0.034	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.035		
b:	0.19	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9694	Calculated Value:	0.2154	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	7.8908
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.35	0.35	0.51	0.51	0.023	0.066			-0.103
2	0.4	0.4	0.56	0.56	0.028	0.016			-0.066
3	0.27	0.27	0.54	0.54	0.103	0.036			-0.036
4	0.45	0.45	0.68	0.68	0.078	0.104			-0.023
5	0.41	0.41	0.56	0.56	0.038	0.016			-0.023
6	0.38	0.38	0.58	0.58	0.008	0.004			-0.016
7	0.37	0.37	0.6	0.6	0.003	0.024			-0.016
8	0.35	0.35	0.58	0.58	0.023	0.004			-0.003
9									0.004
10									0.004
11									0.008
12									0.024
13									0.028
14									0.038
15									0.078
16									0.104

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164468
Alias:	NAS# 9981F
Replicates:	8
Mean:	0.179
SD:	0.033
Tr Mean:	0.179
Trans SD:	0.033

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.026	Statistic:	Student's t
Residual SD:	0.036	Test Residual SD:	0.018	Balanced Design:	Yes
SS:	0.025	Ref. Residual Mean:	0.034	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.035		
b:	0.153	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9251	Calculated Value:	0.5439	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	18.7105
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.15	0.15	0.51	0.51	0.029	0.066			-0.066
2	0.18	0.18	0.56	0.56	0.001	0.016			-0.036
3	0.24	0.24	0.54	0.54	0.061	0.036			-0.029
4	0.19	0.19	0.68	0.68	0.011	0.104			-0.029
5	0.21	0.21	0.56	0.56	0.031	0.016			-0.029
6	0.15	0.15	0.58	0.58	0.029	0.004			-0.019
7	0.16	0.16	0.6	0.6	0.019	0.024			-0.016
8	0.15	0.15	0.58	0.58	0.029	0.004			-0.016
9									0.001
10									0.004
11									0.004
12									0.011
13									0.024
14									0.031
15									0.061
16									0.104

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164469
Alias:	NAS# 9982F
Replicates:	8
Mean:	0.461
SD:	0.063
Tr Mean:	0.461
Trans SD:	0.063

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.049
SS:	0.046
K:	8
b:	0.207
Alpha Level:	0.05
Calculated Value:	0.9336
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.054
Test Residual SD:	0.027
Ref. Residual Mean:	0.034
Ref. Residual SD:	0.035
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.2905
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	4.0267
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.43	0.43	0.51	0.51	0.031	0.066			-0.071
2	0.54	0.54	0.56	0.56	0.079	0.016			-0.066
3	0.47	0.47	0.54	0.54	0.009	0.036			-0.061
4	0.55	0.55	0.68	0.68	0.089	0.104			-0.051
5	0.41	0.41	0.56	0.56	0.051	0.016			-0.036
6	0.4	0.4	0.58	0.58	0.061	0.004			-0.031
7	0.39	0.39	0.6	0.6	0.071	0.024			-0.016
8	0.5	0.5	0.58	0.58	0.039	0.004			-0.016
9									0.004
10									0.004
11									0.009
12									0.024
13									0.039
14									0.079
15									0.089
16									0.104

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164471
Alias:	NAS# 9984F
Replicates:	8
Mean:	0.64
SD:	0.101
Tr Mean:	0.64
Trans SD:	0.101

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.576
SD:	0.05
Tr Mean:	0.576
Trans SD:	0.05

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.068
SS:	0.089
K:	8
b:	0.286
Alpha Level:	0.05
Calculated Value:	0.9181
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.065
Test Residual SD:	0.073
Ref. Residual Mean:	0.034
Ref. Residual SD:	0.035
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.0918
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	-1.601
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.6	0.6	0.51	0.51	0.04	0.066			-0.18
2	0.6	0.6	0.56	0.56	0.04	0.016			-0.066
3	0.68	0.68	0.54	0.54	0.04	0.036			-0.04
4	0.64	0.64	0.68	0.68	0	0.104			-0.04
5	0.68	0.68	0.56	0.56	0.04	0.016			-0.036
6	0.64	0.64	0.58	0.58	0	0.004			-0.016
7	0.46	0.46	0.6	0.6	0.18	0.024			-0.016
8	0.82	0.82	0.58	0.58	0.18	0.004			0
9									0
10									0.004
11									0.004
12									0.024
13									0.04
14									0.04
15									0.104
16									0.18

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164433
Alias:	NAS# 9953F
Replicates:	8
Mean:	0.383
SD:	0.062
Tr Mean:	0.383
Trans SD:	0.062

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	0.414
Trans SD:	0.022

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.052	Statistic:	Approximate t
Residual SD:	0.04	Test Residual SD:	0.027	Balanced Design:	Yes
SS:	0.03	Ref. Residual Mean:	0.016	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.014		
b:	0.17	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9576	Calculated Value:	3.325	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	9
				Experimental Alpha Level:	0.05
				Calculated Value:	1.3471
Override Option:	N/A			Critical Value:	>= 1.833
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.29	0.29	0.43	0.43	0.093	0.016			-0.093
2	0.45	0.45	0.4	0.4	0.068	0.014			-0.063
3	0.44	0.44	0.39	0.39	0.058	0.024			-0.053
4	0.44	0.44	0.46	0.46	0.058	0.046			-0.024
5	0.33	0.33	0.41	0.41	0.053	0.004			-0.014
6	0.39	0.39	0.41	0.41	0.008	0.004			-0.014
7	0.32	0.32	0.4	0.4	0.063	0.014			-0.004
8	0.4	0.4	0.41	0.41	0.018	0.004			-0.004
9									-0.004
10									0.008
11									0.016
12									0.018
13									0.046
14									0.058
15									0.058
16									0.068

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164434
Alias:	NAS# 9954F
Replicates:	8
Mean:	0.285
SD:	0.04
Tr Mean:	0.285
Trans SD:	0.04

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	0.414
Trans SD:	0.022

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.033	Statistic:	Approximate t
Residual SD:	0.028	Test Residual SD:	0.021	Balanced Design:	Yes
SS:	0.015	Ref. Residual Mean:	0.016	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.014		
b:	0.119	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9544	Calculated Value:	1.9071	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	11
				Experimental Alpha Level:	0.05
				Calculated Value:	7.9231
Override Option:	N/A			Critical Value:	>= 1.796
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.27	0.27	0.43	0.43	0.015	0.016			-0.055
2	0.34	0.34	0.4	0.4	0.055	0.014			-0.055
3	0.31	0.31	0.39	0.39	0.025	0.024			-0.024
4	0.32	0.32	0.46	0.46	0.035	0.046			-0.015
5	0.23	0.23	0.41	0.41	0.055	0.004			-0.014
6	0.3	0.3	0.41	0.41	0.015	0.004			-0.014
7	0.23	0.23	0.4	0.4	0.055	0.014			-0.005
8	0.28	0.28	0.41	0.41	0.005	0.004			-0.004
9									-0.004
10									-0.004
11									0.015
12									0.016
13									0.025
14									0.035
15									0.046
16									0.055

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164435
Alias:	NAS# 9955F
Replicates:	8
Mean:	0.349
SD:	0.043
Tr Mean:	0.349
Trans SD:	0.043

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	0.414
Trans SD:	0.022

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.032	Statistic:	Student's t
Residual SD:	0.029	Test Residual SD:	0.027	Balanced Design:	Yes
SS:	0.016	Ref. Residual Mean:	0.016	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.014		
b:	0.123	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9236	Calculated Value:	1.4734	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	3.7896
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.36	0.36	0.43	0.43	0.011	0.016			-0.089
2	0.36	0.36	0.4	0.4	0.011	0.014			-0.029
3	0.34	0.34	0.39	0.39	0.009	0.024			-0.024
4	0.4	0.4	0.46	0.46	0.051	0.046			-0.014
5	0.38	0.38	0.41	0.41	0.031	0.004			-0.014
6	0.32	0.32	0.41	0.41	0.029	0.004			-0.009
7	0.26	0.26	0.4	0.4	0.089	0.014			-0.004
8	0.37	0.37	0.41	0.41	0.021	0.004			-0.004
9									-0.004
10									0.011
11									0.011
12									0.016
13									0.021
14									0.031
15									0.046
16									0.051

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164436
Alias:	NAS# 9956F
Replicates:	8
Mean:	0.166
SD:	0.054
Tr Mean:	0.166
Trans SD:	0.054

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	0.414
Trans SD:	0.022

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.043	Statistic:	Approximate t
Residual SD:	0.035	Test Residual SD:	0.029	Balanced Design:	Yes
SS:	0.024	Ref. Residual Mean:	0.016	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.014		
b:	0.148	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9186	Calculated Value:	2.4046	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	9
				Experimental Alpha Level:	0.05
				Calculated Value:	12.0118
Override Option:	N/A			Critical Value:	>= 1.833
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.14	0.14	0.43	0.43	0.026	0.016			-0.066
2	0.13	0.13	0.4	0.4	0.036	0.014			-0.036
3	0.26	0.26	0.39	0.39	0.094	0.024			-0.026
4	0.18	0.18	0.46	0.46	0.014	0.046			-0.026
5	0.15	0.15	0.41	0.41	0.016	0.004			-0.024
6	0.1	0.1	0.41	0.41	0.066	0.004			-0.016
7	0.14	0.14	0.4	0.4	0.026	0.014			-0.014
8	0.23	0.23	0.41	0.41	0.064	0.004			-0.014
9									-0.004
10									-0.004
11									-0.004
12									0.014
13									0.016
14									0.046
15									0.064
16									0.094

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164437
Alias:	NAS# 9957F
Replicates:	8
Mean:	0.413
SD:	0.078
Tr Mean:	0.413
Trans SD:	0.078

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	0.414
Trans SD:	0.022

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.057	Statistic:	Approximate t
Residual SD:	0.049	Test Residual SD:	0.048	Balanced Design:	Yes
SS:	0.046	Ref. Residual Mean:	0.016	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.014		
b:	0.206	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9286	Calculated Value:	2.3198	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	8
				Experimental Alpha Level:	0.05
				Calculated Value:	0.0438
Override Option:	N/A			Critical Value:	>= 1.86
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.46	0.46	0.43	0.43	0.048	0.016			-0.133
2	0.44	0.44	0.4	0.4	0.028	0.014			-0.063
3	0.28	0.28	0.39	0.39	0.133	0.024			-0.033
4	0.35	0.35	0.46	0.46	0.063	0.046			-0.024
5	0.54	0.54	0.41	0.41	0.128	0.004			-0.014
6	0.38	0.38	0.41	0.41	0.033	0.004			-0.014
7	0.43	0.43	0.4	0.4	0.018	0.014			-0.004
8	0.42	0.42	0.41	0.41	0.008	0.004			-0.004
9									-0.004
10									0.008
11									0.016
12									0.018
13									0.028
14									0.046
15									0.048
16									0.128

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164440
Alias:	NAS# 9958F
Replicates:	8
Mean:	0.269
SD:	0.056
Tr Mean:	0.269
Trans SD:	0.056

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	0.414
Trans SD:	0.022

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.039	Statistic:	Mann-Whitney
Residual SD:	0.036	Test Residual SD:	0.038	Balanced Design:	Yes
SS:	0.025	Ref. Residual Mean:	0.016	Transformation:	rank-order
K:	8	Ref. Residual SD:	0.014		
b:	0.147	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.8604	Calculated Value:	1.6273	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	63.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.28	6	0.43	15	0.011	0.016	0.21		-0.059
2	0.24	3.5	0.4	10.5	0.029	0.014	0.23		-0.039
3	0.29	7	0.39	8.5	0.021	0.024	0.24		-0.029
4	0.27	5	0.46	16	0.001	0.046	0.24		-0.029
5	0.23	2	0.41	13	0.039	0.004	0.27		-0.024
6	0.39	8.5	0.41	13	0.121	0.004	0.28		-0.014
7	0.24	3.5	0.4	10.5	0.029	0.014	0.29		-0.014
8	0.21	1	0.41	13	0.059	0.004	0.39		-0.004
9							0.39		-0.004
10							0.4		-0.004
11							0.4		0.001
12							0.41		0.011
13							0.41		0.016
14							0.41		0.021
15							0.43		0.046
16							0.46		0.121

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164441
Alias:	NAS# 9959F
Replicates:	8
Mean:	0.369
SD:	0.064
Tr Mean:	0.369
Trans SD:	0.064

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	0.414
Trans SD:	0.022

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.049	Statistic:	Approximate t
Residual SD:	0.041	Test Residual SD:	0.036	Balanced Design:	Yes
SS:	0.032	Ref. Residual Mean:	0.016	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.014		
b:	0.174	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9518	Calculated Value:	2.3953	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	9
				Experimental Alpha Level:	0.05
				Calculated Value:	1.8921
Override Option:	N/A			Critical Value:	>= 1.833
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.43	0.43	0.029	0.016			-0.089
2	0.39	0.39	0.4	0.4	0.021	0.014			-0.059
3	0.35	0.35	0.39	0.39	0.019	0.024			-0.029
4	0.28	0.28	0.46	0.46	0.089	0.046			-0.024
5	0.44	0.44	0.41	0.41	0.071	0.004			-0.019
6	0.31	0.31	0.41	0.41	0.059	0.004			-0.014
7	0.47	0.47	0.4	0.4	0.101	0.014			-0.014
8	0.37	0.37	0.41	0.41	0.001	0.004			-0.004
9									-0.004
10									-0.004
11									0.001
12									0.016
13									0.021
14									0.046
15									0.071
16									0.101

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164442
Alias:	NAS# 9960F
Replicates:	8
Mean:	0.313
SD:	0.048
Tr Mean:	0.313
Trans SD:	0.048

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	0.414
Trans SD:	0.022

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.032
SS:	0.019
K:	8
b:	0.135
Alpha Level:	0.05
Calculated Value:	0.941
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.038
Test Residual SD:	0.025
Ref. Residual Mean:	0.016
Ref. Residual SD:	0.014
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.2193
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	10
Experimental Alpha Level:	0.05
Calculated Value:	5.4486
Critical Value:	>= 1.812
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.28	0.28	0.43	0.43	0.033	0.016			-0.053
2	0.27	0.27	0.4	0.4	0.043	0.014			-0.043
3	0.34	0.34	0.39	0.39	0.028	0.024			-0.033
4	0.35	0.35	0.46	0.46	0.038	0.046			-0.024
5	0.29	0.29	0.41	0.41	0.023	0.004			-0.023
6	0.26	0.26	0.41	0.41	0.053	0.004			-0.014
7	0.4	0.4	0.4	0.4	0.088	0.014			-0.014
8	0.31	0.31	0.41	0.41	0.003	0.004			-0.004
9									-0.004
10									-0.004
11									-0.003
12									0.016
13									0.028
14									0.038
15									0.046
16									0.088

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164443
Alias:	NAS# 9961F
Replicates:	8
Mean:	0.321
SD:	0.08
Tr Mean:	0.321
Trans SD:	0.08

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	0.414
Trans SD:	0.022

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.057	Statistic:	Approximate t
Residual SD:	0.05	Test Residual SD:	0.052	Balanced Design:	Yes
SS:	0.048	Ref. Residual Mean:	0.016	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.014		
b:	0.209	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9092	Calculated Value:	2.1382	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	8
				Experimental Alpha Level:	0.05
				Calculated Value:	3.157
Override Option:	N/A			Critical Value:	>= 1.86
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.36	0.36	0.43	0.43	0.039	-0.016			-0.121
2	0.38	0.38	0.4	0.4	0.059	0.014			-0.091
3	0.23	0.23	0.39	0.39	0.091	0.024			-0.024
4	0.32	0.32	0.46	0.46	0.001	0.046			-0.014
5	0.45	0.45	0.41	0.41	0.129	0.004			-0.014
6	0.31	0.31	0.41	0.41	0.011	0.004			-0.011
7	0.32	0.32	0.4	0.4	0.001	0.014			-0.004
8	0.2	0.2	0.41	0.41	0.121	0.004			-0.004
9									-0.004
10									-0.001
11									-0.001
12									0.016
13									0.039
14									0.046
15									0.059
16									0.129

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164449
Alias:	NAS# 9962F
Replicates:	8
Mean:	0.335
SD:	0.052
Tr Mean:	0.335
Trans SD:	0.052

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	0.414
Trans SD:	0.022

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.04	Statistic:	Approximate t
Residual SD:	0.034	Test Residual SD:	0.029	Balanced Design:	Yes
SS:	0.022	Ref. Residual Mean:	0.016	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.014		
b:	0.145	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9505	Calculated Value:	2.1446	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	9
				Experimental Alpha Level:	0.05
				Calculated Value:	3.9743
Override Option:	N/A			Critical Value:	>= 1.833
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.43	0.43	0.005	0.016			-0.075
2	0.41	0.41	0.4	0.4	0.075	0.014			-0.045
3	0.32	0.32	0.39	0.39	0.015	0.024			-0.025
4	0.31	0.31	0.46	0.46	0.025	0.046			-0.024
5	0.35	0.35	0.41	0.41	0.015	0.004			-0.015
6	0.26	0.26	0.41	0.41	0.075	0.004			-0.014
7	0.29	0.29	0.4	0.4	0.045	0.014			-0.014
8	0.4	0.4	0.41	0.41	0.065	0.004			-0.004
9									-0.004
10									-0.004
11									0.005
12									0.015
13									0.016
14									0.046
15									0.065
16									0.075

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164439
Alias:	NAS# 9966F
Replicates:	8
Mean:	0.591
SD:	0.144
Tr Mean:	0.591
Trans SD:	0.144

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	0.414
Trans SD:	0.022

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.088
SS:	0.148
K:	8
b:	0.371
Alpha Level:	0.05
Calculated Value:	0.9279
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.114
Test Residual SD:	0.076
Ref. Residual Mean:	0.016
Ref. Residual SD:	0.014
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	3.5842
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	7
Experimental Alpha Level:	0.05
Calculated Value:	-3.4495
Critical Value:	>= 1.895
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.38	0.38	0.43	0.43	0.211	0.016			-0.211
2	0.83	0.83	0.4	0.4	0.239	0.014			-0.111
3	0.48	0.48	0.39	0.39	0.111	0.024			-0.061
4	0.56	0.56	0.46	0.46	0.031	0.046			-0.041
5	0.68	0.68	0.41	0.41	0.089	0.004			-0.031
6	0.53	0.53	0.41	0.41	0.061	0.004			-0.024
7	0.72	0.72	0.4	0.4	0.129	0.014			-0.014
8	0.55	0.55	0.41	0.41	0.041	0.004			-0.014
9									-0.004
10									-0.004
11									-0.004
12									0.016
13									0.046
14									0.089
15									0.129
16									0.239

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164450
Alias:	NAS# 9967F
Replicates:	8
Mean:	0.34
SD:	0.052
Tr Mean:	0.34
Trans SD:	0.052

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	0.414
Trans SD:	0.022

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.035	Statistic:	Student's t
Residual SD:	0.034	Test Residual SD:	0.037	Balanced Design:	Yes
SS:	0.023	Ref. Residual Mean:	0.016	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.014		
b:	0.144	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9136	Calculated Value:	1.3929	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	3.6722
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.43	0.43	0	0.016			-0.1
2	0.42	0.42	0.4	0.4	0.08	0.014			-0.03
3	0.38	0.38	0.39	0.39	0.04	0.024			-0.024
4	0.24	0.24	0.46	0.46	0.1	0.046			-0.014
5	0.31	0.31	0.41	0.41	0.03	0.004			-0.014
6	0.35	0.35	0.41	0.41	0.01	0.004			-0.01
7	0.33	0.33	0.4	0.4	0.01	0.014			-0.004
8	0.35	0.35	0.41	0.41	0.01	0.004			-0.004
9									-0.004
10									0
11									0.01
12									0.01
13									0.016
14									0.04
15									0.046
16									0.08

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164451
Alias:	NAS# 9968F
Replicates:	8
Mean:	0.326
SD:	0.089
Tr Mean:	0.326
Trans SD:	0.089

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	0.414
Trans SD:	0.022

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.07	Statistic:	Approximate t
Residual SD:	0.056	Test Residual SD:	0.049	Balanced Design:	Yes
SS:	0.059	Ref. Residual Mean:	0.016	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.014		
b:	0.234	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9267	Calculated Value:	3.0012	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	8
				Experimental Alpha Level:	0.05
				Calculated Value:	2.6963
Override Option:	N/A			Critical Value:	>= 1.86
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.3	0.3	0.43	0.43	0.026	0.016			-0.146
2	0.18	0.18	0.4	0.4	0.146	0.014			-0.106
3	0.44	0.44	0.39	0.39	0.114	0.024			-0.026
4	0.41	0.41	0.46	0.46	0.084	0.046			-0.024
5	0.22	0.22	0.41	0.41	0.106	0.004			-0.014
6	0.36	0.36	0.41	0.41	0.034	0.004			-0.014
7	0.35	0.35	0.4	0.4	0.024	0.014			-0.004
8	0.35	0.35	0.41	0.41	0.024	0.004			-0.004
9									-0.004
10									0.016
11									0.024
12									0.024
13									0.034
14									0.046
15									0.084
16									0.114

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164452
Alias:	NAS# 9969F
Replicates:	8
Mean:	0.274
SD:	0.068
Tr Mean:	0.274
Trans SD:	0.068

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	0.414
Trans SD:	0.022

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.044
SS:	0.036
K:	8
b:	0.183
Alpha Level:	0.05
Calculated Value:	0.9314
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.051
Test Residual SD:	0.041
Ref. Residual Mean:	0.016
Ref. Residual SD:	0.014
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.3373
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	5.5236
Critical Value:	>= 1.86
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.19	0.19	0.43	0.43	0.084	0.016			-0.084
2	0.33	0.33	0.4	0.4	0.056	0.014			-0.064
3	0.21	0.21	0.39	0.39	0.064	0.024			-0.044
4	0.29	0.29	0.46	0.46	0.016	0.046			-0.024
5	0.28	0.28	0.41	0.41	0.006	0.004			-0.014
6	0.26	0.26	0.41	0.41	0.014	0.004			-0.014
7	0.23	0.23	0.4	0.4	0.044	0.014			-0.014
8	0.4	0.4	0.41	0.41	0.126	0.004			-0.004
9									-0.004
10									-0.004
11									0.006
12									0.016
13									0.016
14									0.046
15									0.056
16									0.126

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164453
Alias:	NAS# 9970F
Replicates:	8
Mean:	0.489
SD:	0.067
Tr Mean:	0.489
Trans SD:	0.067

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	0.414
Trans SD:	0.022

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.056	Statistic:	Approximate t
Residual SD:	0.043	Test Residual SD:	0.029	Balanced Design:	Yes
SS:	0.034	Ref. Residual Mean:	0.016	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.014		
b:	0.184	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9791	Calculated Value:	3.5805	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	9
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	-3.0228
				Critical Value:	>= 1.833
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.58	0.58	0.43	0.43	0.091	0.016			-0.099
2	0.44	0.44	0.4	0.4	0.049	0.014			-0.059
3	0.54	0.54	0.39	0.39	0.051	0.024			-0.049
4	0.51	0.51	0.46	0.46	0.021	0.046			-0.024
5	0.39	0.39	0.41	0.41	0.099	0.004			-0.019
6	0.55	0.55	0.41	0.41	0.061	0.004			-0.014
7	0.43	0.43	0.4	0.4	0.059	0.014			-0.014
8	0.47	0.47	0.41	0.41	0.019	0.004			-0.004
9									-0.004
10									-0.004
11									0.016
12									0.021
13									0.046
14									0.051
15									0.061
16									0.091

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164454
Alias:	NAS# 9971F
Replicates:	8
Mean:	0.334
SD:	0.073
Tr Mean:	0.334
Trans SD:	0.073

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	0.414
Trans SD:	0.022

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.046
SS:	0.041
K:	8
b:	0.195
Alpha Level:	0.05
Calculated Value:	0.9312
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.056
Test Residual SD:	0.042
Ref. Residual Mean:	0.016
Ref. Residual SD:	0.014
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.6156
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	2.9647
Critical Value:	>= 1.86
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.35	0.35	0.43	0.43	0.016	0.016			-0.124
2	0.31	0.31	0.4	0.4	0.024	0.014			-0.054
3	0.28	0.28	0.39	0.39	0.054	0.024			-0.024
4	0.45	0.45	0.46	0.46	0.116	0.046			-0.024
5	0.38	0.38	0.41	0.41	0.046	0.004			-0.024
6	0.31	0.31	0.41	0.41	0.024	0.004			-0.014
7	0.21	0.21	0.4	0.4	0.124	0.014			-0.014
8	0.38	0.38	0.41	0.41	0.046	0.004			-0.004
9									-0.004
10									-0.004
11									0.016
12									0.016
13									0.046
14									0.046
15									0.046
16									0.116

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164455
Alias:	NAS# 9972F
Replicates:	8
Mean:	0.321
SD:	0.043
Tr Mean:	0.321
Trans SD:	0.043

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	0.414
Trans SD:	0.022

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.032	Statistic:	Student's t
Residual SD:	0.029	Test Residual SD:	0.027	Balanced Design:	Yes
SS:	0.016	Ref. Residual Mean:	0.016	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.014		
b:	0.124	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9373	Calculated Value:	1.4734	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	5.3929
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.33	0.33	0.43	0.43	0.009	0.016			-0.061
2	0.32	0.32	0.4	0.4	0.001	0.014			-0.031
3	0.29	0.29	0.39	0.39	0.031	0.024			-0.024
4	0.36	0.36	0.46	0.46	0.039	0.046			-0.021
5	0.31	0.31	0.41	0.41	0.011	0.004			-0.014
6	0.26	0.26	0.41	0.41	0.061	0.004			-0.014
7	0.4	0.4	0.4	0.4	0.079	0.014			-0.011
8	0.3	0.3	0.41	0.41	0.021	0.004			-0.004
9									-0.004
10									-0.004
11									-0.001
12									0.009
13									0.016
14									0.039
15									0.046
16									0.079

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164456
Alias:	NAS# 9973F
Replicates:	8
Mean:	0.279
SD:	0.085
Tr Mean:	0.279
Trans SD:	0.085

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	0.414
Trans SD:	0.022

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.064	Statistic:	Approximate t
Residual SD:	0.053	Test Residual SD:	0.051	Balanced Design:	Yes
SS:	0.054	Ref. Residual Mean:	0.016	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.014		
b:	0.224	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9281	Calculated Value:	2.5964	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	8
				Experimental Alpha Level:	0.05
				Calculated Value:	4.3364
Override Option:	N/A			Critical Value:	>= 1.86
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.3	0.3	0.43	0.43	0.021	0.016			-0.139
2	0.29	0.29	0.4	0.4	0.011	0.014			-0.079
3	0.32	0.32	0.39	0.39	0.041	0.024			-0.039
4	0.32	0.32	0.46	0.46	0.041	0.046			-0.024
5	0.2	0.2	0.41	0.41	0.079	0.004			-0.014
6	0.24	0.24	0.41	0.41	0.039	0.004			-0.014
7	0.42	0.42	0.4	0.4	0.141	0.014			-0.004
8	0.14	0.14	0.41	0.41	0.139	0.004			-0.004
9									-0.004
10									0.011
11									0.016
12									0.021
13									0.041
14									0.041
15									0.046
16									0.141

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164457
Alias:	NAS# 9974F
Replicates:	8
Mean:	0.348
SD:	0.036
Tr Mean:	0.348
Trans SD:	0.036

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	0.414
Trans SD:	0.022

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.029	Statistic:	Student's t
Residual SD:	0.025	Test Residual SD:	0.017	Balanced Design:	Yes
SS:	0.012	Ref. Residual Mean:	0.016	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.014		
b:	0.108	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.939	Calculated Value:	1.7439	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	4.4634
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.43	0.43	0.008	0.016			-0.048
2	0.3	0.3	0.4	0.4	0.048	0.014			-0.038
3	0.4	0.4	0.39	0.39	0.053	0.024			-0.024
4	0.31	0.31	0.46	0.46	0.038	0.046			-0.018
5	0.38	0.38	0.41	0.41	0.033	0.004			-0.014
6	0.34	0.34	0.41	0.41	0.008	0.004			-0.014
7	0.33	0.33	0.4	0.4	0.018	0.014			-0.008
8	0.38	0.38	0.41	0.41	0.033	0.004			-0.008
9									-0.004
10									-0.004
11									-0.004
12									0.016
13									0.033
14									0.033
15									0.046
16									0.053

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164459
Alias:	NAS# 9975F
Replicates:	8
Mean:	0.46
SD:	0.06
Tr Mean:	0.46
Trans SD:	0.06

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	0.414
Trans SD:	0.022

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.039
SS:	0.028
K:	8
b:	0.164
Alpha Level:	0.05
Calculated Value:	0.943
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.05
Test Residual SD:	0.027
Ref. Residual Mean:	0.016
Ref. Residual SD:	0.014
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	3.2069
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	9
Experimental Alpha Level:	0.05
Calculated Value:	-2.0542
Critical Value:	>= 1.833
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.56	0.56	0.43	0.43	0.1	0.016			-0.07
2	0.52	0.52	0.4	0.4	0.06	0.014			-0.04
3	0.45	0.45	0.39	0.39	0.01	0.024			-0.04
4	0.42	0.42	0.46	0.46	0.04	0.046			-0.04
5	0.42	0.42	0.41	0.41	0.04	0.004			-0.024
6	0.39	0.39	0.41	0.41	0.07	0.004			-0.014
7	0.42	0.42	0.4	0.4	0.04	0.014			-0.014
8	0.5	0.5	0.41	0.41	0.04	0.004			-0.01
9									-0.004
10									-0.004
11									-0.004
12									0.016
13									0.04
14									0.046
15									0.06
16									0.1

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164460
Alias:	NAS# 9976F
Replicates:	8
Mean:	0.515
SD:	0.103
Tr Mean:	0.681
Trans SD:	0.659

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	-0.681
Trans SD:	0.671

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.499	Statistic:	Student's t
Residual SD:		Test Residual SD:	0.387	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.499	Transformation:	Rankits
K:		Ref. Residual SD:	0.407		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	N/A	Calculated Value:	0	Alternate:	x1 < x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally Distributed:	N/A	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	-4.0984
Override Option:	Not Invoked			Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.47	0.667	0.43	-0.077	0.015	0.604		0.39	
2	0.42	-0.234	0.4	-1.138	0.915	0.456		0.4	
3	0.45	0.234	0.39	-1.766	0.447	1.085		0.4	
4	0.47	0.667	0.46	0.396	0.015	1.077		0.41	
5	0.61	1.285	0.41	-0.576	0.604	0.105		0.41	
6	0.54	0.99	0.41	-0.576	0.309	0.105		0.41	
7	0.44	0.077	0.4	-1.138	0.604	0.456		0.42	
8	0.72	1.766	0.41	-0.576	1.085	0.105		0.43	
9								0.44	
10								0.45	
11								0.46	
12								0.47	
13								0.47	
14								0.54	
15								0.61	
16								0.72	

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164461
Alias:	NAS# 9977F
Replicates:	8
Mean:	0.373
SD:	0.053
Tr Mean:	0.373
Trans SD:	0.053

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	0.414
Trans SD:	0.022

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.035
SS:	0.023
K:	8
b:	0.145
Alpha Level:	0.05
Calculated Value:	0.9138
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.038
Test Residual SD:	0.035
Ref. Residual Mean:	0.016
Ref. Residual SD:	0.014
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.6424
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	2.0294
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.35	0.35	0.43	0.43	0.023	0.016			-0.103
2	0.4	0.4	0.4	0.4	0.028	0.014			-0.024
3	0.27	0.27	0.39	0.39	0.103	0.024			-0.023
4	0.45	0.45	0.46	0.46	0.078	0.046			-0.023
5	0.41	0.41	0.41	0.41	0.038	0.004			-0.014
6	0.38	0.38	0.41	0.41	0.008	0.004			-0.014
7	0.37	0.37	0.4	0.4	0.003	0.014			-0.004
8	0.35	0.35	0.41	0.41	0.023	0.004			-0.004
9									-0.004
10									-0.003
11									0.008
12									0.016
13									0.028
14									0.038
15									0.046
16									0.078

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164468
Alias:	NAS# 9981F
Replicates:	8
Mean:	0.179
SD:	0.033
Tr Mean:	0.179
Trans SD:	0.033

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	0.414
Trans SD:	0.022

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.026	Statistic:	Student's t
Residual SD:	0.024	Test Residual SD:	0.018	Balanced Design:	Yes
SS:	0.011	Ref. Residual Mean:	0.016	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.014		
b:	0.1	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.894	Calculated Value:	1.3234	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	16.7105
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.15	0.15	0.43	0.43	0.029	0.016			-0.029
2	0.18	0.18	0.4	0.4	0.001	0.014			-0.029
3	0.24	0.24	0.39	0.39	0.061	0.024			-0.029
4	0.19	0.19	0.46	0.46	0.011	0.046			-0.024
5	0.21	0.21	0.41	0.41	0.031	0.004			-0.019
6	0.15	0.15	0.41	0.41	0.029	0.004			-0.014
7	0.16	0.16	0.4	0.4	0.019	0.014			-0.014
8	0.15	0.15	0.41	0.41	0.029	0.004			-0.004
9									-0.004
10									-0.004
11									0.001
12									0.011
13									0.016
14									0.031
15									0.046
16									0.061

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164469
Alias:	NAS# 9982F
Replicates:	8
Mean:	0.461
SD:	0.063
Tr Mean:	0.461
Trans SD:	0.063

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	0.414
Trans SD:	0.022

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.041
SS:	0.031
K:	8
b:	0.174
Alpha Level:	0.05
Calculated Value:	0.9592
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.054
Test Residual SD:	0.027
Ref. Residual Mean:	0.016
Ref. Residual SD:	0.014
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	3.5637
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	9
Experimental Alpha Level:	0.05
Calculated Value:	-2.0036
Critical Value:	>= 1.833
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.43	0.43	0.43	0.43	0.031	0.016			-0.071
2	0.54	0.54	0.4	0.4	0.079	0.014			-0.061
3	0.47	0.47	0.39	0.39	0.009	0.024			-0.051
4	0.55	0.55	0.46	0.46	0.089	0.046			-0.031
5	0.41	0.41	0.41	0.41	0.051	0.004			-0.024
6	0.4	0.4	0.41	0.41	0.061	0.004			-0.014
7	0.39	0.39	0.4	0.4	0.071	0.014			-0.014
8	0.5	0.5	0.41	0.41	0.039	0.004			-0.004
9									-0.004
10									-0.004
11									0.009
12									0.016
13									0.039
14									0.046
15									0.079
16									0.089

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164471
Alias:	NAS# 9984F
Replicates:	8
Mean:	0.64
SD:	0.101
Tr Mean:	0.751
Trans SD:	0.572

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.414
SD:	0.022
Tr Mean:	-0.751
Trans SD:	0.567

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.447	Statistic:	Student's t
Residual SD:		Test Residual SD:	0.313	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.447	Transformation:	Rankits
K:		Ref. Residual SD:	0.305		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	N/A	Calculated Value:	0	Alternate:	x1 < x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally Distributed:	N/A	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	-5.2721
Override Option:	Not Invoked			Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.6	0.315	0.43	-0.234	0.436	0.517		0.39	
2	0.6	0.315	0.4	-1.138	0.436	0.387		0.4	
3	0.68	1.138	0.39	-1.766	0.387	1.016		0.4	
4	0.64	0.667	0.46	0	0.084	0.751		0.41	
5	0.68	1.138	0.41	-0.576	0.387	0.174		0.41	
6	0.64	0.667	0.41	-0.576	0.084	0.174		0.41	
7	0.46	0	0.4	-1.138	0.751	0.387		0.43	
8	0.82	1.766	0.41	-0.576	1.016	0.174		0.46	
9								0.46	
10								0.6	
11								0.6	
12								0.64	
13								0.64	
14								0.68	
15								0.68	
16								0.82	

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164433
Alias:	NAS# 9953F
Replicates:	8
Mean:	0.383
SD:	0.062
Tr Mean:	0.383
Trans SD:	0.062

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.057
SS:	0.062
K:	8
b:	0.242
Alpha Level:	0.05
Calculated Value:	0.9529
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.052
Test Residual SD:	0.027
Ref. Residual Mean:	0.049
Ref. Residual SD:	0.047
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.1303
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	4.4836
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.29	0.29	0.5	0.5	0.093	0.031			-0.093
2	0.45	0.45	0.47	0.47	0.068	0.061			-0.071
3	0.44	0.44	0.46	0.46	0.058	0.071			-0.063
4	0.44	0.44	0.58	0.58	0.058	0.049			-0.061
5	0.33	0.33	0.68	0.68	0.053	0.149			-0.053
6	0.39	0.39	0.52	0.52	0.008	0.011			-0.031
7	0.32	0.32	0.53	0.53	0.063	0.001			-0.021
8	0.4	0.4	0.51	0.51	0.018	0.021			-0.011
9									-0.001
10									0.008
11									0.018
12									0.049
13									0.058
14									0.058
15									0.068
16									0.149

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164434
Alias:	NAS# 9954F
Replicates:	8
Mean:	0.285
SD:	0.04
Tr Mean:	0.285
Trans SD:	0.04

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.049
SS:	0.046
K:	8
b:	0.206
Alpha Level:	0.05
Calculated Value:	0.9151
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.033
Test Residual SD:	0.021
Ref. Residual Mean:	0.049
Ref. Residual SD:	0.047
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.9326
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	8.5652
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.27	0.27	0.5	0.5	0.015	0.031			-0.071
2	0.34	0.34	0.47	0.47	0.055	0.061			-0.061
3	0.31	0.31	0.46	0.46	0.025	0.071			-0.055
4	0.32	0.32	0.58	0.58	0.035	0.049			-0.055
5	0.23	0.23	0.68	0.68	0.055	0.149			-0.031
6	0.3	0.3	0.52	0.52	0.015	0.011			-0.021
7	0.23	0.23	0.53	0.53	0.055	0.001			-0.015
8	0.28	0.28	0.51	0.51	0.005	0.021			-0.011
9									-0.005
10									-0.001
11									0.015
12									0.025
13									0.035
14									0.049
15									0.055
16									0.149

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164435
Alias:	NAS# 9955F
Replicates:	8
Mean:	0.349
SD:	0.043
Tr Mean:	0.349
Trans SD:	0.043

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.032	Statistic:	Student's t
Residual SD:	0.05	Test Residual SD:	0.027	Balanced Design:	Yes
SS:	0.048	Ref. Residual Mean:	0.049	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.047		
b:	0.212	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9387	Calculated Value:	0.9309	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	6.2352
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.36	0.36	0.5	0.5	0.011	0.031			-0.089
2	0.36	0.36	0.47	0.47	0.011	0.061			-0.071
3	0.34	0.34	0.46	0.46	0.009	0.071			-0.061
4	0.4	0.4	0.58	0.58	0.051	0.049			-0.031
5	0.38	0.38	0.68	0.68	0.031	0.149			-0.029
6	0.32	0.32	0.52	0.52	0.029	0.011			-0.021
7	0.26	0.26	0.53	0.53	0.089	0.001			-0.011
8	0.37	0.37	0.51	0.51	0.021	0.021			-0.009
9									-0.001
10									0.011
11									0.011
12									0.021
13									0.031
14									0.049
15									0.051
16									0.149

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164436
Alias:	NAS# 9956F
Replicates:	8
Mean:	0.166
SD:	0.054
Tr Mean:	0.166
Trans SD:	0.054

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.043	Statistic:	Student's t
Residual SD:	0.054	Test Residual SD:	0.029	Balanced Design:	Yes
SS:	0.055	Ref. Residual Mean:	0.049	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.047		
b:	0.222	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.8906	Calculated Value:	0.338	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	11.6178
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.14	0.14	0.5	0.5	0.026	0.031			-0.071
2	0.13	0.13	0.47	0.47	0.036	0.061			-0.066
3	0.26	0.26	0.46	0.46	0.094	0.071			-0.061
4	0.18	0.18	0.58	0.58	0.014	0.049			-0.036
5	0.15	0.15	0.68	0.68	0.016	0.149			-0.031
6	0.1	0.1	0.52	0.52	0.066	0.011			-0.026
7	0.14	0.14	0.53	0.53	0.026	0.001			-0.026
8	0.23	0.23	0.51	0.51	0.064	0.021			-0.021
9									-0.016
10									-0.011
11									-0.001
12									0.014
13									0.049
14									0.064
15									0.094
16									0.149

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164437
Alias:	NAS# 9957F
Replicates:	8
Mean:	0.413
SD:	0.078
Tr Mean:	0.413
Trans SD:	0.078

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.064
SS:	0.077
K:	8
b:	0.272
Alpha Level:	0.05
Calculated Value:	0.9618
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.057
Test Residual SD:	0.048
Ref. Residual Mean:	0.049
Ref. Residual SD:	0.047
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.3154
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	3.2017
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.46	0.46	0.5	0.5	0.048	0.031			-0.133
2	0.44	0.44	0.47	0.47	0.028	0.061			-0.071
3	0.28	0.28	0.46	0.46	0.133	0.071			-0.063
4	0.35	0.35	0.58	0.58	0.063	0.049			-0.061
5	0.54	0.54	0.68	0.68	0.128	0.149			-0.033
6	0.38	0.38	0.52	0.52	0.033	0.011			-0.031
7	0.43	0.43	0.53	0.53	0.018	0.001			-0.021
8	0.42	0.42	0.51	0.51	0.008	0.021			-0.011
9									-0.001
10									0.008
11									0.018
12									0.028
13									0.048
14									0.049
15									0.128
16									0.149

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164440
Alias:	NAS# 9958F
Replicates:	8
Mean:	0.269
SD:	0.056
Tr Mean:	0.269
Trans SD:	0.056

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.055
SS:	0.057
K:	8
b:	0.221
Alpha Level:	0.05
Calculated Value:	0.8603
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.039
Test Residual SD:	0.038
Ref. Residual Mean:	0.049
Ref. Residual SD:	0.047
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.5003
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	64
Critical Value:	>= 49.0
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.28	6	0.5	11	0.011	0.031	0.21		-0.071
2	0.24	3.5	0.47	10	0.029	0.061	0.23		-0.061
3	0.29	7	0.46	9	0.021	0.071	0.24		-0.059
4	0.27	5	0.58	15	0.001	0.049	0.24		-0.039
5	0.23	2	0.68	16	0.039	0.149	0.27		-0.031
6	0.39	8	0.52	13	0.121	0.011	0.28		-0.029
7	0.24	3.5	0.53	14	0.029	0.001	0.29		-0.029
8	0.21	1	0.51	12	0.059	0.021	0.39		-0.021
9							0.46		-0.011
10							0.47		-0.001
11							0.5		0.001
12							0.51		0.011
13							0.52		0.021
14							0.53		0.049
15							0.58		0.121
16							0.68		0.149

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164441
Alias:	NAS# 9959F
Replicates:	8
Mean:	0.369
SD:	0.064
Tr Mean:	0.369
Trans SD:	0.064

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.058
SS:	0.063
K:	8
b:	0.243
Alpha Level:	0.05
Calculated Value:	0.9349
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.049
Test Residual SD:	0.036
Ref. Residual Mean:	0.049
Ref. Residual SD:	0.047
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.0298
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	4.8381
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.5	0.5	0.029	0.031			-0.089
2	0.39	0.39	0.47	0.47	0.021	0.061			-0.071
3	0.35	0.35	0.46	0.46	0.019	0.071			-0.061
4	0.28	0.28	0.58	0.58	0.089	0.049			-0.059
5	0.44	0.44	0.68	0.68	0.071	0.149			-0.031
6	0.31	0.31	0.52	0.52	0.059	0.011			-0.029
7	0.47	0.47	0.53	0.53	0.101	0.001			-0.021
8	0.37	0.37	0.51	0.51	0.001	0.021			-0.019
9									-0.011
10									-0.001
11									0.001
12									0.021
13									0.049
14									0.071
15									0.101
16									0.149

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164442
Alias:	NAS# 9960F
Replicates:	8
Mean:	0.313
SD:	0.048
Tr Mean:	0.313
Trans SD:	0.048

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.038	Statistic:	Student's t
Residual SD:	0.052	Test Residual SD:	0.025	Balanced Design:	Yes
SS:	0.051	Ref. Residual Mean:	0.049	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.047		
b:	0.214	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9032	Calculated Value:	0.5997	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	7.2602
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.28	0.28	0.5	0.5	0.033	0.031			-0.071
2	0.27	0.27	0.47	0.47	0.043	0.061			-0.061
3	0.34	0.34	0.46	0.46	0.028	0.071			-0.053
4	0.35	0.35	0.58	0.58	0.038	0.049			-0.043
5	0.29	0.29	0.68	0.68	0.023	0.149			-0.033
6	0.26	0.26	0.52	0.52	0.053	0.011			-0.031
7	0.4	0.4	0.53	0.53	0.088	0.001			-0.023
8	0.31	0.31	0.51	0.51	0.003	0.021			-0.021
9									-0.011
10									-0.003
11									-0.001
12									0.028
13									0.038
14									0.049
15									0.088
16									0.149

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164443
Alias:	NAS# 9961F
Replicates:	8
Mean:	0.321
SD:	0.08
Tr Mean:	0.321
Trans SD:	0.08

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.057	Statistic:	Student's t
Residual SD:	0.065	Test Residual SD:	0.052	Balanced Design:	Yes
SS:	0.08	Ref. Residual Mean:	0.049	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.047		
b:	0.276	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9567	Calculated Value:	0.2897	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	5.5709
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.36	0.36	0.5	0.5	0.039	0.031			-0.121
2	0.38	0.38	0.47	0.47	0.059	0.061			-0.091
3	0.23	0.23	0.46	0.46	0.091	0.071			-0.071
4	0.32	0.32	0.58	0.58	0.001	0.049			-0.061
5	0.45	0.45	0.68	0.68	0.129	0.149			-0.031
6	0.31	0.31	0.52	0.52	0.011	0.011			-0.021
7	0.32	0.32	0.53	0.53	0.001	0.001			-0.011
8	0.2	0.2	0.51	0.51	0.121	0.021			-0.011
9									-0.001
10									-0.001
11									-0.001
12									0.039
13									0.049
14									0.059
15									0.129
16									0.149

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164449
Alias:	NAS# 9962F
Replicates:	8
Mean:	0.335
SD:	0.052
Tr Mean:	0.335
Trans SD:	0.052

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.053
SS:	0.053
K:	8
b:	0.222
Alpha Level:	0.05
Calculated Value:	0.9232
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.04
Test Residual SD:	0.029
Ref. Residual Mean:	0.049
Ref. Residual SD:	0.047
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.482
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	6.3501
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.5	0.5	0.005	0.031			-0.075
2	0.41	0.41	0.47	0.47	0.075	0.061			-0.071
3	0.32	0.32	0.46	0.46	0.015	0.071			-0.061
4	0.31	0.31	0.58	0.58	0.025	0.049			-0.045
5	0.35	0.35	0.68	0.68	0.015	0.149			-0.031
6	0.26	0.26	0.52	0.52	0.075	0.011			-0.025
7	0.29	0.29	0.53	0.53	0.045	0.001			-0.021
8	0.4	0.4	0.51	0.51	0.065	0.021			-0.015
9									-0.011
10									-0.001
11									0.005
12									0.015
13									0.049
14									0.065
15									0.075
16									0.149

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164439
Alias:	NAS# 9966F
Replicates:	8
Mean:	0.591
SD:	0.144
Tr Mean:	0.591
Trans SD:	0.144

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.114	Statistic:	Approximate t
Residual SD:	0.097	Test Residual SD:	0.076	Balanced Design:	Yes
SS:	0.18	Ref. Residual Mean:	0.049	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.047		
b:	0.414	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9529	Calculated Value:	2.0421	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	10
				Experimental Alpha Level:	0.05
				Calculated Value:	-1.059
Override Option:	N/A			Critical Value:	>= 1.812
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.38	0.38	0.5	0.5	0.211	0.031			-0.211
2	0.83	0.83	0.47	0.47	0.239	0.061			-0.111
3	0.48	0.48	0.46	0.46	0.111	0.071			-0.071
4	0.56	0.56	0.58	0.58	0.031	0.049			-0.061
5	0.68	0.68	0.68	0.68	0.089	0.149			-0.061
6	0.53	0.53	0.52	0.52	0.061	0.011			-0.041
7	0.72	0.72	0.53	0.53	0.129	0.001			-0.031
8	0.55	0.55	0.51	0.51	0.041	0.021			-0.031
9									-0.021
10									-0.011
11									-0.001
12									0.049
13									0.089
14									0.129
15									0.149
16									0.239

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164450
Alias:	NAS# 9967F
Replicates:	8
Mean:	0.34
SD:	0.052
Tr Mean:	0.34
Trans SD:	0.052

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.035	Statistic:	Student's t
Residual SD:	0.053	Test Residual SD:	0.037	Balanced Design:	Yes
SS:	0.054	Ref. Residual Mean:	0.049	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.047		
b:	0.227	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9514	Calculated Value:	0.6833	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	6.1539
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.5	0.5	0	0.031			-0.1
2	0.42	0.42	0.47	0.47	0.08	0.061			-0.071
3	0.38	0.38	0.46	0.46	0.04	0.071			-0.061
4	0.24	0.24	0.58	0.58	0.1	0.049			-0.031
5	0.31	0.31	0.68	0.68	0.03	0.149			-0.03
6	0.35	0.35	0.52	0.52	0.01	0.011			-0.021
7	0.33	0.33	0.53	0.53	0.01	0.001			-0.011
8	0.35	0.35	0.51	0.51	0.01	0.021			-0.01
9									-0.001
10									0
11									0.01
12									0.01
13									0.04
14									0.049
15									0.08
16									0.149

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164451
Alias:	NAS# 9968F
Replicates:	8
Mean:	0.326
SD:	0.089
Tr Mean:	0.326
Trans SD:	0.089

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.07	Statistic:	Student's t
Residual SD:	0.069	Test Residual SD:	0.049	Balanced Design:	Yes
SS:	0.09	Ref. Residual Mean:	0.049	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.047		
b:	0.299	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9897	Calculated Value:	0.8481	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	5.1002
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.3	0.3	0.5	0.5	0.026	0.031			-0.146
2	0.18	0.18	0.47	0.47	0.146	0.061			-0.106
3	0.44	0.44	0.46	0.46	0.114	0.071			-0.071
4	0.41	0.41	0.58	0.58	0.084	0.049			-0.061
5	0.22	0.22	0.68	0.68	0.106	0.149			-0.031
6	0.36	0.36	0.52	0.52	0.034	0.011			-0.026
7	0.35	0.35	0.53	0.53	0.024	0.001			-0.021
8	0.35	0.35	0.51	0.51	0.024	0.021			-0.011
9									-0.001
10									0.024
11									0.024
12									0.034
13									0.049
14									0.084
15									0.114
16									0.149

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164452
Alias:	NAS# 9969F
Replicates:	8
Mean:	0.274
SD:	0.068
Tr Mean:	0.274
Trans SD:	0.068

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.06
SS:	0.067
K:	8
b:	0.248
Alpha Level:	0.05
Calculated Value:	0.91
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.051
Test Residual SD:	0.041
Ref. Residual Mean:	0.049
Ref. Residual SD:	0.047
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.0855
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	7.4182
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.19	0.19	0.5	0.5	0.084	0.031			-0.084
2	0.33	0.33	0.47	0.47	0.056	0.061			-0.071
3	0.21	0.21	0.46	0.46	0.064	0.071			-0.064
4	0.29	0.29	0.58	0.58	0.016	0.049			-0.061
5	0.28	0.28	0.68	0.68	0.006	0.149			-0.044
6	0.26	0.26	0.52	0.52	0.014	0.011			-0.031
7	0.23	0.23	0.53	0.53	0.044	0.001			-0.021
8	0.4	0.4	0.51	0.51	0.126	0.021			-0.014
9									-0.011
10									-0.001
11									0.006
12									0.016
13									0.049
14									0.056
15									0.126
16									0.149

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164453
Alias:	NAS# 9970F
Replicates:	8
Mean:	0.489
SD:	0.067
Tr Mean:	0.489
Trans SD:	0.067

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.059
SS:	0.066
K:	8
b:	0.252
Alpha Level:	0.05
Calculated Value:	0.9589
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.056
Test Residual SD:	0.029
Ref. Residual Mean:	0.049
Ref. Residual SD:	0.047
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.3537
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	1.2382
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.58	0.58	0.5	0.5	0.091	0.031			-0.099
2	0.44	0.44	0.47	0.47	0.049	0.061			-0.071
3	0.54	0.54	0.46	0.46	0.051	0.071			-0.061
4	0.51	0.51	0.58	0.58	0.021	0.049			-0.059
5	0.39	0.39	0.68	0.68	0.099	0.149			-0.049
6	0.55	0.55	0.52	0.52	0.061	0.011			-0.031
7	0.43	0.43	0.53	0.53	0.059	0.001			-0.021
8	0.47	0.47	0.51	0.51	0.019	0.021			-0.019
9									-0.011
10									-0.001
11									0.021
12									0.049
13									0.051
14									0.061
15									0.091
16									0.149

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164454
Alias:	NAS# 9971F
Replicates:	8
Mean:	0.334
SD:	0.073
Tr Mean:	0.334
Trans SD:	0.073

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.056	Statistic:	Student's t
Residual SD:	0.062	Test Residual SD:	0.042	Balanced Design:	Yes
SS:	0.072	Ref. Residual Mean:	0.049	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.047		
b:	0.263	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9596	Calculated Value:	0.3105	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	5.4975
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.35	0.35	0.5	0.5	0.016	0.031			-0.124
2	0.31	0.31	0.47	0.47	0.024	0.061			-0.071
3	0.28	0.28	0.46	0.46	0.054	0.071			-0.061
4	0.45	0.45	0.58	0.58	0.116	0.049			-0.054
5	0.38	0.38	0.68	0.68	0.046	0.149			-0.031
6	0.31	0.31	0.52	0.52	0.024	0.011			-0.024
7	0.21	0.21	0.53	0.53	0.124	0.001			-0.024
8	0.38	0.38	0.51	0.51	0.046	0.021			-0.021
9									-0.011
10									-0.001
11									0.016
12									0.046
13									0.046
14									0.049
15									0.116
16									0.149

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164455
Alias:	NAS# 9972F
Replicates:	8
Mean:	0.321
SD:	0.043
Tr Mean:	0.321
Trans SD:	0.043

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.032	Statistic:	Student's t
Residual SD:	0.05	Test Residual SD:	0.027	Balanced Design:	Yes
SS:	0.048	Ref. Residual Mean:	0.049	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.047		
b:	0.208	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.8982	Calculated Value:	0.9309	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	7.1747
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.33	0.33	0.5	0.5	0.009	0.031			-0.071
2	0.32	0.32	0.47	0.47	0.001	0.061			-0.061
3	0.29	0.29	0.46	0.46	0.031	0.071			-0.061
4	0.36	0.36	0.58	0.58	0.039	0.049			-0.031
5	0.31	0.31	0.68	0.68	0.011	0.149			-0.031
6	0.26	0.26	0.52	0.52	0.061	0.011			-0.021
7	0.4	0.4	0.53	0.53	0.079	0.001			-0.021
8	0.3	0.3	0.51	0.51	0.021	0.021			-0.011
9									-0.011
10									-0.001
11									-0.001
12									0.009
13									0.039
14									0.049
15									0.079
16									0.149

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164456
Alias:	NAS# 9973F
Replicates:	8
Mean:	0.279
SD:	0.085
Tr Mean:	0.279
Trans SD:	0.085

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.064	Statistic:	Student's t
Residual SD:	0.067	Test Residual SD:	0.051	Balanced Design:	Yes
SS:	0.086	Ref. Residual Mean:	0.049	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.047		
b:	0.287	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9592	Calculated Value:	0.601	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	6.4517
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.3	0.3	0.5	0.5	0.021	0.031			-0.139
2	0.29	0.29	0.47	0.47	0.011	0.061			-0.079
3	0.32	0.32	0.46	0.46	0.041	0.071			-0.071
4	0.32	0.32	0.58	0.58	0.041	0.049			-0.061
5	0.2	0.2	0.68	0.68	0.079	0.149			-0.039
6	0.24	0.24	0.52	0.52	0.039	0.011			-0.031
7	0.42	0.42	0.53	0.53	0.141	0.001			-0.021
8	0.14	0.14	0.51	0.51	0.139	0.021			-0.011
9									-0.001
10									0.011
11									0.021
12									0.041
13									0.041
14									0.049
15									0.141
16									0.149

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164457
Alias:	NAS# 9974F
Replicates:	8
Mean:	0.348
SD:	0.036
Tr Mean:	0.348
Trans SD:	0.036

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.029	Statistic:	Student's t
Residual SD:	0.048	Test Residual SD:	0.017	Balanced Design:	Yes
SS:	0.044	Ref. Residual Mean:	0.049	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.047		
b:	0.198	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.8979	Calculated Value:	1.1336	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	6.5675
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.5	0.5	0.008	0.031			-0.071
2	0.3	0.3	0.47	0.47	0.048	0.061			-0.061
3	0.4	0.4	0.46	0.46	0.053	0.071			-0.048
4	0.31	0.31	0.58	0.58	0.038	0.049			-0.038
5	0.38	0.38	0.68	0.68	0.033	0.149			-0.031
6	0.34	0.34	0.52	0.52	0.008	0.011			-0.021
7	0.33	0.33	0.53	0.53	0.018	0.001			-0.018
8	0.38	0.38	0.51	0.51	0.033	0.021			-0.011
9									-0.008
10									-0.008
11									-0.001
12									0.033
13									0.033
14									0.049
15									0.053
16									0.149

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164459
Alias:	NAS# 9975F
Replicates:	8
Mean:	0.46
SD:	0.06
Tr Mean:	0.46
Trans SD:	0.06

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.05	Statistic:	Student's t
Residual SD:	0.056	Test Residual SD:	0.027	Balanced Design:	Yes
SS:	0.06	Ref. Residual Mean:	0.049	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.047		
b:	0.232	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.8977	Calculated Value:	0.0328	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	2.1788
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.56	0.56	0.5	0.5	0.1	0.031			-0.071
2	0.52	0.52	0.47	0.47	0.06	0.061			-0.07
3	0.45	0.45	0.46	0.46	0.01	0.071			-0.061
4	0.42	0.42	0.58	0.58	0.04	0.049			-0.04
5	0.42	0.42	0.68	0.68	0.04	0.149			-0.04
6	0.39	0.39	0.52	0.52	0.07	0.011			-0.04
7	0.42	0.42	0.53	0.53	0.04	0.001			-0.031
8	0.5	0.5	0.51	0.51	0.04	0.021			-0.021
9									-0.011
10									-0.01
11									-0.001
12									0.04
13									0.049
14									0.06
15									0.1
16									0.149

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164460
Alias:	NAS# 9976F
Replicates:	8
Mean:	0.515
SD:	0.103
Tr Mean:	0.515
Trans SD:	0.103

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.076
SS:	0.109
K:	8
b:	0.308
Alpha Level:	0.05
Calculated Value:	0.8683
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.081
Test Residual SD:	0.056
Ref. Residual Mean:	0.049
Ref. Residual SD:	0.047
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.2372
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	40
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.47	6	0.5	8	0.045	0.031	0.42		-0.095
2	0.42	1	0.47	6	0.095	0.061	0.44		-0.075
3	0.45	3	0.46	4	0.065	0.071	0.45		-0.071
4	0.47	6	0.58	13	0.045	0.049	0.46		-0.065
5	0.61	14	0.68	15	0.095	0.149	0.47		-0.061
6	0.54	12	0.52	10	0.025	0.011	0.47		-0.045
7	0.44	2	0.53	11	0.075	0.001	0.47		-0.045
8	0.72	16	0.51	9	0.205	0.021	0.5		-0.031
9							0.51		-0.021
10							0.52		-0.011
11							0.53		-0.001
12							0.54		0.025
13							0.58		0.049
14							0.61		0.095
15							0.68		0.149
16							0.72		0.205

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164461
Alias:	NAS# 9977F
Replicates:	8
Mean:	0.373
SD:	0.053
Tr Mean:	0.373
Trans SD:	0.053

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.038	Statistic:	Student's t
Residual SD:	0.054	Test Residual SD:	0.035	Balanced Design:	Yes
SS:	0.055	Ref. Residual Mean:	0.049	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.047		
b:	0.229	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9568	Calculated Value:	0.575	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	5.0823
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.35	0.35	0.5	0.5	0.023	0.031			-0.103
2	0.4	0.4	0.47	0.47	0.028	0.061			-0.071
3	0.27	0.27	0.46	0.46	0.103	0.071			-0.061
4	0.45	0.45	0.58	0.58	0.078	0.049			-0.031
5	0.41	0.41	0.68	0.68	0.038	0.149			-0.023
6	0.38	0.38	0.52	0.52	0.008	0.011			-0.023
7	0.37	0.37	0.53	0.53	0.003	0.001			-0.021
8	0.35	0.35	0.51	0.51	0.023	0.021			-0.011
9									-0.003
10									-0.001
11									0.008
12									0.028
13									0.038
14									0.049
15									0.078
16									0.149

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164468
Alias:	NAS# 9981F
Replicates:	8
Mean:	0.179
SD:	0.033
Tr Mean:	0.179
Trans SD:	0.033

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.047
SS:	0.043
K:	8
b:	0.193
Alpha Level:	0.05
Calculated Value:	0.8792
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.026
Test Residual SD:	0.018
Ref. Residual Mean:	0.049
Ref. Residual SD:	0.047
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.3059
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	64
Critical Value:	>= 49.0
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.15	2	0.5	11	0.029	0.031	0.15		-0.071
2	0.18	5	0.47	10	0.001	0.061	0.15		-0.061
3	0.24	8	0.46	9	0.061	0.071	0.15		-0.031
4	0.19	6	0.58	15	0.011	0.049	0.16		-0.029
5	0.21	7	0.68	16	0.031	0.149	0.18		-0.029
6	0.15	2	0.52	13	0.029	0.011	0.19		-0.029
7	0.16	4	0.53	14	0.019	0.001	0.21		-0.021
8	0.15	2	0.51	12	0.029	0.021	0.24		-0.019
9							0.46		-0.011
10							0.47		-0.001
11							0.5		0.001
12							0.51		0.011
13							0.52		0.031
14							0.53		0.049
15							0.58		0.061
16							0.68		0.149

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164469
Alias:	NAS# 9982F
Replicates:	8
Mean:	0.461
SD:	0.063
Tr Mean:	0.461
Trans SD:	0.063

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.058
SS:	0.063
K:	8
b:	0.24
Alpha Level:	0.05
Calculated Value:	0.9109
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.054
Test Residual SD:	0.027
Ref. Residual Mean:	0.049
Ref. Residual SD:	0.047
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.2295
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	2.0874
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.43	0.43	0.5	0.5	0.031	0.031			-0.071
2	0.54	0.54	0.47	0.47	0.079	0.061			-0.071
3	0.47	0.47	0.46	0.46	0.009	0.071			-0.061
4	0.55	0.55	0.58	0.58	0.089	0.049			-0.061
5	0.41	0.41	0.68	0.68	0.051	0.149			-0.051
6	0.4	0.4	0.52	0.52	0.061	0.011			-0.031
7	0.39	0.39	0.53	0.53	0.071	0.001			-0.031
8	0.5	0.5	0.51	0.51	0.039	0.021			-0.021
9									-0.011
10									-0.001
11									0.009
12									0.039
13									0.049
14									0.079
15									0.089
16									0.149

Project Name: P727-1 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164471
Alias:	NAS# 9984F
Replicates:	8
Mean:	0.64
SD:	0.101
Tr Mean:	0.64
Trans SD:	0.101

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.531
SD:	0.071
Tr Mean:	0.531
Trans SD:	0.071

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.065	Statistic:	Student's t
Residual SD:	0.075	Test Residual SD:	0.073	Balanced Design:	Yes
SS:	0.106	Ref. Residual Mean:	0.049	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.047		
b:	0.314	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9283	Calculated Value:	0.5089	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	-2.4986
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.6	0.6	0.5	0.5	0.04	0.031			-0.18
2	0.6	0.6	0.47	0.47	0.04	0.061			-0.071
3	0.68	0.68	0.46	0.46	0.04	0.071			-0.061
4	0.64	0.64	0.58	0.58	0	0.049			-0.04
5	0.68	0.68	0.68	0.68	0.04	0.149			-0.04
6	0.64	0.64	0.52	0.52	0	0.011			-0.031
7	0.46	0.46	0.53	0.53	0.18	0.001			-0.021
8	0.82	0.82	0.51	0.51	0.18	0.021			-0.011
9									-0.001
10									0
11									0
12									0.04
13									0.04
14									0.049
15									0.149
16									0.18

Water Quality Data

BKR	NAS SMPL	CLIENT DESCRIP	REPL	DAY	Overlying water TEMP	DO	COND	pH	NH3	HARD	ALK
17	9983F	05164470	8	0	22.1	6.4	350	7.6	0.4	111	130
23	9977F	05164461	8	0	22.1	6.3	320	7.4	0.5	103	90
25	9967F	05164450	8	0	22.0	6.7	340	7.2	0.4	120	80
28	9957F	05164437	8	0	22.1	8.1	290	7.1	<0.1	77	60
29	9975F	05164459	8	0	22.1	6.9	320	7.1	0.3	103	80
42	9956F	05164436	8	0	22.2	7.4	295	7.5	0.1	85	80
44	9959F	05164441	8	0	22.1	7.0	305	7.4	0.2	103	80
49	9971F	05164454	8	0	22.1	7.2	300	7.2	0.1	103	80
51	9984F	05164471	8	0	22.2	6.0	300	7.0	0.4	111	90
56	9973F	05164456	8	0	22.2	6.8	295	7.1	0.3	103	70
58	9958F	05164440	8	0	22.0	7.2	270	7.2	0.5	77	60
69	9989F	05164478	8	0	22.0	6.4	340	7.3	0.2	120	110
79	9952F	Control	8	0	22.1	6.5	330	7.2	0.5	68	60
82	9976F	05164460	8	0	22.3	6.2	325	7.1	0.3	120	70
101	9981F	05164468	8	0	22.2	7.9	270	7.3	0.1	77	60
115	9969F	05164452	8	0	22.2	7.8	290	7.3	0.1	86	70
119	9966F	05164439	8	0	22.2	7.4	275	7.2	0.2	86	60
126	9968F	05164451	8	0	22.1	7.3	290	7.4	0.1	86	70
127	9982F	05164469	8	0	22.0	5.9	330	7.4	0.3	120	110
129	9960F	05164442	8	0	22.1	6.2	270	7.0	0.5	86	70
131	9961F	05164443	8	0	22.1	7.0	280	7.1	0.1	86	60
136	9970F	05164453	8	0	22.0	7.0	280	7.1	0.2	86	70
142	9954F	05164434	8	0	22.2	6.9	275	7.0	0.3	86	60
150	9962F	05164449	8	0	22.0	6.6	280	7.1	0.9	94	80
191	0002G	05164496	8	0	22.1	5.6	330	7.3	0.5	120	110
194	9953F	05164433	8	0	22.1	6.8	280	7.5	0.3	94	80
195	9994F	05164486	8	0	22.3	6.3	275	7.2	0.3	86	70
206	9974F	05164457	8	0	22.2	7.1	285	7.2	0.3	86	80
224	9998F	05164489	8	0	22.3	6.4	265	7.2	0.3	86	70
235	9955F	05164435	8	0	22.1	6.9	290	7.1	0.2	86	80
240	9990F	05164476	8	0	22.1	6.4	340	7.2	0.1	128	90
252	9972F	05164455	8	0	22.0	7.2	275	7.4	0.1	86	60
17	9983F	05164470	8	1	23.4	5.8		7.6			
23	9977F	05164461	8	1	23.4	5.4		7.4			
25	9967F	05164450	8	1	23.6	5.6		7.1			
28	9957F	05164437	8	1	23.4	6.8		7.2			
29	9975F	05164459	8	1	23.5	6.3		7.1			
42	9956F	05164436	8	1	23.5	6.9		7.3			
44	9959F	05164441	8	1	23.2	6.4		7.3			
49	9971F	05164454	8	1	23.5	6.8		7.2			
51	9984F	05164471	8	1	23.3	6.4		7.2			
56	9973F	05164456	8	1	23.3	6.4		7.4			
58	9958F	05164440	8	1	23.4	6.4		7.1			
69	9989F	05164478	8	1	23.4	6.2		7.3			
79	9952F	Control	8	1	23.5	6.2		7.1			
82	9976F	05164460	8	1	23.4	6.6		7.1			
101	9981F	05164468	8	1	23.3	6.9		7.2			
115	9969F	05164452	8	1	23.7	6.8		7.3			
119	9966F	05164439	8	1	23.3	6.8		7.2			
126	9968F	05164451	8	1	23.2	6.6		7.3			
127	9982F	05164469	8	1	23.1	5.6		7.0			
129	9960F	05164442	8	1	23.5	5.8		7.0			
131	9961F	05164443	8	1	23.3	6.5		7.1			

Data Entry verified against Laboratory Bench Sheets 9-29-05 JRF

136	9970F	05164453	8	1	23.2	6.6		7.1			
142	9954F	05164434	8	1	23.2	6.6		7.1			
150	9962F	05164449	8	1	23.7	6.0		6.9			
191	0002G	05164496	8	1	23.4	3.2		7.0			
194	9953F	05164433	8	1	23.3	6.4		7.1			
195	9994F	05164486	8	1	23.5	5.6		6.9			
206	9974F	05164457	8	1	23.5	6.3		7.3			
224	9998F	05164489	8	1	23.5	6.0		7.0			
235	9955F	05164435	8	1	23.6	6.2		7.1			
240	9990F	05164476	8	1	23.7	6.2		7.3			
252	9972F	05164455	8	1	23.3	6.6		7.2			
17	9983F	05164470	8	2	22.2						
23	9977F	05164461	8	2	22.3						
25	9967F	05164450	8	2	22.5						
28	9957F	05164437	8	2	22.3						
29	9975F	05164459	8	2	22.3						
42	9956F	05164436	8	2	22.2						
44	9959F	05164441	8	2	22.3						
49	9971F	05164454	8	2	22.3						
51	9984F	05164471	8	2	22.3						
56	9973F	05164456	8	2	22.3						
58	9958F	05164440	8	2	22.3						
69	9989F	05164478	8	2	22.3						
79	9952F	Control	8	2	22.4						
82	9976F	05164460	8	2	22.3						
101	9981F	05164468	8	2	22.3						
115	9969F	05164452	8	2	22.6						
119	9966F	05164439	8	2	22.3						
126	9968F	05164451	8	2	22.2						
127	9982F	05164469	8	2	22.1						
129	9960F	05164442	8	2	22.3						
131	9961F	05164443	8	2	22.2						
136	9970F	05164453	8	2	22.2						
142	9954F	05164434	8	2	22.2						
150	9962F	05164449	8	2	22.7						
191	0002G	05164496	8	2	22.3						
194	9953F	05164433	8	2	22.3						
195	9994F	05164486	8	2	22.5						
206	9974F	05164457	8	2	22.3						
224	9998F	05164489	8	2	22.5						
235	9955F	05164435	8	2	22.5						
240	9990F	05164476	8	2	22.4						
252	9972F	05164455	8	2	22.4						
17	9983F	05164470	8	3	22.1						
23	9977F	05164461	8	3	22.3						
25	9967F	05164450	8	3	22.5						
28	9957F	05164437	8	3	22.3						
29	9975F	05164459	8	3	22.3						
42	9956F	05164436	8	3	22.2						
44	9959F	05164441	8	3	22.3						
49	9971F	05164454	8	3	22.3						
51	9984F	05164471	8	3	22.3						
56	9973F	05164456	8	3	22.3						
58	9958F	05164440	8	3	22.3						
69	9989F	05164478	8	3	22.3						
79	9952F	Control	8	3	22.4						
82	9976F	05164460	8	3	22.3						
101	9981F	05164468	8	3	22.3						

115	9969F	05164452	8	3	22.5						
119	9966F	05164439	8	3	22.2						
126	9968F	05164451	8	3	22.2						
127	9982F	05164469	8	3	22.1						
129	9960F	05164442	8	3	22.3						
131	9961F	05164443	8	3	22.2						
136	9970F	05164453	8	3	22.2						
142	9954F	05164434	8	3	22.2						
150	9962F	05164449	8	3	22.6						
191	0002G	05164496	8	3	22.3						
194	9953F	05164433	8	3	22.3						
195	9994F	05164486	8	3	22.5						
206	9974F	05164457	8	3	22.4						
224	9998F	05164489	8	3	22.5						
235	9955F	05164435	8	3	22.4						
240	9990F	05164476	8	3	22.4						
252	9972F	05164455	8	3	22.4						
17	9983F	05164470	8	4	23.2	6.6		7.7			
23	9977F	05164461	8	4	23.4	6.7		7.4			
25	9967F	05164450	8	4	23.8	6.7		7.3			
28	9957F	05164437	8	4	23.5	7.2		7.3			
29	9975F	05164459	8	4	23.5	7.0		7.3			
42	9956F	05164436	8	4	23.4	7.1		7.3			
44	9959F	05164441	8	4	23.5	7.2		7.3			
49	9971F	05164454	8	4	23.5	7.2		7.3			
51	9984F	05164471	8	4	23.6	7.3		7.3			
56	9973F	05164456	8	4	23.6	7.2		7.3			
58	9958F	05164440	8	4	23.5	7.1		7.2			
69	9989F	05164478	8	4	23.4	6.8		7.4			
79	9952F	Control	8	4	23.6	7.0		7.3			
82	9976F	05164460	8	4	23.5	7.1		7.2			
101	9981F	05164468	8	4	23.5	7.4		7.2			
115	9969F	05164452	8	4	23.9	7.2		7.2			
119	9966F	05164439	8	4	23.4	7.2		7.2			
126	9968F	05164451	8	4	23.5	7.3		7.3			
127	9982F	05164469	8	4	23.3	6.4		7.1			
129	9960F	05164442	8	4	23.5	6.7		7.1			
131	9961F	05164443	8	4	23.5	7.1		7.2			
136	9970F	05164453	8	4	23.5	7.1		7.1			
142	9954F	05164434	8	4	23.4	7.1		7.1			
150	9962F	05164449	8	4	23.9	6.8		7.0			
191	0002G	05164496	8	4	23.6	6.3		7.3			
194	9953F	05164433	8	4	23.4	6.8		7.1			
195	9994F	05164486	8	4	23.7	6.4		7.0			
206	9974F	05164457	8	4	23.6	7.0		7.3			
224	9998F	05164489	8	4	23.6	7.0		7.1			
235	9955F	05164435	8	4	23.7	6.7		7.1			
240	9990F	05164476	8	4	23.6	6.9		7.3			
252	9972F	05164455	8	4	23.6	7.3		7.2			
17	9983F	05164470	8	5	22.7						
23	9977F	05164461	8	5	22.8						
25	9967F	05164450	8	5	23.1						
28	9957F	05164437	8	5	22.9						
29	9975F	05164459	8	5	22.9						
42	9956F	05164436	8	5	22.8						
44	9959F	05164441	8	5	23.0						
49	9971F	05164454	8	5	23.0						
51	9984F	05164471	8	5	23.0						

56	9973F	05164456	8	5	23.0						
58	9958F	05164440	8	5	23.0						
69	9989F	05164478	8	5	22.9						
79	9952F	Control	8	5	23.1						
82	9976F	05164460	8	5	23.0						
101	9981F	05164468	8	5	23.0						
115	9969F	05164452	8	5	23.2						
119	9966F	05164439	8	5	23.0						
126	9968F	05164451	8	5	23.0						
127	9982F	05164469	8	5	22.9						
129	9960F	05164442	8	5	23.0						
131	9961F	05164443	8	5	23.0						
136	9970F	05164453	8	5	23.0						
142	9954F	05164434	8	5	22.9						
150	9962F	05164449	8	5	23.3						
191	0002G	05164496	8	5	23.1						
194	9953F	05164433	8	5	23.0						
195	9994F	05164486	8	5	23.1						
206	9974F	05164457	8	5	23.1						
224	9998F	05164489	8	5	23.1						
235	9955F	05164435	8	5	23.1						
240	9990F	05164476	8	5	23.0						
252	9972F	05164455	8	5	23.0						
17	9983F	05164470	8	6	23.1	6.7	300	7.4			
23	9977F	05164461	8	6	23.2	6.7	285	7.0			
25	9967F	05164450	8	6	23.4	7.0	285	7.0			
28	9957F	05164437	8	6	23.2	7.4	275	7.0			
29	9975F	05164459	8	6	23.3	7.2	285	6.9			
42	9956F	05164436	8	6	23.1	7.2	275	7.0			
44	9959F	05164441	8	6	23.3	7.3	275	7.0			
49	9971F	05164454	8	6	23.2	7.5	275	7.0			
51	9984F	05164471	8	6	23.2	7.3	285	7.0			
56	9973F	05164456	8	6	23.2	7.2	285	7.1			
58	9958F	05164440	8	6	23.2	7.3	275	7.0			
69	9989F	05164478	8	6	23.2	6.9	290	7.3			
79	9952F	Control	8	6	23.3	7.0	280	7.1			
82	9976F	05164460	8	6	23.2	7.2	285	7.1			
101	9981F	05164468	8	6	23.2	7.4	275	7.1			
115	9969F	05164452	8	6	23.4	7.2	280	7.1			
119	9966F	05164439	8	6	23.1	7.3	270	7.0			
126	9968F	05164451	8	6	23.1	7.3	275	7.0			
127	9982F	05164469	8	6	23.1	6.3	280	6.9			
129	9960F	05164442	8	6	23.2	6.9	270	6.9			
131	9961F	05164443	8	6	23.3	7.3	275	6.9			
136	9970F	05164453	8	6	23.3	7.2	280	7.0			
142	9954F	05164434	8	6	23.2	7.2	275	7.0			
150	9962F	05164449	8	6	23.5	6.6	275	6.9			
191	0002G	05164496	8	6	23.3	6.0	295	7.1			
194	9953F	05164433	8	6	23.2	7.0	275	7.0			
195	9994F	05164486	8	6	23.3	6.3	280	6.9			
206	9974F	05164457	8	6	23.3	7.1	280	7.1			
224	9998F	05164489	8	6	23.3	6.9	270	7.0			
235	9955F	05164435	8	6	23.4	6.9	280	6.9			
240	9990F	05164476	8	6	23.3	6.9	290	7.1			
252	9972F	05164455	8	6	23.3	7.1	275	7.1			
17	9983F	05164470	8	7	22.9						
23	9977F	05164461	8	7	23.1						
25	9967F	05164450	8	7	23.3						

28	9957F	05164437	8	7	23.2						
29	9975F	05164459	8	7	23.2						
42	9956F	05164436	8	7	23.1						
44	9959F	05164441	8	7	23.1						
49	9971F	05164454	8	7	23.2						
51	9984F	05164471	8	7	23.2						
56	9973F	05164456	8	7	23.2						
58	9958F	05164440	8	7	23.2						
69	9989F	05164478	8	7	23.1						
79	9952F	Control	8	7	23.2						
82	9976F	05164460	8	7	23.2						
101	9981F	05164468	8	7	23.2						
115	9969F	05164452	8	7	23.2						
119	9966F	05164439	8	7	23.1						
126	9968F	05164451	8	7	23.2						
127	9982F	05164469	8	7	23.1						
129	9960F	05164442	8	7	23.1						
131	9961F	05164443	8	7	23.2						
136	9970F	05164453	8	7	23.2						
142	9954F	05164434	8	7	23.2						
150	9962F	05164449	8	7	23.3						
191	0002G	05164496	8	7	23.2						
194	9953F	05164433	8	7	23.2						
195	9994F	05164486	8	7	23.2						
206	9974F	05164457	8	7	23.2						
224	9998F	05164489	8	7	23.3						
235	9955F	05164435	8	7	23.3						
240	9990F	05164476	8	7	23.2						
252	9972F	05164455	8	7	23.3						
17	9983F	05164470	8	8	23.2	6.1		7.3			
23	9977F	05164461	8	8	23.3	6.0		7.0			
25	9967F	05164450	8	8	23.6	6.4		6.9			
28	9957F	05164437	8	8	23.4	6.8		6.9			
29	9975F	05164459	8	8	23.4	6.3		6.9			
42	9956F	05164436	8	8	23.3	6.3		6.9			
44	9959F	05164441	8	8	23.4	6.4		6.9			
49	9971F	05164454	8	8	23.4	6.6		6.9			
51	9984F	05164471	8	8	23.4	6.2		6.9			
56	9973F	05164456	8	8	23.4	6.2		7.0			
58	9958F	05164440	8	8	23.3	6.3		6.9			
69	9989F	05164478	8	8	23.3	5.7		7.3			
79	9952F	Control	8	8	23.4	6.1		7.0			
82	9976F	05164460	8	8	23.4	6.2		6.9			
101	9981F	05164468	8	8	23.4	6.5		6.9			
115	9969F	05164452	8	8	23.5	6.6		7.0			
119	9966F	05164439	8	8	23.3	6.4		6.9			
126	9968F	05164451	8	8	23.3	6.4		7.0			
127	9982F	05164469	8	8	23.2	3.4		6.8			
129	9960F	05164442	8	8	23.3	5.9		6.8			
131	9961F	05164443	8	8	23.3	6.1		6.9			
136	9970F	05164453	8	8	23.3	6.1		6.9			
142	9954F	05164434	8	8	23.2	6.2		6.8			
150	9962F	05164449	8	8	23.5	4.9		6.7			
191	0002G	05164496	8	8	23.2	4.4		7.1			
194	9953F	05164433	8	8	23.2	6.1		6.9			
195	9994F	05164486	8	8	23.4	5.5		6.8			
206	9974F	05164457	8	8	23.3	6.4		7.0			
224	9998F	05164489	8	8	23.3	5.6		6.9			

235	9955F	05164435	8	8	23.4	6.2		6.9			
240	9990F	05164476	8	8	23.3	6.1		7.0			
252	9972F	05164455	8	8	23.4	6.3		6.9			
17	9983F	05164470	8	9	23.0						
23	9977F	05164461	8	9	23.0						
25	9967F	05164450	8	9	23.2						
28	9957F	05164437	8	9	23.0						
29	9975F	05164459	8	9	23.0						
42	9956F	05164436	8	9	23.0						
44	9959F	05164441	8	9	22.9						
49	9971F	05164454	8	9	23.0						
51	9984F	05164471	8	9	23.0						
56	9973F	05164456	8	9	23.0						
58	9958F	05164440	8	9	23.0						
69	9989F	05164478	8	9	22.9						
79	9952F	Control	8	9	23.1						
82	9976F	05164460	8	9	23.0						
101	9981F	05164468	8	9	23.0						
115	9969F	05164452	8	9	23.1						
119	9966F	05164439	8	9	22.9						
126	9968F	05164451	8	9	22.9						
127	9982F	05164469	8	9	23.0						
129	9960F	05164442	8	9	22.9						
131	9961F	05164443	8	9	23.0						
136	9970F	05164453	8	9	23.0						
142	9954F	05164434	8	9	23.0						
150	9962F	05164449	8	9	23.1						
191	0002G	05164496	8	9	23.0						
194	9953F	05164433	8	9	23.0						
195	9994F	05164486	8	9	23.1						
206	9974F	05164457	8	9	23.0						
224	9998F	05164489	8	9	23.0						
235	9955F	05164435	8	9	23.1						
240	9990F	05164476	8	9	23.1						
252	9972F	05164455	8	9	23.1						
17	9983F	05164470	8	10	22.8						
23	9977F	05164461	8	10	22.9						
25	9967F	05164450	8	10	23.1						
28	9957F	05164437	8	10	22.9						
29	9975F	05164459	8	10	22.9						
42	9956F	05164436	8	10	22.9						
44	9959F	05164441	8	10	23.0						
49	9971F	05164454	8	10	23.0						
51	9984F	05164471	8	10	23.0						
56	9973F	05164456	8	10	23.0						
58	9958F	05164440	8	10	22.9						
69	9989F	05164478	8	10	23.0						
79	9952F	Control	8	10	23.1						
82	9976F	05164460	8	10	23.0						
101	9981F	05164468	8	10	23.0						
115	9969F	05164452	8	10	23.1						
119	9966F	05164439	8	10	22.9						
126	9968F	05164451	8	10	23.0						
127	9982F	05164469	8	10	22.9						
129	9960F	05164442	8	10	23.0						
131	9961F	05164443	8	10	23.0						
136	9970F	05164453	8	10	23.0						
142	9954F	05164434	8	10	22.9						

150	9962F	05164449	8	10	23.2						
191	0002G	05164496	8	10	23.0						
194	9953F	05164433	8	10	23.0						
195	9994F	05164486	8	10	23.1						
206	9974F	05164457	8	10	23.0						
224	9998F	05164489	8	10	23.1						
235	9955F	05164435	8	10	23.1						
240	9990F	05164476	8	10	23.1						
252	9972F	05164455	8	10	23.2						
17	9983F	05164470	8	11	22.4	6.5		7.4			
23	9977F	05164461	8	11	22.7	6.5		7.1			
25	9967F	05164450	8	11	22.9	6.8		7.0			
28	9957F	05164437	8	11	22.7	7.1		7.0			
29	9975F	05164459	8	11	22.8	7.0		7.0			
42	9956F	05164436	8	11	22.7	7.0		7.0			
44	9959F	05164441	8	11	22.8	7.0		7.0			
49	9971F	05164454	8	11	22.8	7.0		7.0			
51	9984F	05164471	8	11	22.8	6.7		7.0			
56	9973F	05164456	8	11	22.8	7.0		7.1			
58	9958F	05164440	8	11	22.8	7.1		7.0			
69	9989F	05164478	8	11	22.7	6.3		7.4			
79	9952F	Control	8	11	22.8	6.5		7.2			
82	9976F	05164460	8	11	22.8	6.6		7.1			
101	9981F	05164468	8	11	22.8	6.9		7.0			
115	9969F	05164452	8	11	22.9	6.9		7.1			
119	9966F	05164439	8	11	22.7	6.9		7.0			
126	9968F	05164451	8	11	22.8	7.1		7.0			
127	9982F	05164469	8	11	22.7	5.3		7.0			
129	9960F	05164442	8	11	22.8	6.7		7.0			
131	9961F	05164443	8	11	22.8	7.0		6.9			
136	9970F	05164453	8	11	22.8	7.0		7.0			
142	9954F	05164434	8	11	22.8	7.0		7.0			
150	9962F	05164449	8	11	23.0	6.4		6.9			
191	0002G	05164496	8	11	22.8	5.5		7.2			
194	9953F	05164433	8	11	22.7	6.5		7.1			
195	9994F	05164486	8	11	22.9	5.8		6.9			
206	9974F	05164457	8	11	22.9	7.0		7.0			
224	9998F	05164489	8	11	22.8	6.8		7.1			
235	9955F	05164435	8	11	22.9	6.9		7.1			
240	9990F	05164476	8	11	22.8	6.7		7.2			
252	9972F	05164455	8	11	22.8	7.1		7.1			
17	9983F	05164470	8	12	22.7						
23	9977F	05164461	8	12	22.7						
25	9967F	05164450	8	12	23.0						
28	9957F	05164437	8	12	22.8						
29	9975F	05164459	8	12	22.8						
42	9956F	05164436	8	12	22.7						
44	9959F	05164441	8	12	22.7						
49	9971F	05164454	8	12	22.8						
51	9984F	05164471	8	12	22.8						
56	9973F	05164456	8	12	22.8						
58	9958F	05164440	8	12	22.7						
69	9989F	05164478	8	12	22.7						
79	9952F	Control	8	12	22.8						
82	9976F	05164460	8	12	22.8						
101	9981F	05164468	8	12	22.8						
115	9969F	05164452	8	12	22.9						
119	9966F	05164439	8	12	22.7						

126	9968F	05164451	8	12	22.7						
127	9982F	05164469	8	12	22.7						
129	9960F	05164442	8	12	22.7						
131	9961F	05164443	8	12	22.8						
136	9970F	05164453	8	12	22.8						
142	9954F	05164434	8	12	22.7						
150	9962F	05164449	8	12	22.9						
191	0002G	05164496	8	12	22.8						
194	9953F	05164433	8	12	22.7						
195	9994F	05164486	8	12	22.8						
206	9974F	05164457	8	12	22.8						
224	9998F	05164489	8	12	22.8						
235	9955F	05164435	8	12	22.9						
240	9990F	05164476	8	12	22.8						
252	9972F	05164455	8	12	22.8						
17	9983F	05164470	8	13	22.8	5.6	310	7.4			
23	9977F	05164461	8	13	22.9	5.5	290	7.0			
25	9967F	05164450	8	13	23.1	5.8	290	6.9			
28	9957F	05164437	8	13	22.9	6.4	285	7.0			
29	9975F	05164459	8	13	22.9	5.9	290	6.9			
42	9956F	05164436	8	13	22.8	6.1	285	6.9			
44	9959F	05164441	8	13	22.9	6.2	285	7.0			
49	9971F	05164454	8	13	23.0	6.3	285	7.0			
51	9984F	05164471	8	13	22.9	5.8	290	7.0			
56	9973F	05164456	8	13	22.9	6.0	290	7.1			
58	9958F	05164440	8	13	22.9	6.3	285	7.0			
69	9989F	05164478	8	13	22.9	4.5	310	7.6			
79	9952F	Control	8	13	23.0	5.6	290	7.1			
82	9976F	05164460	8	13	22.9	5.9	290	7.0			
101	9981F	05164468	8	13	22.9	6.2	285	7.0			
115	9969F	05164452	8	13	23.1	6.1	290	7.0			
119	9966F	05164439	8	13	22.9	6.1	285	7.0			
126	9968F	05164451	8	13	23.0	6.2	290	7.0			
127	9982F	05164469	8	13	22.8	3.7	290	6.8			
129	9960F	05164442	8	13	22.9	5.8	285	6.9			
131	9961F	05164443	8	13	22.9	6.2	285	7.0			
136	9970F	05164453	8	13	22.9	6.2	295	7.0			
142	9954F	05164434	8	13	22.9	6.2	285	7.0			
150	9962F	05164449	8	13	23.1	5.2	285	6.8			
191	0002G	05164496	8	13	22.8	4.1	315	7.5			
194	9953F	05164433	8	13	22.8	5.4	285	7.0			
195	9994F	05164486	8	13	22.9	4.7	290	6.9			
206	9974F	05164457	8	13	22.9	6.0	290	7.0			
224	9998F	05164489	8	13	22.9	5.8	290	7.1			
235	9955F	05164435	8	13	22.9	5.9	290	7.0			
240	9990F	05164476	8	13	22.9	5.4	300	7.4			
252	9972F	05164455	8	13	22.9	6.2	285	7.1			
17	9983F	05164470	8	14	22.6						
23	9977F	05164461	8	14	22.7						
25	9967F	05164450	8	14	22.9						
28	9957F	05164437	8	14	22.8						
29	9975F	05164459	8	14	22.8						
42	9956F	05164436	8	14	22.8						
44	9959F	05164441	8	14	22.8						
49	9971F	05164454	8	14	22.9						
51	9984F	05164471	8	14	22.9						
56	9973F	05164456	8	14	22.9						
58	9958F	05164440	8	14	22.8						

69	9989F	05164478	8	14	22.8						
79	9952F	Control	8	14	22.9						
82	9976F	05164460	8	14	22.9						
101	9981F	05164468	8	14	22.9						
115	9969F	05164452	8	14	23.0						
119	9966F	05164439	8	14	22.8						
126	9968F	05164451	8	14	22.9						
127	9982F	05164469	8	14	22.7						
129	9960F	05164442	8	14	22.9						
131	9961F	05164443	8	14	22.9						
136	9970F	05164453	8	14	22.9						
142	9954F	05164434	8	14	22.8						
150	9962F	05164449	8	14	23.1						
191	0002G	05164496	8	14	22.9						
194	9953F	05164433	8	14	22.8						
195	9994F	05164486	8	14	23.0						
206	9974F	05164457	8	14	22.9						
224	9998F	05164489	8	14	22.9						
235	9955F	05164435	8	14	23.0						
240	9990F	05164476	8	14	23.0						
252	9972F	05164455	8	14	22.9						
17	9983F	05164470	8	15	22.7	7.0		7.2			
23	9977F	05164461	8	15	22.8	6.8		7.0			
25	9967F	05164450	8	15	22.9	7.0		6.9			
28	9957F	05164437	8	15	22.8	7.2		7.0			
29	9975F	05164459	8	15	22.8	6.8		6.9			
42	9956F	05164436	8	15	22.8	6.9		6.9			
44	9959F	05164441	8	15	22.8	7.2		6.9			
49	9971F	05164454	8	15	22.9	7.2		7.0			
51	9984F	05164471	8	15	22.9	6.7		6.9			
56	9973F	05164456	8	15	22.9	7.0		7.0			
58	9958F	05164440	8	15	22.8	7.2		6.9			
69	9989F	05164478	8	15	22.8	6.8		7.4			
79	9952F	Control	8	15	22.9	6.5		7.0			
82	9976F	05164460	8	15	22.8	6.6		7.0			
101	9981F	05164468	8	15	22.8	7.1		7.0			
115	9969F	05164452	8	15	22.8	6.9		6.9			
119	9966F	05164439	8	15	22.8	6.9		7.0			
126	9968F	05164451	8	15	22.8	7.0		7.0			
127	9982F	05164469	8	15	22.7	4.9		7.8			
129	9960F	05164442	8	15	22.9	7.1		7.0			
131	9961F	05164443	8	15	22.8	6.7		6.9			
136	9970F	05164453	8	15	22.8	6.8		6.9			
142	9954F	05164434	8	15	22.8	6.9		7.0			
150	9962F	05164449	8	15	23.0	6.9		6.9			
191	0002G	05164496	8	15	22.9	5.4		7.3			
194	9953F	05164433	8	15	22.7	6.6		6.9			
195	9994F	05164486	8	15	22.9	5.9		6.8			
206	9974F	05164457	8	15	22.9	6.6		7.0			
224	9998F	05164489	8	15	22.9	6.7		7.0			
235	9955F	05164435	8	15	22.9	6.8		7.0			
240	9990F	05164476	8	15	22.9	6.8		7.4			
252	9972F	05164455	8	15	22.9	7.0		7.0			
17	9983F	05164470	8	16	22.9						
23	9977F	05164461	8	16	23.0						
25	9967F	05164450	8	16	23.1						
28	9957F	05164437	8	16	23.0						
29	9975F	05164459	8	16	23.0						

42	9956F	05164436	8	16	22.9
44	9959F	05164441	8	16	23.0
49	9971F	05164454	8	16	23.0
51	9984F	05164471	8	16	23.0
56	9973F	05164456	8	16	23.0
58	9958F	05164440	8	16	23.0
69	9989F	05164478	8	16	23.0
79	9952F	Control	8	16	23.1
82	9976F	05164460	8	16	23.0
101	9981F	05164468	8	16	23.0
115	9969F	05164452	8	16	23.1
119	9966F	05164439	8	16	22.9
126	9968F	05164451	8	16	23.0
127	9982F	05164469	8	16	22.9
129	9960F	05164442	8	16	23.0
131	9961F	05164443	8	16	23.0
136	9970F	05164453	8	16	23.0
142	9954F	05164434	8	16	22.9
150	9962F	05164449	8	16	23.2
191	0002G	05164496	8	16	23.0
194	9953F	05164433	8	16	22.9
195	9994F	05164486	8	16	23.1
206	9974F	05164457	8	16	23.0
224	9998F	05164489	8	16	23.0
235	9955F	05164435	8	16	23.0
240	9990F	05164476	8	16	23.0
252	9972F	05164455	8	16	23.1
17	9983F	05164470	8	17	23.2
23	9977F	05164461	8	17	23.3
25	9967F	05164450	8	17	23.4
28	9957F	05164437	8	17	23.3
29	9975F	05164459	8	17	23.3
42	9956F	05164436	8	17	23.3
44	9959F	05164441	8	17	23.3
49	9971F	05164454	8	17	23.3
51	9984F	05164471	8	17	23.3
56	9973F	05164456	8	17	23.3
58	9958F	05164440	8	17	23.3
69	9989F	05164478	8	17	23.3
79	9952F	Control	8	17	23.3
82	9976F	05164460	8	17	23.3
101	9981F	05164468	8	17	23.3
115	9969F	05164452	8	17	23.3
119	9966F	05164439	8	17	23.2
126	9968F	05164451	8	17	23.2
127	9982F	05164469	8	17	23.2
129	9960F	05164442	8	17	23.2
131	9961F	05164443	8	17	23.2
136	9970F	05164453	8	17	23.2
142	9954F	05164434	8	17	23.2
150	9962F	05164449	8	17	23.3
191	0002G	05164496	8	17	23.3
194	9953F	05164433	8	17	23.3
195	9994F	05164486	8	17	23.3
206	9974F	05164457	8	17	23.3
224	9998F	05164489	8	17	23.3
235	9955F	05164435	8	17	23.3
240	9990F	05164476	8	17	23.3

252	9972F	05164455	8	17	23.3			
17	9983F	05164470	8	18	22.9	6.4	7.0	
23	9977F	05164461	8	18	23.0	6.5	6.7	
25	9967F	05164450	8	18	23.1	6.6	6.8	
28	9957F	05164437	8	18	23.1	7.0	6.7	
29	9975F	05164459	8	18	23.1	6.7	6.8	
42	9956F	05164436	8	18	23.0	6.7	6.8	
44	9959F	05164441	8	18	23.1	6.9	6.8	
49	9971F	05164454	8	18	23.1	6.9	6.8	
51	9984F	05164471	8	18	23.1	6.4	6.8	
56	9973F	05164456	8	18	23.1	6.8	6.9	
58	9958F	05164440	8	18	23.1	6.9	6.8	
69	9989F	05164478	8	18	23.1	6.3	7.2	
79	9952F	Control	8	18	23.1	6.5	6.9	
82	9976F	05164460	8	18	23.1	6.5	6.8	
101	9981F	05164468	8	18	23.1	6.9	6.8	
115	9969F	05164452	8	18	23.2	7.0	6.8	
119	9966F	05164439	8	18	23.0	6.8	6.8	
126	9968F	05164451	8	18	23.1	6.8	6.8	
127	9982F	05164469	8	18	23.1	4.4	6.7	
129	9960F	05164442	8	18	23.1	6.5	6.8	
131	9961F	05164443	8	18	23.1	6.7	6.8	
136	9970F	05164453	8	18	23.1	6.7	6.9	
142	9954F	05164434	8	18	23.1	6.6	6.8	
150	9962F	05164449	8	18	23.2	6.3	6.7	
191	0002G	05164496	8	18	23.1	5.3	7.0	
194	9953F	05164433	8	18	23.0	6.4	6.8	
195	9994F	05164486	8	18	23.2	5.3	6.6	
206	9974F	05164457	8	18	23.1	6.5	6.9	
224	9998F	05164489	8	18	23.0	6.4	6.9	
235	9955F	05164435	8	18	23.0	6.8	6.9	
240	9990F	05164476	8	18	23.0	6.5	7.0	
252	9972F	05164455	8	18	23.1	6.8	6.9	
17	9983F	05164470	8	19	22.8			
23	9977F	05164461	8	19	22.8			
25	9967F	05164450	8	19	22.9			
28	9957F	05164437	8	19	22.8			
29	9975F	05164459	8	19	22.9			
42	9956F	05164436	8	19	22.8			
44	9959F	05164441	8	19	22.9			
49	9971F	05164454	8	19	22.9			
51	9984F	05164471	8	19	22.9			
56	9973F	05164456	8	19	22.9			
58	9958F	05164440	8	19	22.8			
69	9989F	05164478	8	19	22.8			
79	9952F	Control	8	19	22.8			
82	9976F	05164460	8	19	22.8			
101	9981F	05164468	8	19	22.9			
115	9969F	05164452	8	19	23.0			
119	9966F	05164439	8	19	22.8			
126	9968F	05164451	8	19	22.8			
127	9982F	05164469	8	19	22.8			
129	9960F	05164442	8	19	22.8			
131	9961F	05164443	8	19	22.9			
136	9970F	05164453	8	19	22.9			
142	9954F	05164434	8	19	22.9			
150	9962F	05164449	8	19	23.0			
191	0002G	05164496	8	19	22.9			

194	9953F	05164433	8	19	22.8						
195	9994F	05164486	8	19	22.9						
206	9974F	05164457	8	19	22.9						
224	9998F	05164489	8	19	22.9						
235	9955F	05164435	8	19	22.9						
240	9990F	05164476	8	19	22.9						
252	9972F	05164455	8	19	22.9						
17	9983F	05164470	8	20	22.7	7.1	310	7.4			
23	9977F	05164461	8	20	22.8	6.8	295	6.9			
25	9967F	05164450	8	20	23.0	6.8	295	7.0			
28	9957F	05164437	8	20	23.0	7.3	290	6.9			
29	9975F	05164459	8	20	22.8	6.6	300	6.9			
42	9956F	05164436	8	20	22.8	6.9	290	7.0			
44	9959F	05164441	8	20	22.8	7.1	290	7.0			
49	9971F	05164454	8	20	22.8	7.1	290	7.0			
51	9984F	05164471	8	20	22.9	7.0	295	7.0			
56	9973F	05164456	8	20	22.9	7.1	295	7.1			
58	9958F	05164440	8	20	22.8	7.2	290	7.0			
69	9989F	05164478	8	20	22.8	6.7	290	7.4			
79	9952F	Control	8	20	22.9	6.7	290	7.1			
82	9976F	05164460	8	20	22.8	6.5	290	7.0			
101	9981F	05164468	8	20	22.8	7.0	290	6.9			
115	9969F	05164452	8	20	23.0	7.1	295	7.0			
119	9966F	05164439	8	20	22.7	7.0	285	6.9			
126	9968F	05164451	8	20	22.8	7.1	290	7.0			
127	9982F	05164469	8	20	22.7	4.7	290	6.8			
129	9960F	05164442	8	20	22.8	6.6	290	7.0			
131	9961F	05164443	8	20	22.8	6.9	290	6.9			
136	9970F	05164453	8	20	22.9	6.9	295	7.0			
142	9954F	05164434	8	20	22.8	7.0	290	6.9			
150	9962F	05164449	8	20	23.0	6.7	290	6.9			
191	0002G	05164496	8	20	22.9	5.8	310	7.1			
194	9953F	05164433	8	20	22.8	7.0	290	7.0			
195	9994F	05164486	8	20	22.9	6.2	290	6.9			
206	9974F	05164457	8	20	22.9	7.0	295	7.1			
224	9998F	05164489	8	20	22.9	6.8	290	7.0			
235	9955F	05164435	8	20	22.9	7.0	295	7.0			
240	9990F	05164476	8	20	22.8	6.9	300	7.1			
252	9972F	05164455	8	20	22.9	7.1	290	7.0			
17	9983F	05164470	8	21	22.9						
23	9977F	05164461	8	21	22.9						
25	9967F	05164450	8	21	23.1						
28	9957F	05164437	8	21	23.0						
29	9975F	05164459	8	21	23.0						
42	9956F	05164436	8	21	22.9						
44	9959F	05164441	8	21	23.0						
49	9971F	05164454	8	21	23.0						
51	9984F	05164471	8	21	23.0						
56	9973F	05164456	8	21	23.0						
58	9958F	05164440	8	21	23.0						
69	9989F	05164478	8	21	22.9						
79	9952F	Control	8	21	23.0						
82	9976F	05164460	8	21	23.0						
101	9981F	05164468	8	21	23.0						
115	9969F	05164452	8	21	23.1						
119	9966F	05164439	8	21	23.0						
126	9968F	05164451	8	21	23.0						
127	9982F	05164469	8	21	22.9						

129	9960F	05164442	8	21	22.9						
131	9961F	05164443	8	21	23.0						
136	9970F	05164453	8	21	23.0						
142	9954F	05164434	8	21	23.0						
150	9962F	05164449	8	21	23.1						
191	0002G	05164496	8	21	23.0						
194	9953F	05164433	8	21	22.9						
195	9994F	05164486	8	21	23.1						
206	9974F	05164457	8	21	23.0						
224	9998F	05164489	8	21	23.0						
235	9955F	05164435	8	21	23.0						
240	9990F	05164476	8	21	22.9						
252	9972F	05164455	8	21	23.0						
17	9983F	05164470	8	22	22.7	7.7		7.7			
23	9977F	05164461	8	22	22.9	7.7		7.4			
25	9967F	05164450	8	22	23.1	8.0		7.5			
28	9957F	05164437	8	22	23.0	8.3		7.5			
29	9975F	05164459	8	22	23.0	7.9		7.4			
42	9956F	05164436	8	22	23.0	7.5		7.3			
44	9959F	05164441	8	22	23.0	7.5		7.3			
49	9971F	05164454	8	22	23.1	7.4		7.2			
51	9984F	05164471	8	22	23.0	7.0		7.2			
56	9973F	05164456	8	22	23.1	7.2		7.3			
58	9958F	05164440	8	22	23.0	7.3		7.2			
69	9989F	05164478	8	22	22.9	6.6		7.5			
79	9952F	Control	8	22	23.0	6.8		7.2			
82	9976F	05164460	8	22	22.9	7.0		7.1			
101	9981F	05164468	8	22	23.0	7.0		7.1			
115	9969F	05164452	8	22	23.1	7.2		7.2			
119	9966F	05164439	8	22	23.0	7.4		7.1			
126	9968F	05164451	8	22	23.0	7.4		7.2			
127	9982F	05164469	8	22	22.9	4.1		6.9			
129	9960F	05164442	8	22	23.0	6.6		7.0			
131	9961F	05164443	8	22	23.0	7.1		7.1			
136	9970F	05164453	8	22	23.0	7.1		7.1			
142	9954F	05164434	8	22	23.0	7.3		7.0			
150	9962F	05164449	8	22	23.1	6.4		6.9			
191	0002G	05164496	8	22	23.1	5.8		7.0			
194	9953F	05164433	8	22	23.0	6.9		7.0			
195	9994F	05164486	8	22	23.1	6.1		6.8			
206	9974F	05164457	8	22	23.1	7.1		7.1			
224	9998F	05164489	8	22	23.0	7.1		6.9			
235	9955F	05164435	8	22	23.1	7.1		6.9			
240	9990F	05164476	8	22	23.0	6.8		7.1			
252	9972F	05164455	8	22	23.0	7.1		7.0			
17	9983F	05164470	8	23	22.9						
23	9977F	05164461	8	23	22.9						
25	9967F	05164450	8	23	23.1						
28	9957F	05164437	8	23	23.0						
29	9975F	05164459	8	23	23.0						
42	9956F	05164436	8	23	23.0						
44	9959F	05164441	8	23	22.9						
49	9971F	05164454	8	23	23.0						
51	9984F	05164471	8	23	23.0						
56	9973F	05164456	8	23	23.0						
58	9958F	05164440	8	23	22.9						
69	9989F	05164478	8	23	22.9						
79	9952F	Control	8	23	22.9						

82	9976F	05164460	8	23	23.0			
101	9981F	05164468	8	23	23.0			
115	9969F	05164452	8	23	23.1			
119	9966F	05164439	8	23	22.9			
126	9968F	05164451	8	23	22.9			
127	9982F	05164469	8	23	22.9			
129	9960F	05164442	8	23	22.9			
131	9961F	05164443	8	23	22.9			
136	9970F	05164453	8	23	22.9			
142	9954F	05164434	8	23	22.9			
150	9962F	05164449	8	23	23.1			
191	0002G	05164496	8	23	22.9			
194	9953F	05164433	8	23	22.9			
195	9994F	05164486	8	23	23.0			
206	9974F	05164457	8	23	22.9			
224	9998F	05164489	8	23	23.0			
235	9955F	05164435	8	23	23.0			
240	9990F	05164476	8	23	22.9			
252	9972F	05164455	8	23	23.0			
17	9983F	05164470	8	24	22.9			
23	9977F	05164461	8	24	22.9			
25	9967F	05164450	8	24	23.0			
28	9957F	05164437	8	24	22.9			
29	9975F	05164459	8	24	22.9			
42	9956F	05164436	8	24	22.8			
44	9959F	05164441	8	24	22.8			
49	9971F	05164454	8	24	22.9			
51	9984F	05164471	8	24	22.9			
56	9973F	05164456	8	24	22.9			
58	9958F	05164440	8	24	22.8			
69	9989F	05164478	8	24	22.9			
79	9952F	Control	8	24	22.9			
82	9976F	05164460	8	24	22.9			
101	9981F	05164468	8	24	22.9			
115	9969F	05164452	8	24	23.0			
119	9966F	05164439	8	24	22.8			
126	9968F	05164451	8	24	22.8			
127	9982F	05164469	8	24	22.7			
129	9960F	05164442	8	24	22.9			
131	9961F	05164443	8	24	22.8			
136	9970F	05164453	8	24	22.8			
142	9954F	05164434	8	24	22.8			
150	9962F	05164449	8	24	23.0			
191	0002G	05164496	8	24	22.8			
194	9953F	05164433	8	24	22.8			
195	9994F	05164486	8	24	23.0			
206	9974F	05164457	8	24	22.9			
224	9998F	05164489	8	24	22.9			
235	9955F	05164435	8	24	23.0			
240	9990F	05164476	8	24	23.0			
252	9972F	05164455	8	24	22.9			
17	9983F	05164470	8	25	22.7	8.0	7.4	
23	9977F	05164461	8	25	22.9	6.6	7.0	
25	9967F	05164450	8	25	23.1	6.5	7.0	
28	9957F	05164437	8	25	22.9	6.6	7.0	
29	9975F	05164459	8	25	22.9	6.7	7.0	
42	9956F	05164436	8	25	22.9	6.6	6.9	
44	9959F	05164441	8	25	23.0	6.5	7.0	

49	9971F	05164454	8	25	23.0	6.5		6.8
51	9984F	05164471	8	25	23.0	6.4		6.9
56	9973F	05164456	8	25	23.0	7.2		7.0
58	9958F	05164440	8	25	22.9	7.2		6.8
69	9989F	05164478	8	25	22.9	6.4		7.4
79	9952F	Control	8	25	23.0	6.8		6.8
82	9976F	05164460	8	25	22.9	6.9		6.9
101	9981F	05164468	8	25	23.0	7.2		6.8
115	9969F	05164452	8	25	23.1	7.3		6.9
119	9966F	05164439	8	25	22.9	7.4		6.8
126	9968F	05164451	8	25	23.0	7.6		7.0
127	9982F	05164469	8	25	22.8	4.8		6.7
129	9960F	05164442	8	25	22.9	6.6		6.8
131	9961F	05164443	8	25	22.9	7.0		6.8
136	9970F	05164453	8	25	22.9	7.0		6.8
142	9954F	05164434	8	25	22.9	7.2		6.8
150	9962F	05164449	8	25	23.1	6.6		6.7
191	0002G	05164496	8	25	23.0	6.9		6.9
194	9953F	05164433	8	25	22.9	6.8		6.9
195	9994F	05164486	8	25	23.1	6.2		6.7
206	9974F	05164457	8	25	23.1	7.4		7.0
224	9998F	05164489	8	25	23.0	7.6		6.7
235	9955F	05164435	8	25	23.0	7.4		6.8
240	9990F	05164476	8	25	23.0	7.4		7.0
252	9972F	05164455	8	25	23.0	7.4		6.8
17	9983F	05164470	8	26	22.7			
23	9977F	05164461	8	26	22.8			
25	9967F	05164450	8	26	22.9			
28	9957F	05164437	8	26	22.8			
29	9975F	05164459	8	26	22.8			
42	9956F	05164436	8	26	22.8			
44	9959F	05164441	8	26	22.9			
49	9971F	05164454	8	26	22.8			
51	9984F	05164471	8	26	22.9			
56	9973F	05164456	8	26	22.9			
58	9958F	05164440	8	26	22.8			
69	9989F	05164478	8	26	22.8			
79	9952F	Control	8	26	22.8			
82	9976F	05164460	8	26	22.8			
101	9981F	05164468	8	26	22.8			
115	9969F	05164452	8	26	22.9			
119	9966F	05164439	8	26	22.7			
126	9968F	05164451	8	26	22.8			
127	9982F	05164469	8	26	22.7			
129	9960F	05164442	8	26	22.8			
131	9961F	05164443	8	26	22.8			
136	9970F	05164453	8	26	22.8			
142	9954F	05164434	8	26	22.8			
150	9962F	05164449	8	26	22.9			
191	0002G	05164496	8	26	22.9			
194	9953F	05164433	8	26	22.8			
195	9994F	05164486	8	26	22.9			
206	9974F	05164457	8	26	22.9			
224	9998F	05164489	8	26	22.8			
235	9955F	05164435	8	26	22.9			
240	9990F	05164476	8	26	22.8			
252	9972F	05164455	8	26	22.9			
17	9983F	05164470	8	27	22.8	6.6	320	7.2

23	9977F	05164461	8	27	22.9	5.5	300	6.8			
25	9967F	05164450	8	27	23.0	6.3	300	6.9			
28	9957F	05164437	8	27	22.9	6.7	290	6.9			
29	9975F	05164459	8	27	23.0	6.2	300	6.9			
42	9956F	05164436	8	27	22.9	6.1	290	6.8			
44	9959F	05164441	8	27	22.9	6.0	290	6.9			
49	9971F	05164454	8	27	23.0	6.2	285	6.8			
51	9984F	05164471	8	27	22.9	5.3	290	6.9			
56	9973F	05164456	8	27	22.9	5.8	290	6.9			
58	9958F	05164440	8	27	22.9	5.5	285	6.8			
69	9989F	05164478	8	27	22.8	4.8	300	7.3			
79	9952F	Control	8	27	22.9	5.4	285	6.9			
82	9976F	05164460	8	27	22.9	5.2	290	6.9			
101	9981F	05164468	8	27	22.9	5.9	285	6.8			
115	9969F	05164452	8	27	23.0	6.1	285	6.9			
119	9966F	05164439	8	27	22.9	6.0	280	6.8			
126	9968F	05164451	8	27	22.9	6.7	285	7.0			
127	9982F	05164469	8	27	22.9	3.8	285	6.7			
129	9960F	05164442	8	27	22.9	5.2	280	6.8			
131	9961F	05164443	8	27	22.9	5.8	300	6.9			
136	9970F	05164453	8	27	22.9	5.8	290	6.9			
142	9954F	05164434	8	27	22.9	5.7	285	6.8			
150	9962F	05164449	8	27	23.1	4.6	285	6.8			
191	0002G	05164496	8	27	23.0	4.5	320	6.9			
194	9953F	05164433	8	27	22.9	5.6	290	6.8			
195	9994F	05164486	8	27	23.1	4.6	290	6.7			
206	9974F	05164457	8	27	23.0	6.6	290	6.9			
224	9998F	05164489	8	27	23.0	5.1	280	6.7			
235	9955F	05164435	8	27	23.1	5.5	290	6.9			
240	9990F	05164476	8	27	23.0	5.3	285	7.0			
252	9972F	05164455	8	27	23.0	5.7	280	6.9			
17	9983F	05164470	8	28	23.4	4.9	325	7.2	<0.1	103	100
23	9977F	05164461	8	28	23.3	4.6	295	6.7	<0.1	86	70
25	9967F	05164450	8	28	23.4	5.3	295	6.6	<0.1	86	60
28	9957F	05164437	8	28	23.4	6.2	285	6.6	<0.1	77	60
29	9975F	05164459	8	28	23.4	4.4	285	6.7	<0.1	94	80
42	9956F	05164436	8	28	23.3	5.9	290	6.7	<0.1	77	70
44	9959F	05164441	8	28	23.4	5.3	290	6.8	<0.1	94	80
49	9971F	05164454	8	28	23.4	5.7	280	6.7	<0.1	86	60
51	9984F	05164471	8	28	23.3	4.2	290	7.0	<0.1	86	80
56	9973F	05164456	8	28	23.4	4.9	295	6.9	<0.1	86	80
58	9958F	05164440	8	28	23.4	5.4	290	6.8	<0.1	86	60
69	9989F	05164478	8	28	23.3	3.9	340	7.3	<0.1	120	90
79	9952F	Control	8	28	23.4	4.6	295	6.8	<0.1	77	70
82	9976F	05164460	8	28	23.4	4.3	290	6.7	0.1	94	70
101	9981F	05164468	8	28	23.3	4.6	280	6.8	<0.1	77	60
115	9969F	05164452	8	28	23.4	5.6	290	6.8	<0.1	94	70
119	9966F	05164439	8	28	23.3	5.1	280	6.7	<0.1	77	70
126	9968F	05164451	8	28	23.2	5.8	285	6.8	<0.1	86	70
127	9982F	05164469	8	28	23.3	4.0	295	6.8	1.1	86	70
129	9960F	05164442	8	28	23.3	4.2	280	6.8	<0.1	77	70
131	9961F	05164443	8	28	23.2	5.1	295	6.7	<0.1	77	70
136	9970F	05164453	8	28	23.2	4.9	300	6.7	<0.1	86	80
142	9954F	05164434	8	28	23.2	5.2	290	6.8	<0.1	86	60
150	9962F	05164449	8	28	23.3	3.6	280	6.6	<0.1	86	70
191	0002G	05164496	8	28	23.3	3.8	340	6.8	<0.1	111	100
194	9953F	05164433	8	28	23.3	5.0	285	6.9	<0.1	77	60
195	9994F	05164486	8	28	23.3	3.4	285	6.7	<0.1	77	60

206	9974F	05164457	8	28	23.4	5.4	290	6.7	<0.1	77	60
224	9998F	05164489	8	28	23.3	4.6	275	6.6	<0.1	77	60
235	9955F	05164435	8	28	23.3	4.8	290	6.7	0.5	86	70
240	9990F	05164476	8	28	23.4	4.4	320	6.8	<0.1	103	90
252	9972F	05164455	8	28	23.3	5.3	290	6.8	<0.1	77	60
				Mean	23.0	6.4	291	7.0	---	91	75
				SD	0.3	0.9	15	0.2	---	14	15
				n	928	448	192	448	64	64	64
				Min	22.0	3.2	265	6.6	<0.1	68	60
				Max	23.9	8.3	350	7.8	1.1	128	130

CHAIN-OF-CUSTODY RECORDS

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/21/2005
Carrier Name:	FedEx
Airbill:	850842532346
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

	Relinquished By (Date / Time)	Received By (Date / Time)
1	4/21/05 12:00	4-22-05 1320
2		
3		
4		

Sampler Signature: Jeff Franklin

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164433	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05164433 (Ice Only) (1)	RM704A1(X1)	S: 4/20/2005	8:50	NAS # 9953F
05164434	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05164434 (Ice Only) (1)	RM698A1(X1)	S: 4/20/2005	10:10	NAS # 9954F
05164435	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164435 (Ice Only) (1)	RM744A1(X1)	S: 4/20/2005	10:45	NAS # 9955F
05164436	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164436 (Ice Only) (1)	RM744A2(X3)	S: 4/20/2005	11:45	NAS # 9956F
05164437	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05164437 (Ice Only) (1)	RM692A1(X1)	S: 4/20/2005	11:15	NAS # 9957F

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Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.0°C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? Y	Shipment Iced? Y

BIO-28 = Bioassay 28-day

TR Number: 10-555125664-042105-0006

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USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No:
L

Date Shipped:	4/21/2005
Carrier Name:	FedEx
Airbill:	850842532335
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/21/05 12:00	[signature]	4-22-05 1320
2				
3				
4				

Sampler Signature: Jeff Franklin

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164440	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05164440 (Ice Only) (1)	RM687A1	S: 4/20/2005	14:00	NAS # 9958 F
05164441	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05164441 (Ice Only) (1)	RM689A1(X3)	S: 4/20/2005	12:55	NAS# 9959 F
05164442	Sediment/ Josh Butler	L/G	BIO-28 (90)	05164442 (Ice Only) (1)	RM706A1(X1)	S: 4/20/2005	13:30	NAS# 9960 F
05164443	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164443 (Ice Only) (1)	RM743A2(X3)	S: 4/20/2005	13:15	NAS# 9961 F
05164449	Sediment/ Josh Butler	L/G	BIO-28 (90)	05164449 (Ice Only) (1)	RM706A2(X7)	S: 4/20/2005	16:25	NAS # 9962 F

-0058 3814 of 395-

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.0 °C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? Y	Shipment Iced? Y

BIO-28 = Bioassay 28-day

TR Number: 10-555125664-042105-0005

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USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/22/2005
Carrier Name:	UPS
Airbill:	1Z E72 494 44 9812 7675
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/22/05 11:00	[signature]	4-23-05 0935
2				
3				
4				

Sampler Signature: Jeff Franklin

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
~~05164439~~	~~Sediment/~~ Jeff Franklin	L/G	~~BIO-28 (90)~~	~~05164439 (Ice Only) (1)~~	~~RM686A1(X3)~~	~~S: 4/21/2005~~	~~9:30~~	NAS# 9966F
05164450	Sediment/ Greg Warren	L/G	BIO-28 (90)	05164450 (Ice Only) (1)	RM708A1(X3)	S: 4/21/2005	9:43	NAS# 9967F
05164451	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05164451 (Ice Only) (1)	RM680A1(X1)	S: 4/21/2005	~~10:25~~ 10:40 NG	NAS# 9968F
05164452	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164452 (Ice Only) (1)	RM742A1(X1)	S: 4/21/2005	11:00	NAS# 9969F

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Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.5°C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? Y	Shipment Iced? Y

BIO-28 = Bioassay 28-day

TR Number: 10-55125664-042105-0017

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USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/22/2005
Carrier Name:	UPS
Airbill:	1Z E72 494 44 9947 4691
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

	Relinquished By (Date / Time)	Received By (Date / Time)
1	4/22/05 11:00	Gwald Lussier 4-23-05 0935
2		
3		
4		

Sampler Signature: Jeff Franklin

For Lab Use Only
Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164453	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164453 (Ice Only) (1)	RM743A1(X1)	S: 4/21/2005	10:15	NAS# 9970F
05164454	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05164454 (Ice Only) (1)	RM678A1(X1)	S: 4/21/2005	12:35	NAS# 9971F
05164455	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164455 (Ice Only) (1)	RM742A2(X5)	S: 4/21/2005	12:20	NAS# 9972F
05164456	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05164456 (Ice Only) (1)	RM677A1(X3)	S: 4/21/2005	13:20	NAS# 9973F

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Shipment for Case Complete? N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.0°C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? Y	Shipment Iced? Y

BIO-28 = Bioassay 28-day

TR Number: 10-555125664-042105-0018

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USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/22/2005
Carrier Name:	UPS
Airbill:	1Z E72 494 44 9753 8063
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/22/05 11:00	[signature]	4-25-05 0935
2				
3				
4				

Sampler Signature: [signature]

For Lab Use Only
Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164457	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05164457 (Ice Only) (1)	RM676A1(X3)	S: 4/21/2005	14:05	NAS # 9974F
05164459	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164459 (Ice Only) (1)	RM741A1(X3)	S: 4/21/2005	13:30	NAS# 9975F
05164460	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164460 (Ice Only) (1)	RM740A1(X1)	S: 4/21/2005	14:30	NAS# 9976F
05164461	Sediment/ Greg Warren	L/G	BIO-28 (90)	05164461 (Ice Only) (1)	RM724A1(X1)	S: 4/21/2005	13:20	NAS# 9977F

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Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.0°C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? Y	Shipment Iced? Y

BIO-28 = Bioassay 28-day

TR Number: 10-555125664-042105-0019

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Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/25/2005
Carrier Name:	FedEx
Airbill:	8508 4253 2357
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

Relinquished By	(Date / Time)	Received By	(Date / Time)
1	4/25/05 13:00	Gerald Irizarri	4-26-05 1310
2			
3			
4			

Sampler Signature: Jeff Franklin

For Lab Use Only
Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164468	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164468 (Ice Only) (1)	RM738A1(X3)	S: 4/22/2005	11:00	NAS # 9991F
05164469	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164469 (Ice Only) (1)	RM739A1(X3)	S: 4/22/2005	10:00	NAS # 9992F
05164470	Sediment/ John Culley	L/G	BIO-28 (90)	~~05164470 (Ice Only)~~ NG 05164470 (Ice Only) (2)	RM732R1	S: 4/22/2005	11:35	NAS # 9993F
05164471	Sediment/ Josh Butler	L/G	BIO-28 (90)	05164471 (Ice Only) (1)	RM724A2(X3)	S: 4/22/2005	11:27	NAS # 9994F
05164472	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164472 (Ice Only) (1)	RM737A1(X3)	S: 4/22/2005	12:15	NAS # 9995F

Pgs 384 & 385

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.0 °C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? Y	Shipment Iced? Y
BIO-28 = Bioassay 28-day				

TR Number: 10-555125664-042305-0001

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USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/25/2005
Carrier Name:	FedEx
Airbill:	8508 4253 2368
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/25/05 13:00	[signature]	4-26-05 1310
2				
3				
4				

Sampler Signature: [signature]

For Lab Use Only
Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164473	Sediment/ Josh Butler	L/G	BIO-28 (90)	05164473 (Ice Only) (1)	RM723A1(X1)	S: 4/22/2005	12:55	NAS # 9996F
05164474	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164474 (Ice Only) (1)	RM736A1(X1)	S: 4/22/2005	13:45	NAS # 9987F
05164475	Sediment/ Josh Butler	L/G	BIO-28 (90)	05164475 (Ice Only) (1)	RM723A2(X3)	S: 4/22/2005	15:16	NAS # 9988F
05164478	Sediment/ John Culley	L/G	BIO-28 (90)	~~05164478 (Ice Only),~~ NG 05164478 (Ice Only) (2)	RM726R1	S: 4/22/2005	13:20	NAS # 9989F

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Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.0°C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? Y	Shipment Iced? Y

BIO-28 = Bioassay 28-day

TR Number: 10-555125664-042305-0002

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Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/25/2005
Carrier Name:	FedEx
Airbill:	8508 4253 2770
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/25/05/13:00	[signature]	4-26-05
2				
3				
4				

Sampler Signature: [signature]

For Lab Use Only
Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
~~05164478~~	~~Sediment/~~ John Culley	~~L/G~~	~~BIO-28 (90)~~	~~051644 (Ice Only),~~ NG ~~05164476 (Ice Only) (2)~~	RM721R1	S: 4/22/2005	14:39	NAS # 9990F
05164479	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164479 (Ice Only) (1)	RM734A1(X3)	S: 4/22/2005	15:00	NAS # 9991F
05164483	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05164483 (Ice Only) (1)	RM661A1(X1)	S: 4/22/2005	10:15	NAS # 9992F
05164485	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05164485 (Ice Only) (1)	RM658A1(X3)	S: 4/22/2005	11:30	NAS # 9993F

page 390 of 395

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G		Custody Seal Intact? ___ Shipment Iced? ___
BIO-28 = Bioassay 28-day				

TR Number: 10-555125664-042305-0003

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LABORATORY COPY

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/25/2005
Carrier Name:	FedEx
Airbill:	8508 4253 3397
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/25/05/13:00	[signature]	4-26-05 1310
2				
3				
4				

Sampler Signature: [signature]

For Lab Use Only
Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164486	Sediment/ John Culley	L/G	BIO-28 (90)	~~051644 (Ice Only);~~ UG 05164486 (Ice Only) (2)	RM705R1	S: 4/23/2005	9:25	NAS # 9994F
05164487	Sediment/ Greg Warren	L/G	BIO-28 (90)	05164487 (Ice Only) (1)	RM713A1(X3)	S: 4/23/2005	9:30	NAS # 9995F
05164494	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164494 (Ice Only) (1)	RM729A1(X1)	S: 4/23/2005	12:30	NAS # 9996F
05164507	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164507 (Ice Only) (1)	RM727A1(X1)	S: 4/23/2005	14:15	NAS # 9997F

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Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.0°C	Chain of Custody Seal Number:
Analysis Key: BIO-28 = Bioassay 28-day	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? Y	Shipment Iced? Y

TR Number: 10-555125664-042505-0003

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USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/25/2005
Carrier Name:	FedEx
Airbill:	8508 4253 3375
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/25/05 13:00	[signature]	4-26-05 1310
2				
3				
4				

Sampler Signature: [signature]

For Lab Use Only
Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164489	Sediment/ John Culley	L/G	BIO-28 (90)	~~051644 (Ice Only),~~ NG 05164489 (Ice Only) (2)	RM686R1	S: 4/23/2005	11:20	NAS # 9998 F
05164491	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164491 (Ice Only) (1)	RM730A1(X1)	S: 4/23/2005	11:15	NAS # 9998 F
05164493	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164493 (Ice Only) (1)	RM733A1(X1)	S: 4/23/2005	9:45	NAS # 00016
05164496	Sediment/ John Culley	L/G	BIO-28 (90)	~~051644 (Ice Only),~~ NG 05164496 (Ice Only) (2)	RM685R1	S: 4/23/2005	13:50	NAS # 00026

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Shipment for Case Complete? N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.5 °C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? Y	Shipment Iced? Y
BIO-28 = Bioassay 28-day				

TR Number: 10-555125664-042505-0004

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/27/2005
Carrier Name:	FedEx
Airbill:	8508 4253 3147
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/27/05 12:00	[signature]	4-28-05 1420
2				
3				
4				

Sampler Signature: [signature]

For Lab Use Only
Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05174405	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05174405 (Ice Only) (1)	RM644A1(X3)	S: 4/26/2005	10:15	NAS# 00326
05174406	Sediment/ Josh Butler	L/G	BIO-28 (90)	05174406 (Ice Only) (1)	RM637A1(X1)	S: 4/26/2005	11:26	NAS# 00336
05174408	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05174408 (Ice Only) (1)	RM642A1(X1)	S: 4/26/2005	11:50	NAS# 00346
05174412	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05174412 (Ice Only) (1)	RM641A1(X1)	S: 4/26/2005	13:54	NAS# 00356
05174413	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05174413 (Ice Only) (1)	RM640A1(X3)	S: 4/26/2005	15:20	NAS# 00366

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Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.0°C	Chain of Custody Seal Number:
Analysis Key: BIO-28 = Bioassay 28-day	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? Y	Shipment Iced? Y

TR Number: 10-555125664-042605-0012

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: L

Date Shipped:	4/27/2005
Carrier Name:	FedEx
Airbill:	8508 4253 3386
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

Relinquished By	(Date / Time)	Received By	(Date / Time)
1	4/27/05/12:00	Gerald Grissom	4-28-05 1420
2			
3			
4			

Sampler Signature: Jeff Franklin

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05174407	Sediment/ Josh Butler	L/G	BIO-28 (90)	05174407 (Ice Only) (1)	RM634A1(X1)	S: 4/26/2005	14:02	NAS# 00376
05174409	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05174409 (Ice Only) (1)	RM605A1(X1)	S: 4/26/2005	14:17	NAS# 00386
05174410	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05174410 (Ice Only) (1)	RM606A1(X3)	S: 4/26/2005	13:01	NAS# 00396
05174411	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05174411 (Ice Only) (1)	RM616A1(X3)	S: 4/26/2005	10:16	NAS # 00406
05174415	Sediment/ Josh Butler	L/G	BIO-28 (90)	05174415 (Ice Only) (1)	RM628A1(X1)	S: 4/26/2005	15:42	NAS # 00416

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Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.0°C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? Y	Shipment Iced? Y

BIO-28 = Bioassay 28-day

TR Number: 10-555125664-042605-0011

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No:
L

Date Shipped:	4/29/2005
Carrier Name:	UPS
Airbill:	1Z E72 494 44 9779 2832
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1		4/29/05 12:00	Gualdoni	4-30-05 0905
2				
3				
4				

Sampler Signature:

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05174423	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05174423 (Ice Only) (1)	RM603A1(X1)	S: 4/28/2005	10:45	NAS # 00426
05174424	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05174424 (Ice Only) (1)	RM605A2(X8)	S: 4/28/2005	9:47	NAS# 00436
05174427	Sediment/ Greg Warren	L/G	BIO-28 (90)	05174427 (Ice Only) (1)	RM622A1(X3)	S: 4/28/2005	9:58	NAS# 00446

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Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.5 °C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? Y	Shipment Iced? Y

BIO-28 = Bioassay 28-day

TR Number: 10-555125664-042805-0006

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

APPENDIX III

RAW DATA – REFERENCE TOXICANT TEST

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-

ACUTE TOXICITY TEST (ALL SPECIES)

REVIEWED PAGES 1-7 -6-1

Test No. 999-1957 Client: QC Test Investigator

Test Type (rangefinding/definitive) Test Length (hr) 96

Species *Hyalella azteca*

STUDY MANAGEMENT

Client: QC test

Client's Study Monitor: QC test

Testing Laboratory: Northwestern Aquatic Sciences

Test Location: Newport Laboratory

Laboratory's Study Personnel:

Proj. Man./Study Dir. G.J. Irissarri 6-1

QA Officer L. K. Nemeth

1. GA Butler 4-5 2. Bill Montgomery now

3. 4.

Test Beginning: 4-28-05 1030 Test Ending: 5-2-05 1130

TEST MATERIAL Lot No.: MALLINCKRODT TNE

Description: Cadmium as $CdCl_2 \cdot 2.5H_2O$ (1.0 mg/ml) Prepared: 7-13-04

NAS Sample No.				
Date of Collection:				
Date of Receipt:				
Temperature (deg C):				
Dissolved oxygen (mg/L):				
pH:				
Conductivity (umhos/cm):				
Hardness (mg/L):				
Alkalinity (mg/L):				
Salinity (ppt):				
Total chlorine (mg/L):				
Total ammonia-N (mg/L):				
:				

DILUTION WATER

Description: Moderately hard synthetic water

Date of Preparation/Collection: 4-22-05

Water Quality: Cond. (umhos/cm): 280 Salinity (ppt) — pH 7.6

Hardness (mg/L as $CaCO_3$): 80 Alkalinity (mg/L as $CaCO_3$): 70

Treatments: Aerated ≥ 24 hrs

TEST LOCATION

Test conducted in (circle one): (room 1) room 2 trailer water bath other:

Randomization chart:

REP A	7.5	ϕ	30	60	3.75	15				
REP B	3.75	60	15	ϕ	7.5	30				

Error codes: 1) Correction of handwriting error
2) Written in wrong location; entry deleted
3) Wrong date deleted; replaced with correct date
4) Error found in measurement; measurement repeated

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-_____

ACUTE TOXICITY TEST (ALL SPECIES)

Test No. 999-1957 Client QC Test Investigator _____

TEST ORGANISMS

Species: *Hyalella azteca* Age: 7-8 DAYS Size: _____

Source: Chesapeake Cultures, Hayes, VA Date received: 4-26-05

Acclimation Data:

Date	Temp. (deg.C)	DO (mg/L)	pH	Cond. umhos/cm	Hardness (mg/L)	Alkalinity (mg/L)	Feeding * Amount	Feeding description	Water changes
4-26-05	20.1	10.6	7.1	435	170	190	20 mL	YTC	YES
4-27-05	20.8	8.8	8.2	385	137	160	10 mL	YTC	YES
4-28-05	20.8	9.4	7.9	305	103	80	10 mL	YTC	
Mean	20.6	9.3	7.7	375	137	143			
S.D.	0.4	1.2	0.6	66	34	57			
(N)	3	3	3	3	3	3			

* PER PAN

Photoperiod during acclimation: 16:8, L:D

TEST PROCEDURES AND CONDITIONS

Test concentrations (50% series recommended): 60, 30, 15, 7.5, 3.75, 0 ug/L

Test chamber: 250 ml glass beakers Test volume: 100 ml

Replicates/treatment: 10 Organisms/treatment: 20 (10/rep)

Test water changes: None Aeration during test: None

Feeding: 0.5 ml YTC suspension per beaker on days 0 and 2

Duration: 24-hr, 48-hr, (96-hr) Test temperature (deg.C): (23 ± 1) or 20 ± 1

Beaker placement: Stratified randomization Photoperiod: 16:8, L:D

MISCELLANEOUS NOTES

Test solution preparation:

1st working stock made by 1:99 (1ml ↑ 100 ml) dilution of concentrated 1.0 mg/ml Cd stock.
Final conc.: 10 ug/L.

2nd working stock made by 10:90 (10ml ↑ 100 ml) dilution of concentrated 1st working stock.
Final conc.: 1ug/L.

Test concentration (ug/L)	ml of 2nd working stock per **200** ml	Dilution water
60	12	Brought up to final volume of 200 ml with dilution water and distributed evenly between two replicates
30	6	
15	3	
7.5	1.5	
3.75	0.75	
0	0	

EW 1
4-28-05

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-_____

ACUTE TOXICITY TEST (ALL SPECIES)

Test No. 999-1957 Client QC Test

DAILY RECORD SHEET

Day 0 (4 /28/05) GJ

Conc. (ug/L)	Temp. (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L)	Survivors A	Survivors B
1. 60	23.6	8.2	260	7.7	77	60	10	10
2. 30	23.6	8.2	265	7.7			10	10
3. 15	23.5	8.2	270	7.7			10	10
4. 7.5	23.6	8.2	270	7.7			10	10
5. 3.75	23.7	8.2	270	7.7			10	10
6. 0	23.7	8.2	260	7.6	77	60	10	10
All animals fed 0.5 ml YTC suspension. Initials: GJ								

Day 1 (4 /29 /05) GJ

Conc. (ug/L)	Temp. (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L)	Survivors A	Survivors B
1. 60	23.8	7.8	265	7.3			8(2D)	7(3D)
2. 30	23.8	7.9	280	7.3			8(2D)	9(1D)
3. 15	23.8	7.8	285	7.3			10	8(2D)
4. 7.5	23.9	8.0	280	7.3			10	10
5. 3.75	23.8	7.9	280	7.3			10	10
6. 0	23.8	8.0	270	7.3			10	10

Day 2 (4 /30 /05) GJ

Conc. (ug/L)	Temp. (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L)	Survivors A	Survivors B
1. 60	23.4	7.7	275	7.4			Ø (8D)	Ø (7D)
2. 30	23.4	7.7	295	7.4			3(5D)	4(5D)
3. 15	23.3	7.8	300	7.4			5(5D)	3(5D)
4. 7.5	23.4	7.7	290	7.4			9(1D)	10
5. 3.75	23.4	7.8	285	7.4			10	10
6. 0	23.3	7.8	275	7.4			10	10
All animals fed 0.5 ml YTC suspension. Initials: GJ								

Day 3 (5 / 1 /05) GJ

Conc. (ug/L)	Temp. (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L)	Survivors A	Survivors B
1. 60	-	-	-	-			Ø	Ø
2. 30	23.5	7.4	300	7.6			Ø (3D)	Ø (4D)
3. 15	23.4	7.4	300	7.6			Ø (5D)	1 (2D)
4. 7.5	23.5	7.5	290	7.7			8 (1D)	9 (1D)
5. 3.75	23.5	7.5	290	7.7			10	10
6. 0	23.4	7.4	275	7.6			10	10

Day 4 (5 / 2 /05) GJ

Conc. (ug/L)	Temp. (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L)	Survivors A	Survivors B
1. 60	-	-	-	-	-	-	Ø	Ø
2. 30	-	-	-	-			Ø	Ø
3. 15	24.4	8.1	310	7.5			Ø	Ø (1D)
4. 7.5	24.6	8.0	305	7.5			6 (2D)	6 (3D)
5. 3.75	24.6	8.0	300	7.4			10	8 (2D)
6. 0	24.5	8.0	295	7.5	94	80	10	10
Mean	23.7	7.9	283	7.5	83	67		
SD	0.4	0.3	14	0.2	10	12		
n	27	27	27	27	3	3		

Chesapeake Cultures

P.O. Box 507 Hayes, VA 23072 (804) 693-4046 (804)694-4704 fax
www.c-cultures.com
e-mail growfish@c-cultures.com

NAS

Shipment Information

Species *Hyalella azteca* Date *4/25/04*

Age *4-5d on shipt ~1.5mm* P.O. No. *verbal*

Quanitity *3400+* Invoice No. *5014*

Temperature *24°C* Salinity *—* pH *7.96*

Notes *Thank you!*

RECEIVED 4-26-05
-6 S 1

Biologist *Elizabeth Williams*

* *Please inspect shipment and report any problem immediately* *

Acute 96-hr Toxicity Test-96 Hr Survival

Start Date:	4/28/2005 10:30	Test ID:	999-1957	Sample ID:	REF-Ref Toxicant
End Date:	5/2/2005 11:30	Lab ID:	ORNAS-Northwestern Aquati	Sample Type:	CDCL-Cadmium chloride
Sample Date:		Protocol:	EPAF 91-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:					

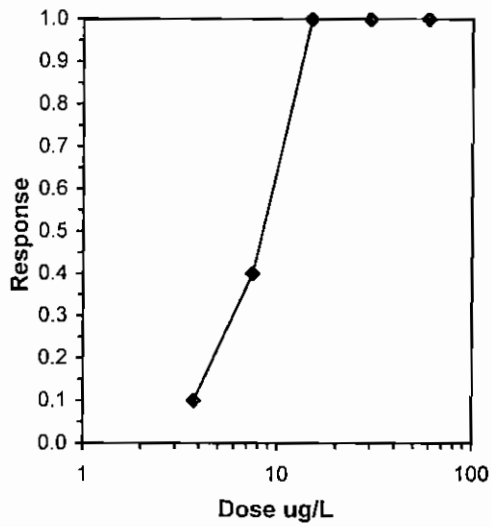
Conc-ug/L	1	2
D-Control	1.0000	1.0000
3.75	1.0000	0.8000
7.5	0.6000	0.6000
15	0.0000	0.0000
30	0.0000	0.0000
60	0.0000	0.0000

			Transform: Arcsin Square Root					Number	Total
Conc-ug/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Resp	Number
D-Control	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	2	0	20
3.75	0.9000	0.9000	1.2596	1.1071	1.4120	17.115	2	2	20
7.5	0.6000	0.6000	0.8861	0.8861	0.8861	0.000	2	8	20
15	0.0000	0.0000	0.1588	0.1588	0.1588	0.000	2	20	20
30	0.0000	0.0000	0.1588	0.1588	0.1588	0.000	2	20	20
60	0.0000	0.0000	0.1588	0.1588	0.1588	0.000	2	20	20

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Normality of the data set cannot be confirmed				
Equality of variance cannot be confirmed				

Trimmed Spearman-Karber

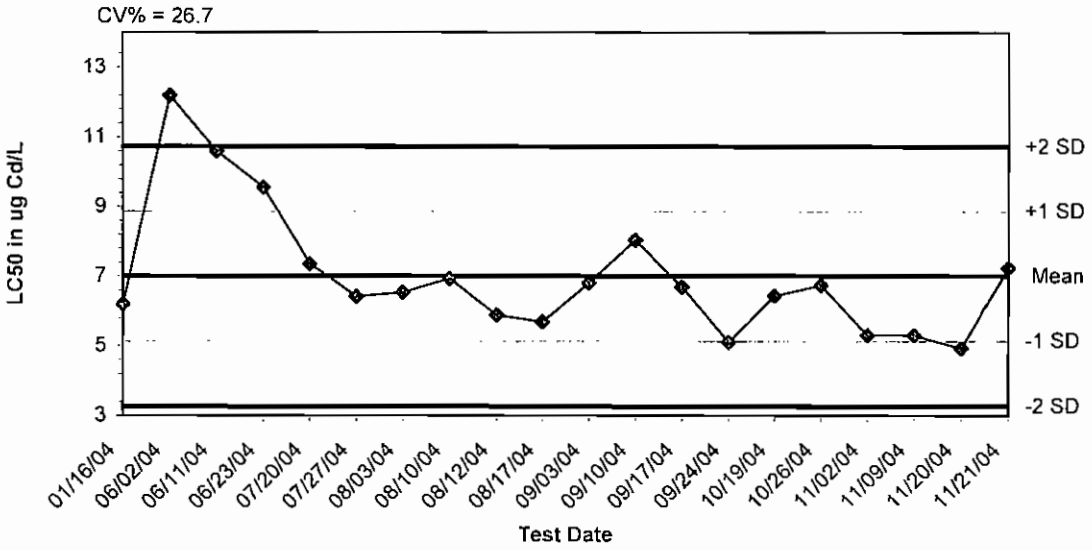
Trim Level	EC50	95% CL	
0.0%			
5.0%			
10.0%	7.8888	6.4847	9.5970
20.0%	8.1004	6.2744	10.4579
Auto-10.0%	7.8888	6.4847	9.5970



Test: AT-Acute 96-hr Toxicity Test							Test ID: 999-1957		
Species: HA-Hyalella azteca							Protocol: EPAF 91-EPA Freshwater		
Sample ID: REF-Ref Toxicant							Sample Type: CDCL-Cadmium chloride		
Start Date: 4/28/2005 10:30				End Date: 5/2/2005 11:30			Lab ID: ORNAS-Northwestern Aquatic Sciences		
Pos	ID	Rep	Group	Start	24 Hr	48 Hr	72 Hr	96 Hr	Notes
	1	1	D-Control	10	10	10	10	10	
	2	2	D-Control	10	10	10	10	10	
	3	1	3.750	10	10	10	10	10	
	4	2	3.750	10	10	10	10	8	
	5	1	7.500	10	10	9	8	6	
	6	2	7.500	10	10	10	9	6	
	7	1	15.000	10	10	5	0	0	
	8	2	15.000	10	8	3	1	0	
	9	1	30.000	10	8	3	0	0	
	10	2	30.000	10	9	4	0	0	
	11	1	60.000	10	8	0	0	0	
	12	2	60.000	10	7	0	0	0	

Comments:

Hyalella azteca 96-hr reference toxicant test - last 20 points



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
01/16/04	6.1900	6.9930	5.1261	3.2592	8.8599	10.7268
06/02/04	12.2000	6.9930	5.1261	3.2592	8.8599	10.7268
06/11/04	10.6000	6.9930	5.1261	3.2592	8.8599	10.7268
06/23/04	9.5600	6.9930	5.1261	3.2592	8.8599	10.7268
07/20/04	7.3500	6.9930	5.1261	3.2592	8.8599	10.7268
07/27/04	6.4100	6.9930	5.1261	3.2592	8.8599	10.7268
08/03/04	6.5300	6.9930	5.1261	3.2592	8.8599	10.7268
08/10/04	6.9300	6.9930	5.1261	3.2592	8.8599	10.7268
08/12/04	5.8800	6.9930	5.1261	3.2592	8.8599	10.7268
08/17/04	5.6800	6.9930	5.1261	3.2592	8.8599	10.7268
09/03/04	6.8000	6.9930	5.1261	3.2592	8.8599	10.7268
09/10/04	8.0300	6.9930	5.1261	3.2592	8.8599	10.7268
09/17/04	6.6900	6.9930	5.1261	3.2592	8.8599	10.7268
09/24/04	5.1000	6.9930	5.1261	3.2592	8.8599	10.7268
10/19/04	6.4300	6.9930	5.1261	3.2592	8.8599	10.7268
10/26/04	6.7300	6.9930	5.1261	3.2592	8.8599	10.7268
11/02/04	5.3000	6.9930	5.1261	3.2592	8.8599	10.7268
11/09/04	5.3000	6.9930	5.1261	3.2592	8.8599	10.7268
11/20/04	4.9300	6.9930	5.1261	3.2592	8.8599	10.7268
11/21/04	7.2200	6.9930	5.1261	3.2592	8.8599	10.7268

MSR
12-16-04

ADDENDUM

November 8, 2005

(ADDITIONAL STATISTICAL COMPARISONS AT P=0.01)

Freshwater Sediment Average ind. biomass

Start Date:	4/28/05 10:50	Test ID:	727-1
End Date:	5/26/05 12:10	Lab ID:	ORNAS-Northwestern Aquati
Sample Date:		Protocol:	NASXXXHA4C-Hyalella 28-d
Comments:			

Sample ID:								
Sample Type:	SED-Sediment							
Test Species:	HA-Hyalella azteca							

Conc-	1	2	3	4	5	6	7	8
D-Control	0.4090	0.4226	0.4317	0.4825	0.3806	0.3669	0.3865	0.3788
Ref05164470	0.5648	0.5531	0.6223	0.6534	0.5768	0.5107	0.5909	0.5911
5164433	0.2852	0.4499	0.4377	0.4443	0.3273	0.3909	0.3221	0.4030
5164434	0.2719	0.3395	0.3097	0.3201	0.2327	0.3022	0.2252	0.2825
5164435	0.3554	0.3644	0.3375	0.3987	0.3802	0.3234	0.2587	0.3749
5164436	0.1414	0.1306	0.2584	0.1799	0.1480	0.1000	0.1351	0.2316
5164437	0.4558	0.4401	0.2779	0.3472	0.5437	0.3760	0.4304	0.4219
5164440	0.2823	0.2357	0.2928	0.2718	0.2264	0.3871	0.2425	0.2051
5164441	0.3427	0.3943	0.3471	0.2777	0.4400	0.3079	0.4651	0.3692
5164442	0.2787	0.2673	0.3361	0.3470	0.2926	0.2622	0.3955	0.3131
5164443	0.3561	0.3810	0.2349	0.3218	0.4477	0.3051	0.3185	0.2016
5164449	0.3407	0.4070	0.3218	0.3117	0.3457	0.2585	0.2947	0.3976
5164439	0.3783	0.8340	0.4822	0.5644	0.6776	0.5326	0.7167	0.5463
5164450	0.3367	0.4237	0.3820	0.2422	0.3073	0.3494	0.3260	0.3469
5164451	0.3044	0.1831	0.4394	0.4067	0.2187	0.3575	0.3517	0.3469
5164452	0.1943	0.3274	0.2059	0.2907	0.2767	0.2608	0.2269	0.3994
5164453	0.5774	0.4357	0.5366	0.5064	0.3946	0.5489	0.4258	0.4657
5164454	0.3539	0.3097	0.2830	0.4505	0.3840	0.3062	0.2070	0.3760
5164455	0.3307	0.3249	0.2930	0.3550	0.3052	0.2581	0.3951	0.2959
5164456	0.2981	0.2872	0.3163	0.3194	0.1952	0.2351	0.4212	0.1386
5164457	0.3419	0.2999	0.3978	0.3129	0.3804	0.3369	0.3295	0.3794
5164459	0.5617	0.5160	0.4530	0.4236	0.4206	0.3880	0.4182	0.4971

			Transform: Untransformed						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.4073	0.6988	0.4073	0.3669	0.4825	9.315	8			
Ref05164470	0.5829	1.0000	0.5829	0.5107	0.6534	7.428	8			
*5164433	0.3825	0.6563	0.3825	0.2852	0.4499	16.550	8	7.388	2.624	0.0712
*5164434	0.2855	0.4898	0.2855	0.2252	0.3395	14.259	8	14.155	2.624	0.0551
*5164435	0.3492	0.5990	0.3492	0.2587	0.3987	12.503	8	10.752	2.624	0.0571
*5164436	0.1656	0.2841	0.1656	0.1000	0.2584	32.693	8	17.024	2.624	0.0643
*5164437	0.4116	0.7062	0.4116	0.2779	0.5437	19.251	8	5.365	2.624	0.0838
*5164440	0.2680	0.4597	0.2680	0.2051	0.3871	21.114	8	12.502	2.624	0.0661
*5164441	0.3680	0.6313	0.3680	0.2777	0.4651	17.235	8	7.915	2.624	0.0713
*5164442	0.3116	0.5345	0.3116	0.2622	0.3955	14.729	8	12.164	2.624	0.0585
*5164443	0.3208	0.5504	0.3208	0.2016	0.4477	24.381	8	8.290	2.624	0.0830
*5164449	0.3347	0.5742	0.3347	0.2585	0.4070	14.913	8	10.624	2.624	0.0613
5164439	0.5915	1.0148	0.5915	0.3783	0.8340	24.376	8			
*5164450	0.3393	0.5820	0.3393	0.2422	0.4237	15.649	8	10.058	2.624	0.0636
*5164451	0.3260	0.5594	0.3260	0.1831	0.4394	26.900	8	7.427	2.624	0.0908
*5164452	0.2728	0.4679	0.2728	0.1943	0.3994	24.879	8	10.897	2.624	0.0747
*5164453	0.4864	0.8344	0.4864	0.3946	0.5774	13.508	8	3.469	2.624	0.0730
*5164454	0.3338	0.5726	0.3338	0.2070	0.4505	22.167	8	8.219	2.624	0.0795
*5164455	0.3197	0.5485	0.3197	0.2581	0.3951	13.143	8	12.336	2.624	0.0560
*5164456	0.2764	0.4742	0.2764	0.1386	0.4212	31.272	8	8.968	2.624	0.0897
*5164457	0.3473	0.5959	0.3473	0.2999	0.3978	10.067	8	11.972	2.624	0.0516
*5164459	0.4598	0.7888	0.4598	0.3880	0.5617	12.923	8	4.737	2.624	0.0682

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.32587	1.035	0.02375	-0.0318
Bartlett's Test indicates equal variances (p = 0.02)	33.3266	36.1908		
The control means are significantly different (p = 5.64E-07)	8.6256	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.06822	0.11703	0.06341	0.00377	2.6E-27	19, 140

Freshwater Sediment 28-day survival

Start Date:	4/28/05 10:50	Test ID: 727-1	Sample ID:
End Date:	5/26/05 12:10	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.9000	1.0000	1.0000	0.8000	1.0000	1.0000	1.0000	1.0000
Ref05164470	1.0000	1.0000	0.9000	1.0000	0.9000	1.0000	1.0000	0.9000
5164433	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	0.9000	1.0000
5164434	1.0000	0.8000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
5164435	0.9000	0.9000	0.8000	0.9000	1.0000	0.7000	0.6000	0.9000
5164436	0.8000	0.8000	0.7000	0.7000	0.7000	0.6000	0.8000	0.9000
5164437	0.9000	1.0000	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000
5164440	0.9000	1.0000	1.0000	1.0000	1.0000	0.7000	1.0000	0.9000
5164441	0.9000	0.9000	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000
5164442	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000	0.8000	0.9000
5164443	0.9000	0.8000	0.8000	0.9000	0.7000	0.7000	0.8000	0.9000
5164449	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000
5164439	1.0000	1.0000	1.0000	1.0000	0.8000	0.8000	0.9000	1.0000
5164450	0.9000	0.9000	0.8000	0.9000	1.0000	1.0000	0.9000	1.0000
5164451	1.0000	0.8000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000
5164452	0.9000	0.9000	0.7000	1.0000	1.0000	0.8000	1.0000	0.8000
5164453	0.8000	0.9000	0.8000	1.0000	0.9000	1.0000	1.0000	0.9000
5164454	0.9000	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000
5164455	0.9000	0.9000	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000
5164456	0.8000	1.0000	0.6000	1.0000	0.9000	1.0000	1.0000	0.9000
5164457	1.0000	1.0000	0.8000	1.0000	1.0000	0.9000	1.0000	0.7000
5164459	0.6000	0.8000	0.9000	0.9000	0.7000	0.9000	0.9000	0.7000

			Transform: Arcsin Square Root						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.9625	1.0000	1.3535	1.1071	1.4120	8.476	8			
Ref05164470	0.9625	1.0000	1.3509	1.2490	1.4120	6.244	8			
5164433	0.9625	1.0000	1.3509	1.2490	1.4120	6.244	8			
5164434	0.9625	1.0000	1.3535	1.1071	1.4120	8.476	8			
*5164435	0.8375	0.8701	1.1741	0.8861	1.4120	14.396	8	2.648	2.624	0.1753
*5164436	0.7500	0.7792	1.0538	0.8861	1.2490	10.553	8	6.022	2.624	0.1295
5164437	0.9500	0.9870	1.3305	1.2490	1.4120	6.547	8			
5164440	0.9375	0.9740	1.3187	0.9912	1.4120	11.484	8			
5164441	0.9375	0.9740	1.3102	1.2490	1.4120	6.438	8			
5164442	0.9500	0.9870	1.3332	1.1071	1.4120	8.799	8			
*5164443	0.8125	0.8442	1.1314	0.9912	1.2490	9.603	8	4.515	2.624	0.1276
5164449	0.9500	0.9870	1.3305	1.2490	1.4120	6.547	8			
5164439	0.9375	0.9740	1.3154	1.1071	1.4120	10.667	8			
5164450	0.9250	0.9610	1.2924	1.1071	1.4120	8.514	8			
5164451	0.9625	1.0000	1.3535	1.1071	1.4120	8.476	8			
5164452	0.8875	0.9221	1.2424	0.9912	1.4120	13.124	8			
5164453	0.9125	0.9481	1.2747	1.1071	1.4120	10.042	8			
5164454	0.9750	1.0130	1.3713	1.2490	1.4120	5.501	8			
5164455	0.9500	0.9870	1.3305	1.2490	1.4120	6.547	8			
5164456	0.9000	0.9351	1.2674	0.8861	1.4120	15.071	8			
5164457	0.9250	0.9610	1.3009	0.9912	1.4120	12.925	8			
*5164459	0.8000	0.8312	1.1215	0.8861	1.2490	13.255	8	3.797	2.624	0.1586

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.95702	0.919	-0.3715	-0.4647
Bartlett's Test indicates equal variances (p = 0.32)	4.67099	13.2767		
The control means are not significantly different (p = 0.96)	0.05232	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.08896	0.0934	0.10007	0.01639	7.8E-04	4, 35

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

Pos	ID	Rep	Group	Day 0	Day 10	psurv Day 10	Day 20	psurv Day 20	Day 28	psurv day 28	Dry Wt (mg)	Tare Wt (mg)	Wt. count	TWT	WT	Ashed dry wt	TAFDW	AFDW
	1	1	D-Control	10					9	0.9	31.569	27.888	9	3.681	0.409			
	2	2	D-Control	10					10	1	32.3	28.074	10	4.226	0.4226			
	3	3	D-Control	10					10	1	34.085	29.768	10	4.317	0.4317			
	4	4	D-Control	10					8	0.8	34.154	30.294	8	3.86	0.4825			
	5	5	D-Control	10					10	1	33.196	29.39	10	3.806	0.3806			
	6	6	D-Control	10					10	1	32.921	29.252	10	3.669	0.3669			
	7	7	D-Control	10					10	1	32.515	28.65	10	3.865	0.3865			
	8	8	D-Control	10					10	1	31.417	27.629	10	3.788	0.3788			
	9	1	Ref05164470	10					10	1	33.056	27.408	10	5.648	0.5648			
	10	2	Ref05164470	10					10	1	33.229	27.698	10	5.531	0.5531			
	11	3	Ref05164470	10					9	0.9	34.843	29.242	9	5.601	0.622333			
	12	4	Ref05164470	10					10	1	35.703	29.169	10	6.534	0.6534			
	13	5	Ref05164470	10					9	0.9	32.987	27.796	9	5.191	0.576778			
	14	6	Ref05164470	10					10	1	33.368	28.261	10	5.107	0.5107			
	15	7	Ref05164470	10					10	1	33.575	27.666	10	5.909	0.5909			
	16	8	Ref05164470	10					9	0.9	35.039	29.719	9	5.32	0.591111			
	17	1	5164433	10					10	1	32.492	29.64	10	2.852	0.2852			
	18	2	5164433	10					10	1	31.732	27.233	10	4.499	0.4499			
	19	3	5164433	10					9	0.9	31.415	27.476	9	3.939	0.437667			
	20	4	5164433	10					10	1	34.726	30.283	10	4.443	0.4443			
	21	5	5164433	10					10	1	33.666	30.393	10	3.273	0.3273			
	22	6	5164433	10					9	0.9	32.134	28.616	9	3.518	0.390889			
	23	7	5164433	10					9	0.9	31.005	28.106	9	2.899	0.322111			
	24	8	5164433	10					10	1	32.783	28.753	10	4.03	0.403			
	25	1	5164434	10					10	1	33.27	30.551	10	2.719	0.2719			
	26	2	5164434	10					8	0.8	31.995	29.279	8	2.716	0.3395			
	27	3	5164434	10					10	1	32.215	29.118	10	3.097	0.3097			
	28	4	5164434	10					10	1	32.446	29.245	10	3.201	0.3201			
	29	5	5164434	10					9	0.9	30.449	28.355	9	2.094	0.232667			
	30	6	5164434	10					10	1	30.724	27.702	10	3.022	0.3022			
	31	7	5164434	10					10	1	29.667	27.415	10	2.252	0.2252			
	32	8	5164434	10					10	1	31.959	29.134	10	2.825	0.2825			
	33	1	5164435	10					9	0.9	33.694	30.495	9	3.199	0.355444			
	34	2	5164435	10					9	0.9	30.293	27.013	9	3.28	0.364444			
	35	3	5164435	10					8	0.8	29.804	27.104	8	2.7	0.3375			
	36	4	5164435	10					9	0.9	32.364	29.573	7	2.791	0.398714			
	37	5	5164435	10					10	1	32.558	28.756	10	3.802	0.3802			
	38	6	5164435	10					7	0.7	31.766	29.502	7	2.264	0.323429			
	39	7	5164435	10					6	0.6	31.295	29.743	6	1.552	0.258667			

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	40	8	5164435	10					9	0.9	30.963	27.589	9	3.374	0.374889				
	41	1	5164436	10					8	0.8	29.172	28.041	8	1.131	0.141375				
	42	2	5164436	10					8	0.8	28.61	27.565	8	1.045	0.130625				
	43	3	5164436	10					7	0.7	28.957	27.148	7	1.809	0.258429				
	44	4	5164436	10					7	0.7	34.2	32.941	7	1.259	0.179857				
	45	5	5164436	10					7	0.7	31.068	30.032	7	1.036	0.148				
	46	6	5164436	10					6	0.6	28.011	27.411	6	0.6	0.1				
	47	7	5164436	10					8	0.8	29.069	27.988	8	1.081	0.135125				
	48	8	5164436	10					9	0.9	30.125	28.041	9	2.084	0.231556				
	49	1	5164437	10					9	0.9	34.376	30.274	9	4.102	0.455778				
	50	2	5164437	10					10	1	32.851	28.45	10	4.401	0.4401				
	51	3	5164437	10					9	0.9	30.723	28.222	9	2.501	0.277889				
	52	4	5164437	10					9	0.9	30.096	26.971	9	3.125	0.347222				
	53	5	5164437	10					9	0.9	33.955	29.062	9	4.893	0.543667				
	54	6	5164437	10					10	1	33.006	29.246	10	3.76	0.376				
	55	7	5164437	10					10	1	31.743	27.439	10	4.304	0.4304				
	56	8	5164437	10					10	1	33.622	29.403	10	4.219	0.4219				
	57	1	5164440	10					9	0.9	30.932	28.391	9	2.541	0.282333				
	58	2	5164440	10					10	1	29.385	27.028	10	2.357	0.2357				
	59	3	5164440	10					10	1	33.315	30.387	10	2.928	0.2928				
	60	4	5164440	10					10	1	34.224	31.506	10	2.718	0.2718				
	61	5	5164440	10					10	1	29.074	26.81	10	2.264	0.2264				
	62	6	5164440	10					7	0.7	31.885	29.175	7	2.71	0.387143				
	63	7	5164440	10					10	1	31.22	28.795	10	2.425	0.2425				
	64	8	5164440	10					9	0.9	29.998	28.152	9	1.846	0.205111				
	65	1	5164441	10					9	0.9	31.334	28.25	9	3.084	0.342667				
	66	2	5164441	10					9	0.9	32.279	28.73	9	3.549	0.394333				
	67	3	5164441	10					9	0.9	31.806	28.682	9	3.124	0.347111				
	68	4	5164441	10					9	0.9	31.888	29.389	9	2.499	0.277667				
	69	5	5164441	10					9	0.9	32.719	28.759	9	3.96	0.44				
	70	6	5164441	10					10	1	31.775	28.696	10	3.079	0.3079				
	71	7	5164441	10					10	1	32.677	28.026	10	4.651	0.4651				
	72	8	5164441	10					10	1	32.186	28.494	10	3.692	0.3692				
	73	1	5164442	10					10	1	30.158	27.371	10	2.787	0.2787				
	74	2	5164442	10					10	1	31.467	28.794	10	2.673	0.2673				
	75	3	5164442	10					9	0.9	31.251	28.226	9	3.025	0.336111				
	76	4	5164442	10					10	1	32.015	28.545	10	3.47	0.347				
	77	5	5164442	10					10	1	32.586	29.66	10	2.926	0.2926				
	78	6	5164442	10					10	1	30.621	27.999	10	2.622	0.2622				
	79	7	5164442	10					8	0.8	32.295	29.131	8	3.164	0.3955				
	80	8	5164442	10					9	0.9	30.543	27.725	9	2.818	0.313111				

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	81	1	5164443	10					9	0.9	32.376	29.171	9	3.205	0.356111				
	82	2	5164443	10					8	0.8	30.856	27.808	8	3.048	0.381				
	83	3	5164443	10					8	0.8	31.844	29.965	8	1.879	0.234875				
	84	4	5164443	10					9	0.9	30.17	27.274	9	2.896	0.321778				
	85	5	5164443	10					7	0.7	32.601	29.467	7	3.134	0.447714				
	86	6	5164443	10					7	0.7	31.23	29.094	7	2.136	0.305143				
	87	7	5164443	10					8	0.8	30.73	28.182	8	2.548	0.3185				
	88	8	5164443	10					9	0.9	29.467	27.653	9	1.814	0.201556				
	89	1	5164449	10					9	0.9	31.563	28.497	9	3.066	0.340667				
	90	2	5164449	10					10	1	32.636	28.566	10	4.07	0.407				
	91	3	5164449	10					9	0.9	32.046	29.15	9	2.896	0.321778				
	92	4	5164449	10					10	1	31.163	28.046	10	3.117	0.3117				
	93	5	5164449	10					10	1	31.444	27.987	10	3.457	0.3457				
	94	6	5164449	10					10	1	29.96	27.375	10	2.585	0.2585				
	95	7	5164449	10					9	0.9	30.476	27.824	9	2.652	0.294667				
	96	8	5164449	10					9	0.9	31.896	28.318	9	3.578	0.397556				
	97	1	5164439	10					10	1	33.249	29.466	10	3.783	0.3783				
	98	2	5164439	10					10	1	37.36	29.02	10	8.34	0.834				
	99	3	5164439	10					10	1	33.602	28.78	10	4.822	0.4822				
	100	4	5164439	10					10	1	33.938	28.294	10	5.644	0.5644				
	101	5	5164439	10					8	0.8	33.2	27.779	8	5.421	0.677625				
	102	6	5164439	10					8	0.8	32.555	28.294	8	4.261	0.532625				
	103	7	5164439	10					9	0.9	35.083	28.633	9	6.45	0.716667				
	104	8	5164439	10					10	1	33.624	28.161	10	5.463	0.5463				
	105	1	5164450	10					9	0.9	32.877	29.847	9	3.03	0.336667				
	106	2	5164450	10					9	0.9	33.176	29.363	9	3.813	0.423667				
	107	3	5164450	10					8	0.8	31.25	28.194	8	3.056	0.382				
	108	4	5164450	10					9	0.9	30.402	28.222	9	2.18	0.242222				
	109	5	5164450	10					10	1	32.348	29.275	10	3.073	0.3073				
	110	6	5164450	10					10	1	33.421	29.927	10	3.494	0.3494				
	111	7	5164450	10					9	0.9	32.359	29.425	9	2.934	0.326				
	112	8	5164450	10					10	1	30.285	26.816	10	3.469	0.3469				
	113	1	5164451	10					10	1	31.448	28.404	10	3.044	0.3044				
	114	2	5164451	10					8	0.8	29.185	27.72	8	1.465	0.183125				
	115	3	5164451	10					10	1	33.809	29.415	10	4.394	0.4394				
	116	4	5164451	10					9	0.9	30.879	27.219	9	3.66	0.406667				
	117	5	5164451	10					10	1	32.414	30.227	10	2.187	0.2187				
	118	6	5164451	10					10	1	32.652	29.077	10	3.575	0.3575				
	119	7	5164451	10					10	1	33.551	30.034	10	3.517	0.3517				
	120	8	5164451	10					10	1	31.999	28.53	10	3.469	0.3469				
	121	1	5164452	10					9	0.9	30.562	28.813	9	1.749	0.194333				

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	122	2	5164452	10					9	0.9	33.555	30.608	9	2.947	0.327444				
	123	3	5164452	10					7	0.7	30.938	29.497	7	1.441	0.205857				
	124	4	5164452	10					10	1	31.263	28.356	10	2.907	0.2907				
	125	5	5164452	10					10	1	29.984	27.217	10	2.767	0.2767				
	126	6	5164452	10					8	0.8	30.794	28.708	8	2.086	0.26075				
	127	7	5164452	10					10	1	30.375	28.106	10	2.269	0.2269				
	128	8	5164452	10					8	0.8	32.21	29.015	8	3.195	0.399375				
	129	1	5164453	10					8	0.8	33.247	28.628	8	4.619	0.577375				
	130	2	5164453	10					9	0.9	34.566	30.645	9	3.921	0.435667				
	131	3	5164453	10					8	0.8	32.322	28.029	8	4.293	0.536625				
	132	4	5164453	10					10	1	32.882	27.818	10	5.064	0.5064				
	133	5	5164453	10					9	0.9	31.151	27.6	9	3.551	0.394556				
	134	6	5164453	10					10	1	31.055	25.566	10	5.489	0.5489				
	135	7	5164453	10					10	1	33.142	28.884	10	4.258	0.4258				
	136	8	5164453	10					9	0.9	31.383	27.192	9	4.191	0.465667				
	137	1	5164454	10					9	0.9	30.997	27.812	9	3.185	0.353889				
	138	2	5164454	10					10	1	29.983	26.886	10	3.097	0.3097				
	139	3	5164454	10					10	1	30.697	27.867	10	2.83	0.283				
	140	4	5164454	10					10	1	32.609	28.104	10	4.505	0.4505				
	141	5	5164454	10					10	1	32.678	28.838	10	3.84	0.384				
	142	6	5164454	10					9	0.9	32.048	29.292	9	2.756	0.306222				
	143	7	5164454	10					10	1	29.723	27.653	10	2.07	0.207				
	144	8	5164454	10					10	1	31.921	28.161	10	3.76	0.376				
	145	1	5164455	10					9	0.9	32.366	29.39	9	2.976	0.330667				
	146	2	5164455	10					9	0.9	32.624	29.7	9	2.924	0.324889				
	147	3	5164455	10					9	0.9	31.277	28.64	9	2.637	0.293				
	148	4	5164455	10					10	1	32.096	28.546	10	3.55	0.355				
	149	5	5164455	10					9	0.9	31.579	28.832	9	2.747	0.305222				
	150	6	5164455	10					10	1	30.655	28.074	10	2.581	0.2581				
	151	7	5164455	10					10	1	34.039	30.088	10	3.951	0.3951				
	152	8	5164455	10					10	1	31.965	29.006	10	2.959	0.2959				
	153	1	5164456	10					8	0.8	32.065	29.68	8	2.385	0.298125				
	154	2	5164456	10					10	1	31.505	28.633	10	2.872	0.2872				
	155	3	5164456	10					6	0.6	29.759	27.861	6	1.898	0.316333				
	156	4	5164456	10					10	1	32.671	29.477	10	3.194	0.3194				
	157	5	5164456	10					9	0.9	31.482	29.725	9	1.757	0.195222				
	158	6	5164456	10					10	1	31.033	28.682	10	2.351	0.2351				
	159	7	5164456	10					10	1	30.708	26.496	10	4.212	0.4212				
	160	8	5164456	10					9	0.9	30.322	29.075	9	1.247	0.138556				
	161	1	5164457	10					10	1	33.58	30.161	10	3.419	0.3419				
	162	2	5164457	10					10	1	32.609	29.61	10	2.999	0.2999				

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	163	3	5164457	10					8	0.8	32.304	29.122	8	3.182	0.39775			
	164	4	5164457	10					10	1	33.151	30.022	10	3.129	0.3129			
	165	5	5164457	10					10	1	32.069	28.265	10	3.804	0.3804			
	166	6	5164457	10					9	0.9	32.636	29.604	9	3.032	0.336889			
	167	7	5164457	10					10	1	31.405	28.11	10	3.295	0.3295			
	168	8	5164457	10					7	0.7	30.908	28.252	7	2.656	0.379429			
	169	1	5164459	10					6	0.6	32.15	28.78	6	3.37	0.561667			
	170	2	5164459	10					8	0.8	30.96	26.832	8	4.128	0.516			
	171	3	5164459	10					9	0.9	32.931	28.854	9	4.077	0.453			
	172	4	5164459	10					9	0.9	31.743	27.931	9	3.812	0.423556			
	173	5	5164459	10					7	0.7	32.757	29.813	7	2.944	0.420571			
	174	6	5164459	10					9	0.9	32.457	28.965	9	3.492	0.388			
	175	7	5164459	10					9	0.9	32.066	28.302	9	3.764	0.418222			
	176	8	5164459	10					7	0.7	32.356	28.876	7	3.48	0.497143			

Comments: Data entry verified against EXCEL spreadsheet - MLR 11-10-05

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Freshwater Sediment-Average ind. biomass

Start Date:	4/28/05 10:50	Test ID: 727-1b	Sample ID:
End Date:	5/26/05 12:10	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.4090	0.4226	0.4317	0.4825	0.3806	0.3669	0.3865	0.3788
Ref05164470	0.5648	0.5531	0.6223	0.6534	0.5768	0.5107	0.5909	0.5911
5164460	0.4651	0.4242	0.4488	0.4706	0.6082	0.5415	0.4396	0.7207
5164461	0.3506	0.3987	0.2697	0.4458	0.4050	0.3832	0.3656	0.3464
5164468	0.1461	0.1814	0.2369	0.1895	0.2057	0.1544	0.1590	0.1500
5164469	0.4263	0.5413	0.4709	0.5504	0.4108	0.4033	0.3854	0.5001
5164471	0.6008	0.6013	0.6836	0.6415	0.6815	0.6423	0.4638	0.8246

			Transform: Untransformed					1-Tailed		
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.4073	0.6988	0.4073	0.3669	0.4825	9.315	8			
Ref05164470	0.5829	1.0000	0.5829	0.5107	0.6534	7.428	8			
5164460	0.5148	0.8833	0.5148	0.4242	0.7207	20.035	8			
*5164461	0.3706	0.6358	0.3706	0.2697	0.4458	14.049	8	8.866	2.624	0.0628
*5164468	0.1779	0.3052	0.1779	0.1461	0.2369	17.899	8	21.316	2.624	0.0499
*5164469	0.4611	0.7910	0.4611	0.3854	0.5504	13.918	8	4.451	2.624	0.0718
5164471	0.6424	1.1021	0.6424	0.4638	0.8246	15.759	8			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.97953	0.904	0.03141	-0.3267
Bartlett's Test indicates equal variances (p = 0.01)	10.5746	11.3449		
The control means are significantly different (p = 5.64E-07)	8.6256	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.07183	0.12324	0.23299	0.00243	7.7E-15	3, 28

Freshwater Sediment 28-day survival

Start Date:	4/28/05 10:50	Test ID: 727-1b	Sample ID:
End Date:	5/26/05 12:10	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.9000	1.0000	1.0000	0.8000	1.0000	1.0000	1.0000	1.0000
Ref05164470	1.0000	1.0000	0.9000	1.0000	0.9000	1.0000	1.0000	0.9000
5164460	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
5164461	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
5164468	0.8000	0.8000	0.9000	1.0000	0.9000	1.0000	0.9000	0.6000
5164469	0.9000	0.9000	1.0000	0.8000	0.9000	0.9000	1.0000	0.9000
5164471	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	1.0000	0.8000

			Transform: Arcsin Square Root						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.9625	1.0000	1.3535	1.1071	1.4120	8.476	8			
Ref05164470	0.9625	1.0000	1.3509	1.2490	1.4120	6.244	8			
5164460	0.9750	1.0130	1.3713	1.2490	1.4120	5.501	8			
5164461	0.9875	1.0260	1.3916	1.2490	1.4120	4.140	8			
5164468	0.8625	0.8961	1.2089	0.8861	1.4120	14.404	8	2.075	2.624	0.1795
5164469	0.9125	0.9481	1.2721	1.1071	1.4120	7.806	8			
5164471	0.9500	0.9870	1.3332	1.1071	1.4120	8.799	8			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.87958	0.844	-0.688	1.14913
F-Test indicates equal variances (p = 0.07)	4.26253	8.88531		
The control means are not significantly different (p = 0.96)	0.05232	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences	0.10366	0.10884	0.08061	0.01872	0.05688	1, 14

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1b
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

Pos	ID	Rep	Group	Day 0	Day 10	psurv Day 10	Day 20	psurv Day 20	Day 28	psurv day 28	Dry Wt (mg)	Tare Wt (mg)	Wt. count	TWT	WT	Ashed dry wt	TAFDW	AFDW
	1	1	D-Control	10					9	0.9	31.569	27.888	9	3.681	0.409			
	2	2	D-Control	10					10	1	32.3	28.074	10	4.226	0.4226			
	3	3	D-Control	10					10	1	34.085	29.768	10	4.317	0.4317			
	4	4	D-Control	10					8	0.8	34.154	30.294	8	3.86	0.4825			
	5	5	D-Control	10					10	1	33.196	29.39	10	3.806	0.3806			
	6	6	D-Control	10					10	1	32.921	29.252	10	3.669	0.3669			
	7	7	D-Control	10					10	1	32.515	28.65	10	3.865	0.3865			
	8	8	D-Control	10					10	1	31.417	27.629	10	3.788	0.3788			
	9	1	Ref05164470	10					10	1	33.056	27.408	10	5.648	0.5648			
	10	2	Ref05164470	10					10	1	33.229	27.698	10	5.531	0.5531			
	11	3	Ref05164470	10					9	0.9	34.843	29.242	9	5.601	0.622333			
	12	4	Ref05164470	10					10	1	35.703	29.169	10	6.534	0.6534			
	13	5	Ref05164470	10					9	0.9	32.987	27.796	9	5.191	0.576778			
	14	6	Ref05164470	10					10	1	33.368	28.261	10	5.107	0.5107			
	15	7	Ref05164470	10					10	1	33.575	27.666	10	5.909	0.5909			
	16	8	Ref05164470	10					9	0.9	35.039	29.719	9	5.32	0.591111			
	17	1	5164460	10					10	1	34.83	30.179	10	4.651	0.4651			
	18	2	5164460	10					9	0.9	33.339	29.521	9	3.818	0.424222			
	19	3	5164460	10					10	1	33.194	28.706	10	4.488	0.4488			
	20	4	5164460	10					10	1	33.448	28.742	10	4.706	0.4706			
	21	5	5164460	10					9	0.9	34.357	28.883	9	5.474	0.608222			
	22	6	5164460	10					10	1	35.364	29.949	10	5.415	0.5415			
	23	7	5164460	10					10	1	32.77	28.374	10	4.396	0.4396			
	24	8	5164460	10					10	1	36.19	28.983	10	7.207	0.7207			
	25	1	5164461	10					10	1	34.781	31.275	10	3.506	0.3506			
	26	2	5164461	10					10	1	32.829	28.842	10	3.987	0.3987			
	27	3	5164461	10					10	1	31.398	28.701	10	2.697	0.2697			
	28	4	5164461	10					10	1	32.163	27.705	10	4.458	0.4458			
	29	5	5164461	10					9	0.9	32.063	28.418	9	3.645	0.405			
	30	6	5164461	10					10	1	32.77	28.938	10	3.832	0.3832			
	31	7	5164461	10					10	1	31.926	28.27	10	3.656	0.3656			
	32	8	5164461	10					10	1	31.15	27.686	10	3.464	0.3464			
	33	1	5164468	10					8	0.8	30.182	29.013	8	1.169	0.146125			
	34	2	5164468	10					8	0.8	29.403	27.952	8	1.451	0.181375			
	35	3	5164468	10					9	0.9	30.513	28.381	9	2.132	0.236889			
	36	4	5164468	10					10	1	28.447	26.552	10	1.895	0.1895			
	37	5	5164468	10					9	0.9	31.068	29.217	9	1.851	0.205667			
	38	6	5164468	10					10	1	30.655	29.111	10	1.544	0.1544			
	39	7	5164468	10					9	0.9	28.882	27.451	9	1.431	0.159			

data entry verified against EXCEL spreadsheet TMR 11-10-05

(see below)

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1b
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	40	8	5164468	10					6	0.6	30.419	29.519	6	0.9	0.15			
	41	1	5164469	10					9	0.9	31.785	27.948	9	3.837	0.426333			
	42	2	5164469	10					9	0.9	32.998	28.126	9	4.872	0.541333			
	43	3	5164469	10					10	1	33.513	28.804	10	4.709	0.4709			
	44	4	5164469	10					8	0.8	31.521	27.118	8	4.403	0.550375			
	45	5	5164469	10					9	0.9	32.39	28.693	9	3.697	0.410778			
	46	6	5164469	10					9	0.9	31.656	28.026	9	3.63	0.403333			
	47	7	5164469	10					10	1	31.647	28.178	9	3.469	0.385444			
	48	8	5164469	10					9	0.9	33.996	29.995	8	4.001	0.500125			
	49	1	5164471	10					10	1	32.481	26.473	10	6.008	0.6008			
	50	2	5164471	10					10	1	33.432	27.419	10	6.013	0.6013			
	51	3	5164471	10					9	0.9	34.562	28.41	9	6.152	0.683556			
	52	4	5164471	10					9	0.9	33.081	27.949	8	5.132	0.6415			
	53	5	5164471	10					10	1	35.329	28.514	10	6.815	0.6815			
	54	6	5164471	10					10	1	36.323	29.9	10	6.423	0.6423			
	55	7	5164471	10					10	1	35.533	30.895	10	4.638	0.4638			
	56	8	5164471	10					8	0.8	36.225	29.628	8	6.597	0.824625			

Comments: Data entry verified against EXCEL spreadsheet - MLR 11-10 05

Freshwater Sediment Average ind. biomass

Start Date:	4/28/05 10:50	Test ID:	727-1	Sample ID:	
End Date:	5/26/05 12:10	Lab ID:	ORNAS-Northwestern Aquati	Sample Type:	SED-Sediment
Sample Date:		Protocol:	NASXXXHA4C-Hyalella 28-d	Test Species:	HA-Hyalella azteca
Comments:					

Conc-	1	2	3	4	5	6	7	8
D-Control	0.4090	0.4226	0.4317	0.4825	0.3806	0.3669	0.3865	0.3788
Ref05164478	0.5351	0.6299	0.5825	0.5870	0.6730	0.5205	0.5401	0.5448
5164433	0.2852	0.4499	0.4377	0.4443	0.3273	0.3909	0.3221	0.4030
5164434	0.2719	0.3395	0.3097	0.3201	0.2327	0.3022	0.2252	0.2825
5164435	0.3554	0.3644	0.3375	0.3987	0.3802	0.3234	0.2587	0.3749
5164436	0.1414	0.1306	0.2584	0.1799	0.1480	0.1000	0.1351	0.2316
5164437	0.4558	0.4401	0.2779	0.3472	0.5437	0.3760	0.4304	0.4219
5164440	0.2823	0.2357	0.2928	0.2718	0.2264	0.3871	0.2425	0.2051
5164441	0.3427	0.3943	0.3471	0.2777	0.4400	0.3079	0.4651	0.3692
5164442	0.2787	0.2673	0.3361	0.3470	0.2926	0.2622	0.3955	0.3131
5164443	0.3561	0.3810	0.2349	0.3218	0.4477	0.3051	0.3185	0.2016
5164449	0.3407	0.4070	0.3218	0.3117	0.3457	0.2585	0.2947	0.3976
5164439	0.3783	0.8340	0.4822	0.5644	0.6776	0.5326	0.7167	0.5463
5164450	0.3367	0.4237	0.3820	0.2422	0.3073	0.3494	0.3260	0.3469
5164451	0.3044	0.1831	0.4394	0.4067	0.2187	0.3575	0.3517	0.3469
5164452	0.1943	0.3274	0.2059	0.2907	0.2767	0.2608	0.2269	0.3994
5164453	0.5774	0.4357	0.5366	0.5064	0.3946	0.5489	0.4258	0.4657
5164454	0.3539	0.3097	0.2830	0.4505	0.3840	0.3062	0.2070	0.3760
5164455	0.3307	0.3249	0.2930	0.3550	0.3052	0.2581	0.3951	0.2959
5164456	0.2981	0.2872	0.3163	0.3194	0.1952	0.2351	0.4212	0.1386
5164457	0.3419	0.2999	0.3978	0.3129	0.3804	0.3369	0.3295	0.3794
5164459	0.5617	0.5160	0.4530	0.4236	0.4206	0.3880	0.4182	0.4971

			Transform: Untransformed						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.4073	0.7064	0.4073	0.3669	0.4825	9.315	8			
Ref05164478	0.5766	1.0000	0.5766	0.5205	0.6730	9.151	8			
*5164433	0.3825	0.6634	0.3825	0.2852	0.4499	16.550	8	6.660	2.624	0.0765
*5164434	0.2855	0.4951	0.2855	0.2252	0.3395	14.259	8	12.357	2.624	0.0618
*5164435	0.3492	0.6055	0.3492	0.2587	0.3987	12.503	8	9.394	2.624	0.0635
*5164436	0.1656	0.2872	0.1656	0.1000	0.2584	32.693	8	15.376	2.624	0.0702
*5164437	0.4116	0.7139	0.4116	0.2779	0.5437	19.251	8	4.902	2.624	0.0883
*5164440	0.2680	0.4647	0.2680	0.2051	0.3871	21.114	8	11.284	2.624	0.0718
*5164441	0.3680	0.6382	0.3680	0.2777	0.4651	17.235	8	7.152	2.624	0.0766
*5164442	0.3116	0.5403	0.3116	0.2622	0.3955	14.729	8	10.721	2.624	0.0649
*5164443	0.3208	0.5564	0.3208	0.2016	0.4477	24.381	8	7.667	2.624	0.0876
*5164449	0.3347	0.5805	0.3347	0.2585	0.4070	14.913	8	9.421	2.624	0.0674
5164439	0.5915	1.0258	0.5915	0.3783	0.8340	24.376	8			
*5164450	0.3393	0.5884	0.3393	0.2422	0.4237	15.649	8	8.968	2.624	0.0695
*5164451	0.3260	0.5655	0.3260	0.1831	0.4394	26.900	8	6.924	2.624	0.0950
*5164452	0.2728	0.4730	0.2728	0.1943	0.3994	24.879	8	9.998	2.624	0.0798
*5164453	0.4864	0.8435	0.4864	0.3946	0.5774	13.508	8	3.029	2.624	0.0782
*5164454	0.3338	0.5789	0.3338	0.2070	0.4505	22.167	8	7.558	2.624	0.0843
*5164455	0.3197	0.5545	0.3197	0.2581	0.3951	13.143	8	10.771	2.624	0.0626
*5164456	0.2764	0.4793	0.2764	0.1386	0.4212	31.272	8	8.385	2.624	0.0940
*5164457	0.3473	0.6024	0.3473	0.2999	0.3978	10.067	8	10.245	2.624	0.0587
*5164459	0.4598	0.7974	0.4598	0.3880	0.5617	12.923	8	4.159	2.624	0.0737

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.37705	1.035	0.04666	-0.0718
Bartlett's Test indicates equal variances (p = 0.03)	31.991	36.1908		
The control means are significantly different (p = 3.52E-06)	7.36766	2.14479		

Hypothesis Test (1-tail 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.07373	0.12787	0.06218	0.00382	1.1E-26	19, 140

Freshwater Sediment 28-day survival

Start Date:	4/28/05 10:50	Test ID:	727-1
End Date:	5/26/05 12:10	Lab ID:	ORNAS-Northwestern Aquati
Sample Date:		Protocol:	NASXXXHA4C-Hyalella 28-d
Comments:			

Sample ID:								
Sample Type:	SED-Sediment							
Test Species:	HA-Hyalella azteca							

Conc-	1	2	3	4	5	6	7	8
D-Control	0.9000	1.0000	1.0000	0.8000	1.0000	1.0000	1.0000	1.0000
Ref05164478	1.0000	0.9000	1.0000	0.9000	0.9000	1.0000	1.0000	1.0000
5164433	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	0.9000	1.0000
5164434	1.0000	0.8000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
5164435	0.9000	0.9000	0.8000	0.9000	1.0000	0.7000	0.6000	0.9000
5164436	0.8000	0.8000	0.7000	0.7000	0.7000	0.6000	0.8000	0.9000
5164437	0.9000	1.0000	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000
5164440	0.9000	1.0000	1.0000	1.0000	1.0000	0.7000	1.0000	0.9000
5164441	0.9000	0.9000	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000
5164442	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000	0.8000	0.9000
5164443	0.9000	0.8000	0.8000	0.9000	0.7000	0.7000	0.8000	0.9000
5164449	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000
5164439	1.0000	1.0000	1.0000	1.0000	0.8000	0.8000	0.9000	1.0000
5164450	0.9000	0.9000	0.8000	0.9000	1.0000	1.0000	0.9000	1.0000
5164451	1.0000	0.8000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000
5164452	0.9000	0.9000	0.7000	1.0000	1.0000	0.8000	1.0000	0.8000
5164453	0.8000	0.9000	0.8000	1.0000	0.9000	1.0000	1.0000	0.9000
5164454	0.9000	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000
5164455	0.9000	0.9000	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000
5164456	0.8000	1.0000	0.6000	1.0000	0.9000	1.0000	1.0000	0.9000
5164457	1.0000	1.0000	0.8000	1.0000	1.0000	0.9000	1.0000	0.7000
5164459	0.6000	0.8000	0.9000	0.9000	0.7000	0.9000	0.9000	0.7000

			Transform: Arcsin Square Root						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.9625	1.0000	1.3535	1.1071	1.4120	8.476	8			
Ref05164478	0.9625	1.0000	1.3509	1.2490	1.4120	6.244	8			
5164433	0.9625	1.0000	1.3509	1.2490	1.4120	6.244	8			
5164434	0.9625	1.0000	1.3535	1.1071	1.4120	8.476	8			
*5164435	0.8375	0.8701	1.1741	0.8861	1.4120	14.396	8	2.648	2.624	0.1753
*5164436	0.7500	0.7792	1.0538	0.8861	1.2490	10.553	8	6.022	2.624	0.1295
5164437	0.9500	0.9870	1.3305	1.2490	1.4120	6.547	8			
5164440	0.9375	0.9740	1.3187	0.9912	1.4120	11.484	8			
5164441	0.9375	0.9740	1.3102	1.2490	1.4120	6.438	8			
5164442	0.9500	0.9870	1.3332	1.1071	1.4120	8.799	8			
*5164443	0.8125	0.8442	1.1314	0.9912	1.2490	9.603	8	4.515	2.624	0.1276
5164449	0.9500	0.9870	1.3305	1.2490	1.4120	6.547	8			
5164439	0.9375	0.9740	1.3154	1.1071	1.4120	10.667	8			
5164450	0.9250	0.9610	1.2924	1.1071	1.4120	8.514	8			
5164451	0.9625	1.0000	1.3535	1.1071	1.4120	8.476	8			
5164452	0.8875	0.9221	1.2424	0.9912	1.4120	13.124	8			
5164453	0.9125	0.9481	1.2747	1.1071	1.4120	10.042	8			
5164454	0.9750	1.0130	1.3713	1.2490	1.4120	5.501	8			
5164455	0.9500	0.9870	1.3305	1.2490	1.4120	6.547	8			
5164456	0.9000	0.9351	1.2674	0.8861	1.4120	15.071	8			
5164457	0.9250	0.9610	1.3009	0.9912	1.4120	12.925	8			
*5164459	0.8000	0.8312	1.1215	0.8861	1.2490	13.255	8	3.797	2.624	0.1586

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.95702	0.919	-0.3715	-0.4647
Bartlett's Test indicates equal variances (p = 0.32)	4.67099	13.2767		
The control means are not significantly different (p = 0.96)	0.05232	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.08896	0.0934	0.10007	0.01639	7.8E-04	4, 35

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

Pos	ID	Rep	Group	Day 0	Day 10	psurv Day 10	Day 20	psurv Day 20	Day 28	psurv day 28	Dry Wt (mg)	Tare Wt (mg)	Wt. count	TWT	WT	Ashed dry wt	TAFDW	AFDW
	1	1	D-Control	10					9	0.9	31.569	27.888	9	3.681	0.409			
	2	2	D-Control	10					10	1	32.3	28.074	10	4.226	0.4226			
	3	3	D-Control	10					10	1	34.085	29.768	10	4.317	0.4317			
	4	4	D-Control	10					8	0.8	34.154	30.294	8	3.86	0.4825			
	5	5	D-Control	10					10	1	33.196	29.39	10	3.806	0.3806			
	6	6	D-Control	10					10	1	32.921	29.252	10	3.669	0.3669			
	7	7	D-Control	10					10	1	32.515	28.65	10	3.865	0.3865			
	8	8	D-Control	10					10	1	31.417	27.629	10	3.788	0.3788			
	9	1	Ref05164478	10					10	1	59.188	53.837	10	5.351	0.5351			
	10	2	Ref05164478	10					9	0.9	33.976	28.307	9	5.669	0.629889			
	11	3	Ref05164478	10					10	1	34.558	28.733	10	5.825	0.5825			
	12	4	Ref05164478	10					9	0.9	33.606	28.323	9	5.283	0.587			
	13	5	Ref05164478	10					9	0.9	33.897	27.84	9	6.057	0.673			
	14	6	Ref05164478	10					10	1	32.988	27.783	10	5.205	0.5205			
	15	7	Ref05164478	10					10	1	34.057	29.196	9	4.861	0.540111			
	16	8	Ref05164478	10					10	1	34.52	29.072	10	5.448	0.5448			
	17	1	5164433	10					10	1	32.492	29.64	10	2.852	0.2852			
	18	2	5164433	10					10	1	31.732	27.233	10	4.499	0.4499			
	19	3	5164433	10					9	0.9	31.415	27.476	9	3.939	0.437667			
	20	4	5164433	10					10	1	34.726	30.283	10	4.443	0.4443			
	21	5	5164433	10					10	1	33.666	30.393	10	3.273	0.3273			
	22	6	5164433	10					9	0.9	32.134	28.616	9	3.518	0.390889			
	23	7	5164433	10					9	0.9	31.005	28.106	9	2.899	0.322111			
	24	8	5164433	10					10	1	32.783	28.753	10	4.03	0.403			
	25	1	5164434	10					10	1	33.27	30.551	10	2.719	0.2719			
	26	2	5164434	10					8	0.8	31.995	29.279	8	2.716	0.3395			
	27	3	5164434	10					10	1	32.215	29.118	10	3.097	0.3097			
	28	4	5164434	10					10	1	32.446	29.245	10	3.201	0.3201			
	29	5	5164434	10					9	0.9	30.449	28.355	9	2.094	0.232667			
	30	6	5164434	10					10	1	30.724	27.702	10	3.022	0.3022			
	31	7	5164434	10					10	1	29.667	27.415	10	2.252	0.2252			
	32	8	5164434	10					10	1	31.959	29.134	10	2.825	0.2825			
	33	1	5164435	10					9	0.9	33.694	30.495	9	3.199	0.355444			
	34	2	5164435	10					9	0.9	30.293	27.013	9	3.28	0.364444			
	35	3	5164435	10					8	0.8	29.804	27.104	8	2.7	0.3375			
	36	4	5164435	10					9	0.9	32.364	29.573	7	2.791	0.398714			
	37	5	5164435	10					10	1	32.558	28.756	10	3.802	0.3802			
	38	6	5164435	10					7	0.7	31.766	29.502	7	2.264	0.323429			
	39	7	5164435	10					6	0.6	31.295	29.743	6	1.552	0.258667			

data entry verified against EXCEL spreadsheet MSB 11-10-05

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	40	8	5164435	10					9	0.9	30.963	27.589	9	3.374	0.374889					
	41	1	5164436	10					8	0.8	29.172	28.041	8	1.131	0.141375					
	42	2	5164436	10					8	0.8	28.61	27.565	8	1.045	0.130625					
	43	3	5164436	10					7	0.7	28.957	27.148	7	1.809	0.258429					
	44	4	5164436	10					7	0.7	34.2	32.941	7	1.259	0.179857					
	45	5	5164436	10					7	0.7	31.068	30.032	7	1.036	0.148					
	46	6	5164436	10					6	0.6	28.011	27.411	6	0.6	0.1					
	47	7	5164436	10					8	0.8	29.069	27.988	8	1.081	0.135125					
	48	8	5164436	10					9	0.9	30.125	28.041	9	2.084	0.231556					
	49	1	5164437	10					9	0.9	34.376	30.274	9	4.102	0.455778					
	50	2	5164437	10					10	1	32.851	28.45	10	4.401	0.4401					
	51	3	5164437	10					9	0.9	30.723	28.222	9	2.501	0.277889					
	52	4	5164437	10					9	0.9	30.096	26.971	9	3.125	0.347222					
	53	5	5164437	10					9	0.9	33.955	29.062	9	4.893	0.543667					
	54	6	5164437	10					10	1	33.006	29.246	10	3.76	0.376					
	55	7	5164437	10					10	1	31.743	27.439	10	4.304	0.4304					
	56	8	5164437	10					10	1	33.622	29.403	10	4.219	0.4219					
	57	1	5164440	10					9	0.9	30.932	28.391	9	2.541	0.282333					
	58	2	5164440	10					10	1	29.385	27.028	10	2.357	0.2357					
	59	3	5164440	10					10	1	33.315	30.387	10	2.928	0.2928					
	60	4	5164440	10					10	1	34.224	31.506	10	2.718	0.2718					
	61	5	5164440	10					10	1	29.074	26.81	10	2.264	0.2264					
	62	6	5164440	10					7	0.7	31.885	29.175	7	2.71	0.387143					
	63	7	5164440	10					10	1	31.22	28.795	10	2.425	0.2425					
	64	8	5164440	10					9	0.9	29.998	28.152	9	1.846	0.205111					
	65	1	5164441	10					9	0.9	31.334	28.25	9	3.084	0.342667					
	66	2	5164441	10					9	0.9	32.279	28.73	9	3.549	0.394333					
	67	3	5164441	10					9	0.9	31.806	28.682	9	3.124	0.347111					
	68	4	5164441	10					9	0.9	31.888	29.389	9	2.499	0.277667					
	69	5	5164441	10					9	0.9	32.719	28.759	9	3.96	0.44					
	70	6	5164441	10					10	1	31.775	28.696	10	3.079	0.3079					
	71	7	5164441	10					10	1	32.677	28.026	10	4.651	0.4651					
	72	8	5164441	10					10	1	32.186	28.494	10	3.692	0.3692					
	73	1	5164442	10					10	1	30.158	27.371	10	2.787	0.2787					
	74	2	5164442	10					10	1	31.467	28.794	10	2.673	0.2673					
	75	3	5164442	10					9	0.9	31.251	28.226	9	3.025	0.336111					
	76	4	5164442	10					10	1	32.015	28.545	10	3.47	0.347					
	77	5	5164442	10					10	1	32.586	29.66	10	2.926	0.2926					
	78	6	5164442	10					10	1	30.621	27.999	10	2.622	0.2622					
	79	7	5164442	10					8	0.8	32.295	29.131	8	3.164	0.3955					
	80	8	5164442	10					9	0.9	30.543	27.725	9	2.818	0.313111					

Test: FW-Freshwater Sediment
Test ID: 727-1
Species: HA-Hyalella azteca
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample ID:
Sample Type: SED-Sediment
Start Date: 4/28/05 10:50
End Date: 5/26/05 12:10
Lab ID: ORNAS-Northwestern Aquatic Sciences

	81	1	5164443	10					9	0.9	32.376	29.171	9	3.205	0.356111			
	82	2	5164443	10					8	0.8	30.856	27.808	8	3.048	0.381			
	83	3	5164443	10					8	0.8	31.844	29.965	8	1.879	0.234875			
	84	4	5164443	10					9	0.9	30.17	27.274	9	2.896	0.321778			
	85	5	5164443	10					7	0.7	32.601	29.467	7	3.134	0.447714			
	86	6	5164443	10					7	0.7	31.23	29.094	7	2.136	0.305143			
	87	7	5164443	10					8	0.8	30.73	28.182	8	2.548	0.3185			
	88	8	5164443	10					9	0.9	29.467	27.653	9	1.814	0.201556			
	89	1	5164449	10					9	0.9	31.563	28.497	9	3.066	0.340667			
	90	2	5164449	10					10	1	32.636	28.566	10	4.07	0.407			
	91	3	5164449	10					9	0.9	32.046	29.15	9	2.896	0.321778			
	92	4	5164449	10					10	1	31.163	28.046	10	3.117	0.3117			
	93	5	5164449	10					10	1	31.444	27.987	10	3.457	0.3457			
	94	6	5164449	10					10	1	29.96	27.375	10	2.585	0.2585			
	95	7	5164449	10					9	0.9	30.476	27.824	9	2.652	0.294667			
	96	8	5164449	10					9	0.9	31.896	28.318	9	3.578	0.397556			
	97	1	5164439	10					10	1	33.249	29.466	10	3.783	0.3783			
	98	2	5164439	10					10	1	37.36	29.02	10	8.34	0.834			
	99	3	5164439	10					10	1	33.602	28.78	10	4.822	0.4822			
	100	4	5164439	10					10	1	33.938	28.294	10	5.644	0.5644			
	101	5	5164439	10					8	0.8	33.2	27.779	8	5.421	0.677625			
	102	6	5164439	10					8	0.8	32.555	28.294	8	4.261	0.532625			
	103	7	5164439	10					9	0.9	35.083	28.633	9	6.45	0.716667			
	104	8	5164439	10					10	1	33.624	28.161	10	5.463	0.5463			
	105	1	5164450	10					9	0.9	32.877	29.847	9	3.03	0.336667			
	106	2	5164450	10					9	0.9	33.176	29.363	9	3.813	0.423667			
	107	3	5164450	10					8	0.8	31.25	28.194	8	3.056	0.382			
	108	4	5164450	10					9	0.9	30.402	28.222	9	2.18	0.242222			
	109	5	5164450	10					10	1	32.348	29.275	10	3.073	0.3073			
	110	6	5164450	10					10	1	33.421	29.927	10	3.494	0.3494			
	111	7	5164450	10					9	0.9	32.359	29.425	9	2.934	0.326			
	112	8	5164450	10					10	1	30.285	26.816	10	3.469	0.3469			
	113	1	5164451	10					10	1	31.448	28.404	10	3.044	0.3044			
	114	2	5164451	10					8	0.8	29.185	27.72	8	1.465	0.183125			
	115	3	5164451	10					10	1	33.809	29.415	10	4.394	0.4394			
	116	4	5164451	10					9	0.9	30.879	27.219	9	3.66	0.406667			
	117	5	5164451	10					10	1	32.414	30.227	10	2.187	0.2187			
	118	6	5164451	10					10	1	32.652	29.077	10	3.575	0.3575			
	119	7	5164451	10					10	1	33.551	30.034	10	3.517	0.3517			
	120	8	5164451	10					10	1	31.999	28.53	10	3.469	0.3469			
	121	1	5164452	10					9	0.9	30.562	28.813	9	1.749	0.194333			

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	122	2	5164452	10					9	0.9	33.555	30.608	9	2.947	0.327444				
	123	3	5164452	10					7	0.7	30.938	29.497	7	1.441	0.205857				
	124	4	5164452	10					10	1	31.263	28.356	10	2.907	0.2907				
	125	5	5164452	10					10	1	29.984	27.217	10	2.767	0.2767				
	126	6	5164452	10					8	0.8	30.794	28.708	8	2.086	0.26075				
	127	7	5164452	10					10	1	30.375	28.106	10	2.269	0.2269				
	128	8	5164452	10					8	0.8	32.21	29.015	8	3.195	0.399375				
	129	1	5164453	10					8	0.8	33.247	28.628	8	4.619	0.577375				
	130	2	5164453	10					9	0.9	34.566	30.645	9	3.921	0.435667				
	131	3	5164453	10					8	0.8	32.322	28.029	8	4.293	0.536625				
	132	4	5164453	10					10	1	32.882	27.818	10	5.064	0.5064				
	133	5	5164453	10					9	0.9	31.151	27.6	9	3.551	0.394556				
	134	6	5164453	10					10	1	31.055	25.566	10	5.489	0.5489				
	135	7	5164453	10					10	1	33.142	28.884	10	4.258	0.4258				
	136	8	5164453	10					9	0.9	31.383	27.192	9	4.191	0.465667				
	137	1	5164454	10					9	0.9	30.997	27.812	9	3.185	0.353889				
	138	2	5164454	10					10	1	29.983	26.886	10	3.097	0.3097				
	139	3	5164454	10					10	1	30.697	27.867	10	2.83	0.283				
	140	4	5164454	10					10	1	32.609	28.104	10	4.505	0.4505				
	141	5	5164454	10					10	1	32.678	28.838	10	3.84	0.384				
	142	6	5164454	10					9	0.9	32.048	29.292	9	2.756	0.306222				
	143	7	5164454	10					10	1	29.723	27.653	10	2.07	0.207				
	144	8	5164454	10					10	1	31.921	28.161	10	3.76	0.376				
	145	1	5164455	10					9	0.9	32.366	29.39	9	2.976	0.330667				
	146	2	5164455	10					9	0.9	32.624	29.7	9	2.924	0.324889				
	147	3	5164455	10					9	0.9	31.277	28.64	9	2.637	0.293				
	148	4	5164455	10					10	1	32.096	28.546	10	3.55	0.355				
	149	5	5164455	10					9	0.9	31.579	28.832	9	2.747	0.305222				
	150	6	5164455	10					10	1	30.655	28.074	10	2.581	0.2581				
	151	7	5164455	10					10	1	34.039	30.088	10	3.951	0.3951				
	152	8	5164455	10					10	1	31.965	29.006	10	2.959	0.2959				
	153	1	5164456	10					8	0.8	32.065	29.68	8	2.385	0.298125				
	154	2	5164456	10					10	1	31.505	28.633	10	2.872	0.2872				
	155	3	5164456	10					6	0.6	29.759	27.861	6	1.898	0.316333				
	156	4	5164456	10					10	1	32.671	29.477	10	3.194	0.3194				
	157	5	5164456	10					9	0.9	31.482	29.725	9	1.757	0.195222				
	158	6	5164456	10					10	1	31.033	28.682	10	2.351	0.2351				
	159	7	5164456	10					10	1	30.708	26.496	10	4.212	0.4212				
	160	8	5164456	10					9	0.9	30.322	29.075	9	1.247	0.138556				
	161	1	5164457	10					10	1	33.58	30.161	10	3.419	0.3419				
	162	2	5164457	10					10	1	32.609	29.61	10	2.999	0.2999				

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	163	3	5164457	10					8	0.8	32.304	29.122	8	3.182	0.39775			
	164	4	5164457	10					10	1	33.151	30.022	10	3.129	0.3129			
	165	5	5164457	10					10	1	32.069	28.265	10	3.804	0.3804			
	166	6	5164457	10					9	0.9	32.636	29.604	9	3.032	0.336889			
	167	7	5164457	10					10	1	31.405	28.11	10	3.295	0.3295			
	168	8	5164457	10					7	0.7	30.908	28.252	7	2.656	0.379429			
	169	1	5164459	10					6	0.6	32.15	28.78	6	3.37	0.561667			
	170	2	5164459	10					8	0.8	30.96	26.832	8	4.128	0.516			
	171	3	5164459	10					9	0.9	32.931	28.854	9	4.077	0.453			
	172	4	5164459	10					9	0.9	31.743	27.931	9	3.812	0.423556			
	173	5	5164459	10					7	0.7	32.757	29.813	7	2.944	0.420571			
	174	6	5164459	10					9	0.9	32.457	28.965	9	3.492	0.388			
	175	7	5164459	10					9	0.9	32.066	28.302	9	3.764	0.418222			
	176	8	5164459	10					7	0.7	32.356	28.876	7	3.48	0.497143			

Comments:

Freshwater Sediment-Average ind. biomass

Start Date:	4/28/05 10:50	Test ID: 727-1b	Sample ID:
End Date:	5/26/05 12:10	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.4090	0.4226	0.4317	0.4825	0.3806	0.3669	0.3865	0.3788
Ref05164478	0.5351	0.6299	0.5825	0.5870	0.6730	0.5205	0.5401	0.5448
5164460	0.4651	0.4242	0.4488	0.4706	0.6082	0.5415	0.4396	0.7207
5164461	0.3506	0.3987	0.2697	0.4458	0.4050	0.3832	0.3656	0.3464
5164468	0.1461	0.1814	0.2369	0.1895	0.2057	0.1544	0.1590	0.1500
5164469	0.4263	0.5413	0.4709	0.5504	0.4108	0.4033	0.3854	0.5001
5164471	0.6008	0.6013	0.6836	0.6415	0.6815	0.6423	0.4638	0.8246

			Transform: Untransformed					1-Tailed		
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.4073	0.7064	0.4073	0.3669	0.4825	9.315	8			
Ref05164478	0.5766	1.0000	0.5766	0.5205	0.6730	9.151	8			
5164460	0.5148	0.8929	0.5148	0.4242	0.7207	20.035	8			
*5164461	0.3706	0.6428	0.3706	0.2697	0.4458	14.049	8	7.860	2.624	0.0688
*5164468	0.1779	0.3085	0.1779	0.1461	0.2369	17.899	8	18.302	2.624	0.0572
*5164469	0.4611	0.7996	0.4611	0.3854	0.5504	13.918	8	3.933	2.624	0.0771
5164471	0.6424	1.1141	0.6424	0.4638	0.8246	15.759	8			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.97353	0.904	0.2367	-0.4429
Bartlett's Test indicates equal variances (p = 0.02)	9.40182	11.3449		
The control means are significantly different (p = 3.52E-06)	7.36766	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.07709	0.13369	0.22688	0.00266	3.4E-14	3, 28

Freshwater Sediment-28-day survival

Start Date:	4/28/05 10:50	Test ID: 727-1b	Sample ID:
End Date:	5/26/05 12:10	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.9000	1.0000	1.0000	0.8000	1.0000	1.0000	1.0000	1.0000
Ref05164478	1.0000	0.9000	1.0000	0.9000	0.9000	1.0000	1.0000	1.0000
5164460	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
5164461	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
5164468	0.8000	0.8000	0.9000	1.0000	0.9000	1.0000	0.9000	0.6000
5164469	0.9000	0.9000	1.0000	0.8000	0.9000	0.9000	1.0000	0.9000
5164471	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	1.0000	0.8000

			Transform: Arcsin Square Root						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.9625	1.0000	1.3535	1.1071	1.4120	8.476	8			
Ref05164478	0.9625	1.0000	1.3509	1.2490	1.4120	6.244	8			
5164460	0.9750	1.0130	1.3713	1.2490	1.4120	5.501	8			
5164461	0.9875	1.0260	1.3916	1.2490	1.4120	4.140	8			
5164468	0.8625	0.8961	1.2089	0.8861	1.4120	14.404	8	2.075	2.624	0.1795
5164469	0.9125	0.9481	1.2721	1.1071	1.4120	7.806	8			
5164471	0.9500	0.9870	1.3332	1.1071	1.4120	8.799	8			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.87958	0.844	-0.688	1.14913
F-Test indicates equal variances (p = 0.07)	4.26253	8.88531		
The control means are not significantly different (p = 0.96)	0.05232	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences	0.10366	0.10884	0.08061	0.01872	0.05688	1, 14

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1b
Protocol: ~~NASXXX~~HA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

Pos	ID	Rep	Group	Day 0	Day 10	psurv Day 10	Day 20	psurv Day 20	Day 28	psurv day 28	Dry Wt (mg)	Tare Wt (mg)	Wt. count	TWT	WT	Ashed dry wt	TAFDW	AFDW
	1	1	D-Control	10					9	0.9	31.569	27.888	9	3.681	0.409			
	2	2	D-Control	10					10	1	32.3	28.074	10	4.226	0.4226			
	3	3	D-Control	10					10	1	34.085	29.768	10	4.317	0.4317			
	4	4	D-Control	10					8	0.8	34.154	30.294	8	3.86	0.4825			
	5	5	D-Control	10					10	1	33.196	29.39	10	3.806	0.3806			
	6	6	D-Control	10					10	1	32.921	29.252	10	3.669	0.3669			
	7	7	D-Control	10					10	1	32.515	28.65	10	3.865	0.3865			
	8	8	D-Control	10					10	1	31.417	27.629	10	3.788	0.3788			
	9	1	Ref05164478	10					10	1	59.188	53.837	10	5.351	0.5351			
	10	2	Ref05164478	10					9	0.9	33.976	28.307	9	5.669	0.629889			
	11	3	Ref05164478	10					10	1	34.558	28.733	10	5.825	0.5825			
	12	4	Ref05164478	10					9	0.9	33.606	28.323	9	5.283	0.587			
	13	5	Ref05164478	10					9	0.9	33.897	27.84	9	6.057	0.673			
	14	6	Ref05164478	10					10	1	32.988	27.783	10	5.205	0.5205			
	15	7	Ref05164478	10					10	1	34.057	29.196	9	4.861	0.540111			
	16	8	Ref05164478	10					10	1	34.52	29.072	10	5.448	0.5448			
	17	1	5164460	10					10	1	34.83	30.179	10	4.651	0.4651			
	18	2	5164460	10					9	0.9	33.339	29.521	9	3.818	0.424222			
	19	3	5164460	10					10	1	33.194	28.706	10	4.488	0.4488			
	20	4	5164460	10					10	1	33.448	28.742	10	4.706	0.4706			
	21	5	5164460	10					9	0.9	34.357	28.883	9	5.474	0.608222			
	22	6	5164460	10					10	1	35.364	29.949	10	5.415	0.5415			
	23	7	5164460	10					10	1	32.77	28.374	10	4.396	0.4396			
	24	8	5164460	10					10	1	36.19	28.983	10	7.207	0.7207			
	25	1	5164461	10					10	1	34.781	31.275	10	3.506	0.3506			
	26	2	5164461	10					10	1	32.829	28.842	10	3.987	0.3987			
	27	3	5164461	10					10	1	31.398	28.701	10	2.697	0.2697			
	28	4	5164461	10					10	1	32.163	27.705	10	4.458	0.4458			
	29	5	5164461	10					9	0.9	32.063	28.418	9	3.645	0.405			
	30	6	5164461	10					10	1	32.77	28.938	10	3.832	0.3832			
	31	7	5164461	10					10	1	31.926	28.27	10	3.656	0.3656			
	32	8	5164461	10					10	1	31.15	27.686	10	3.464	0.3464			
	33	1	5164468	10					8	0.8	30.182	29.013	8	1.169	0.146125			
	34	2	5164468	10					8	0.8	29.403	27.952	8	1.451	0.181375			
	35	3	5164468	10					9	0.9	30.513	28.381	9	2.132	0.236889			
	36	4	5164468	10					10	1	28.447	26.552	10	1.895	0.1895			
	37	5	5164468	10					9	0.9	31.068	29.217	9	1.851	0.205667			
	38	6	5164468	10					10	1	30.655	29.111	10	1.544	0.1544			
	39	7	5164468	10					9	0.9	28.882	27.451	9	1.431	0.159			

data entry verified against EXCEL spreadsheet MER 11-10-05

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1b
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	40	8	5164468	10					6	0.6	30.419	29.519	6	0.9	0.15			
	41	1	5164469	10					9	0.9	31.785	27.948	9	3.837	0.426333			
	42	2	5164469	10					9	0.9	32.998	28.126	9	4.872	0.541333			
	43	3	5164469	10					10	1	33.513	28.804	10	4.709	0.4709			
	44	4	5164469	10					8	0.8	31.521	27.118	8	4.403	0.550375			
	45	5	5164469	10					9	0.9	32.39	28.693	9	3.697	0.410778			
	46	6	5164469	10					9	0.9	31.656	28.026	9	3.63	0.403333			
	47	7	5164469	10					10	1	31.647	28.178	9	3.469	0.385444			
	48	8	5164469	10					9	0.9	33.996	29.995	8	4.001	0.500125			
	49	1	5164471	10					10	1	32.481	26.473	10	6.008	0.6008			
	50	2	5164471	10					10	1	33.432	27.419	10	6.013	0.6013			
	51	3	5164471	10					9	0.9	34.562	28.41	9	6.152	0.683556			
	52	4	5164471	10					9	0.9	33.081	27.949	8	5.132	0.6415			
	53	5	5164471	10					10	1	35.329	28.514	10	6.815	0.6815			
	54	6	5164471	10					10	1	36.323	29.9	10	6.423	0.6423			
	55	7	5164471	10					10	1	35.533	30.895	10	4.638	0.4638			
	56	8	5164471	10					8	0.8	36.225	29.628	8	6.597	0.824625			

Comments:

Freshwater Sediment-Average ind. biomass

Start Date:	4/28/05 10:50	Test ID: 727-1	Sample ID:
End Date:	5/26/05 12:10	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.4090	0.4226	0.4317	0.4825	0.3806	0.3669	0.3865	0.3788
Ref05164476	0.4272	0.4392	0.3779	0.4109	0.4529	0.4363	0.4933	0.4213
5164433	0.2852	0.4499	0.4377	0.4443	0.3273	0.3909	0.3221	0.4030
5164434	0.2719	0.3395	0.3097	0.3201	0.2327	0.3022	0.2252	0.2825
5164435	0.3554	0.3644	0.3375	0.3987	0.3802	0.3234	0.2587	0.3749
5164436	0.1414	0.1306	0.2584	0.1799	0.1480	0.1000	0.1351	0.2316
5164437	0.4558	0.4401	0.2779	0.3472	0.5437	0.3760	0.4304	0.4219
5164440	0.2823	0.2357	0.2928	0.2718	0.2264	0.3871	0.2425	0.2051
5164441	0.3427	0.3943	0.3471	0.2777	0.4400	0.3079	0.4651	0.3692
5164442	0.2787	0.2673	0.3361	0.3470	0.2926	0.2622	0.3955	0.3131
5164443	0.3561	0.3810	0.2349	0.3218	0.4477	0.3051	0.3185	0.2016
5164449	0.3407	0.4070	0.3218	0.3117	0.3457	0.2585	0.2947	0.3976
5164439	0.3783	0.8340	0.4822	0.5644	0.6776	0.5326	0.7167	0.5463
5164450	0.3367	0.4237	0.3820	0.2422	0.3073	0.3494	0.3260	0.3469
5164451	0.3044	0.1831	0.4394	0.4067	0.2187	0.3575	0.3517	0.3469
5164452	0.1943	0.3274	0.2059	0.2907	0.2767	0.2608	0.2269	0.3994
5164453	0.5774	0.4357	0.5366	0.5064	0.3946	0.5489	0.4258	0.4657
5164454	0.3539	0.3097	0.2830	0.4505	0.3840	0.3062	0.2070	0.3760
5164455	0.3307	0.3249	0.2930	0.3550	0.3052	0.2581	0.3951	0.2959
5164456	0.2981	0.2872	0.3163	0.3194	0.1952	0.2351	0.4212	0.1386
5164457	0.3419	0.2999	0.3978	0.3129	0.3804	0.3369	0.3295	0.3794
5164459	0.5617	0.5160	0.4530	0.4236	0.4206	0.3880	0.4182	0.4971

			Transform: Untransformed					1-Tailed		
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.4073	0.9421	0.4073	0.3669	0.4825	9.315	8			
Ref05164476	0.4324	1.0000	0.4324	0.3779	0.4933	7.707	8			
5164433	0.3825	0.8848	0.3825	0.2852	0.4499	16.550	8	1.970	2.624	0.0664
*5164434	0.2855	0.6602	0.2855	0.2252	0.3395	14.259	8	7.898	2.624	0.0488
*5164435	0.3492	0.8075	0.3492	0.2587	0.3987	12.503	8	4.285	2.624	0.0510
*5164436	0.1656	0.3830	0.1656	0.1000	0.2584	32.693	8	11.867	2.624	0.0590
5164437	0.4116	0.9520	0.4116	0.2779	0.5437	19.251	8			
*5164440	0.2680	0.6198	0.2680	0.2051	0.3871	21.114	8	7.081	2.624	0.0609
5164441	0.3680	0.8511	0.3680	0.2777	0.4651	17.235	8	2.542	2.624	0.0665
*5164442	0.3116	0.7206	0.3116	0.2622	0.3955	14.729	8	6.025	2.624	0.0526
*5164443	0.3208	0.7420	0.3208	0.2016	0.4477	24.381	8	3.710	2.624	0.0789
*5164449	0.3347	0.7741	0.3347	0.2585	0.4070	14.913	8	4.603	2.624	0.0557
5164439	0.5915	1.3681	0.5915	0.3783	0.8340	24.376	8			
*5164450	0.3393	0.7847	0.3393	0.2422	0.4237	15.649	8	4.201	2.624	0.0582
*5164451	0.3260	0.7541	0.3260	0.1831	0.4394	26.900	8	3.205	2.624	0.0871
*5164452	0.2728	0.6308	0.2728	0.1943	0.3994	24.879	8	5.972	2.624	0.0701
5164453	0.4864	1.1249	0.4864	0.3946	0.5774	13.508	8			
*5164454	0.3338	0.7720	0.3338	0.2070	0.4505	22.167	8	3.436	2.624	0.0753
*5164455	0.3197	0.7395	0.3197	0.2581	0.3951	13.143	8	5.940	2.624	0.0498
*5164456	0.2764	0.6392	0.2764	0.1386	0.4212	31.272	8	4.763	2.624	0.0860
*5164457	0.3473	0.8033	0.3473	0.2999	0.3978	10.067	8	4.980	2.624	0.0448
5164459	0.4598	1.0634	0.4598	0.3880	0.5617	12.923	8			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.50496	1.035	0.0137	0.14975
Bartlett's Test indicates equal variances (p = 0.03)	28.4611	31.9999		
The control means are not significantly different (p = 0.18)	1.40306	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.04482	0.10366	0.0266	0.00356	8.2E-12	16, 119

Freshwater Sediment 28-day survival

Start Date: 4/28/05 10:50 Test ID: 727-1 Sample ID:
End Date: 5/26/05 12:10 Lab ID: ORNAS-Northwestern Aquati Sample Type: SED-Sediment
Sample Date: Protocol: NASXXXHA4C-Hyalella 28-d Test Species: HA-Hyalella azteca
Comments:

Conc-	1	2	3	4	5	6	7	8
D-Control	0.9000	1.0000	1.0000	0.8000	1.0000	1.0000	1.0000	1.0000
Ref05164476	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5164433	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	0.9000	1.0000
5164434	1.0000	0.8000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
5164435	0.9000	0.9000	0.8000	0.9000	1.0000	0.7000	0.6000	0.9000
5164436	0.8000	0.8000	0.7000	0.7000	0.7000	0.6000	0.8000	0.9000
5164437	0.9000	1.0000	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000
5164440	0.9000	1.0000	1.0000	1.0000	1.0000	0.7000	1.0000	0.9000
5164441	0.9000	0.9000	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000
5164442	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000	0.8000	0.9000
5164443	0.9000	0.8000	0.8000	0.9000	0.7000	0.7000	0.8000	0.9000
5164449	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000
5164439	1.0000	1.0000	1.0000	1.0000	0.8000	0.8000	0.9000	1.0000
5164450	0.9000	0.9000	0.8000	0.9000	1.0000	1.0000	0.9000	1.0000
5164451	1.0000	0.8000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000
5164452	0.9000	0.9000	0.7000	1.0000	1.0000	0.8000	1.0000	0.8000
5164453	0.8000	0.9000	0.8000	1.0000	0.9000	1.0000	1.0000	0.9000
5164454	0.9000	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000
5164455	0.9000	0.9000	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000
5164456	0.8000	1.0000	0.6000	1.0000	0.9000	1.0000	1.0000	0.9000
5164457	1.0000	1.0000	0.8000	1.0000	1.0000	0.9000	1.0000	0.7000
5164459	0.6000	0.8000	0.9000	0.9000	0.7000	0.9000	0.9000	0.7000

			Transform: Arcsin Square Root						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.9625	0.9625	1.3535	1.1071	1.4120	8.476	8			
Ref05164476	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	8			
5164433	0.9625	0.9625	1.3509	1.2490	1.4120	6.244	8			
5164434	0.9625	0.9625	1.3535	1.1071	1.4120	8.476	8			
*5164435	0.8375	0.8375	1.1741	0.8861	1.4120	14.396	8	3.982	2.998	0.1792
*5164436	0.7500	0.7500	1.0538	0.8861	1.2490	10.553	8	9.112	2.998	0.1179
5164437	0.9500	0.9500	1.3305	1.2490	1.4120	6.547	8			
5164440	0.9375	0.9375	1.3187	0.9912	1.4120	11.484	8			
5164441	0.9375	0.9375	1.3102	1.2490	1.4120	6.438	8			
5164442	0.9500	0.9500	1.3332	1.1071	1.4120	8.799	8			
5164443	0.8125	0.8125	1.1314	0.9912	1.2490	9.603	8			
5164449	0.9500	0.9500	1.3305	1.2490	1.4120	6.547	8			
5164439	0.9375	0.9375	1.3154	1.1071	1.4120	10.667	8			
5164450	0.9250	0.9250	1.2924	1.1071	1.4120	8.514	8			
5164451	0.9625	0.9625	1.3535	1.1071	1.4120	8.476	8			
5164452	0.8875	0.8875	1.2424	0.9912	1.4120	13.124	8			
5164453	0.9125	0.9125	1.2747	1.1071	1.4120	10.042	8			
5164454	0.9750	0.9750	1.3713	1.2490	1.4120	5.501	8			
5164455	0.9500	0.9500	1.3305	1.2490	1.4120	6.547	8			
5164456	0.9000	0.9000	1.2674	0.8861	1.4120	15.071	8			
5164457	0.9250	0.9250	1.3009	0.9912	1.4120	12.925	8			
5164459	0.8000	0.8000	1.1215	0.8861	1.2490	13.255	8			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.927	0.884	-0.433	1.53666
Equality of variance cannot be confirmed				
The control means are not significantly different (p = 0.17)	1.44167	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Heteroscedastic t Test indicates significant differences	0.0496	0.05087	0.26593	0.01364	1.6E-05	2, 21

Freshwater Sediment-28-day survival

Start Date:	4/28/05 10:50	Test ID: 727-1	Sample ID:
End Date:	5/26/05 12:10	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.9000	1.0000	1.0000	0.8000	1.0000	1.0000	1.0000	1.0000
Ref05164476	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5164433	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	0.9000	1.0000
5164434	1.0000	0.8000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
5164435	0.9000	0.9000	0.8000	0.9000	1.0000	0.7000	0.6000	0.9000
5164436	0.8000	0.8000	0.7000	0.7000	0.7000	0.6000	0.8000	0.9000
5164437	0.9000	1.0000	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000
5164440	0.9000	1.0000	1.0000	1.0000	1.0000	0.7000	1.0000	0.9000
5164441	0.9000	0.9000	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000
5164442	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000	0.8000	0.9000
5164443	0.9000	0.8000	0.8000	0.9000	0.7000	0.7000	0.8000	0.9000
5164449	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000
5164439	1.0000	1.0000	1.0000	1.0000	0.8000	0.8000	0.9000	1.0000
5164450	0.9000	0.9000	0.8000	0.9000	1.0000	1.0000	0.9000	1.0000
5164451	1.0000	0.8000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000
5164452	0.9000	0.9000	0.7000	1.0000	1.0000	0.8000	1.0000	0.8000
5164453	0.8000	0.9000	0.8000	1.0000	0.9000	1.0000	1.0000	0.9000
5164454	0.9000	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000
5164455	0.9000	0.9000	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000
5164456	0.8000	1.0000	0.6000	1.0000	0.9000	1.0000	1.0000	0.9000
5164457	1.0000	1.0000	0.8000	1.0000	1.0000	0.9000	1.0000	0.7000
5164459	0.6000	0.8000	0.9000	0.9000	0.7000	0.9000	0.9000	0.7000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	0.9625	0.9625	1.3535	1.1071	1.4120	8.476	8		
Ref05164476	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	8		
5164433	0.9625	0.9625	1.3509	1.2490	1.4120	6.244	8	56.00	45.00
5164434	0.9625	0.9625	1.3535	1.1071	1.4120	8.476	8		
5164435	0.8375	0.8375	1.1741	0.8861	1.4120	14.396	8		
5164436	0.7500	0.7500	1.0538	0.8861	1.2490	10.553	8		
5164437	0.9500	0.9500	1.3305	1.2490	1.4120	6.547	8	52.00	45.00
5164440	0.9375	0.9375	1.3187	0.9912	1.4120	11.484	8	56.00	45.00
5164441	0.9375	0.9375	1.3102	1.2490	1.4120	6.438	8	48.00	45.00
5164442	0.9500	0.9500	1.3332	1.1071	1.4120	8.799	8	56.00	45.00
*5164443	0.8125	0.8125	1.1314	0.9912	1.2490	9.603	8	36.00	45.00
5164449	0.9500	0.9500	1.3305	1.2490	1.4120	6.547	8	52.00	45.00
5164439	0.9375	0.9375	1.3154	1.1071	1.4120	10.667	8	56.00	45.00
5164450	0.9250	0.9250	1.2924	1.1071	1.4120	8.514	8	48.00	45.00
5164451	0.9625	0.9625	1.3535	1.1071	1.4120	8.476	8		
5164452	0.8875	0.8875	1.2424	0.9912	1.4120	13.124	8	48.00	45.00
5164453	0.9125	0.9125	1.2747	1.1071	1.4120	10.042	8	48.00	45.00
5164454	0.9750	0.9750	1.3713	1.2490	1.4120	5.501	8		
5164455	0.9500	0.9500	1.3305	1.2490	1.4120	6.547	8	52.00	45.00
5164456	0.9000	0.9000	1.2674	0.8861	1.4120	15.071	8	52.00	45.00
5164457	0.9250	0.9250	1.3009	0.9912	1.4120	12.925	8	56.00	45.00
*5164459	0.8000	0.8000	1.1215	0.8861	1.2490	13.255	8	36.00	45.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.01)	2.04877	1.035	-0.7695	0.19766
Equality of variance cannot be confirmed				
The control means are not significantly different (p = 0.17)	1.44167	2.14479		

Hypothesis Test (1-tail, 0.01)

Wilcoxon Two-Sample Test indicates significant differences

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

Pos	ID	Rep	Group	Day 0	Day 10	psurv Day 10	Day 20	psurv Day 20	Day 28	psurv day 28	Dry Wt (mg)	Tare Wt (mg)	Wt. count	TWT	WT	Ashed dry wt	TAFDW	AFDW
	1	1	D-Control	10					9	0.9	31.569	27.888	9	3.681	0.409			
	2	2	D-Control	10					10	1	32.3	28.074	10	4.226	0.4226			
	3	3	D-Control	10					10	1	34.085	29.768	10	4.317	0.4317			
	4	4	D-Control	10					8	0.8	34.154	30.294	8	3.86	0.4825			
	5	5	D-Control	10					10	1	33.196	29.39	10	3.806	0.3806			
	6	6	D-Control	10					10	1	32.921	29.252	10	3.669	0.3669			
	7	7	D-Control	10					10	1	32.515	28.65	10	3.865	0.3865			
	8	8	D-Control	10					10	1	31.417	27.629	10	3.788	0.3788			
	9	1	Ref05164476	10					10	1	32.88	28.608	10	4.272	0.4272			
	10	2	Ref05164476	10					10	1	34.474	30.082	10	4.392	0.4392			
	11	3	Ref05164476	10					10	1	31.097	27.318	10	3.779	0.3779			
	12	4	Ref05164476	10					10	1	32.952	28.843	10	4.109	0.4109			
	13	5	Ref05164476	10					10	1	32.637	28.108	10	4.529	0.4529			
	14	6	Ref05164476	10					10	1	33.649	29.286	10	4.363	0.4363			
	15	7	Ref05164476	10					10	1	33.147	28.214	10	4.933	0.4933			
	16	8	Ref05164476	10					10	1	32.84	28.627	10	4.213	0.4213			
	17	1	5164433	10					10	1	32.492	29.64	10	2.852	0.2852			
	18	2	5164433	10					10	1	31.732	27.233	10	4.499	0.4499			
	19	3	5164433	10					9	0.9	31.415	27.476	9	3.939	0.437667			
	20	4	5164433	10					10	1	34.726	30.283	10	4.443	0.4443			
	21	5	5164433	10					10	1	33.666	30.393	10	3.273	0.3273			
	22	6	5164433	10					9	0.9	32.134	28.616	9	3.518	0.390889			
	23	7	5164433	10					9	0.9	31.005	28.106	9	2.899	0.322111			
	24	8	5164433	10					10	1	32.783	28.753	10	4.03	0.403			
	25	1	5164434	10					10	1	33.27	30.551	10	2.719	0.2719			
	26	2	5164434	10					8	0.8	31.995	29.279	8	2.716	0.3395			
	27	3	5164434	10					10	1	32.215	29.118	10	3.097	0.3097			
	28	4	5164434	10					10	1	32.446	29.245	10	3.201	0.3201			
	29	5	5164434	10					9	0.9	30.449	28.355	9	2.094	0.232667			
	30	6	5164434	10					10	1	30.724	27.702	10	3.022	0.3022			
	31	7	5164434	10					10	1	29.667	27.415	10	2.252	0.2252			
	32	8	5164434	10					10	1	31.959	29.134	10	2.825	0.2825			
	33	1	5164435	10					9	0.9	33.694	30.495	9	3.199	0.355444			
	34	2	5164435	10					9	0.9	30.293	27.013	9	3.28	0.364444			
	35	3	5164435	10					8	0.8	29.804	27.104	8	2.7	0.3375			
	36	4	5164435	10					9	0.9	32.364	29.573	7	2.791	0.398714			
	37	5	5164435	10					10	1	32.558	28.756	10	3.802	0.3802			
	38	6	5164435	10					7	0.7	31.766	29.502	7	2.264	0.323429			
	39	7	5164435	10					6	0.6	31.295	29.743	6	1.552	0.258667			

data entry verified against EXCEL spreadsheet MR 11-10-05

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	40	8	5164435	10					9	0.9	30.963	27.589	9	3.374	0.374889			
	41	1	5164436	10					8	0.8	29.172	28.041	8	1.131	0.141375			
	42	2	5164436	10					8	0.8	28.61	27.565	8	1.045	0.130625			
	43	3	5164436	10					7	0.7	28.957	27.148	7	1.809	0.258429			
	44	4	5164436	10					7	0.7	34.2	32.941	7	1.259	0.179857			
	45	5	5164436	10					7	0.7	31.068	30.032	7	1.036	0.148			
	46	6	5164436	10					6	0.6	28.011	27.411	6	0.6	0.1			
	47	7	5164436	10					8	0.8	29.069	27.988	8	1.081	0.135125			
	48	8	5164436	10					9	0.9	30.125	28.041	9	2.084	0.231556			
	49	1	5164437	10					9	0.9	34.376	30.274	9	4.102	0.455778			
	50	2	5164437	10					10	1	32.851	28.45	10	4.401	0.4401			
	51	3	5164437	10					9	0.9	30.723	28.222	9	2.501	0.277889			
	52	4	5164437	10					9	0.9	30.096	26.971	9	3.125	0.347222			
	53	5	5164437	10					9	0.9	33.955	29.062	9	4.893	0.543667			
	54	6	5164437	10					10	1	33.006	29.246	10	3.76	0.376			
	55	7	5164437	10					10	1	31.743	27.439	10	4.304	0.4304			
	56	8	5164437	10					10	1	33.622	29.403	10	4.219	0.4219			
	57	1	5164440	10					9	0.9	30.932	28.391	9	2.541	0.282333			
	58	2	5164440	10					10	1	29.385	27.028	10	2.357	0.2357			
	59	3	5164440	10					10	1	33.315	30.387	10	2.928	0.2928			
	60	4	5164440	10					10	1	34.224	31.506	10	2.718	0.2718			
	61	5	5164440	10					10	1	29.074	26.81	10	2.264	0.2264			
	62	6	5164440	10					7	0.7	31.885	29.175	7	2.71	0.387143			
	63	7	5164440	10					10	1	31.22	28.795	10	2.425	0.2425			
	64	8	5164440	10					9	0.9	29.998	28.152	9	1.846	0.205111			
	65	1	5164441	10					9	0.9	31.334	28.25	9	3.084	0.342667			
	66	2	5164441	10					9	0.9	32.279	28.73	9	3.549	0.394333			
	67	3	5164441	10					9	0.9	31.806	28.682	9	3.124	0.347111			
	68	4	5164441	10					9	0.9	31.888	29.389	9	2.499	0.277667			
	69	5	5164441	10					9	0.9	32.719	28.759	9	3.96	0.44			
	70	6	5164441	10					10	1	31.775	28.696	10	3.079	0.3079			
	71	7	5164441	10					10	1	32.677	28.026	10	4.651	0.4651			
	72	8	5164441	10					10	1	32.186	28.494	10	3.692	0.3692			
	73	1	5164442	10					10	1	30.158	27.371	10	2.787	0.2787			
	74	2	5164442	10					10	1	31.467	28.794	10	2.673	0.2673			
	75	3	5164442	10					9	0.9	31.251	28.226	9	3.025	0.336111			
	76	4	5164442	10					10	1	32.015	28.545	10	3.47	0.347			
	77	5	5164442	10					10	1	32.586	29.66	10	2.926	0.2926			
	78	6	5164442	10					10	1	30.621	27.999	10	2.622	0.2622			
	79	7	5164442	10					8	0.8	32.295	29.131	8	3.164	0.3955			
	80	8	5164442	10					9	0.9	30.543	27.725	9	2.818	0.313111			

ToxCalc 5.0.23N

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	81	1	5164443	10					9	0.9	32.376	29.171	9	3.205	0.356111				
	82	2	5164443	10					8	0.8	30.856	27.808	8	3.048	0.381				
	83	3	5164443	10					8	0.8	31.844	29.965	8	1.879	0.234875				
	84	4	5164443	10					9	0.9	30.17	27.274	9	2.896	0.321778				
	85	5	5164443	10					7	0.7	32.601	29.467	7	3.134	0.447714				
	86	6	5164443	10					7	0.7	31.23	29.094	7	2.136	0.305143				
	87	7	5164443	10					8	0.8	30.73	28.182	8	2.548	0.3185				
	88	8	5164443	10					9	0.9	29.467	27.653	9	1.814	0.201556				
	89	1	5164449	10					9	0.9	31.563	28.497	9	3.066	0.340667				
	90	2	5164449	10					10	1	32.636	28.566	10	4.07	0.407				
	91	3	5164449	10					9	0.9	32.046	29.15	9	2.896	0.321778				
	92	4	5164449	10					10	1	31.163	28.046	10	3.117	0.3117				
	93	5	5164449	10					10	1	31.444	27.987	10	3.457	0.3457				
	94	6	5164449	10					10	1	29.96	27.375	10	2.585	0.2585				
	95	7	5164449	10					9	0.9	30.476	27.824	9	2.652	0.294667				
	96	8	5164449	10					9	0.9	31.896	28.318	9	3.578	0.397556				
	97	1	5164439	10					10	1	33.249	29.466	10	3.783	0.3783				
	98	2	5164439	10					10	1	37.36	29.02	10	8.34	0.834				
	99	3	5164439	10					10	1	33.602	28.78	10	4.822	0.4822				
	100	4	5164439	10					10	1	33.938	28.294	10	5.644	0.5644				
	101	5	5164439	10					8	0.8	33.2	27.779	8	5.421	0.677625				
	102	6	5164439	10					8	0.8	32.555	28.294	8	4.261	0.532625				
	103	7	5164439	10					9	0.9	35.083	28.633	9	6.45	0.716667				
	104	8	5164439	10					10	1	33.624	28.161	10	5.463	0.5463				
	105	1	5164450	10					9	0.9	32.877	29.847	9	3.03	0.336667				
	106	2	5164450	10					9	0.9	33.176	29.363	9	3.813	0.423667				
	107	3	5164450	10					8	0.8	31.25	28.194	8	3.056	0.382				
	108	4	5164450	10					9	0.9	30.402	28.222	9	2.18	0.242222				
	109	5	5164450	10					10	1	32.348	29.275	10	3.073	0.3073				
	110	6	5164450	10					10	1	33.421	29.927	10	3.494	0.3494				
	111	7	5164450	10					9	0.9	32.359	29.425	9	2.934	0.326				
	112	8	5164450	10					10	1	30.285	26.816	10	3.469	0.3469				
	113	1	5164451	10					10	1	31.448	28.404	10	3.044	0.3044				
	114	2	5164451	10					8	0.8	29.185	27.72	8	1.465	0.183125				
	115	3	5164451	10					10	1	33.809	29.415	10	4.394	0.4394				
	116	4	5164451	10					9	0.9	30.879	27.219	9	3.66	0.406667				
	117	5	5164451	10					10	1	32.414	30.227	10	2.187	0.2187				
	118	6	5164451	10					10	1	32.652	29.077	10	3.575	0.3575				
	119	7	5164451	10					10	1	33.551	30.034	10	3.517	0.3517				
	120	8	5164451	10					10	1	31.999	28.53	10	3.469	0.3469				
	121	1	5164452	10					9	0.9	30.562	28.813	9	1.749	0.194333				

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Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	122	2	5164452	10					9	0.9	33.555	30.608	9	2.947	0.327444			
	123	3	5164452	10					7	0.7	30.938	29.497	7	1.441	0.205857			
	124	4	5164452	10					10	1	31.263	28.356	10	2.907	0.2907			
	125	5	5164452	10					10	1	29.984	27.217	10	2.767	0.2767			
	126	6	5164452	10					8	0.8	30.794	28.708	8	2.086	0.26075			
	127	7	5164452	10					10	1	30.375	28.106	10	2.269	0.2269			
	128	8	5164452	10					8	0.8	32.21	29.015	8	3.195	0.399375			
	129	1	5164453	10					8	0.8	33.247	28.628	8	4.619	0.577375			
	130	2	5164453	10					9	0.9	34.566	30.645	9	3.921	0.435667			
	131	3	5164453	10					8	0.8	32.322	28.029	8	4.293	0.536625			
	132	4	5164453	10					10	1	32.882	27.818	10	5.064	0.5064			
	133	5	5164453	10					9	0.9	31.151	27.6	9	3.551	0.394556			
	134	6	5164453	10					10	1	31.055	25.566	10	5.489	0.5489			
	135	7	5164453	10					10	1	33.142	28.884	10	4.258	0.4258			
	136	8	5164453	10					9	0.9	31.383	27.192	9	4.191	0.465667			
	137	1	5164454	10					9	0.9	30.997	27.812	9	3.185	0.353889			
	138	2	5164454	10					10	1	29.983	26.886	10	3.097	0.3097			
	139	3	5164454	10					10	1	30.697	27.867	10	2.83	0.283			
	140	4	5164454	10					10	1	32.609	28.104	10	4.505	0.4505			
	141	5	5164454	10					10	1	32.678	28.838	10	3.84	0.384			
	142	6	5164454	10					9	0.9	32.048	29.292	9	2.756	0.306222			
	143	7	5164454	10					10	1	29.723	27.653	10	2.07	0.207			
	144	8	5164454	10					10	1	31.921	28.161	10	3.76	0.376			
	145	1	5164455	10					9	0.9	32.366	29.39	9	2.976	0.330667			
	146	2	5164455	10					9	0.9	32.624	29.7	9	2.924	0.324889			
	147	3	5164455	10					9	0.9	31.277	28.64	9	2.637	0.293			
	148	4	5164455	10					10	1	32.096	28.546	10	3.55	0.355			
	149	5	5164455	10					9	0.9	31.579	28.832	9	2.747	0.305222			
	150	6	5164455	10					10	1	30.655	28.074	10	2.581	0.2581			
	151	7	5164455	10					10	1	34.039	30.088	10	3.951	0.3951			
	152	8	5164455	10					10	1	31.965	29.006	10	2.959	0.2959			
	153	1	5164456	10					8	0.8	32.065	29.68	8	2.385	0.298125			
	154	2	5164456	10					10	1	31.505	28.633	10	2.872	0.2872			
	155	3	5164456	10					6	0.6	29.759	27.861	6	1.898	0.316333			
	156	4	5164456	10					10	1	32.671	29.477	10	3.194	0.3194			
	157	5	5164456	10					9	0.9	31.482	29.725	9	1.757	0.195222			
	158	6	5164456	10					10	1	31.033	28.682	10	2.351	0.2351			
	159	7	5164456	10					10	1	30.708	26.496	10	4.212	0.4212			
	160	8	5164456	10					9	0.9	30.322	29.075	9	1.247	0.138556			
	161	1	5164457	10					10	1	33.58	30.161	10	3.419	0.3419			
	162	2	5164457	10					10	1	32.609	29.61	10	2.999	0.2999			

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	163	3	5164457	10					8	0.8	32.304	29.122	8	3.182	0.39775			
	164	4	5164457	10					10	1	33.151	30.022	10	3.129	0.3129			
	165	5	5164457	10					10	1	32.069	28.265	10	3.804	0.3804			
	166	6	5164457	10					9	0.9	32.636	29.604	9	3.032	0.336889			
	167	7	5164457	10					10	1	31.405	28.11	10	3.295	0.3295			
	168	8	5164457	10					7	0.7	30.908	28.252	7	2.656	0.379429			
	169	1	5164459	10					6	0.6	32.15	28.78	6	3.37	0.561667			
	170	2	5164459	10					8	0.8	30.96	26.832	8	4.128	0.516			
	171	3	5164459	10					9	0.9	32.931	28.854	9	4.077	0.453			
	172	4	5164459	10					9	0.9	31.743	27.931	9	3.812	0.423556			
	173	5	5164459	10					7	0.7	32.757	29.813	7	2.944	0.420571			
	174	6	5164459	10					9	0.9	32.457	28.965	9	3.492	0.388			
	175	7	5164459	10					9	0.9	32.066	28.302	9	3.764	0.418222			
	176	8	5164459	10					7	0.7	32.356	28.876	7	3.48	0.497143			

Comments:

Freshwater Sediment-Average ind. biomass

Start Date:	4/28/05 10:50	Test ID: 727-1b	Sample ID:
End Date:	5/26/05 12:10	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.4090	0.4226	0.4317	0.4825	0.3806	0.3669	0.3865	0.3788
Ref05164476	0.4272	0.4392	0.3779	0.4109	0.4529	0.4363	0.4933	0.4213
5164460	0.4651	0.4242	0.4488	0.4706	0.6082	0.5415	0.4396	0.7207
5164461	0.3506	0.3987	0.2697	0.4458	0.4050	0.3832	0.3656	0.3464
5164468	0.1461	0.1814	0.2369	0.1895	0.2057	0.1544	0.1590	0.1500
5164469	0.4263	0.5413	0.4709	0.5504	0.4108	0.4033	0.3854	0.5001
5164471	0.6008	0.6013	0.6836	0.6415	0.6815	0.6423	0.4638	0.8246

			Transform: Untransformed					1-Tailed		
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.4073	0.9421	0.4073	0.3669	0.4825	9.315	8			
Ref05164476	0.4324	1.0000	0.4324	0.3779	0.4933	7.707	8			
5164460	0.5148	1.1907	0.5148	0.4242	0.7207	20.035	8			
*5164461	0.3706	0.8572	0.3706	0.2697	0.4458	14.049	8	2.825	2.624	0.0574
*5164468	0.1779	0.4114	0.1779	0.1461	0.2369	17.899	8	15.619	2.624	0.0428
5164469	0.4611	1.0664	0.4611	0.3854	0.5504	13.918	8			
5164471	0.6424	1.4858	0.6424	0.4638	0.8246	15.759	8			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.96542	0.884	-0.2884	1.15474
Bartlett's Test indicates equal variances (p = 0.02)	8.2394	9.21035		
The control means are not significantly different (p = 0.18)	1.40306	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.04276	0.0989	0.14099	0.00161	6.5E-11	2, 21

Freshwater Sediment 28-day survival

Start Date:	4/28/05 10:50	Test ID: 727-1b	Sample ID:
End Date:	5/26/05 12:10	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.9000	1.0000	1.0000	0.8000	1.0000	1.0000	1.0000	1.0000
Ref05164476	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5164460	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
5164461	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
5164468	0.8000	0.8000	0.9000	1.0000	0.9000	1.0000	0.9000	0.6000
5164469	0.9000	0.9000	1.0000	0.8000	0.9000	0.9000	1.0000	0.9000
5164471	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	1.0000	0.8000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	0.9625	0.9625	1.3535	1.1071	1.4120	8.476	8		
Ref05164476	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	8		
5164460	0.9750	0.9750	1.3713	1.2490	1.4120	5.501	8		
5164461	0.9875	0.9875	1.3916	1.2490	1.4120	4.140	8		
*5164468	0.8625	0.8625	1.2089	0.8861	1.4120	14.404	8	44.00	45.00
*5164469	0.9125	0.9125	1.2721	1.1071	1.4120	7.806	8	44.00	45.00
5164471	0.9500	0.9500	1.3332	1.1071	1.4120	8.799	8	56.00	45.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.93642	0.904	-0.721	1.67408
Equality of variance cannot be confirmed				
The control means are not significantly different (p = 0.17)	1.44167	2.14479		
Hypothesis Test (1-tail, 0.01)				
Wilcoxon Two-Sample Test indicates significant differences				

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1b
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

Pos	ID	Rep	Group	Day 0	Day 10	psurv Day 10	Day 20	psurv Day 20	Day 28	psurv day 28	Dry Wt (mg)	Tare Wt (mg)	Wt. count	TWT	WT	Ashed dry wt	TAFDW	AFDW
	1	1	D-Control	10					9	0.9	31.569	27.888	9	3.681	0.409			
	2	2	D-Control	10					10	1	32.3	28.074	10	4.226	0.4226			
	3	3	D-Control	10					10	1	34.085	29.768	10	4.317	0.4317			
	4	4	D-Control	10					8	0.8	34.154	30.294	8	3.86	0.4825			
	5	5	D-Control	10					10	1	33.196	29.39	10	3.806	0.3806			
	6	6	D-Control	10					10	1	32.921	29.252	10	3.669	0.3669			
	7	7	D-Control	10					10	1	32.515	28.65	10	3.865	0.3865			
	8	8	D-Control	10					10	1	31.417	27.629	10	3.788	0.3788			
	9	1	Ref05164476	10					10	1	32.88	28.608	10	4.272	0.4272			
	10	2	Ref05164476	10					10	1	34.474	30.082	10	4.392	0.4392			
	11	3	Ref05164476	10					10	1	31.097	27.318	10	3.779	0.3779			
	12	4	Ref05164476	10					10	1	32.952	28.843	10	4.109	0.4109			
	13	5	Ref05164476	10					10	1	32.637	28.108	10	4.529	0.4529			
	14	6	Ref05164476	10					10	1	33.649	29.286	10	4.363	0.4363			
	15	7	Ref05164476	10					10	1	33.147	28.214	10	4.933	0.4933			
	16	8	Ref05164476	10					10	1	32.84	28.627	10	4.213	0.4213			
	17	1	5164460	10					10	1	34.83	30.179	10	4.651	0.4651			
	18	2	5164460	10					9	0.9	33.339	29.521	9	3.818	0.424222			
	19	3	5164460	10					10	1	33.194	28.706	10	4.488	0.4488			
	20	4	5164460	10					10	1	33.448	28.742	10	4.706	0.4706			
	21	5	5164460	10					9	0.9	34.357	28.883	9	5.474	0.608222			
	22	6	5164460	10					10	1	35.364	29.949	10	5.415	0.5415			
	23	7	5164460	10					10	1	32.77	28.374	10	4.396	0.4396			
	24	8	5164460	10					10	1	36.19	28.983	10	7.207	0.7207			
	25	1	5164461	10					10	1	34.781	31.275	10	3.506	0.3506			
	26	2	5164461	10					10	1	32.829	28.842	10	3.987	0.3987			
	27	3	5164461	10					10	1	31.398	28.701	10	2.697	0.2697			
	28	4	5164461	10					10	1	32.163	27.705	10	4.458	0.4458			
	29	5	5164461	10					9	0.9	32.063	28.418	9	3.645	0.405			
	30	6	5164461	10					10	1	32.77	28.938	10	3.832	0.3832			
	31	7	5164461	10					10	1	31.926	28.27	10	3.656	0.3656			
	32	8	5164461	10					10	1	31.15	27.686	10	3.464	0.3464			
	33	1	5164468	10					8	0.8	30.182	29.013	8	1.169	0.146125			
	34	2	5164468	10					8	0.8	29.403	27.952	8	1.451	0.181375			
	35	3	5164468	10					9	0.9	30.513	28.381	9	2.132	0.236889			
	36	4	5164468	10					10	1	28.447	26.552	10	1.895	0.1895			
	37	5	5164468	10					9	0.9	31.068	29.217	9	1.851	0.205667			
	38	6	5164468	10					10	1	30.655	29.111	10	1.544	0.1544			
	39	7	5164468	10					9	0.9	28.882	27.451	9	1.431	0.159			

data entry verified against EXCEL spreadsheet TMR 11-10-05

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1b
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	40	8	5164468	10					6	0.6	30.419	29.519	6	0.9	0.15				
	41	1	5164469	10					9	0.9	31.785	27.948	9	3.837	0.426333				
	42	2	5164469	10					9	0.9	32.998	28.126	9	4.872	0.541333				
	43	3	5164469	10					10	1	33.513	28.804	10	4.709	0.4709				
	44	4	5164469	10					8	0.8	31.521	27.118	8	4.403	0.550375				
	45	5	5164469	10					9	0.9	32.39	28.693	9	3.697	0.410778				
	46	6	5164469	10					9	0.9	31.656	28.026	9	3.63	0.403333				
	47	7	5164469	10					10	1	31.647	28.178	9	3.469	0.385444				
	48	8	5164469	10					9	0.9	33.996	29.995	8	4.001	0.500125				
	49	1	5164471	10					10	1	32.481	26.473	10	6.008	0.6008				
	50	2	5164471	10					10	1	33.432	27.419	10	6.013	0.6013				
	51	3	5164471	10					9	0.9	34.562	28.41	9	6.152	0.683556				
	52	4	5164471	10					9	0.9	33.081	27.949	8	5.132	0.6415				
	53	5	5164471	10					10	1	35.329	28.514	10	6.815	0.6815				
	54	6	5164471	10					10	1	36.323	29.9	10	6.423	0.6423				
	55	7	5164471	10					10	1	35.533	30.895	10	4.638	0.4638				
	56	8	5164471	10					8	0.8	36.225	29.628	8	6.597	0.824625				

Comments:

Freshwater Sediment-Average ind. biomass

Start Date: 4/28/05 10:50 Test ID: 727-1 Sample ID:
End Date: 5/26/05 12:10 Lab ID: ORNAS-Northwestern Aquati Sample Type: SED-Sediment
Sample Date: Protocol: NASXXXHA4C-Hyalella 28-d Test Species: HA-Hyalella azteca
Comments:

Conc-	1	2	3	4	5	6	7	8
D-Control	0.4090	0.4226	0.4317	0.4825	0.3806	0.3669	0.3865	0.3788
Ref05164486	0.5127	0.5615	0.5433	0.6843	0.5598	0.5774	0.5978	0.5818
5164433	0.2852	0.4499	0.4377	0.4443	0.3273	0.3909	0.3221	0.4030
5164434	0.2719	0.3395	0.3097	0.3201	0.2327	0.3022	0.2252	0.2825
5164435	0.3554	0.3644	0.3375	0.3987	0.3802	0.3234	0.2587	0.3749
5164436	0.1414	0.1306	0.2584	0.1799	0.1480	0.1000	0.1351	0.2316
5164437	0.4558	0.4401	0.2779	0.3472	0.5437	0.3760	0.4304	0.4219
5164440	0.2823	0.2357	0.2928	0.2718	0.2264	0.3871	0.2425	0.2051
5164441	0.3427	0.3943	0.3471	0.2777	0.4400	0.3079	0.4651	0.3692
5164442	0.2787	0.2673	0.3361	0.3470	0.2926	0.2622	0.3955	0.3131
5164443	0.3561	0.3810	0.2349	0.3218	0.4477	0.3051	0.3185	0.2016
5164449	0.3407	0.4070	0.3218	0.3117	0.3457	0.2585	0.2947	0.3976
5164439	0.3783	0.8340	0.4822	0.5644	0.6776	0.5326	0.7167	0.5463
5164450	0.3367	0.4237	0.3820	0.2422	0.3073	0.3494	0.3260	0.3469
5164451	0.3044	0.1831	0.4394	0.4067	0.2187	0.3575	0.3517	0.3469
5164452	0.1943	0.3274	0.2059	0.2907	0.2767	0.2608	0.2269	0.3994
5164453	0.5774	0.4357	0.5366	0.5064	0.3946	0.5489	0.4258	0.4657
5164454	0.3539	0.3097	0.2830	0.4505	0.3840	0.3062	0.2070	0.3760
5164455	0.3307	0.3249	0.2930	0.3550	0.3052	0.2581	0.3951	0.2959
5164456	0.2981	0.2872	0.3163	0.3194	0.1952	0.2351	0.4212	0.1386
5164457	0.3419	0.2999	0.3978	0.3129	0.3804	0.3369	0.3295	0.3794
5164459	0.5617	0.5160	0.4530	0.4236	0.4206	0.3880	0.4182	0.4971

			Transform: Untransformed						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.4073	0.7055	0.4073	0.3669	0.4825	9.315	8			
Ref05164486	0.5773	1.0000	0.5773	0.5127	0.6843	8.731	8			
*5164433	0.3825	0.6626	0.3825	0.2852	0.4499	16.550	8	6.808	2.624	0.0751
*5164434	0.2855	0.4945	0.2855	0.2252	0.3395	14.259	8	12.741	2.624	0.0601
*5164435	0.3492	0.6048	0.3492	0.2587	0.3987	12.503	8	9.678	2.624	0.0619
*5164436	0.1656	0.2869	0.1656	0.1000	0.2584	32.693	8	15.741	2.624	0.0686
*5164437	0.4116	0.7130	0.4116	0.2779	0.5437	19.251	8	4.991	2.624	0.0871
*5164440	0.2680	0.4642	0.2680	0.2051	0.3871	21.114	8	11.547	2.624	0.0703
*5164441	0.3680	0.6374	0.3680	0.2777	0.4651	17.235	8	7.308	2.624	0.0752
*5164442	0.3116	0.5397	0.3116	0.2622	0.3955	14.729	8	11.027	2.624	0.0633
*5164443	0.3208	0.5557	0.3208	0.2016	0.4477	24.381	8	7.796	2.624	0.0863
*5164449	0.3347	0.5797	0.3347	0.2585	0.4070	14.913	8	9.674	2.624	0.0658
5164439	0.5915	1.0246	0.5915	0.3783	0.8340	24.376	8			
*5164450	0.3393	0.5877	0.3393	0.2422	0.4237	15.649	8	9.197	2.624	0.0679
*5164451	0.3260	0.5648	0.3260	0.1831	0.4394	26.900	8	7.026	2.624	0.0939
*5164452	0.2728	0.4725	0.2728	0.1943	0.3994	24.879	8	10.191	2.624	0.0784
*5164453	0.4864	0.8425	0.4864	0.3946	0.5774	13.508	8	3.107	2.624	0.0768
*5164454	0.3338	0.5782	0.3338	0.2070	0.4505	22.167	8	7.694	2.624	0.0831
*5164455	0.3197	0.5538	0.3197	0.2581	0.3951	13.143	8	11.102	2.624	0.0609
*5164456	0.2764	0.4787	0.2764	0.1386	0.4212	31.272	8	8.507	2.624	0.0928
*5164457	0.3473	0.6016	0.3473	0.2999	0.3978	10.067	8	10.604	2.624	0.0569
*5164459	0.4598	0.7964	0.4598	0.3880	0.5617	12.923	8	4.267	2.624	0.0723

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.41659	1.035	0.05333	-0.0293
Bartlett's Test indicates equal variances (p = 0.03)	32.2541	36.1908		
The control means are significantly different (p = 2.40E-06)	7.62151	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.0723	0.12523	0.06232	0.00381	8.7E-27	19, 140

Freshwater Sediment 28-day survival

Start Date:	4/28/05 10:50	Test ID:	727-1	Sample ID:	
End Date:	5/26/05 12:10	Lab ID:	ORNAS-Northwestern Aquati	Sample Type:	SED-Sediment
Sample Date:		Protocol:	NASXXXHA4C-Hyalella 28-d	Test Species:	HA-Hyalella azteca
Comments:					

Conc-	1	2	3	4	5	6	7	8
D-Control	0.9000	1.0000	1.0000	0.8000	1.0000	1.0000	1.0000	1.0000
Ref05164486	1.0000	1.0000	1.0000	0.9000	0.8000	1.0000	1.0000	1.0000
5164433	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	0.9000	1.0000
5164434	1.0000	0.8000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
5164435	0.9000	0.9000	0.8000	0.9000	1.0000	0.7000	0.6000	0.9000
5164436	0.8000	0.8000	0.7000	0.7000	0.7000	0.6000	0.8000	0.9000
5164437	0.9000	1.0000	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000
5164440	0.9000	1.0000	1.0000	1.0000	1.0000	0.7000	1.0000	0.9000
5164441	0.9000	0.9000	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000
5164442	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000	0.8000	0.9000
5164443	0.9000	0.8000	0.8000	0.9000	0.7000	0.7000	0.8000	0.9000
5164449	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000
5164439	1.0000	1.0000	1.0000	1.0000	0.8000	0.8000	0.9000	1.0000
5164450	0.9000	0.9000	0.8000	0.9000	1.0000	1.0000	0.9000	1.0000
5164451	1.0000	0.8000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000
5164452	0.9000	0.9000	0.7000	1.0000	1.0000	0.8000	1.0000	0.8000
5164453	0.8000	0.9000	0.8000	1.0000	0.9000	1.0000	1.0000	0.9000
5164454	0.9000	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000
5164455	0.9000	0.9000	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000
5164456	0.8000	1.0000	0.6000	1.0000	0.9000	1.0000	1.0000	0.9000
5164457	1.0000	1.0000	0.8000	1.0000	1.0000	0.9000	1.0000	0.7000
5164459	0.6000	0.8000	0.9000	0.9000	0.7000	0.9000	0.9000	0.7000

			Transform: Arcsin Square Root						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.9625	1.0000	1.3535	1.1071	1.4120	8.476	8			
Ref05164486	0.9625	1.0000	1.3535	1.1071	1.4120	8.476	8			
5164433	0.9625	1.0000	1.3509	1.2490	1.4120	6.244	8			
5164434	0.9625	1.0000	1.3535	1.1071	1.4120	8.476	8			
5164435	0.8375	0.8701	1.1741	0.8861	1.4120	14.396	8			
*5164436	0.7500	0.7792	1.0538	0.8861	1.2490	10.553	8	5.307	2.624	0.1483
5164437	0.9500	0.9870	1.3305	1.2490	1.4120	6.547	8			
5164440	0.9375	0.9740	1.3187	0.9912	1.4120	11.484	8			
5164441	0.9375	0.9740	1.3102	1.2490	1.4120	6.438	8			
5164442	0.9500	0.9870	1.3332	1.1071	1.4120	8.799	8			
*5164443	0.8125	0.8442	1.1314	0.9912	1.2490	9.603	8	3.977	2.624	0.1466
5164449	0.9500	0.9870	1.3305	1.2490	1.4120	6.547	8			
5164439	0.9375	0.9740	1.3154	1.1071	1.4120	10.667	8			
5164450	0.9250	0.9610	1.2924	1.1071	1.4120	8.514	8			
5164451	0.9625	1.0000	1.3535	1.1071	1.4120	8.476	8			
5164452	0.8875	0.9221	1.2424	0.9912	1.4120	13.124	8			
5164453	0.9125	0.9481	1.2747	1.1071	1.4120	10.042	8			
5164454	0.9750	1.0130	1.3713	1.2490	1.4120	5.501	8			
5164455	0.9500	0.9870	1.3305	1.2490	1.4120	6.547	8			
5164456	0.9000	0.9351	1.2674	0.8861	1.4120	15.071	8			
5164457	0.9250	0.9610	1.3009	0.9912	1.4120	12.925	8			
5164459	0.8000	0.8312	1.1215	0.8861	1.2490	13.255	8			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.94216	0.884	-0.5134	-0.1374
Bartlett's Test indicates equal variances (p = 0.68)	0.76711	9.21035		
The control means are not significantly different (p = 1.00)	0	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.0802	0.08411	0.19367	0.01244	7.1E-05	2, 21

Freshwater Sediment-28-day survival

Start Date: 4/28/05 10:50 Test ID: 727-1 Sample ID:
End Date: 5/26/05 12:10 Lab ID: ORNAS-Northwestern Aquati Sample Type: SED-Sediment
Sample Date: Protocol: NASXXXHA4C-Hyalella 28-d Test Species: HA-Hyalella azteca
Comments:

Conc-	1	2	3	4	5	6	7	8
D-Control	0.9000	1.0000	1.0000	0.8000	1.0000	1.0000	1.0000	1.0000
Ref05164486	1.0000	1.0000	1.0000	0.9000	0.8000	1.0000	1.0000	1.0000
5164433	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	0.9000	1.0000
5164434	1.0000	0.8000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
5164435	0.9000	0.9000	0.8000	0.9000	1.0000	0.7000	0.6000	0.9000
5164436	0.8000	0.8000	0.7000	0.7000	0.7000	0.6000	0.8000	0.9000
5164437	0.9000	1.0000	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000
5164440	0.9000	1.0000	1.0000	1.0000	1.0000	0.7000	1.0000	0.9000
5164441	0.9000	0.9000	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000
5164442	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000	0.8000	0.9000
5164443	0.9000	0.8000	0.8000	0.9000	0.7000	0.7000	0.8000	0.9000
5164449	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000
5164439	1.0000	1.0000	1.0000	1.0000	0.8000	0.8000	0.9000	1.0000
5164450	0.9000	0.9000	0.8000	0.9000	1.0000	1.0000	0.9000	1.0000
5164451	1.0000	0.8000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000
5164452	0.9000	0.9000	0.7000	1.0000	1.0000	0.8000	1.0000	0.8000
5164453	0.8000	0.9000	0.8000	1.0000	0.9000	1.0000	1.0000	0.9000
5164454	0.9000	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000
5164455	0.9000	0.9000	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000
5164456	0.8000	1.0000	0.6000	1.0000	0.9000	1.0000	1.0000	0.9000
5164457	1.0000	1.0000	0.8000	1.0000	1.0000	0.9000	1.0000	0.7000
5164459	0.6000	0.8000	0.9000	0.9000	0.7000	0.9000	0.9000	0.7000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	0.9625	1.0000	1.3535	1.1071	1.4120	8.476	8		
Ref05164486	0.9625	1.0000	1.3535	1.1071	1.4120	8.476	8		
5164433	0.9625	1.0000	1.3509	1.2490	1.4120	6.244	8		
5164434	0.9625	1.0000	1.3535	1.1071	1.4120	8.476	8		
5164435	0.8375	0.8701	1.1741	0.8861	1.4120	14.396	8	47.50	45.00
5164436	0.7500	0.7792	1.0538	0.8861	1.2490	10.553	8		
5164437	0.9500	0.9870	1.3305	1.2490	1.4120	6.547	8		
5164440	0.9375	0.9740	1.3187	0.9912	1.4120	11.484	8		
5164441	0.9375	0.9740	1.3102	1.2490	1.4120	6.438	8		
5164442	0.9500	0.9870	1.3332	1.1071	1.4120	8.799	8		
5164443	0.8125	0.8442	1.1314	0.9912	1.2490	9.603	8		
5164449	0.9500	0.9870	1.3305	1.2490	1.4120	6.547	8		
5164439	0.9375	0.9740	1.3154	1.1071	1.4120	10.667	8		
5164450	0.9250	0.9610	1.2924	1.1071	1.4120	8.514	8		
5164451	0.9625	1.0000	1.3535	1.1071	1.4120	8.476	8		
5164452	0.8875	0.9221	1.2424	0.9912	1.4120	13.124	8		
5164453	0.9125	0.9481	1.2747	1.1071	1.4120	10.042	8		
5164454	0.9750	1.0130	1.3713	1.2490	1.4120	5.501	8		
5164455	0.9500	0.9870	1.3305	1.2490	1.4120	6.547	8		
5164456	0.9000	0.9351	1.2674	0.8861	1.4120	15.071	8		
5164457	0.9250	0.9610	1.3009	0.9912	1.4120	12.925	8		
*5164459	0.8000	0.8312	1.1215	0.8861	1.2490	13.255	8	42.50	45.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.89513	0.884	-0.6869	-0.4528
Bartlett's Test indicates equal variances (p = 0.68)	0.76711	9.21035		
The control means are not significantly different (p = 1.00)	0	2.14479		

Hypothesis Test (1-tail, 0.01)

Wilcoxon Two-Sample Test indicates significant differences

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

Pos	ID	Rep	Group	Day 0	Day 10	psurv Day 10	Day 20	psurv Day 20	Day 28	psurv day 28	Dry Wt (mg)	Tare Wt (mg)	Wt. count	TWT	WT	Ashed dry wt	TAFDW	AFDW
	1	1	D-Control	10					9	0.9	31.569	27.888	9	3.681	0.409			
	2	2	D-Control	10					10	1	32.3	28.074	10	4.226	0.4226			
	3	3	D-Control	10					10	1	34.085	29.768	10	4.317	0.4317			
	4	4	D-Control	10					8	0.8	34.154	30.294	8	3.86	0.4825			
	5	5	D-Control	10					10	1	33.196	29.39	10	3.806	0.3806			
	6	6	D-Control	10					10	1	32.921	29.252	10	3.669	0.3669			
	7	7	D-Control	10					10	1	32.515	28.65	10	3.865	0.3865			
	8	8	D-Control	10					10	1	31.417	27.629	10	3.788	0.3788			
	9	1	Ref05164486	10					10	1	36.425	31.298	10	5.127	0.5127			
	10	2	Ref05164486	10					10	1	32.402	26.787	10	5.615	0.5615			
	11	3	Ref05164486	10					10	1	34.701	29.268	10	5.433	0.5433			
	12	4	Ref05164486	10					9	0.9	35.388	29.229	9	6.159	0.684333			
	13	5	Ref05164486	10					8	0.8	34.465	29.987	8	4.478	0.55975			
	14	6	Ref05164486	10					10	1	34.778	29.004	10	5.774	0.5774			
	15	7	Ref05164486	10					10	1	35.715	29.737	10	5.978	0.5978			
	16	8	Ref05164486	10					10	1	35.607	29.789	10	5.818	0.5818			
	17	1	5164433	10					10	1	32.492	29.64	10	2.852	0.2852			
	18	2	5164433	10					10	1	31.732	27.233	10	4.499	0.4499			
	19	3	5164433	10					9	0.9	31.415	27.476	9	3.939	0.437667			
	20	4	5164433	10					10	1	34.726	30.283	10	4.443	0.4443			
	21	5	5164433	10					10	1	33.666	30.393	10	3.273	0.3273			
	22	6	5164433	10					9	0.9	32.134	28.616	9	3.518	0.390889			
	23	7	5164433	10					9	0.9	31.005	28.106	9	2.899	0.322111			
	24	8	5164433	10					10	1	32.783	28.753	10	4.03	0.403			
	25	1	5164434	10					10	1	33.27	30.551	10	2.719	0.2719			
	26	2	5164434	10					8	0.8	31.995	29.279	8	2.716	0.3395			
	27	3	5164434	10					10	1	32.215	29.118	10	3.097	0.3097			
	28	4	5164434	10					10	1	32.446	29.245	10	3.201	0.3201			
	29	5	5164434	10					9	0.9	30.449	28.355	9	2.094	0.232667			
	30	6	5164434	10					10	1	30.724	27.702	10	3.022	0.3022			
	31	7	5164434	10					10	1	29.667	27.415	10	2.252	0.2252			
	32	8	5164434	10					10	1	31.959	29.134	10	2.825	0.2825			
	33	1	5164435	10					9	0.9	33.694	30.495	9	3.199	0.355444			
	34	2	5164435	10					9	0.9	30.293	27.013	9	3.28	0.364444			
	35	3	5164435	10					8	0.8	29.804	27.104	8	2.7	0.3375			
	36	4	5164435	10					9	0.9	32.364	29.573	7	2.791	0.398714			
	37	5	5164435	10					10	1	32.558	28.756	10	3.802	0.3802			
	38	6	5164435	10					7	0.7	31.766	29.502	7	2.264	0.323429			
	39	7	5164435	10					6	0.6	31.295	29.743	6	1.552	0.258667			

data entry verified against EXCEL spreadsheet MSK 11-10-05

Page 4 of 10

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	40	8	5164435	10					9	0.9	30.963	27.589	9	3.374	0.374889					
	41	1	5164436	10					8	0.8	29.172	28.041	8	1.131	0.141375					
	42	2	5164436	10					8	0.8	28.61	27.565	8	1.045	0.130625					
	43	3	5164436	10					7	0.7	28.957	27.148	7	1.809	0.258429					
	44	4	5164436	10					7	0.7	34.2	32.941	7	1.259	0.179857					
	45	5	5164436	10					7	0.7	31.068	30.032	7	1.036	0.148					
	46	6	5164436	10					6	0.6	28.011	27.411	6	0.6	0.1					
	47	7	5164436	10					8	0.8	29.069	27.988	8	1.081	0.135125					
	48	8	5164436	10					9	0.9	30.125	28.041	9	2.084	0.231556					
	49	1	5164437	10					9	0.9	34.376	30.274	9	4.102	0.455778					
	50	2	5164437	10					10	1	32.851	28.45	10	4.401	0.4401					
	51	3	5164437	10					9	0.9	30.723	28.222	9	2.501	0.277889					
	52	4	5164437	10					9	0.9	30.096	26.971	9	3.125	0.347222					
	53	5	5164437	10					9	0.9	33.955	29.062	9	4.893	0.543667					
	54	6	5164437	10					10	1	33.006	29.246	10	3.76	0.376					
	55	7	5164437	10					10	1	31.743	27.439	10	4.304	0.4304					
	56	8	5164437	10					10	1	33.622	29.403	10	4.219	0.4219					
	57	1	5164440	10					9	0.9	30.932	28.391	9	2.541	0.282333					
	58	2	5164440	10					10	1	29.385	27.028	10	2.357	0.2357					
	59	3	5164440	10					10	1	33.315	30.387	10	2.928	0.2928					
	60	4	5164440	10					10	1	34.224	31.506	10	2.718	0.2718					
	61	5	5164440	10					10	1	29.074	26.81	10	2.264	0.2264					
	62	6	5164440	10					7	0.7	31.885	29.175	7	2.71	0.387143					
	63	7	5164440	10					10	1	31.22	28.795	10	2.425	0.2425					
	64	8	5164440	10					9	0.9	29.998	28.152	9	1.846	0.205111					
	65	1	5164441	10					9	0.9	31.334	28.25	9	3.084	0.342667					
	66	2	5164441	10					9	0.9	32.279	28.73	9	3.549	0.394333					
	67	3	5164441	10					9	0.9	31.806	28.682	9	3.124	0.347111					
	68	4	5164441	10					9	0.9	31.888	29.389	9	2.499	0.277667					
	69	5	5164441	10					9	0.9	32.719	28.759	9	3.96	0.44					
	70	6	5164441	10					10	1	31.775	28.696	10	3.079	0.3079					
	71	7	5164441	10					10	1	32.677	28.026	10	4.651	0.4651					
	72	8	5164441	10					10	1	32.186	28.494	10	3.692	0.3692					
	73	1	5164442	10					10	1	30.158	27.371	10	2.787	0.2787					
	74	2	5164442	10					10	1	31.467	28.794	10	2.673	0.2673					
	75	3	5164442	10					9	0.9	31.251	28.226	9	3.025	0.336111					
	76	4	5164442	10					10	1	32.015	28.545	10	3.47	0.347					
	77	5	5164442	10					10	1	32.586	29.66	10	2.926	0.2926					
	78	6	5164442	10					10	1	30.621	27.999	10	2.622	0.2622					
	79	7	5164442	10					8	0.8	32.295	29.131	8	3.164	0.3955					
	80	8	5164442	10					9	0.9	30.543	27.725	9	2.818	0.313111					

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	81	1	5164443	10					9	0.9	32.376	29.171	9	3.205	0.356111				
	82	2	5164443	10					8	0.8	30.856	27.808	8	3.048	0.381				
	83	3	5164443	10					8	0.8	31.844	29.965	8	1.879	0.234875				
	84	4	5164443	10					9	0.9	30.17	27.274	9	2.896	0.321778				
	85	5	5164443	10					7	0.7	32.601	29.467	7	3.134	0.447714				
	86	6	5164443	10					7	0.7	31.23	29.094	7	2.136	0.305143				
	87	7	5164443	10					8	0.8	30.73	28.182	8	2.548	0.3185				
	88	8	5164443	10					9	0.9	29.467	27.653	9	1.814	0.201556				
	89	1	5164449	10					9	0.9	31.563	28.497	9	3.066	0.340667				
	90	2	5164449	10					10	1	32.636	28.566	10	4.07	0.407				
	91	3	5164449	10					9	0.9	32.046	29.15	9	2.896	0.321778				
	92	4	5164449	10					10	1	31.163	28.046	10	3.117	0.3117				
	93	5	5164449	10					10	1	31.444	27.987	10	3.457	0.3457				
	94	6	5164449	10					10	1	29.96	27.375	10	2.585	0.2585				
	95	7	5164449	10					9	0.9	30.476	27.824	9	2.652	0.294667				
	96	8	5164449	10					9	0.9	31.896	28.318	9	3.578	0.397556				
	97	1	5164439	10					10	1	33.249	29.466	10	3.783	0.3783				
	98	2	5164439	10					10	1	37.36	29.02	10	8.34	0.834				
	99	3	5164439	10					10	1	33.602	28.78	10	4.822	0.4822				
	100	4	5164439	10					10	1	33.938	28.294	10	5.644	0.5644				
	101	5	5164439	10					8	0.8	33.2	27.779	8	5.421	0.677625				
	102	6	5164439	10					8	0.8	32.555	28.294	8	4.261	0.532625				
	103	7	5164439	10					9	0.9	35.083	28.633	9	6.45	0.716667				
	104	8	5164439	10					10	1	33.624	28.161	10	5.463	0.5463				
	105	1	5164450	10					9	0.9	32.877	29.847	9	3.03	0.336667				
	106	2	5164450	10					9	0.9	33.176	29.363	9	3.813	0.423667				
	107	3	5164450	10					8	0.8	31.25	28.194	8	3.056	0.382				
	108	4	5164450	10					9	0.9	30.402	28.222	9	2.18	0.242222				
	109	5	5164450	10					10	1	32.348	29.275	10	3.073	0.3073				
	110	6	5164450	10					10	1	33.421	29.927	10	3.494	0.3494				
	111	7	5164450	10					9	0.9	32.359	29.425	9	2.934	0.326				
	112	8	5164450	10					10	1	30.285	26.816	10	3.469	0.3469				
	113	1	5164451	10					10	1	31.448	28.404	10	3.044	0.3044				
	114	2	5164451	10					8	0.8	29.185	27.72	8	1.465	0.183125				
	115	3	5164451	10					10	1	33.809	29.415	10	4.394	0.4394				
	116	4	5164451	10					9	0.9	30.879	27.219	9	3.66	0.406667				
	117	5	5164451	10					10	1	32.414	30.227	10	2.187	0.2187				
	118	6	5164451	10					10	1	32.652	29.077	10	3.575	0.3575				
	119	7	5164451	10					10	1	33.551	30.034	10	3.517	0.3517				
	120	8	5164451	10					10	1	31.999	28.53	10	3.469	0.3469				
	121	1	5164452	10					9	0.9	30.562	28.813	9	1.749	0.194333				

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	122	2	5164452	10					9	0.9	33.555	30.608	9	2.947	0.327444			
	123	3	5164452	10					7	0.7	30.938	29.497	7	1.441	0.205857			
	124	4	5164452	10					10	1	31.263	28.356	10	2.907	0.2907			
	125	5	5164452	10					10	1	29.984	27.217	10	2.767	0.2767			
	126	6	5164452	10					8	0.8	30.794	28.708	8	2.086	0.26075			
	127	7	5164452	10					10	1	30.375	28.106	10	2.269	0.2269			
	128	8	5164452	10					8	0.8	32.21	29.015	8	3.195	0.399375			
	129	1	5164453	10					8	0.8	33.247	28.628	8	4.619	0.577375			
	130	2	5164453	10					9	0.9	34.566	30.645	9	3.921	0.435667			
	131	3	5164453	10					8	0.8	32.322	28.029	8	4.293	0.536625			
	132	4	5164453	10					10	1	32.882	27.818	10	5.064	0.5064			
	133	5	5164453	10					9	0.9	31.151	27.6	9	3.551	0.394556			
	134	6	5164453	10					10	1	31.055	25.566	10	5.489	0.5489			
	135	7	5164453	10					10	1	33.142	28.884	10	4.258	0.4258			
	136	8	5164453	10					9	0.9	31.383	27.192	9	4.191	0.465667			
	137	1	5164454	10					9	0.9	30.997	27.812	9	3.185	0.353889			
	138	2	5164454	10					10	1	29.983	26.886	10	3.097	0.3097			
	139	3	5164454	10					10	1	30.697	27.867	10	2.83	0.283			
	140	4	5164454	10					10	1	32.609	28.104	10	4.505	0.4505			
	141	5	5164454	10					10	1	32.678	28.838	10	3.84	0.384			
	142	6	5164454	10					9	0.9	32.048	29.292	9	2.756	0.306222			
	143	7	5164454	10					10	1	29.723	27.653	10	2.07	0.207			
	144	8	5164454	10					10	1	31.921	28.161	10	3.76	0.376			
	145	1	5164455	10					9	0.9	32.366	29.39	9	2.976	0.330667			
	146	2	5164455	10					9	0.9	32.624	29.7	9	2.924	0.324889			
	147	3	5164455	10					9	0.9	31.277	28.64	9	2.637	0.293			
	148	4	5164455	10					10	1	32.096	28.546	10	3.55	0.355			
	149	5	5164455	10					9	0.9	31.579	28.832	9	2.747	0.305222			
	150	6	5164455	10					10	1	30.655	28.074	10	2.581	0.2581			
	151	7	5164455	10					10	1	34.039	30.088	10	3.951	0.3951			
	152	8	5164455	10					10	1	31.965	29.006	10	2.959	0.2959			
	153	1	5164456	10					8	0.8	32.065	29.68	8	2.385	0.298125			
	154	2	5164456	10					10	1	31.505	28.633	10	2.872	0.2872			
	155	3	5164456	10					6	0.6	29.759	27.861	6	1.898	0.316333			
	156	4	5164456	10					10	1	32.671	29.477	10	3.194	0.3194			
	157	5	5164456	10					9	0.9	31.482	29.725	9	1.757	0.195222			
	158	6	5164456	10					10	1	31.033	28.682	10	2.351	0.2351			
	159	7	5164456	10					10	1	30.708	26.496	10	4.212	0.4212			
	160	8	5164456	10					9	0.9	30.322	29.075	9	1.247	0.138556			
	161	1	5164457	10					10	1	33.58	30.161	10	3.419	0.3419			
	162	2	5164457	10					10	1	32.609	29.61	10	2.999	0.2999			

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	163	3	5164457	10					8	0.8	32.304	29.122	8	3.182	0.39775			
	164	4	5164457	10					10	1	33.151	30.022	10	3.129	0.3129			
	165	5	5164457	10					10	1	32.069	28.265	10	3.804	0.3804			
	166	6	5164457	10					9	0.9	32.636	29.604	9	3.032	0.336889			
	167	7	5164457	10					10	1	31.405	28.11	10	3.295	0.3295			
	168	8	5164457	10					7	0.7	30.908	28.252	7	2.656	0.379429			
	169	1	5164459	10					6	0.6	32.15	28.78	6	3.37	0.561667			
	170	2	5164459	10					8	0.8	30.96	26.832	8	4.128	0.516			
	171	3	5164459	10					9	0.9	32.931	28.854	9	4.077	0.453			
	172	4	5164459	10					9	0.9	31.743	27.931	9	3.812	0.423556			
	173	5	5164459	10					7	0.7	32.757	29.813	7	2.944	0.420571			
	174	6	5164459	10					9	0.9	32.457	28.965	9	3.492	0.388			
	175	7	5164459	10					9	0.9	32.066	28.302	9	3.764	0.418222			
	176	8	5164459	10					7	0.7	32.356	28.876	7	3.48	0.497143			

Comments:

Freshwater Sediment-Average ind. biomass

Start Date:	4/28/05 10:50	Test ID: 727-1b	Sample ID:
End Date:	5/26/05 12:10	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.4090	0.4226	0.4317	0.4825	0.3806	0.3669	0.3865	0.3788
Ref05164486	0.5127	0.5615	0.5433	0.6843	0.5598	0.5774	0.5978	0.5818
5164460	0.4651	0.4242	0.4488	0.4706	0.6082	0.5415	0.4396	0.7207
5164461	0.3506	0.3987	0.2697	0.4458	0.4050	0.3832	0.3656	0.3464
5164468	0.1461	0.1814	0.2369	0.1895	0.2057	0.1544	0.1590	0.1500
5164469	0.4263	0.5413	0.4709	0.5504	0.4108	0.4033	0.3854	0.5001
5164471	0.6008	0.6013	0.6836	0.6415	0.6815	0.6423	0.4638	0.8246

			Transform: Untransformed					1-Tailed		
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.4073	0.7055	0.4073	0.3669	0.4825	9.315	8			
Ref05164486	0.5773	1.0000	0.5773	0.5127	0.6843	8.731	8			
5164460	0.5148	0.8918	0.5148	0.4242	0.7207	20.035	8			
*5164461	0.3706	0.6420	0.3706	0.2697	0.4458	14.049	8	8.067	2.624	0.0672
*5164468	0.1779	0.3081	0.1779	0.1461	0.2369	17.899	8	18.952	2.624	0.0553
5164469	0.4611	0.7986	0.4611	0.3854	0.5504	13.918	8			
5164471	0.6424	1.1128	0.6424	0.4638	0.8246	15.759	8			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.96358	0.884	0.29053	1.27485
Bartlett's Test indicates equal variances (p = 0.10)	4.65428	9.21035		
The control means are significantly different (p = 2.40E-06)	7.62151	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.05532	0.09582	0.31926	0.00209	3.0E-13	2, 21

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1b
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

Pos	ID	Rep	Group	Day 0	Day 10	psurv Day 10	Day 20	psurv Day 20	Day 28	psurv day 28	Dry Wt (mg)	Tare Wt (mg)	Wt. count	TWT	WT	Ashed dry wt	TAFDW	AFDW
	1	1	D-Control	10					9	0.9	31.569	27.888	9	3.681	0.409			
	2	2	D-Control	10					10	1	32.3	28.074	10	4.226	0.4226			
	3	3	D-Control	10					10	1	34.085	29.768	10	4.317	0.4317			
	4	4	D-Control	10					8	0.8	34.154	30.294	8	3.86	0.4825			
	5	5	D-Control	10					10	1	33.196	29.39	10	3.806	0.3806			
	6	6	D-Control	10					10	1	32.921	29.252	10	3.669	0.3669			
	7	7	D-Control	10					10	1	32.515	28.65	10	3.865	0.3865			
	8	8	D-Control	10					10	1	31.417	27.629	10	3.788	0.3788			
	9	1	Ref05164486	10					10	1	36.425	31.298	10	5.127	0.5127			
	10	2	Ref05164486	10					10	1	32.402	26.787	10	5.615	0.5615			
	11	3	Ref05164486	10					10	1	34.701	29.268	10	5.433	0.5433			
	12	4	Ref05164486	10					9	0.9	35.388	29.229	9	6.159	0.684333			
	13	5	Ref05164486	10					8	0.8	34.465	29.987	8	4.478	0.55975			
	14	6	Ref05164486	10					10	1	34.778	29.004	10	5.774	0.5774			
	15	7	Ref05164486	10					10	1	35.715	29.737	10	5.978	0.5978			
	16	8	Ref05164486	10					10	1	35.607	29.789	10	5.818	0.5818			
	17	1	5164460	10					10	1	34.83	30.179	10	4.651	0.4651			
	18	2	5164460	10					9	0.9	33.339	29.521	9	3.818	0.424222			
	19	3	5164460	10					10	1	33.194	28.706	10	4.488	0.4488			
	20	4	5164460	10					10	1	33.448	28.742	10	4.706	0.4706			
	21	5	5164460	10					9	0.9	34.357	28.883	9	5.474	0.608222			
	22	6	5164460	10					10	1	35.364	29.949	10	5.415	0.5415			
	23	7	5164460	10					10	1	32.77	28.374	10	4.396	0.4396			
	24	8	5164460	10					10	1	36.19	28.983	10	7.207	0.7207			
	25	1	5164461	10					10	1	34.781	31.275	10	3.506	0.3506			
	26	2	5164461	10					10	1	32.829	28.842	10	3.987	0.3987			
	27	3	5164461	10					10	1	31.398	28.701	10	2.697	0.2697			
	28	4	5164461	10					10	1	32.163	27.705	10	4.458	0.4458			
	29	5	5164461	10					9	0.9	32.063	28.418	9	3.645	0.405			
	30	6	5164461	10					10	1	32.77	28.938	10	3.832	0.3832			
	31	7	5164461	10					10	1	31.926	28.27	10	3.656	0.3656			
	32	8	5164461	10					10	1	31.15	27.686	10	3.464	0.3464			
	33	1	5164468	10					8	0.8	30.182	29.013	8	1.169	0.146125			
	34	2	5164468	10					8	0.8	29.403	27.952	8	1.451	0.181375			
	35	3	5164468	10					9	0.9	30.513	28.381	9	2.132	0.236889			
	36	4	5164468	10					10	1	28.447	26.552	10	1.895	0.1895			
	37	5	5164468	10					9	0.9	31.068	29.217	9	1.851	0.205667			
	38	6	5164468	10					10	1	30.655	29.111	10	1.544	0.1544			
	39	7	5164468	10					9	0.9	28.882	27.451	9	1.431	0.159			

data entry verified against EXCEL spreadsheet 11-10-05 MLR

PAGE 1 OF 3

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1b
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	40	8	5164468	10					6	0.6	30.419	29.519	6	0.9	0.15			
	41	1	5164469	10					9	0.9	31.785	27.948	9	3.837	0.426333			
	42	2	5164469	10					9	0.9	32.998	28.126	9	4.872	0.541333			
	43	3	5164469	10					10	1	33.513	28.804	10	4.709	0.4709			
	44	4	5164469	10					8	0.8	31.521	27.118	8	4.403	0.550375			
	45	5	5164469	10					9	0.9	32.39	28.693	9	3.697	0.410778			
	46	6	5164469	10					9	0.9	31.656	28.026	9	3.63	0.403333			
	47	7	5164469	10					10	1	31.647	28.178	9	3.469	0.385444			
	48	8	5164469	10					9	0.9	33.996	29.995	8	4.001	0.500125			
	49	1	5164471	10					10	1	32.481	26.473	10	6.008	0.6008			
	50	2	5164471	10					10	1	33.432	27.419	10	6.013	0.6013			
	51	3	5164471	10					9	0.9	34.562	28.41	9	6.152	0.683556			
	52	4	5164471	10					9	0.9	33.081	27.949	8	5.132	0.6415			
	53	5	5164471	10					10	1	35.329	28.514	10	6.815	0.6815			
	54	6	5164471	10					10	1	36.323	29.9	10	6.423	0.6423			
	55	7	5164471	10					10	1	35.533	30.895	10	4.638	0.4638			
	56	8	5164471	10					8	0.8	36.225	29.628	8	6.597	0.824625			

Comments:

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Freshwater Sediment-Average ind. biomass

Start Date:	4/28/05 10:50	Test ID: 727-1	Sample ID:
End Date:	5/26/05 12:10	Lab ID: ~~ORNAS~~-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
~~D-Control~~	0.4090	0.4226	0.4317	0.4825	0.3806	0.3669	0.3865	0.3788
Ref05164489	0.4342	0.3954	0.3923	0.4597	0.4102	0.4056	0.3969	0.4130
5164433	0.2852	0.4499	0.4377	0.4443	0.3273	0.3909	0.3221	0.4030
5164434	0.2719	0.3395	0.3097	0.3201	0.2327	0.3022	0.2252	0.2825
5164435	0.3554	0.3644	0.3375	0.3987	0.3802	0.3234	0.2587	0.3749
5164436	0.1414	0.1306	0.2584	0.1799	0.1480	0.1000	0.1351	0.2316
5164437	0.4558	0.4401	0.2779	0.3472	0.5437	0.3760	0.4304	0.4219
5164440	0.2823	0.2357	0.2928	0.2718	0.2264	0.3871	0.2425	0.2051
5164441	0.3427	0.3943	0.3471	0.2777	0.4400	0.3079	0.4651	0.3692
5164442	0.2787	0.2673	0.3361	0.3470	0.2926	0.2622	0.3955	0.3131
5164443	0.3561	0.3810	0.2349	0.3218	0.4477	0.3051	0.3185	0.2016
5164449	0.3407	0.4070	0.3218	0.3117	0.3457	0.2585	0.2947	0.3976
5164439	0.3783	0.8340	0.4822	0.5644	0.6776	0.5326	0.7167	0.5463
5164450	0.3367	0.4237	0.3820	0.2422	0.3073	0.3494	0.3260	0.3469
5164451	0.3044	0.1831	0.4394	0.4067	0.2187	0.3575	0.3517	0.3469
5164452	0.1943	0.3274	0.2059	0.2907	0.2767	0.2608	0.2269	0.3994
5164453	0.5774	0.4357	0.5366	0.5064	0.3946	0.5489	0.4258	0.4657
5164454	0.3539	0.3097	0.2830	0.4505	0.3840	0.3062	0.2070	0.3760
5164455	0.3307	0.3249	0.2930	0.3550	0.3052	0.2581	0.3951	0.2959
5164456	0.2981	0.2872	0.3163	0.3194	0.1952	0.2351	0.4212	0.1386
5164457	0.3419	0.2999	0.3978	0.3129	0.3804	0.3369	0.3295	0.3794
5164459	0.5617	0.5160	0.4530	0.4236	0.4206	0.3880	0.4182	0.4971

			Transform: Untransformed						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.4073	0.9853	0.4073	0.3669	0.4825	9.315	8			
Ref05164489	0.4134	1.0000	0.4134	0.3923	0.4597	5.551	8			
5164433	0.3825	0.9253	0.3825	0.2852	0.4499	16.550	8			
*5164434	0.2855	0.6905	0.2855	0.2252	0.3395	14.259	8	7.744	2.624	0.0434
*5164435	0.3492	0.8446	0.3492	0.2587	0.3987	12.503	8	3.685	2.624	0.0458
*5164436	0.1656	0.4006	0.1656	0.1000	0.2584	32.693	8	11.918	2.624	0.0546
5164437	0.4116	0.9957	0.4116	0.2779	0.5437	19.251	8			
*5164440	0.2680	0.6482	0.2680	0.2051	0.3871	21.114	8	6.737	2.624	0.0567
5164441	0.3680	0.8901	0.3680	0.2777	0.4651	17.235	8	1.905	2.624	0.0626
*5164442	0.3116	0.7536	0.3116	0.2622	0.3955	14.729	8	5.614	2.624	0.0476
5164443	0.3208	0.7761	0.3208	0.2016	0.4477	24.381	8			
*5164449	0.3347	0.8096	0.3347	0.2585	0.4070	14.913	8	4.053	2.624	0.0510
5164439	0.5915	1.4308	0.5915	0.3783	0.8340	24.376	8			
*5164450	0.3393	0.8207	0.3393	0.2422	0.4237	15.649	8	3.626	2.624	0.0537
5164451	0.3260	0.7887	0.3260	0.1831	0.4394	26.900	8			
*5164452	0.2728	0.6598	0.2728	0.1943	0.3994	24.879	8	5.554	2.624	0.0665
5164453	0.4864	1.1765	0.4864	0.3946	0.5774	13.508	8			
5164454	0.3338	0.8074	0.3338	0.2070	0.4505	22.167	8			
*5164455	0.3197	0.7734	0.3197	0.2581	0.3951	13.143	8	5.534	2.624	0.0444
5164456	0.2764	0.6686	0.2764	0.1386	0.4212	31.272	8			
*5164457	0.3473	0.8402	0.3473	0.2999	0.3978	10.067	8	4.469	2.624	0.0388
5164459	0.4598	1.1121	0.4598	0.3880	0.5617	12.923	8			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.57021	1.035	0.38013	0.09666
Bartlett's Test indicates unequal variances (p = 1.19E-03)	30.7858	24.725		
The control means are not significantly different (p = 0.70)	0.38838	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.03881	0.09387	0.0312	0.00244	7.4E-14	11, 84

Freshwater Sediment-Average ind. biomass

Start Date:	4/28/05 10:50	Test ID: 727-1	Sample ID:
End Date:	5/26/05 12:10	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.4090	0.4226	0.4317	0.4825	0.3806	0.3669	0.3865	0.3788
Ref05164489	0.4342	0.3954	0.3923	0.4597	0.4102	0.4056	0.3969	0.4130
5164433	0.2852	0.4499	0.4377	0.4443	0.3273	0.3909	0.3221	0.4030
5164434	0.2719	0.3395	0.3097	0.3201	0.2327	0.3022	0.2252	0.2825
5164435	0.3554	0.3644	0.3375	0.3987	0.3802	0.3234	0.2587	0.3749
5164436	0.1414	0.1306	0.2584	0.1799	0.1480	0.1000	0.1351	0.2316
5164437	0.4558	0.4401	0.2779	0.3472	0.5437	0.3760	0.4304	0.4219
5164440	0.2823	0.2357	0.2928	0.2718	0.2264	0.3871	0.2425	0.2051
5164441	0.3427	0.3943	0.3471	0.2777	0.4400	0.3079	0.4651	0.3692
5164442	0.2787	0.2673	0.3361	0.3470	0.2926	0.2622	0.3955	0.3131
5164443	0.3561	0.3810	0.2349	0.3218	0.4477	0.3051	0.3185	0.2016
5164449	0.3407	0.4070	0.3218	0.3117	0.3457	0.2585	0.2947	0.3976
5164439	0.3783	0.8340	0.4822	0.5644	0.6776	0.5326	0.7167	0.5463
5164450	0.3367	0.4237	0.3820	0.2422	0.3073	0.3494	0.3260	0.3469
5164451	0.3044	0.1831	0.4394	0.4067	0.2187	0.3575	0.3517	0.3469
5164452	0.1943	0.3274	0.2059	0.2907	0.2767	0.2608	0.2269	0.3994
5164453	0.5774	0.4357	0.5366	0.5064	0.3946	0.5489	0.4258	0.4657
5164454	0.3539	0.3097	0.2830	0.4505	0.3840	0.3062	0.2070	0.3760
5164455	0.3307	0.3249	0.2930	0.3550	0.3052	0.2581	0.3951	0.2959
5164456	0.2981	0.2872	0.3163	0.3194	0.1952	0.2351	0.4212	0.1386
5164457	0.3419	0.2999	0.3978	0.3129	0.3804	0.3369	0.3295	0.3794
5164459	0.5617	0.5160	0.4530	0.4236	0.4206	0.3880	0.4182	0.4971

			Transform: Untransformed						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.4073	0.9853	0.4073	0.3669	0.4825	9.315	8			
Ref05164489	0.4134	1.0000	0.4134	0.3923	0.4597	5.551	8			
5164433	0.3825	0.9253	0.3825	0.2852	0.4499	16.550	8			
5164434	0.2855	0.6905	0.2855	0.2252	0.3395	14.259	8			
5164435	0.3492	0.8446	0.3492	0.2587	0.3987	12.503	8			
5164436	0.1656	0.4006	0.1656	0.1000	0.2584	32.693	8			
5164437	0.4116	0.9957	0.4116	0.2779	0.5437	19.251	8			
5164440	0.2680	0.6482	0.2680	0.2051	0.3871	21.114	8			
5164441	0.3680	0.8901	0.3680	0.2777	0.4651	17.235	8			
5164442	0.3116	0.7536	0.3116	0.2622	0.3955	14.729	8			
*5164443	0.3208	0.7761	0.3208	0.2016	0.4477	24.381	8	3.212	2.896	0.0835
5164449	0.3347	0.8096	0.3347	0.2585	0.4070	14.913	8			
5164439	0.5915	1.4308	0.5915	0.3783	0.8340	24.376	8			
5164450	0.3393	0.8207	0.3393	0.2422	0.4237	15.649	8			
5164451	0.3260	0.7887	0.3260	0.1831	0.4394	26.900	8	2.726	2.998	0.0961
5164452	0.2728	0.6598	0.2728	0.1943	0.3994	24.879	8			
5164453	0.4864	1.1765	0.4864	0.3946	0.5774	13.508	8			
*5164454	0.3338	0.8074	0.3338	0.2070	0.4505	22.167	8	2.907	2.896	0.0793
5164455	0.3197	0.7734	0.3197	0.2581	0.3951	13.143	8			
*5164456	0.2764	0.6686	0.2764	0.1386	0.4212	31.272	8	4.334	2.998	0.0948
5164457	0.3473	0.8402	0.3473	0.2999	0.3978	10.067	8			
5164459	0.4598	1.1121	0.4598	0.3880	0.5617	12.923	8			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.95961	0.919	-0.1977	0.00923
Bartlett's Test indicates equal variances (p = 0.16)	6.50872	13.2767		
The control means are not significantly different (p = 0.70)	0.38838	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Heteroscedastic t Test indicates significant differences	0.09479	0.22928	0.01972	0.00546	0.0144	4, 35

Freshwater Sediment-28-day survival

Start Date:	4/28/05 10:50	Test ID: 727-1	Sample ID:
End Date:	5/26/05 12:10	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.9000	1.0000	1.0000	0.8000	1.0000	1.0000	1.0000	1.0000
Ref05164489	0.9000	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	1.0000
5164433	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	0.9000	1.0000
5164434	1.0000	0.8000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
5164435	0.9000	0.9000	0.8000	0.9000	1.0000	0.7000	0.6000	0.9000
5164436	0.8000	0.8000	0.7000	0.7000	0.7000	0.6000	0.8000	0.9000
5164437	0.9000	1.0000	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000
5164440	0.9000	1.0000	1.0000	1.0000	1.0000	0.7000	1.0000	0.9000
5164441	0.9000	0.9000	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000
5164442	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000	0.8000	0.9000
5164443	0.9000	0.8000	0.8000	0.9000	0.7000	0.7000	0.8000	0.9000
5164449	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000
5164439	1.0000	1.0000	1.0000	1.0000	0.8000	0.8000	0.9000	1.0000
5164450	0.9000	0.9000	0.8000	0.9000	1.0000	1.0000	0.9000	1.0000
5164451	1.0000	0.8000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000
5164452	0.9000	0.9000	0.7000	1.0000	1.0000	0.8000	1.0000	0.8000
5164453	0.8000	0.9000	0.8000	1.0000	0.9000	1.0000	1.0000	0.9000
5164454	0.9000	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000
5164455	0.9000	0.9000	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000
5164456	0.8000	1.0000	0.6000	1.0000	0.9000	1.0000	1.0000	0.9000
5164457	1.0000	1.0000	0.8000	1.0000	1.0000	0.9000	1.0000	0.7000
5164459	0.6000	0.8000	0.9000	0.9000	0.7000	0.9000	0.9000	0.7000

			Transform: Arcsin Square Root						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.9625	1.0000	1.3535	1.1071	1.4120	8.476	8			
Ref05164489	0.9625	1.0000	1.3509	1.2490	1.4120	6.244	8			
5164433	0.9625	1.0000	1.3509	1.2490	1.4120	6.244	8			
5164434	0.9625	1.0000	1.3535	1.1071	1.4120	8.476	8			
*5164435	0.8375	0.8701	1.1741	0.8861	1.4120	14.396	8	2.648	2.624	0.1753
*5164436	0.7500	0.7792	1.0538	0.8861	1.2490	10.553	8	6.022	2.624	0.1295
5164437	0.9500	0.9870	1.3305	1.2490	1.4120	6.547	8			
5164440	0.9375	0.9740	1.3187	0.9912	1.4120	11.484	8			
5164441	0.9375	0.9740	1.3102	1.2490	1.4120	6.438	8			
5164442	0.9500	0.9870	1.3332	1.1071	1.4120	8.799	8			
*5164443	0.8125	0.8442	1.1314	0.9912	1.2490	9.603	8	4.515	2.624	0.1276
5164449	0.9500	0.9870	1.3305	1.2490	1.4120	6.547	8			
5164439	0.9375	0.9740	1.3154	1.1071	1.4120	10.667	8			
5164450	0.9250	0.9610	1.2924	1.1071	1.4120	8.514	8			
5164451	0.9625	1.0000	1.3535	1.1071	1.4120	8.476	8			
5164452	0.8875	0.9221	1.2424	0.9912	1.4120	13.124	8			
5164453	0.9125	0.9481	1.2747	1.1071	1.4120	10.042	8			
5164454	0.9750	1.0130	1.3713	1.2490	1.4120	5.501	8			
5164455	0.9500	0.9870	1.3305	1.2490	1.4120	6.547	8			
5164456	0.9000	0.9351	1.2674	0.8861	1.4120	15.071	8			
5164457	0.9250	0.9610	1.3009	0.9912	1.4120	12.925	8			
*5164459	0.8000	0.8312	1.1215	0.8861	1.2490	13.255	8	3.797	2.624	0.1586

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.95702	0.919	-0.3715	-0.4647
Bartlett's Test indicates equal variances (p = 0.32)	4.67099	13.2767		
The control means are not significantly different (p = 0.96)	0.05232	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.08896	0.0934	0.10007	0.01639	7.8E-04	4, 35

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

Pos	ID	Rep	Group	Day 0	Day 10	psurv Day 10	Day 20	psurv Day 20	Day 28	psurv day 28	Dry Wt (mg)	Tare Wt (mg)	Wt. count	TWT	WT	Ashed dry wt	TAFDW	AFDW
	1	1	D-Control	10					9	0.9	31.569	27.888	9	3.681	0.409			
	2	2	D-Control	10					10	1	32.3	28.074	10	4.226	0.4226			
	3	3	D-Control	10					10	1	34.085	29.768	10	4.317	0.4317			
	4	4	D-Control	10					8	0.8	34.154	30.294	8	3.86	0.4825			
	5	5	D-Control	10					10	1	33.196	29.39	10	3.806	0.3806			
	6	6	D-Control	10					10	1	32.921	29.252	10	3.669	0.3669			
	7	7	D-Control	10					10	1	32.515	28.65	10	3.865	0.3865			
	8	8	D-Control	10					10	1	31.417	27.629	10	3.788	0.3788			
	9	1	Ref05164489	10					9	0.9	34.493	30.585	9	3.908	0.434222			
	10	2	Ref05164489	10					10	1	31.242	27.288	10	3.954	0.3954			
	11	3	Ref05164489	10					10	1	33.14	29.217	10	3.923	0.3923			
	12	4	Ref05164489	10					9	0.9	33.685	29.548	9	4.137	0.459667			
	13	5	Ref05164489	10					9	0.9	31.892	28.2	9	3.692	0.410222			
	14	6	Ref05164489	10					10	1	33.734	29.678	10	4.056	0.4056			
	15	7	Ref05164489	10					10	1	31.24	27.271	10	3.969	0.3969			
	16	8	Ref05164489	10					10	1	33.039	28.909	10	4.13	0.413			
	17	1	5164433	10					10	1	32.492	29.64	10	2.852	0.2852			
	18	2	5164433	10					10	1	31.732	27.233	10	4.499	0.4499			
	19	3	5164433	10					9	0.9	31.415	27.476	9	3.939	0.437667			
	20	4	5164433	10					10	1	34.726	30.283	10	4.443	0.4443			
	21	5	5164433	10					10	1	33.666	30.393	10	3.273	0.3273			
	22	6	5164433	10					9	0.9	32.134	28.616	9	3.518	0.390889			
	23	7	5164433	10					9	0.9	31.005	28.106	9	2.899	0.322111			
	24	8	5164433	10					10	1	32.783	28.753	10	4.03	0.403			
	25	1	5164434	10					10	1	33.27	30.551	10	2.719	0.2719			
	26	2	5164434	10					8	0.8	31.995	29.279	8	2.716	0.3395			
	27	3	5164434	10					10	1	32.215	29.118	10	3.097	0.3097			
	28	4	5164434	10					10	1	32.446	29.245	10	3.201	0.3201			
	29	5	5164434	10					9	0.9	30.449	28.355	9	2.094	0.232667			
	30	6	5164434	10					10	1	30.724	27.702	10	3.022	0.3022			
	31	7	5164434	10					10	1	29.667	27.415	10	2.252	0.2252			
	32	8	5164434	10					10	1	31.959	29.134	10	2.825	0.2825			
	33	1	5164435	10					9	0.9	33.694	30.495	9	3.199	0.355444			
	34	2	5164435	10					9	0.9	30.293	27.013	9	3.28	0.364444			
	35	3	5164435	10					8	0.8	29.804	27.104	8	2.7	0.3375			
	36	4	5164435	10					9	0.9	32.364	29.573	7	2.791	0.398714			
	37	5	5164435	10					10	1	32.558	28.756	10	3.802	0.3802			
	38	6	5164435	10					7	0.7	31.766	29.502	7	2.264	0.323429			
	39	7	5164435	10					6	0.6	31.295	29.743	6	1.552	0.258667			

data entry verified against EXCEL Spreadsheet MSR 11-10-05

DAYS 28 TO 28

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	40	8	5164435	10					9	0.9	30.963	27.589	9	3.374	0.374889				
	41	1	5164436	10					8	0.8	29.172	28.041	8	1.131	0.141375				
	42	2	5164436	10					8	0.8	28.61	27.565	8	1.045	0.130625				
	43	3	5164436	10					7	0.7	28.957	27.148	7	1.809	0.258429				
	44	4	5164436	10					7	0.7	34.2	32.941	7	1.259	0.179857				
	45	5	5164436	10					7	0.7	31.068	30.032	7	1.036	0.148				
	46	6	5164436	10					6	0.6	28.011	27.411	6	0.6	0.1				
	47	7	5164436	10					8	0.8	29.069	27.988	8	1.081	0.135125				
	48	8	5164436	10					9	0.9	30.125	28.041	9	2.084	0.231556				
	49	1	5164437	10					9	0.9	34.376	30.274	9	4.102	0.455778				
	50	2	5164437	10					10	1	32.851	28.45	10	4.401	0.4401				
	51	3	5164437	10					9	0.9	30.723	28.222	9	2.501	0.277889				
	52	4	5164437	10					9	0.9	30.096	26.971	9	3.125	0.347222				
	53	5	5164437	10					9	0.9	33.955	29.062	9	4.893	0.543667				
	54	6	5164437	10					10	1	33.006	29.246	10	3.76	0.376				
	55	7	5164437	10					10	1	31.743	27.439	10	4.304	0.4304				
	56	8	5164437	10					10	1	33.622	29.403	10	4.219	0.4219				
	57	1	5164440	10					9	0.9	30.932	28.391	9	2.541	0.282333				
	58	2	5164440	10					10	1	29.385	27.028	10	2.357	0.2357				
	59	3	5164440	10					10	1	33.315	30.387	10	2.928	0.2928				
	60	4	5164440	10					10	1	34.224	31.506	10	2.718	0.2718				
	61	5	5164440	10					10	1	29.074	26.81	10	2.264	0.2264				
	62	6	5164440	10					7	0.7	31.885	29.175	7	2.71	0.387143				
	63	7	5164440	10					10	1	31.22	28.795	10	2.425	0.2425				
	64	8	5164440	10					9	0.9	29.998	28.152	9	1.846	0.205111				
	65	1	5164441	10					9	0.9	31.334	28.25	9	3.084	0.342667				
	66	2	5164441	10					9	0.9	32.279	28.73	9	3.549	0.394333				
	67	3	5164441	10					9	0.9	31.806	28.682	9	3.124	0.347111				
	68	4	5164441	10					9	0.9	31.888	29.389	9	2.499	0.277667				
	69	5	5164441	10					9	0.9	32.719	28.759	9	3.96	0.44				
	70	6	5164441	10					10	1	31.775	28.696	10	3.079	0.3079				
	71	7	5164441	10					10	1	32.677	28.026	10	4.651	0.4651				
	72	8	5164441	10					10	1	32.186	28.494	10	3.692	0.3692				
	73	1	5164442	10					10	1	30.158	27.371	10	2.787	0.2787				
	74	2	5164442	10					10	1	31.467	28.794	10	2.673	0.2673				
	75	3	5164442	10					9	0.9	31.251	28.226	9	3.025	0.336111				
	76	4	5164442	10					10	1	32.015	28.545	10	3.47	0.347				
	77	5	5164442	10					10	1	32.586	29.66	10	2.926	0.2926				
	78	6	5164442	10					10	1	30.621	27.999	10	2.622	0.2622				
	79	7	5164442	10					8	0.8	32.295	29.131	8	3.164	0.3955				
	80	8	5164442	10					9	0.9	30.543	27.725	9	2.818	0.313111				

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Test: FW-Freshwater Sediment
Test ID: 727-1
Species: HA-Hyalella azteca
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample ID:
Sample Type: SED-Sediment
Start Date: 4/28/05 10:50
End Date: 5/26/05 12:10
Lab ID: ORNAS-Northwestern Aquatic Sciences

	81	1	5164443	10					9	0.9	32.376	29.171	9	3.205	0.356111				
	82	2	5164443	10					8	0.8	30.856	27.808	8	3.048	0.381				
	83	3	5164443	10					8	0.8	31.844	29.965	8	1.879	0.234875				
	84	4	5164443	10					9	0.9	30.17	27.274	9	2.896	0.321778				
	85	5	5164443	10					7	0.7	32.601	29.467	7	3.134	0.447714				
	86	6	5164443	10					7	0.7	31.23	29.094	7	2.136	0.305143				
	87	7	5164443	10					8	0.8	30.73	28.182	8	2.548	0.3185				
	88	8	5164443	10					9	0.9	29.467	27.653	9	1.814	0.201556				
	89	1	5164449	10					9	0.9	31.563	28.497	9	3.066	0.340667				
	90	2	5164449	10					10	1	32.636	28.566	10	4.07	0.407				
	91	3	5164449	10					9	0.9	32.046	29.15	9	2.896	0.321778				
	92	4	5164449	10					10	1	31.163	28.046	10	3.117	0.3117				
	93	5	5164449	10					10	1	31.444	27.987	10	3.457	0.3457				
	94	6	5164449	10					10	1	29.96	27.375	10	2.585	0.2585				
	95	7	5164449	10					9	0.9	30.476	27.824	9	2.652	0.294667				
	96	8	5164449	10					9	0.9	31.896	28.318	9	3.578	0.397556				
	97	1	5164439	10					10	1	33.249	29.466	10	3.783	0.3783				
	98	2	5164439	10					10	1	37.36	29.02	10	8.34	0.834				
	99	3	5164439	10					10	1	33.602	28.78	10	4.822	0.4822				
	100	4	5164439	10					10	1	33.938	28.294	10	5.644	0.5644				
	101	5	5164439	10					8	0.8	33.2	27.779	8	5.421	0.677625				
	102	6	5164439	10					8	0.8	32.555	28.294	8	4.261	0.532625				
	103	7	5164439	10					9	0.9	35.083	28.633	9	6.45	0.716667				
	104	8	5164439	10					10	1	33.624	28.161	10	5.463	0.5463				
	105	1	5164450	10					9	0.9	32.877	29.847	9	3.03	0.336667				
	106	2	5164450	10					9	0.9	33.176	29.363	9	3.813	0.423667				
	107	3	5164450	10					8	0.8	31.25	28.194	8	3.056	0.382				
	108	4	5164450	10					9	0.9	30.402	28.222	9	2.18	0.242222				
	109	5	5164450	10					10	1	32.348	29.275	10	3.073	0.3073				
	110	6	5164450	10					10	1	33.421	29.927	10	3.494	0.3494				
	111	7	5164450	10					9	0.9	32.359	29.425	9	2.934	0.326				
	112	8	5164450	10					10	1	30.285	26.816	10	3.469	0.3469				
	113	1	5164451	10					10	1	31.448	28.404	10	3.044	0.3044				
	114	2	5164451	10					8	0.8	29.185	27.72	8	1.465	0.183125				
	115	3	5164451	10					10	1	33.809	29.415	10	4.394	0.4394				
	116	4	5164451	10					9	0.9	30.879	27.219	9	3.66	0.406667				
	117	5	5164451	10					10	1	32.414	30.227	10	2.187	0.2187				
	118	6	5164451	10					10	1	32.652	29.077	10	3.575	0.3575				
	119	7	5164451	10					10	1	33.551	30.034	10	3.517	0.3517				
	120	8	5164451	10					10	1	31.999	28.53	10	3.469	0.3469				
	121	1	5164452	10					9	0.9	30.562	28.813	9	1.749	0.194333				

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	122	2	5164452	10					9	0.9	33.555	30.608	9	2.947	0.327444				
	123	3	5164452	10					7	0.7	30.938	29.497	7	1.441	0.205857				
	124	4	5164452	10					10	1	31.263	28.356	10	2.907	0.2907				
	125	5	5164452	10					10	1	29.984	27.217	10	2.767	0.2767				
	126	6	5164452	10					8	0.8	30.794	28.708	8	2.086	0.26075				
	127	7	5164452	10					10	1	30.375	28.106	10	2.269	0.2269				
	128	8	5164452	10					8	0.8	32.21	29.015	8	3.195	0.399375				
	129	1	5164453	10					8	0.8	33.247	28.628	8	4.619	0.577375				
	130	2	5164453	10					9	0.9	34.566	30.645	9	3.921	0.435667				
	131	3	5164453	10					8	0.8	32.322	28.029	8	4.293	0.536625				
	132	4	5164453	10					10	1	32.882	27.818	10	5.064	0.5064				
	133	5	5164453	10					9	0.9	31.151	27.6	9	3.551	0.394556				
	134	6	5164453	10					10	1	31.055	25.566	10	5.489	0.5489				
	135	7	5164453	10					10	1	33.142	28.884	10	4.258	0.4258				
	136	8	5164453	10					9	0.9	31.383	27.192	9	4.191	0.465667				
	137	1	5164454	10					9	0.9	30.997	27.812	9	3.185	0.353889				
	138	2	5164454	10					10	1	29.983	26.886	10	3.097	0.3097				
	139	3	5164454	10					10	1	30.697	27.867	10	2.83	0.283				
	140	4	5164454	10					10	1	32.609	28.104	10	4.505	0.4505				
	141	5	5164454	10					10	1	32.678	28.838	10	3.84	0.384				
	142	6	5164454	10					9	0.9	32.048	29.292	9	2.756	0.306222				
	143	7	5164454	10					10	1	29.723	27.653	10	2.07	0.207				
	144	8	5164454	10					10	1	31.921	28.161	10	3.76	0.376				
	145	1	5164455	10					9	0.9	32.366	29.39	9	2.976	0.330667				
	146	2	5164455	10					9	0.9	32.624	29.7	9	2.924	0.324889				
	147	3	5164455	10					9	0.9	31.277	28.64	9	2.637	0.293				
	148	4	5164455	10					10	1	32.096	28.546	10	3.55	0.355				
	149	5	5164455	10					9	0.9	31.579	28.832	9	2.747	0.305222				
	150	6	5164455	10					10	1	30.655	28.074	10	2.581	0.2581				
	151	7	5164455	10					10	1	34.039	30.088	10	3.951	0.3951				
	152	8	5164455	10					10	1	31.965	29.006	10	2.959	0.2959				
	153	1	5164456	10					8	0.8	32.065	29.68	8	2.385	0.298125				
	154	2	5164456	10					10	1	31.505	28.633	10	2.872	0.2872				
	155	3	5164456	10					6	0.6	29.759	27.861	6	1.898	0.316333				
	156	4	5164456	10					10	1	32.671	29.477	10	3.194	0.3194				
	157	5	5164456	10					9	0.9	31.482	29.725	9	1.757	0.195222				
	158	6	5164456	10					10	1	31.033	28.682	10	2.351	0.2351				
	159	7	5164456	10					10	1	30.708	26.496	10	4.212	0.4212				
	160	8	5164456	10					9	0.9	30.322	29.075	9	1.247	0.138556				
	161	1	5164457	10					10	1	33.58	30.161	10	3.419	0.3419				
	162	2	5164457	10					10	1	32.609	29.61	10	2.999	0.2999				

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Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	163	3	5164457	10					8	0.8	32.304	29.122	8	3.182	0.39775			
	164	4	5164457	10					10	1	33.151	30.022	10	3.129	0.3129			
	165	5	5164457	10					10	1	32.069	28.265	10	3.804	0.3804			
	166	6	5164457	10					9	0.9	32.636	29.604	9	3.032	0.336889			
	167	7	5164457	10					10	1	31.405	28.11	10	3.295	0.3295			
	168	8	5164457	10					7	0.7	30.908	28.252	7	2.656	0.379429			
	169	1	5164459	10					6	0.6	32.15	28.78	6	3.37	0.561667			
	170	2	5164459	10					8	0.8	30.96	26.832	8	4.128	0.516			
	171	3	5164459	10					9	0.9	32.931	28.854	9	4.077	0.453			
	172	4	5164459	10					9	0.9	31.743	27.931	9	3.812	0.423556			
	173	5	5164459	10					7	0.7	32.757	29.813	7	2.944	0.420571			
	174	6	5164459	10					9	0.9	32.457	28.965	9	3.492	0.388			
	175	7	5164459	10					9	0.9	32.066	28.302	9	3.764	0.418222			
	176	8	5164459	10					7	0.7	32.356	28.876	7	3.48	0.497143			

Comments:

Freshwater Sediment-Average ind. biomass

Start Date:	4/28/05 10:50	Test ID: 727-1b	Sample ID:
End Date:	5/26/05 12:10	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.4090	0.4226	0.4317	0.4825	0.3806	0.3669	0.3865	0.3788
Ref05164489	0.4342	0.3954	0.3923	0.4597	0.4102	0.4056	0.3969	0.4130
5164460	0.4651	0.4242	0.4488	0.4706	0.6082	0.5415	0.4396	0.7207
5164461	0.3506	0.3987	0.2697	0.4458	0.4050	0.3832	0.3656	0.3464
5164468	0.1461	0.1814	0.2369	0.1895	0.2057	0.1544	0.1590	0.1500
5164469	0.4263	0.5413	0.4709	0.5504	0.4108	0.4033	0.3854	0.5001
5164471	0.6008	0.6013	0.6836	0.6415	0.6815	0.6423	0.4638	0.8246

			Transform: Untransformed						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.4073	0.9853	0.4073	0.3669	0.4825	9.315	8			
Ref05164489	0.4134	1.0000	0.4134	0.3923	0.4597	5.551	8			
5164460	0.5148	1.2453	0.5148	0.4242	0.7207	20.035	8			
5164461	0.3706	0.8965	0.3706	0.2697	0.4458	14.049	8	2.127	2.624	0.0528
*5164468	0.1779	0.4302	0.1779	0.1461	0.2369	17.899	8	16.976	2.624	0.0364
5164469	0.4611	1.1153	0.4611	0.3854	0.5504	13.918	8			
5164471	0.6424	1.5539	0.6424	0.4638	0.8246	15.759	8			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.94017	0.884	-0.3238	1.89992
Bartlett's Test indicates unequal variances (p = 2.10E-03)	12.3356	9.21035		
The control means are not significantly different (p = 0.70)	0.38838	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.03642	0.08809	0.12596	0.00142	5.6E-11	2, 21

Freshwater Sediment 28-day survival

Start Date:	4/28/05 10:50	Test ID: 727-1b	Sample ID:
End Date:	5/26/05 12:10	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.9000	1.0000	1.0000	0.8000	1.0000	1.0000	1.0000	1.0000
Ref05164489	0.9000	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	1.0000
5164460	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
5164461	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
5164468	0.8000	0.8000	0.9000	1.0000	0.9000	1.0000	0.9000	0.6000
5164469	0.9000	0.9000	1.0000	0.8000	0.9000	0.9000	1.0000	0.9000
5164471	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	1.0000	0.8000

			Transform: Arcsin Square Root						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.9625	1.0000	1.3535	1.1071	1.4120	8.476	8			
Ref05164489	0.9625	1.0000	1.3509	1.2490	1.4120	6.244	8			
5164460	0.9750	1.0130	1.3713	1.2490	1.4120	5.501	8			
5164461	0.9875	1.0260	1.3916	1.2490	1.4120	4.140	8			
5164468	0.8625	0.8961	1.2089	0.8861	1.4120	14.404	8	2.075	2.624	0.1795
5164469	0.9125	0.9481	1.2721	1.1071	1.4120	7.806	8			
5164471	0.9500	0.9870	1.3332	1.1071	1.4120	8.799	8			

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.87958		0.844		-0.688	1.14913
F-Test indicates equal variances (p = 0.07)	4.26253		8.88531			
The control means are not significantly different (p = 0.96)	0.05232		2.14479			
Hypothesis Test (1-tail, 0.01)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates no significant differences	0.10366	0.10884	0.08061	0.01872	0.05688	1, 14

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1b
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

Pos	ID	Rep	Group	Day 0	Day 10	psurv Day 10	Day 20	psurv Day 20	Day 28	psurv day 28	Dry Wt (mg)	Tare Wt (mg)	Wt. count	TWT	WT	Ashed dry wt	TAFDW	AFDW
	1	1	D-Control	10					9	0.9	31.569	27.888	9	3.681	0.409			
	2	2	D-Control	10					10	1	32.3	28.074	10	4.226	0.4226			
	3	3	D-Control	10					10	1	34.085	29.768	10	4.317	0.4317			
	4	4	D-Control	10					8	0.8	34.154	30.294	8	3.86	0.4825			
	5	5	D-Control	10					10	1	33.196	29.39	10	3.806	0.3806			
	6	6	D-Control	10					10	1	32.921	29.252	10	3.669	0.3669			
	7	7	D-Control	10					10	1	32.515	28.65	10	3.865	0.3865			
	8	8	D-Control	10					10	1	31.417	27.629	10	3.788	0.3788			
	9	1	Ref05164489	10					9	0.9	34.493	30.585	9	3.908	0.434222			
	10	2	Ref05164489	10					10	1	31.242	27.288	10	3.954	0.3954			
	11	3	Ref05164489	10					10	1	33.14	29.217	10	3.923	0.3923			
	12	4	Ref05164489	10					9	0.9	33.685	29.548	9	4.137	0.459667			
	13	5	Ref05164489	10					9	0.9	31.892	28.2	9	3.692	0.410222			
	14	6	Ref05164489	10					10	1	33.734	29.678	10	4.056	0.4056			
	15	7	Ref05164489	10					10	1	31.24	27.271	10	3.969	0.3969			
	16	8	Ref05164489	10					10	1	33.039	28.909	10	4.13	0.413			
	17	1	5164460	10					10	1	34.83	30.179	10	4.651	0.4651			
	18	2	5164460	10					9	0.9	33.339	29.521	9	3.818	0.424222			
	19	3	5164460	10					10	1	33.194	28.706	10	4.488	0.4488			
	20	4	5164460	10					10	1	33.448	28.742	10	4.706	0.4706			
	21	5	5164460	10					9	0.9	34.357	28.883	9	5.474	0.608222			
	22	6	5164460	10					10	1	35.364	29.949	10	5.415	0.5415			
	23	7	5164460	10					10	1	32.77	28.374	10	4.396	0.4396			
	24	8	5164460	10					10	1	36.19	28.983	10	7.207	0.7207			
	25	1	5164461	10					10	1	34.781	31.275	10	3.506	0.3506			
	26	2	5164461	10					10	1	32.829	28.842	10	3.987	0.3987			
	27	3	5164461	10					10	1	31.398	28.701	10	2.697	0.2697			
	28	4	5164461	10					10	1	32.163	27.705	10	4.458	0.4458			
	29	5	5164461	10					9	0.9	32.063	28.418	9	3.645	0.405			
	30	6	5164461	10					10	1	32.77	28.938	10	3.832	0.3832			
	31	7	5164461	10					10	1	31.926	28.27	10	3.656	0.3656			
	32	8	5164461	10					10	1	31.15	27.686	10	3.464	0.3464			
	33	1	5164468	10					8	0.8	30.182	29.013	8	1.169	0.146125			
	34	2	5164468	10					8	0.8	29.403	27.952	8	1.451	0.181375			
	35	3	5164468	10					9	0.9	30.513	28.381	9	2.132	0.236889			
	36	4	5164468	10					10	1	28.447	26.552	10	1.895	0.1895			
	37	5	5164468	10					9	0.9	31.068	29.217	9	1.851	0.205667			
	38	6	5164468	10					10	1	30.655	29.111	10	1.544	0.1544			
	39	7	5164468	10					9	0.9	28.882	27.451	9	1.431	0.159			

data entry verified against EXCEL spreadsheet MLR 11-10-05

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1b
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	40	8	5164468	10					6	0.6	30.419	29.519	6	0.9	0.15			
	41	1	5164469	10					9	0.9	31.785	27.948	9	3.837	0.426333			
	42	2	5164469	10					9	0.9	32.998	28.126	9	4.872	0.541333			
	43	3	5164469	10					10	1	33.513	28.804	10	4.709	0.4709			
	44	4	5164469	10					8	0.8	31.521	27.118	8	4.403	0.550375			
	45	5	5164469	10					9	0.9	32.39	28.693	9	3.697	0.410778			
	46	6	5164469	10					9	0.9	31.656	28.026	9	3.63	0.403333			
	47	7	5164469	10					10	1	31.647	28.178	9	3.469	0.385444			
	48	8	5164469	10					9	0.9	33.996	29.995	8	4.001	0.500125			
	49	1	5164471	10					10	1	32.481	26.473	10	6.008	0.6008			
	50	2	5164471	10					10	1	33.432	27.419	10	6.013	0.6013			
	51	3	5164471	10					9	0.9	34.562	28.41	9	6.152	0.683556			
	52	4	5164471	10					9	0.9	33.081	27.949	8	5.132	0.6415			
	53	5	5164471	10					10	1	35.329	28.514	10	6.815	0.6815			
	54	6	5164471	10					10	1	36.323	29.9	10	6.423	0.6423			
	55	7	5164471	10					10	1	35.533	30.895	10	4.638	0.4638			
	56	8	5164471	10					8	0.8	36.225	29.628	8	6.597	0.824625			

Comments:

Freshwater Sediment-Average ind. biomass

Start Date:	4/28/05 10:50	Test ID: 727-1	Sample ID:
End Date:	5/26/05 12:10	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.4090	0.4226	0.4317	0.4825	0.3806	0.3669	0.3865	0.3788
Ref05164496	0.5000	0.4654	0.4588	0.5756	0.6793	0.5182	0.5286	0.5149
5164433	0.2852	0.4499	0.4377	0.4443	0.3273	0.3909	0.3221	0.4030
5164434	0.2719	0.3395	0.3097	0.3201	0.2327	0.3022	0.2252	0.2825
5164435	0.3554	0.3644	0.3375	0.3987	0.3802	0.3234	0.2587	0.3749
5164436	0.1414	0.1306	0.2584	0.1799	0.1480	0.1000	0.1351	0.2316
5164437	0.4558	0.4401	0.2779	0.3472	0.5437	0.3760	0.4304	0.4219
5164440	0.2823	0.2357	0.2928	0.2718	0.2264	0.3871	0.2425	0.2051
5164441	0.3427	0.3943	0.3471	0.2777	0.4400	0.3079	0.4651	0.3692
5164442	0.2787	0.2673	0.3361	0.3470	0.2926	0.2622	0.3955	0.3131
5164443	0.3561	0.3810	0.2349	0.3218	0.4477	0.3051	0.3185	0.2016
5164449	0.3407	0.4070	0.3218	0.3117	0.3457	0.2585	0.2947	0.3976
5164439	0.3783	0.8340	0.4822	0.5644	0.6776	0.5326	0.7167	0.5463
5164450	0.3367	0.4237	0.3820	0.2422	0.3073	0.3494	0.3260	0.3469
5164451	0.3044	0.1831	0.4394	0.4067	0.2187	0.3575	0.3517	0.3469
5164452	0.1943	0.3274	0.2059	0.2907	0.2767	0.2608	0.2269	0.3994
5164453	0.5774	0.4357	0.5366	0.5064	0.3946	0.5489	0.4258	0.4657
5164454	0.3539	0.3097	0.2830	0.4505	0.3840	0.3062	0.2070	0.3760
5164455	0.3307	0.3249	0.2930	0.3550	0.3052	0.2581	0.3951	0.2959
5164456	0.2981	0.2872	0.3163	0.3194	0.1952	0.2351	0.4212	0.1386
5164457	0.3419	0.2999	0.3978	0.3129	0.3804	0.3369	0.3295	0.3794
5164459	0.5617	0.5160	0.4530	0.4236	0.4206	0.3880	0.4182	0.4971

			Transform: Untransformed						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.4073	0.7684	0.4073	0.3669	0.4825	9.315	8			
Ref05164496	0.5301	1.0000	0.5301	0.4588	0.6793	13.317	8			
*5164433	0.3825	0.7217	0.3825	0.2852	0.4499	16.550	8	4.401	2.624	0.0880
*5164434	0.2855	0.5385	0.2855	0.2252	0.3395	14.259	8	8.491	2.624	0.0756
*5164435	0.3492	0.6587	0.3492	0.2587	0.3987	12.503	8	6.166	2.624	0.0770
*5164436	0.1656	0.3124	0.1656	0.1000	0.2584	32.693	8	11.587	2.624	0.0826
*5164437	0.4116	0.7765	0.4116	0.2779	0.5437	19.251	8	3.158	2.624	0.0985
*5164440	0.2680	0.5055	0.2680	0.2051	0.3871	21.114	8	8.195	2.624	0.0839
*5164441	0.3680	0.6942	0.3680	0.2777	0.4651	17.235	8	4.831	2.624	0.0881
*5164442	0.3116	0.5878	0.3116	0.2622	0.3955	14.729	8	7.341	2.624	0.0781
*5164443	0.3208	0.6052	0.3208	0.2016	0.4477	24.381	8	5.617	2.624	0.0978
*5164449	0.3347	0.6314	0.3347	0.2585	0.4070	14.913	8	6.393	2.624	0.0802
5164439	0.5915	1.1159	0.5915	0.3783	0.8340	24.376	8			
*5164450	0.3393	0.6400	0.3393	0.2422	0.4237	15.649	8	6.110	2.624	0.0820
*5164451	0.3260	0.6151	0.3260	0.1831	0.4394	26.900	8	5.126	2.624	0.1045
*5164452	0.2728	0.5145	0.2728	0.1943	0.3994	24.879	8	7.433	2.624	0.0909
5164453	0.4864	0.9175	0.4864	0.3946	0.5774	13.508	8			
*5164454	0.3338	0.6297	0.3338	0.2070	0.4505	22.167	8	5.429	2.624	0.0949
*5164455	0.3197	0.6032	0.3197	0.2581	0.3951	13.143	8	7.242	2.624	0.0762
*5164456	0.2764	0.5214	0.2764	0.1386	0.4212	31.272	8	6.430	2.624	0.1036
*5164457	0.3473	0.6552	0.3473	0.2999	0.3978	10.067	8	6.562	2.624	0.0731
5164459	0.4598	0.8673	0.4598	0.3880	0.5617	12.923	8	2.156	2.624	0.0856

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.44765	1.035	0.115	0.09152
Bartlett's Test indicates equal variances (p = 0.08)	26.9638	34.8052		
The control means are significantly different (p = 6.88E-04)	4.33287	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.08562	0.16151	0.04762	0.00391	2.9E-20	18, 133

Freshwater Sediment 28-day survival

Start Date:	4/28/05 10:50	Test ID: 727-1	Sample ID:
End Date:	5/26/05 12:10	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.9000	1.0000	1.0000	0.8000	1.0000	1.0000	1.0000	1.0000
Ref05164496	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000
5164433	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	0.9000	1.0000
5164434	1.0000	0.8000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
5164435	0.9000	0.9000	0.8000	0.9000	1.0000	0.7000	0.6000	0.9000
5164436	0.8000	0.8000	0.7000	0.7000	0.7000	0.6000	0.8000	0.9000
5164437	0.9000	1.0000	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000
5164440	0.9000	1.0000	1.0000	1.0000	1.0000	0.7000	1.0000	0.9000
5164441	0.9000	0.9000	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000
5164442	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000	0.8000	0.9000
5164443	0.9000	0.8000	0.8000	0.9000	0.7000	0.7000	0.8000	0.9000
5164449	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000
5164439	1.0000	1.0000	1.0000	1.0000	0.8000	0.8000	0.9000	1.0000
5164450	0.9000	0.9000	0.8000	0.9000	1.0000	1.0000	0.9000	1.0000
5164451	1.0000	0.8000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000
5164452	0.9000	0.9000	0.7000	1.0000	1.0000	0.8000	1.0000	0.8000
5164453	0.8000	0.9000	0.8000	1.0000	0.9000	1.0000	1.0000	0.9000
5164454	0.9000	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000
5164455	0.9000	0.9000	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000
5164456	0.8000	1.0000	0.6000	1.0000	0.9000	1.0000	1.0000	0.9000
5164457	1.0000	1.0000	0.8000	1.0000	1.0000	0.9000	1.0000	0.7000
5164459	0.6000	0.8000	0.9000	0.9000	0.7000	0.9000	0.9000	0.7000

			Transform: Arcsin Square Root					1-Tailed		
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.9625	0.9747	1.3535	1.1071	1.4120	8.476	8			
Ref05164496	0.9875	1.0000	1.3916	1.2490	1.4120	4.140	8			
5164433	0.9625	0.9747	1.3509	1.2490	1.4120	6.244	8			
5164434	0.9625	0.9747	1.3535	1.1071	1.4120	8.476	8			
*5164435	0.8375	0.8481	1.1741	0.8861	1.4120	14.396	8	3.446	2.624	0.1657
*5164436	0.7500	0.7595	1.0538	0.8861	1.2490	10.553	8	7.631	2.624	0.1162
5164437	0.9500	0.9620	1.3305	1.2490	1.4120	6.547	8			
5164440	0.9375	0.9494	1.3187	0.9912	1.4120	11.484	8			
5164441	0.9375	0.9494	1.3102	1.2490	1.4120	6.438	8	2.256	2.624	0.0948
5164442	0.9500	0.9620	1.3332	1.1071	1.4120	8.799	8			
*5164443	0.8125	0.8228	1.1314	0.9912	1.2490	9.603	8	5.986	2.624	0.1141
5164449	0.9500	0.9620	1.3305	1.2490	1.4120	6.547	8			
5164439	0.9375	0.9494	1.3154	1.1071	1.4120	10.667	8			
5164450	0.9250	0.9367	1.2924	1.1071	1.4120	8.514	8	2.259	2.624	0.1153
5164451	0.9625	0.9747	1.3535	1.1071	1.4120	8.476	8			
5164452	0.8875	0.8987	1.2424	0.9912	1.4120	13.124	8	2.440	2.624	0.1605
5164453	0.9125	0.9241	1.2747	1.1071	1.4120	10.042	8	2.357	2.624	0.1302
5164454	0.9750	0.9873	1.3713	1.2490	1.4120	5.501	8			
5164455	0.9500	0.9620	1.3305	1.2490	1.4120	6.547	8			
5164456	0.9000	0.9114	1.2674	0.8861	1.4120	15.071	8			
5164457	0.9250	0.9367	1.3009	0.9912	1.4120	12.925	8			
*5164459	0.8000	0.8101	1.1215	0.8861	1.2490	13.255	8	4.793	2.624	0.1479

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.84376	1.035	-0.2917	-0.5601
Bartlett's Test indicates equal variances (p = 0.20)	10.9821	20.0902		
The control means are not significantly different (p = 0.42)	0.83954	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.07147	0.07381	0.09363	0.01559	1.0E-05	8, 63

Freshwater Sediment 28-day survival

Start Date:	4/28/05 10:50	Test ID: 727-1	Sample ID:
End Date:	5/26/05 12:10	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.9000	1.0000	1.0000	0.8000	1.0000	1.0000	1.0000	1.0000
Ref05164496	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000
5164433	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	0.9000	1.0000
5164434	1.0000	0.8000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
5164435	0.9000	0.9000	0.8000	0.9000	1.0000	0.7000	0.6000	0.9000
5164436	0.8000	0.8000	0.7000	0.7000	0.7000	0.6000	0.8000	0.9000
5164437	0.9000	1.0000	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000
5164440	0.9000	1.0000	1.0000	1.0000	1.0000	0.7000	1.0000	0.9000
5164441	0.9000	0.9000	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000
5164442	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000	0.8000	0.9000
5164443	0.9000	0.8000	0.8000	0.9000	0.7000	0.7000	0.8000	0.9000
5164449	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000
5164439	1.0000	1.0000	1.0000	1.0000	0.8000	0.8000	0.9000	1.0000
5164450	0.9000	0.9000	0.8000	0.9000	1.0000	1.0000	0.9000	1.0000
5164451	1.0000	0.8000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000
5164452	0.9000	0.9000	0.7000	1.0000	1.0000	0.8000	1.0000	0.8000
5164453	0.8000	0.9000	0.8000	1.0000	0.9000	1.0000	1.0000	0.9000
5164454	0.9000	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000
5164455	0.9000	0.9000	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000
5164456	0.8000	1.0000	0.6000	1.0000	0.9000	1.0000	1.0000	0.9000
5164457	1.0000	1.0000	0.8000	1.0000	1.0000	0.9000	1.0000	0.7000
5164459	0.6000	0.8000	0.9000	0.9000	0.7000	0.9000	0.9000	0.7000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	0.9625	0.9747	1.3535	1.1071	1.4120	8.476	8		
Ref05164496	0.9875	1.0000	1.3916	1.2490	1.4120	4.140	8		
5164433	0.9625	0.9747	1.3509	1.2490	1.4120	6.244	8		
5164434	0.9625	0.9747	1.3535	1.1071	1.4120	8.476	8		
5164435	0.8375	0.8481	1.1741	0.8861	1.4120	14.396	8		
5164436	0.7500	0.7595	1.0538	0.8861	1.2490	10.553	8		
5164437	0.9500	0.9620	1.3305	1.2490	1.4120	6.547	8		
5164440	0.9375	0.9494	1.3187	0.9912	1.4120	11.484	8		
5164441	0.9375	0.9494	1.3102	1.2490	1.4120	6.438	8		
5164442	0.9500	0.9620	1.3332	1.1071	1.4120	8.799	8		
5164443	0.8125	0.8228	1.1314	0.9912	1.2490	9.603	8		
5164449	0.9500	0.9620	1.3305	1.2490	1.4120	6.547	8		
5164439	0.9375	0.9494	1.3154	1.1071	1.4120	10.667	8		
5164450	0.9250	0.9367	1.2924	1.1071	1.4120	8.514	8		
5164451	0.9625	0.9747	1.3535	1.1071	1.4120	8.476	8		
5164452	0.8875	0.8987	1.2424	0.9912	1.4120	13.124	8		
5164453	0.9125	0.9241	1.2747	1.1071	1.4120	10.042	8		
5164454	0.9750	0.9873	1.3713	1.2490	1.4120	5.501	8		
5164455	0.9500	0.9620	1.3305	1.2490	1.4120	6.547	8		
5164456	0.9000	0.9114	1.2674	0.8861	1.4120	15.071	8	55.00	45.00
5164457	0.9250	0.9367	1.3009	0.9912	1.4120	12.925	8		
5164459	0.8000	0.8101	1.1215	0.8861	1.2490	13.255	8		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.8125	0.844	-1.5146	3.21187
F-Test indicates unequal variances (p = 5.28E-03)	10.9907	8.88531		
The control means are not significantly different (p = 0.42)	0.83954	2.14479		

Hypothesis Test (1-tail, 0.01)

Wilcoxon Two-Sample Test indicates no significant differences

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

Pos	ID	Rep	Group	Day 0	Day 10	psurv Day 10	Day 20	psurv Day 20	Day 28	psurv day 28	Dry Wt (mg)	Tare Wt (mg)	Wt. count	TWT	WT	Ashed dry wt	TAFDW	AFDW
	1	1	D-Control	10					9	0.9	31.569	27.888	9	3.681	0.409			
	2	2	D-Control	10					10	1	32.3	28.074	10	4.226	0.4226			
	3	3	D-Control	10					10	1	34.085	29.768	10	4.317	0.4317			
	4	4	D-Control	10					8	0.8	34.154	30.294	8	3.86	0.4825			
	5	5	D-Control	10					10	1	33.196	29.39	10	3.806	0.3806			
	6	6	D-Control	10					10	1	32.921	29.252	10	3.669	0.3669			
	7	7	D-Control	10					10	1	32.515	28.65	10	3.865	0.3865			
	8	8	D-Control	10					10	1	31.417	27.629	10	3.788	0.3788			
	9	1	Ref05164496	10					10	1	33.702	28.702	10	5	0.5			
	10	2	Ref05164496	10					10	1	33.719	29.065	10	4.654	0.4654	data entry		
	11	3	Ref05164496	10					10	1	35.973	31.385	10	4.588	0.4588	verified		
	12	4	Ref05164496	10					10	1	34.733	28.977	10	5.756	0.5756	against		
	13	5	Ref05164496	10					10	1	33.703	26.91	10	6.793	0.6793	EXCEL		
	14	6	Ref05164496	10					10	1	33.167	27.985	10	5.182	0.5182	spreadsheet		
	15	7	Ref05164496	10					9	0.9	34.365	29.608	9	4.757	0.528556		MSB	
	16	8	Ref05164496	10					10	1	33.393	28.244	10	5.149	0.5149		11-10-05	
	17	1	5164433.000	10					10	1	32.492	29.64	10	2.852	0.2852			
	18	2	5164433.000	10					10	1	31.732	27.233	10	4.499	0.4499			
	19	3	5164433.000	10					9	0.9	31.415	27.476	9	3.939	0.437667			
	20	4	5164433.000	10					10	1	34.726	30.283	10	4.443	0.4443			
	21	5	5164433.000	10					10	1	33.666	30.393	10	3.273	0.3273			
	22	6	5164433.000	10					9	0.9	32.134	28.616	9	3.518	0.390889			
	23	7	5164433.000	10					9	0.9	31.005	28.106	9	2.899	0.322111			
	24	8	5164433.000	10					10	1	32.783	28.753	10	4.03	0.403			
	25	1	5164434.000	10					10	1	33.27	30.551	10	2.719	0.2719			
	26	2	5164434.000	10					8	0.8	31.995	29.279	8	2.716	0.3395			
	27	3	5164434.000	10					10	1	32.215	29.118	10	3.097	0.3097			
	28	4	5164434.000	10					10	1	32.446	29.245	10	3.201	0.3201			
	29	5	5164434.000	10					9	0.9	30.449	28.355	9	2.094	0.232667			
	30	6	5164434.000	10					10	1	30.724	27.702	10	3.022	0.3022			
	31	7	5164434.000	10					10	1	29.667	27.415	10	2.252	0.2252			
	32	8	5164434.000	10					10	1	31.959	29.134	10	2.825	0.2825			
	33	1	5164435.000	10					9	0.9	33.694	30.495	9	3.199	0.355444			
	34	2	5164435.000	10					9	0.9	30.293	27.013	9	3.28	0.364444			
	35	3	5164435.000	10					8	0.8	29.804	27.104	8	2.7	0.3375			
	36	4	5164435.000	10					9	0.9	32.364	29.573	7	2.791	0.398714			
	37	5	5164435.000	10					10	1	32.558	28.756	10	3.802	0.3802			
	38	6	5164435.000	10					7	0.7	31.766	29.502	7	2.264	0.323429			
	39	7	5164435.000	10					6	0.6	31.295	29.743	6	1.552	0.258667			

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	40	8	5164435.000	10					9	0.9	30.963	27.589	9	3.374	0.374889			
	41	1	5164436.000	10					8	0.8	29.172	28.041	8	1.131	0.141375			
	42	2	5164436.000	10					8	0.8	28.61	27.565	8	1.045	0.130625			
	43	3	5164436.000	10					7	0.7	28.957	27.148	7	1.809	0.258429			
	44	4	5164436.000	10					7	0.7	34.2	32.941	7	1.259	0.179857			
	45	5	5164436.000	10					7	0.7	31.068	30.032	7	1.036	0.148			
	46	6	5164436.000	10					6	0.6	28.011	27.411	6	0.6	0.1			
	47	7	5164436.000	10					8	0.8	29.069	27.988	8	1.081	0.135125			
	48	8	5164436.000	10					9	0.9	30.125	28.041	9	2.084	0.231556			
	49	1	5164437.000	10					9	0.9	34.376	30.274	9	4.102	0.455778			
	50	2	5164437.000	10					10	1	32.851	28.45	10	4.401	0.4401			
	51	3	5164437.000	10					9	0.9	30.723	28.222	9	2.501	0.277889			
	52	4	5164437.000	10					9	0.9	30.096	26.971	9	3.125	0.347222			
	53	5	5164437.000	10					9	0.9	33.955	29.062	9	4.893	0.543667			
	54	6	5164437.000	10					10	1	33.006	29.246	10	3.76	0.376			
	55	7	5164437.000	10					10	1	31.743	27.439	10	4.304	0.4304			
	56	8	5164437.000	10					10	1	33.622	29.403	10	4.219	0.4219			
	57	1	5164440.000	10					9	0.9	30.932	28.391	9	2.541	0.282333			
	58	2	5164440.000	10					10	1	29.385	27.028	10	2.357	0.2357			
	59	3	5164440.000	10					10	1	33.315	30.387	10	2.928	0.2928			
	60	4	5164440.000	10					10	1	34.224	31.506	10	2.718	0.2718			
	61	5	5164440.000	10					10	1	29.074	26.81	10	2.264	0.2264			
	62	6	5164440.000	10					7	0.7	31.885	29.175	7	2.71	0.387143			
	63	7	5164440.000	10					10	1	31.22	28.795	10	2.425	0.2425			
	64	8	5164440.000	10					9	0.9	29.998	28.152	9	1.846	0.205111			
	65	1	5164441.000	10					9	0.9	31.334	28.25	9	3.084	0.342667			
	66	2	5164441.000	10					9	0.9	32.279	28.73	9	3.549	0.394333			
	67	3	5164441.000	10					9	0.9	31.806	28.682	9	3.124	0.347111			
	68	4	5164441.000	10					9	0.9	31.888	29.389	9	2.499	0.277667			
	69	5	5164441.000	10					9	0.9	32.719	28.759	9	3.96	0.44			
	70	6	5164441.000	10					10	1	31.775	28.696	10	3.079	0.3079			
	71	7	5164441.000	10					10	1	32.677	28.026	10	4.651	0.4651			
	72	8	5164441.000	10					10	1	32.186	28.494	10	3.692	0.3692			
	73	1	5164442.000	10					10	1	30.158	27.371	10	2.787	0.2787			
	74	2	5164442.000	10					10	1	31.467	28.794	10	2.673	0.2673			
	75	3	5164442.000	10					9	0.9	31.251	28.226	9	3.025	0.336111			
	76	4	5164442.000	10					10	1	32.015	28.545	10	3.47	0.347			
	77	5	5164442.000	10					10	1	32.586	29.66	10	2.926	0.2926			
	78	6	5164442.000	10					10	1	30.621	27.999	10	2.622	0.2622			
	79	7	5164442.000	10					8	0.8	32.295	29.131	8	3.164	0.3955			
	80	8	5164442.000	10					9	0.9	30.543	27.725	9	2.818	0.313111			

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	81	1	5164443.000	10					9	0.9	32.376	29.171	9	3.205	0.356111				
	82	2	5164443.000	10					8	0.8	30.856	27.808	8	3.048	0.381				
	83	3	5164443.000	10					8	0.8	31.844	29.965	8	1.879	0.234875				
	84	4	5164443.000	10					9	0.9	30.17	27.274	9	2.896	0.321778				
	85	5	5164443.000	10					7	0.7	32.601	29.467	7	3.134	0.447714				
	86	6	5164443.000	10					7	0.7	31.23	29.094	7	2.136	0.305143				
	87	7	5164443.000	10					8	0.8	30.73	28.182	8	2.548	0.3185				
	88	8	5164443.000	10					9	0.9	29.467	27.653	9	1.814	0.201556				
	89	1	5164449.000	10					9	0.9	31.563	28.497	9	3.066	0.340667				
	90	2	5164449.000	10					10	1	32.636	28.566	10	4.07	0.407				
	91	3	5164449.000	10					9	0.9	32.046	29.15	9	2.896	0.321778				
	92	4	5164449.000	10					10	1	31.163	28.046	10	3.117	0.3117				
	93	5	5164449.000	10					10	1	31.444	27.987	10	3.457	0.3457				
	94	6	5164449.000	10					10	1	29.96	27.375	10	2.585	0.2585				
	95	7	5164449.000	10					9	0.9	30.476	27.824	9	2.652	0.294667				
	96	8	5164449.000	10					9	0.9	31.896	28.318	9	3.578	0.397556				
	97	1	5164439.000	10					10	1	33.249	29.466	10	3.783	0.3783				
	98	2	5164439.000	10					10	1	37.36	29.02	10	8.34	0.834				
	99	3	5164439.000	10					10	1	33.602	28.78	10	4.822	0.4822				
	100	4	5164439.000	10					10	1	33.938	28.294	10	5.644	0.5644				
	101	5	5164439.000	10					8	0.8	33.2	27.779	8	5.421	0.677625				
	102	6	5164439.000	10					8	0.8	32.555	28.294	8	4.261	0.532625				
	103	7	5164439.000	10					9	0.9	35.083	28.633	9	6.45	0.716667				
	104	8	5164439.000	10					10	1	33.624	28.161	10	5.463	0.5463				
	105	1	5164450.000	10					9	0.9	32.877	29.847	9	3.03	0.336667				
	106	2	5164450.000	10					9	0.9	33.176	29.363	9	3.813	0.423667				
	107	3	5164450.000	10					8	0.8	31.25	28.194	8	3.056	0.382				
	108	4	5164450.000	10					9	0.9	30.402	28.222	9	2.18	0.242222				
	109	5	5164450.000	10					10	1	32.348	29.275	10	3.073	0.3073				
	110	6	5164450.000	10					10	1	33.421	29.927	10	3.494	0.3494				
	111	7	5164450.000	10					9	0.9	32.359	29.425	9	2.934	0.326				
	112	8	5164450.000	10					10	1	30.285	26.816	10	3.469	0.3469				
	113	1	5164451.000	10					10	1	31.448	28.404	10	3.044	0.3044				
	114	2	5164451.000	10					8	0.8	29.185	27.72	8	1.465	0.183125				
	115	3	5164451.000	10					10	1	33.809	29.415	10	4.394	0.4394				
	116	4	5164451.000	10					9	0.9	30.879	27.219	9	3.66	0.406667				
	117	5	5164451.000	10					10	1	32.414	30.227	10	2.187	0.2187				
	118	6	5164451.000	10					10	1	32.652	29.077	10	3.575	0.3575				
	119	7	5164451.000	10					10	1	33.551	30.034	10	3.517	0.3517				
	120	8	5164451.000	10					10	1	31.999	28.53	10	3.469	0.3469				
	121	1	5164452.000	10					9	0.9	30.562	28.813	9	1.749	0.194333				

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Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	122	2	5164452.000	10					9	0.9	33.555	30.608	9	2.947	0.327444			
	123	3	5164452.000	10					7	0.7	30.938	29.497	7	1.441	0.205857			
	124	4	5164452.000	10					10	1	31.263	28.356	10	2.907	0.2907			
	125	5	5164452.000	10					10	1	29.984	27.217	10	2.767	0.2767			
	126	6	5164452.000	10					8	0.8	30.794	28.708	8	2.086	0.26075			
	127	7	5164452.000	10					10	1	30.375	28.106	10	2.269	0.2269			
	128	8	5164452.000	10					8	0.8	32.21	29.015	8	3.195	0.399375			
	129	1	5164453.000	10					8	0.8	33.247	28.628	8	4.619	0.577375			
	130	2	5164453.000	10					9	0.9	34.566	30.645	9	3.921	0.435667			
	131	3	5164453.000	10					8	0.8	32.322	28.029	8	4.293	0.536625			
	132	4	5164453.000	10					10	1	32.882	27.818	10	5.064	0.5064			
	133	5	5164453.000	10					9	0.9	31.151	27.6	9	3.551	0.394556			
	134	6	5164453.000	10					10	1	31.055	25.566	10	5.489	0.5489			
	135	7	5164453.000	10					10	1	33.142	28.884	10	4.258	0.4258			
	136	8	5164453.000	10					9	0.9	31.383	27.192	9	4.191	0.465667			
	137	1	5164454.000	10					9	0.9	30.997	27.812	9	3.185	0.353889			
	138	2	5164454.000	10					10	1	29.983	26.886	10	3.097	0.3097			
	139	3	5164454.000	10					10	1	30.697	27.867	10	2.83	0.283			
	140	4	5164454.000	10					10	1	32.609	28.104	10	4.505	0.4505			
	141	5	5164454.000	10					10	1	32.678	28.838	10	3.84	0.384			
	142	6	5164454.000	10					9	0.9	32.048	29.292	9	2.756	0.306222			
	143	7	5164454.000	10					10	1	29.723	27.653	10	2.07	0.207			
	144	8	5164454.000	10					10	1	31.921	28.161	10	3.76	0.376			
	145	1	5164455.000	10					9	0.9	32.366	29.39	9	2.976	0.330667			
	146	2	5164455.000	10					9	0.9	32.624	29.7	9	2.924	0.324889			
	147	3	5164455.000	10					9	0.9	31.277	28.64	9	2.637	0.293			
	148	4	5164455.000	10					10	1	32.096	28.546	10	3.55	0.355			
	149	5	5164455.000	10					9	0.9	31.579	28.832	9	2.747	0.305222			
	150	6	5164455.000	10					10	1	30.655	28.074	10	2.581	0.2581			
	151	7	5164455.000	10					10	1	34.039	30.088	10	3.951	0.3951			
	152	8	5164455.000	10					10	1	31.965	29.006	10	2.959	0.2959			
	153	1	5164456.000	10					8	0.8	32.065	29.68	8	2.385	0.298125			
	154	2	5164456.000	10					10	1	31.505	28.633	10	2.872	0.2872			
	155	3	5164456.000	10					6	0.6	29.759	27.861	6	1.898	0.316333			
	156	4	5164456.000	10					10	1	32.671	29.477	10	3.194	0.3194			
	157	5	5164456.000	10					9	0.9	31.482	29.725	9	1.757	0.195222			
	158	6	5164456.000	10					10	1	31.033	28.682	10	2.351	0.2351			
	159	7	5164456.000	10					10	1	30.708	26.496	10	4.212	0.4212			
	160	8	5164456.000	10					9	0.9	30.322	29.075	9	1.247	0.138556			
	161	1	5164457.000	10					10	1	33.58	30.161	10	3.419	0.3419			
	162	2	5164457.000	10					10	1	32.609	29.61	10	2.999	0.2999			

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	163	3	5164457.000	10					8	0.8	32.304	29.122	8	3.182	0.39775			
	164	4	5164457.000	10					10	1	33.151	30.022	10	3.129	0.3129			
	165	5	5164457.000	10					10	1	32.069	28.265	10	3.804	0.3804			
	166	6	5164457.000	10					9	0.9	32.636	29.604	9	3.032	0.336889			
	167	7	5164457.000	10					10	1	31.405	28.11	10	3.295	0.3295			
	168	8	5164457.000	10					7	0.7	30.908	28.252	7	2.656	0.379429			
	169	1	5164459.000	10					6	0.6	32.15	28.78	6	3.37	0.561667			
	170	2	5164459.000	10					8	0.8	30.96	26.832	8	4.128	0.516			
	171	3	5164459.000	10					9	0.9	32.931	28.854	9	4.077	0.453			
	172	4	5164459.000	10					9	0.9	31.743	27.931	9	3.812	0.423556			
	173	5	5164459.000	10					7	0.7	32.757	29.813	7	2.944	0.420571			
	174	6	5164459.000	10					9	0.9	32.457	28.965	9	3.492	0.388			
	175	7	5164459.000	10					9	0.9	32.066	28.302	9	3.764	0.418222			
	176	8	5164459.000	10					7	0.7	32.356	28.876	7	3.48	0.497143			

Comments:

Freshwater Sediment-Average ind. biomass

Start Date:	4/28/05 10:50	Test ID: 727-1b	Sample ID:
End Date:	5/26/05 12:10	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.4090	0.4226	0.4317	0.4825	0.3806	0.3669	0.3865	0.3788
Ref05164496	0.5000	0.4654	0.4588	0.5756	0.6793	0.5182	0.5286	0.5149
5164460	0.4651	0.4242	0.4488	0.4706	0.6082	0.5415	0.4396	0.7207
5164461	0.3506	0.3987	0.2697	0.4458	0.4050	0.3832	0.3656	0.3464
5164468	0.1461	0.1814	0.2369	0.1895	0.2057	0.1544	0.1590	0.1500
5164469	0.4263	0.5413	0.4709	0.5504	0.4108	0.4033	0.3854	0.5001
5164471	0.6008	0.6013	0.6836	0.6415	0.6815	0.6423	0.4638	0.8246

			Transform: Untransformed					1-Tailed		
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.4073	0.7684	0.4073	0.3669	0.4825	9.315	8			
Ref05164496	0.5301	1.0000	0.5301	0.4588	0.6793	13.317	8			
5164460	0.5148	0.9712	0.5148	0.4242	0.7207	20.035	8			
*5164461	0.3706	0.6992	0.3706	0.2697	0.4458	14.049	8	5.142	2.624	0.0814
*5164468	0.1779	0.3355	0.1779	0.1461	0.2369	17.899	8	12.865	2.624	0.0719
5164469	0.4611	0.8698	0.4611	0.3854	0.5504	13.918	8	2.046	2.624	0.0885
5164471	0.6424	1.2119	0.6424	0.4638	0.8246	15.759	8			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.97431	0.904	0.62694	0.68323
Bartlett's Test indicates equal variances (p = 0.03)	8.74431	11.3449		
The control means are significantly different (p = 6.88E-04)	4.33287	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.08852	0.16699	0.18653	0.00321	3.8E-12	3, 28

Freshwater Sediment 28-day survival

Start Date:	4/28/05 10:50	Test ID: 727-1b	Sample ID:
End Date:	5/26/05 12:10	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.9000	1.0000	1.0000	0.8000	1.0000	1.0000	1.0000	1.0000
Ref05164496	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000
5164460	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
5164461	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
5164468	0.8000	0.8000	0.9000	1.0000	0.9000	1.0000	0.9000	0.6000
5164469	0.9000	0.9000	1.0000	0.8000	0.9000	0.9000	1.0000	0.9000
5164471	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	1.0000	0.8000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	0.9625	0.9747	1.3535	1.1071	1.4120	8.476	8		
Ref05164496	0.9875	1.0000	1.3916	1.2490	1.4120	4.140	8		
5164460	0.9750	0.9873	1.3713	1.2490	1.4120	5.501	8		
5164461	0.9875	1.0000	1.3916	1.2490	1.4120	4.140	8		
5164468	0.8625	0.8734	1.2089	0.8861	1.4120	14.404	8	46.50	45.00
5164469	0.9125	0.9241	1.2721	1.1071	1.4120	7.806	8		
5164471	0.9500	0.9620	1.3332	1.1071	1.4120	8.799	8		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.8438	0.844	-0.839	2.31552
F-Test indicates unequal variances (p = 9.22E-03)	9.13399	8.88531		
The control means are not significantly different (p = 0.42)	0.83954	2.14479		

Hypothesis Test (1-tail, 0.01)

Wilcoxon Two-Sample Test indicates no significant differences

Freshwater Sediment-28-day survival

Start Date:	4/28/05 10:50	Test ID: 727-1b	Sample ID:
End Date:	5/26/05 12:10	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.9000	1.0000	1.0000	0.8000	1.0000	1.0000	1.0000	1.0000
Ref05164496	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000
5164460	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
5164461	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
5164468	0.8000	0.8000	0.9000	1.0000	0.9000	1.0000	0.9000	0.6000
5164469	0.9000	0.9000	1.0000	0.8000	0.9000	0.9000	1.0000	0.9000
5164471	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	1.0000	0.8000

			Transform: Arcsin Square Root						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.9625	0.9747	1.3535	1.1071	1.4120	8.476	8			
Ref05164496	0.9875	1.0000	1.3916	1.2490	1.4120	4.140	8			
5164460	0.9750	0.9873	1.3713	1.2490	1.4120	5.501	8			
5164461	0.9875	1.0000	1.3916	1.2490	1.4120	4.140	8			
5164468	0.8625	0.8734	1.2089	0.8861	1.4120	14.404	8			
*5164469	0.9125	0.9241	1.2721	1.1071	1.4120	7.806	8	2.946	2.624	0.1065
5164471	0.9500	0.9620	1.3332	1.1071	1.4120	8.799	8			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.84771	0.844	-0.3004	1.35615
F-Test indicates equal variances (p = 0.17)	2.96993	8.88531		
The control means are not significantly different (p = 0.42)	0.83954	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.04766	0.04923	0.05721	0.00659	0.01062	1, 14

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1b
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

Pos	ID	Rep	Group	Day 0	Day 10	psurv Day 10	Day 20	psurv Day 20	Day 28	psurv day 28	Dry Wt (mg)	Tare Wt (mg)	Wt. count	TWT	WT	Ashed dry wt	TAFDW	AFDW
	1	1	D-Control	10					9	0.9	31.569	27.888	9	3.681	0.409			
	2	2	D-Control	10					10	1	32.3	28.074	10	4.226	0.4226			
	3	3	D-Control	10					10	1	34.085	29.768	10	4.317	0.4317			
	4	4	D-Control	10					8	0.8	34.154	30.294	8	3.86	0.4825			
	5	5	D-Control	10					10	1	33.196	29.39	10	3.806	0.3806			
	6	6	D-Control	10					10	1	32.921	29.252	10	3.669	0.3669			
	7	7	D-Control	10					10	1	32.515	28.65	10	3.865	0.3865			
	8	8	D-Control	10					10	1	31.417	27.629	10	3.788	0.3788			
	9	1	Ref05164496	10					10	1	33.702	28.702	10	5	0.5			
	10	2	Ref05164496	10					10	1	33.719	29.065	10	4.654	0.4654			
	11	3	Ref05164496	10					10	1	35.973	31.385	10	4.588	0.4588			
	12	4	Ref05164496	10					10	1	34.733	28.977	10	5.756	0.5756			
	13	5	Ref05164496	10					10	1	33.703	26.91	10	6.793	0.6793			
	14	6	Ref05164496	10					10	1	33.167	27.985	10	5.182	0.5182			
	15	7	Ref05164496	10					9	0.9	34.365	29.608	9	4.757	0.528556			
	16	8	Ref05164496	10					10	1	33.393	28.244	10	5.149	0.5149			
	17	1	5164460	10					10	1	34.83	30.179	10	4.651	0.4651			
	18	2	5164460	10					9	0.9	33.339	29.521	9	3.818	0.424222			
	19	3	5164460	10					10	1	33.194	28.706	10	4.488	0.4488			
	20	4	5164460	10					10	1	33.448	28.742	10	4.706	0.4706			
	21	5	5164460	10					9	0.9	34.357	28.883	9	5.474	0.608222			
	22	6	5164460	10					10	1	35.364	29.949	10	5.415	0.5415			
	23	7	5164460	10					10	1	32.77	28.374	10	4.396	0.4396			
	24	8	5164460	10					10	1	36.19	28.983	10	7.207	0.7207			
	25	1	5164461	10					10	1	34.781	31.275	10	3.506	0.3506			
	26	2	5164461	10					10	1	32.829	28.842	10	3.987	0.3987			
	27	3	5164461	10					10	1	31.398	28.701	10	2.697	0.2697			
	28	4	5164461	10					10	1	32.163	27.705	10	4.458	0.4458			
	29	5	5164461	10					9	0.9	32.063	28.418	9	3.645	0.405			
	30	6	5164461	10					10	1	32.77	28.938	10	3.832	0.3832			
	31	7	5164461	10					10	1	31.926	28.27	10	3.656	0.3656			
	32	8	5164461	10					10	1	31.15	27.686	10	3.464	0.3464			
	33	1	5164468	10					8	0.8	30.182	29.013	8	1.169	0.146125			
	34	2	5164468	10					8	0.8	29.403	27.952	8	1.451	0.181375			
	35	3	5164468	10					9	0.9	30.513	28.381	9	2.132	0.236889			
	36	4	5164468	10					10	1	28.447	26.552	10	1.895	0.1895			
	37	5	5164468	10					9	0.9	31.068	29.217	9	1.851	0.205667			
	38	6	5164468	10					10	1	30.655	29.111	10	1.544	0.1544			
	39	7	5164468	10					9	0.9	28.882	27.451	9	1.431	0.159			

data entry verified against EXCEL spreadsheet MR 11-10-05

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Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 4/28/05 10:50 End Date: 5/26/05 12:10

Test ID: 727-1b
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	40	8	5164468	10					6	0.6	30.419	29.519	6	0.9	0.15				
	41	1	5164469	10					9	0.9	31.785	27.948	9	3.837	0.426333				
	42	2	5164469	10					9	0.9	32.998	28.126	9	4.872	0.541333				
	43	3	5164469	10					10	1	33.513	28.804	10	4.709	0.4709				
	44	4	5164469	10					8	0.8	31.521	27.118	8	4.403	0.550375				
	45	5	5164469	10					9	0.9	32.39	28.693	9	3.697	0.410778				
	46	6	5164469	10					9	0.9	31.656	28.026	9	3.63	0.403333				
	47	7	5164469	10					10	1	31.647	28.178	9	3.469	0.385444				
	48	8	5164469	10					9	0.9	33.996	29.995	8	4.001	0.500125				
	49	1	5164471	10					10	1	32.481	26.473	10	6.008	0.6008				
	50	2	5164471	10					10	1	33.432	27.419	10	6.013	0.6013				
	51	3	5164471	10					9	0.9	34.562	28.41	9	6.152	0.683556				
	52	4	5164471	10					9	0.9	33.081	27.949	8	5.132	0.6415				
	53	5	5164471	10					10	1	35.329	28.514	10	6.815	0.6815				
	54	6	5164471	10					10	1	36.323	29.9	10	6.423	0.6423				
	55	7	5164471	10					10	1	35.533	30.895	10	4.638	0.4638				
	56	8	5164471	10					8	0.8	36.225	29.628	8	6.597	0.824625				

Comments:

REPORT

of

TEST NO. 727-2

HYALELLA AZTECA 28-DAY SEDIMENT TOXICITY TEST OF FRESHWATER SEDIMENTS

Submitted to

CH2M Hill
2300 N.W. WALNUT BLVD.
CORVALLIS, OR 97330

Submitted by

NORTHWESTERN AQUATIC SCIENCES
3814 YAQUINA BAY ROAD
P.O. BOX 1437
NEWPORT, OR 97365

November 29, 2005

TOXICITY TEST REPORT

TEST IDENTIFICATION

Test No.: 727-2

Title: Toxicity of freshwater sediments collected from the upper Columbia River using a 28-day amphipod, *Hyalella azteca*, sediment bioassay.

Protocol No.: NAS-XXX-HA4c, February 11, 2000 (Revision 3 (4-26-05). Based on ASTM 1996 (Standard test methods for measuring the toxicity of sediment-associated contaminants with fresh water invertebrates, E1706-95b), Am. Soc. Test. Mat. Phila., PA, and EPA Method 100.4 (Methods for measuring the toxicity and bioaccumulation of sediment-associated contaminants with freshwater invertebrates, EPA/600/R-94/024).

STUDY MANAGEMENT

Study Sponsor: CH2M-Hill, 2300 NW Walnut Blvd., Corvallis, OR 97330.

Sponsor's Study Monitor: Mr. Dennis Shelton

Testing Laboratory: Northwestern Aquatic Sciences, P.O. Box 1437, Newport, OR 97365

Test Location: Newport laboratory

Laboratory's Study Personnel: G.J. Irissarri, B.S., Proj. Man./Study Dir.; L.K. Nemeth, M.B.A., QA Officer; R.S. Caldwell, PhD, Sr. Aq. Toxicologist; M.S. Redmond, M.S., Aq. Toxicologist; G.A. Buhler, B.S., Aq. Toxicologist; W.T. Montgomery, A.A., Sr. Tech.; S.J. Gage, B.A., Tech.; B.B. Pridgeon, Lab Assistant.

Study Schedule:

Test Beginning: 5-5-05, 1045 hrs.

Test Ending: 6-2-05, 1130 hrs.

Disposition of Study Records: All specimens, raw data, reports and other study records are stored according to Good Laboratory Practice regulations at Northwestern Aquatic Sciences, 3814 Yaquina Bay Rd., Newport, OR 97365.

Good Laboratory Practices: The test was conducted following the principles of Good Laboratory Practices (GLP) as defined in the EPA/TSCA Good Laboratory Practice regulations revised August 17, 1989 (40 CFR Part 792).

Statement of Quality Assurance: The test data were reviewed by the Quality Assurance Unit to assure that the study was performed in accordance with the protocol and standard operating procedures. This report is an accurate reflection of the raw data.

TEST MATERIAL

Test Sediments: Upper Columbia River freshwater test sediments. Details are as follows:

NAS Sample No.	9983F	9985F	9986F	9987F	9988F
CH2M-Hill No.	05164470	05164472	05164473	05164474	05164475
Collection Date	4/22/05	4/22/05	4/22/05	4/22/05	4/22/05
Receipt Date	4/26/05	4/26/05	4/26/05	4/26/05	4/26/05

NAS Sample No.	9989F	9990F	9991F	9992F	9993F
CH2M-Hill No.	05164478	05164476	05164479	05164483	05164485
Collection Date	4/22/05	4/22/05	4/22/05	4/22/05	4/22/05
Receipt Date	4/26/05	4/26/05	4/26/05	4/26/05	4/26/05

NAS Sample No.	9994F	9995F	9996F	9997F	9998F
CH2M-Hill No.	05164486	05164487	05164494	05164407	05164489
Collection Date	4/23/05	4/23/05	4/23/05	4/23/05	4/23/05
Reeeipt Date	4/26/05	4/26/05	4/26/05	4/26/05	4/26/05

NAS Sample No.	9999F	0001G	0002G	0032G	0033G
CH2M-Hill No.	05164491	05164493	05164496	05174405	05174406
Collection Date	4/23/05	4/23/05	4/23/05	4/26/05	4/26/05
Reeeipt Date	4/26/05	4/26/05	4/26/05	4/28/05	4/28/05

NAS Sample No.	0034G	0035G	0036G	0037G	0038G
CH2M-Hill No.	05174408	05174412	05174413	05174407	05174409
Collection Date	4/26/05	4/26/05	4/26/05	4/26/05	4/26/05
Receipt Date	4/28/05	4/28/05	4/28/05	4/28/05	4/28/05
NAS Sample No.	0039G	0040G	0041G	0042G	0043G
CH2M-Hill No.	05174410	05174411	05174415	05174423	05174424
Collection Date	4/26/05	4/26/05	4/26/05	4/28/05	4/28/05
Receipt Date	4/28/05	4/28/05	4/28/05	4/30/05	4/30/05
NAS Sample No.	0044G				
CH2M-Hill No.	05174427				
Collection Date	4/28/05				
Receipt Date	4/30/05				

Control Sediment: The negative control sediment (NAS#9952F) was collected on 4-22-05 from an area approximately one mile east of the Hwy. 101 bridge at Beaver Creek, approx. 8 miles south of Newport, OR.
Treatments: Homogenized at test set up by mixing using stainless steel implements.
Storage: All test and reference sediments were stored at 4°C in the dark in sealed containers until used.

TEST WATER

Source: Modified tap water (tap water hardness adjusted to 70 ± 5 mg/L at client request).
Dates of Preparation: 5/2/05, 5/5/05, 5/8/05, 5/11/05, 5/13/05, 5/16/05, 5/19/05, 5/20/05, 5/24/05, 5/26/05
Water Quality:
pH: 7.4, 7.4, 7.3, 7.3, 7.5, 7.3, 7.5, 7.4, 7.4, 7.5 (mean ± SD: 7.4 ± 0.1)
conductivity: 275, 270, 280, 280, 280, 280, 270, 270, 270, 270 µmhos/cm (mean ± SD: 275 ± 5)
hardness: 68, 68, 68, 68, 68, 68, 68, 68, 68, 68 mg/L as $CaCO_3$ (mean ± SD: 68 ± 0)
alkalinity: 60, 70, 70, 70, 60, 60, 60, 70, 60, 60 mg/L as $CaCO_3$. (mean ± SD: 64 ± 5)
Pretreatment: Aerated ≥24 hr.

TEST ORGANISMS

Species: *Hyalella azteca,* amphipod.
Age/Size: 7-8 days old
Source: Chesapeake Cultures, Hayes, VA; received 5-3-05
Acclimation: Temperature, 21.8 ± 1.6°C; dissolved oxygen, 9.3 ± 1.9 mg/L; pH, 7.6 ± 0.5; conductivity, 380 ± 36 µmhos/cm; hardness, 151 ± 28 mg/L as $CaCO_3$; and alkalinity, 170 ± 53 mg/L as $CaCO_3$. Half of the water was replaced daily with test dilution water during holding. Animals were fed YTC daily during holding.

TEST PROCEDURES AND CONDITIONS

The following is an abbreviated statement of the test procedures and a statement of the test conditions actually employed. See the test protocol (Appendix I) for a more detailed description of the test procedures used in this study.

Test Chambers: 300 ml high-form glass beakers
Test Volumes: 100 ml sediment layer; 175 ml test water.
Replicates/Treatment: 8
Organisms/Treatment: 80
Water Volume Changes: 2 water volumes per day
Aeration: None.
Feeding: Animals are fed 1.0 ml of YTC suspension per beaker daily.
Effects Criteria: 1) survival after 28 days, and 2) average individual dry weight after 28 days. Death is defined as no visible movement or response to tactile stimulation. Missing organisms were considered to be dead.
Water Quality and Other Test Conditions: The temperature, dissolved oxygen, conductivity, pH, hardness, alkalinity, and ammonia-nitrogen were measured in the overlying water of one replicate test container per treatment on days 0 and 28 of the test. Temperature was measured daily, dissolved oxygen and pH three times

per week, and conductivity weekly, in the overlying water of one replicate test container per treatment. Hardness and alkalinity were measured with titrimetric methods. Ammonia-N was measured using Hach reagents based on the salicylate (Clin. Chim. Acta 14:403, 1996) colorimetric method; samples were not distilled prior to analysis. The photoperiod was 16:8, L:D.

DATA ANALYSIS METHODS

Survival, mortality and average individual dry weight were calculated for each replicate as follows:

percent survival = 100 x (number surviving/initial number tested)
percent mortality = 100 x (number dead/initial number tested)

average individual dry weight = (final wt. - tare wt.)/number weighed,
where:
final wt. = tare wt. + dry weight of organisms recovered on day 28, in mg

Means and standard deviations for the biological endpoints described above, and for water quality data, were computed using Microsoft Excel 2000. The values for mortality and weight for each test sediment were statistically compared to each of six reference sediments. Where appropriate, an arcsine square root transformation was performed on proportional mortality data before analysis. Following determination of normality and homogeneity of variances, a one-tailed Student T-test, Mann-Whitney or Approximate T test was conducted at the 0.05 level of significance for mortality and weight data. The statistical software used was BioStat (Beta v.4.1 (EXCEL)) bioassay software developed by the U.S. Army Corps of Engineers, Seattle District.

PROTOCOL DEVIATIONS

None.

REFERENCE TOXICANT TEST

The reference toxicant test is a multi-concentration toxicity test using cadmium chloride, to evaluate the performance of the test organisms used in the sediment toxicity test. The performance is evaluated by comparing the results of this test with historical results obtained at the laboratory. A summary of the reference toxicant test result is given below. The reference toxicant test raw data are found in Appendix III.

Test No.: 999-1958
Reference Toxicant and Source: Cadmium as $CdCl_2 \bullet 2½ H_2O$, Mallinckrodt Lot #TNZ, 1.0 mg/ml stock prepared 7-13-04.
Test Date: 5-5-05.
Dilution Water Used: Moderately hard synthetic water prepared from Milli-Q® deionized water.
Result: 96-hr LC50, 4.40 µg/L. This result is within the laboratory's control chart warning limits (3.34 - 10.8 µg/L).

TEST RESULTS

Observations of water quality in the overlying water throughout the test are summarized in Table 1. A detailed tabulation of the water quality results by sample and test day can be found in Appendix II. The means and standard deviations of percent mortality and average individual biomass of *Hyalella* exposed for 28 days to sediments are summarized in Table 2. Statistical comparisons (p=0.05) of mortality and growth are presented in Tables 3 and 4, respectively. Statistical analysis (p=0.01) of mortality and growth are given in Tables 5 and 6. Detailed data organized by sample and replicate, and summary statistics for these observations, are given in Appendix II.

All water quality observations of overlying water temperature and dissolved oxygen were within the protocol specified ranges. Ammonia-N in the overlying water ranged from <0.1 to 0.9 mg/L in all day 0 and day 28 observations.

The test met the acceptability criteria specified in the test protocol with 97.5% mean control survival (≥80% required) and mean control dry weight of 0.38 mg/individual (initial average dry weight was 0.03 mg/individual, measurable growth required). The reference toxicant (positive control) result was within the laboratory's control chart limits (4.40 µ/L; control chart limits 3.34 – 10.8 µg/L).

STUDY APPROVAL

Gerald Lussier 11-28-05
Project Manager/Study Dircctor Date

Julie R. Fiore 11-29-05
Quality Assurance Unit Date

Richard J. Caldwell 11/29/05
Laboratory Director Date

Table 1. Summary of water quality conditions during tests of the amphipod, *Hyalella azteca*, exposed to upper Columbia River freshwater sediments.

Water Quality Parameter	Mean ± S.D.	Minimum	Maximum	N
Temperature (°C)	23.0 ± 0.2	22.4	23.9	928
Dissolved oxygen (mg/L)	6.5 ± 0.8	3.0	8.2	448
Conductivity (µmhos/cm)	289 ± 15	255	350	192
pH	7.0 ± 0.2	6.5	7.8	448
Hardness (mg/L as $CaCO_3$)	92 ± 15	68	137	64
Alkalinity (mg/L as $CaCO_3$)	78 ± 19	60	150	64
Total ammonia (mg/L)	---	<0.1	0.9	64

Table 2. Mortality and growth results of *Hyalella* 28-day toxicity test for Upper Columbia River freshwater sediments.

Sample description		Percent mortality (Mean ± SD)	Average Individual Dry Weight (mg) (Mean ± SD)
CH2M Hill	NAS		
Control	9952F	2.5 ± 4.6	0.38 ± 0.04
5164470	9983F	5.0 ± 5.3	0.50 ± 0.05
5164472	9985F	10.0 ± 13.1	0.19 ± 0.04
5164473	9986F	3.8 ± 5.2	0.65 ± 0.04
5164474	9987F	11.3 ± 11.3	0.34 ± 0.04
5164475	9988F	5.0 ± 7.6	0.42 ± 0.07
5164478	9989F	2.5 ± 4.6	0.52 ± 0.09
5164476	9990F	2.5 ± 4.6	0.39 ± 0.04
5164479	9991F	13.8 ± 10.6	0.23 ± 0.06
5164483	9992F	2.5 ± 4.6	0.35 ± 0.03
5164485	9993F	1.3 ± 3.5	0.41 ± 0.04
5164486	9994F	2.5 ± 4.6	0.53 ± 0.04
5164487	9995F	0.0 ± 0.0	0.33 ± 0.05
5164494	9996F	7.5 ± 7.1	0.45 ± 0.06
5164507	9997F	2.5 ± 4.6	0.41 ± 0.03
5164489	9998F	6.3 ± 14.1	0.42 ± 0.06
5164491	9999F	13.8 ± 10.6	0.34 ± 0.05
5164493	0001G	8.8 ± 11.3	0.50 ± 0.09
5164496	0002G	5.0 ± 7.6	0.47 ± 0.06
5174405	0032G	7.5 ± 17.5	0.34 ± 0.06
5174406	0033G	3.8 ± 5.2	0.45 ± 0.05
5174408	0034G	3.8 ± 7.4	0.30 ± 0.06
5174412	0035G	5.0 ± 7.6	0.35 ± 0.06
5174413	0036G	3.8 ± 7.4	0.40 ± 0.07
5174407	0037G	8.8 ± 8.3	0.37 ± 0.05
5174409	0038G	7.5 ± 8.9	0.49 ± 0.07
5174410	0039G	6.3 ± 7.4	0.42 ± 0.07
5174411	0040G	3.8 ± 7.4	0.48 ± 0.07
5174415	0041G	16.3 ± 25.6	0.52 ± 0.05
5174423	0042G	3.8 ± 7.4	0.32 ± 0.05
5174424	0043G	6.3 ± 7.4	0.33 ± 0.05
5174427	0044G	5.0 ± 10.7	0.52 ± 0.09

Table 3. Comparison of mortality data for sediments compared to each reference sediment. A "+" indicates that the test sediment result is significantly greater than the reference sediment result at the 0.05 alpha level. A dash indicates that it is not significantly greater than the reference sediment.

CH2M Hill Sample No.	NAS No.	Reference 05164470 (9983F)	Reference 05164478 (9989F)	Reference 05164476 (9990F)	Reference 05164486 (9994F)	Reference 05164489 (9998F)	Reference 05164496 (0002G)
05164472	9985F	--	--	--	--	--	--
05164473	9986F	--	--	--	--	--	--
05164474	9987F	--	+	+	+	--	--
05164475	9988F	--	--	--	--	--	--
05164479	9991F	--	+	+	+	--	+
05164483	9992F	--	--	--	--	--	--
05164485	9993F	--	--	--	--	--	--
05164487	9995F	--	--	--	--	--	--
05164494	9996F	--	--	--	--	--	--
05164507	9997F	--	--	--	--	--	--
05164491	9999F	--	+	+	+	--	+
05164493	0001G	--	--	--	--	--	--
05174405	0032G	--	--	--	--	--	--
05174406	0033G	--	--	--	--	--	--
05174408	0034G	--	--	--	--	--	--
05174412	0035G	--	--	--	--	--	--
05174413	0036G	--	--	--	--	--	--
05174407	0037G	--	--	--	--	--	--
05174409	0038G	--	--	--	--	--	--
05174410	0039G	--	--	--	--	--	--
05174411	0040G	--	--	--	--	--	--
05174415	0041G	--	--	--	--	--	--
05174423	0042G	--	--	--	--	--	--
05174424	0043G	--	--	--	--	--	--
05174427	0044G	--	--	--	--	--	--

Table 4. Comparison of growth data for sediments compared to each reference sediment. A "+" indicates that the test sediment result is significantly less than the reference sediment result at the 0.05 alpha level. A dash indicates that it is not significantly less than the reference sediment.

CH2M Hill Sample No.	NAS No.	Reference 05164470 (9983F)	Reference 05164478 (9989F)	Reference 05164476 (9990F)	Reference 05164486 (9994F)	Reference 05164489 (9998F)	Reference 05164496 (0002G)
05164472	9985F	+	+	+	+	+	+
05164473	9986F	--	--	--	--	--	--
05164474	9987F	+	+	+	+	+	+
05164475	9988F	+	+	--	+	--	--
05164479	9991F	+	+	+	+	+	+
05164483	9992F	+	+	+	+	+	+
05164485	9993F	+	+	--	+	--	+
05164487	9995F	+	+	+	+	+	+
05164494	9996F	--	--	--	+	--	--
05164507	9997F	+	+	--	+	--	+
05164491	9999F	+	+	+	+	+	+
05164493	0001G	--	--	--	--	--	--
05174405	0032G	+	+	--	+	+	+
05174406	0033G	+	+	--	+	--	--
05174408	0034G	+	+	+	+	+	+
05174412	0035G	+	+	--	+	+	+
05174413	0036G	+	+	--	+	--	+
05174407	0037G	+	+	--	+	--	+
05174409	0038G	--	--	--	--	--	--
05174410	0039G	+	+	--	+	--	--
05174411	0040G	--	--	--	+	--	--
05174415	0041G	--	--	--	--	--	--
05174423	0042G	+	+	+	+	+	+
05174424	0043G	+	+	+	+	+	+
05174427	0044G	--	--	--	--	--	--

Table 5. Comparison of mortality data for sediments compared to each reference sediment. A "+" indicates that the test sediment result is significantly greater than the reference sediment result at the 0.01 alpha level. A dash indicates that it is not significantly greater than the reference sediment.

CH2M Hill Sample No.	NAS No.	Reference 05164470 (9983F)	Reference 05164478 (9989F)	Reference 05164476 (9990F)	Reference 05164486 (9994F)	Reference 05164489 (9998F)	Reference 05164496 (0002G)
05164472	9985F	--	--	--	--	--	--
05164473	9986F	--	--	--	--	--	--
05164474	9987F	--	--	--	--	--	--
05164475	9988F	--	--	--	--	--	--
05164479	9991F	--	+	+	+	--	--
05164483	9992F	--	--	--	--	--	--
05164485	9993F	--	--	--	--	--	--
05164487	9995F	--	--	--	--	--	--
05164494	9996F	--	--	--	--	--	--
05164507	9997F	--	--	--	--	--	--
05164491	9999F	--	+	+	+	--	--
05164493	0001G	--	--	--	--	--	--
05174405	0032G	--	--	--	--	--	--
05174406	0033G	--	--	--	--	--	--
05174408	0034G	--	--	--	--	--	--
05174412	0035G	--	--	--	--	--	--
05174413	0036G	--	--	--	--	--	--
05174407	0037G	--	--	--	--	--	--
05174409	0038G	--	--	--	--	--	--
05174410	0039G	--	--	--	--	--	--
05174411	0040G	--	--	--	--	--	--
05174415	0041G	--	--	--	--	--	--
05174423	0042G	--	--	--	--	--	--
05174424	0043G	--	--	--	--	--	--
05174427	0044G	--	--	--	--	--	--

Table 6. Comparison of growth data for sediments compared to each reference sediment. A "+" indicates that the test sediment result is significantly less than the reference sediment result at the 0.01 alpha level. A dash indicates that it is not significantly less than the reference sediment.

CH2M Hill Sample No.	NAS No.	Reference 05164470 (9983F)	Reference 05164478 (9989F)	Reference 05164476 (9990F)	Reference 05164486 (9994F)	Reference 05164489 (9998F)	Reference 05164496 (0002G)
05164472	9985F	+	+	+	+	+	+
05164473	9986F	--	--	--	--	--	--
05164474	9987F	+	+	+	+	+	+
05164475	9988F	--	--	--	+	--	--
05164479	9991F	+	+	+	+	--	+
05164483	9992F	+	--	--	+	+	+
05164485	9993F	+	+	--	+	--	--
05164487	9995F	+	+	--	+	+	+
05164494	9996F	--	--	--	+	--	--
05164507	9997F	+	+	--	+	--	+
05164491	9999F	+	+	--	+	+	+
05164493	0001G	--	--	--	--	--	--
05174405	0032G	+	+	--	+	--	+
05174406	0033G	--	--	--	+	--	--
05174408	0034G	+	+	+	+	+	+
05174412	0035G	+	+	--	+	--	+
05174413	0036G	+	+	--	+	--	--
05174407	0037G	+	+	--	+	--	+
05174409	0038G	--	--	--	--	--	--
05174410	0039G	--	--	--	+	--	--
05174411	0040G	--	--	--	--	--	--
05174415	0041G	--	--	--	--	--	--
05174423	0042G	+	+	+	+	+	+
05174424	0043G	+	+	--	+	+	+
05174427	0044G	--	--	--	--	--	--

APPENDIX I

PROTOCOL

TEST PROTOCOL

**FRESHWATER AMPHIPOD, *HYALELLA AZTECA*,
28-DAY SEDIMENT SURVIVAL AND GROWTH TEST**

1. INTRODUCTION

1.1 Purpose of Study: The purpose of this study is to characterize the chronic toxicity of freshwater sediments using a 28-day exposure and survival and growth endpoints with the amphipod, *Hyalella azteca*.

1.2 Referenced Method: This protocol is based on ASTM Method E 1706-00 (ASTM 2001) and EPA Method 100.1 (EPA/600/R-99/064)

1.3 Summary of Method: A summary of test conditions for the amphipod 28-day sediment survival and growth test is tabulated below. The test with *Hyalella azteca* is conducted at 23 ± 1°C with a 16L:8D photoperiod at an illuminance of about 100-1000 lux. Test chambers are 300-mL high-form lipless beakers containing 100 mL of sediment and 175 mL of overlying water. Ten 7-8day old amphipods are used in each replicate. The number of replicates/treatment depends on the objective of the test. Eight replicates are recommended for routine testing. Amphipods in each test chamber are fed 1.0 mL of YCT food daily. Each chamber receives two volume additions per day of overlying water. Test endpoints include survival and growth.

2. STUDY MANAGEMENT

2.1 Sponsor's Name and Address:

_____
_____
_____
_____

2.2 Sponsor's Study Monitor:

_____

2.3 Name of Testing Laboratory:
Northwestern Aquatic Sciences
3814 Yaquina Bay Road, P.O. Box 1437
Newport, OR 97365.

2.4 Test Loeation:

_____

2.5 Laboratory's Personnel to be Assigned to the Study:
Study Director: _____
Quality Assurance Unit: _____
Aquatic Toxicologist: _____
Aquatic Toxicologist: _____

2.6 Proposed Testing Schedule: Tests are normally begun within 14 days of sample colleetion. Reference toxicant tcst to be run concurrently.

2.7 Good Laboratory Practices: The test is conducted following the principles of Good Laboratory Practices (GLP) as defined in the EPA/TSCA Good Laboratory Practice regulations revised August 17, 1989 (40 CFR Part 792).

3. TEST MATERIAL

The test materials are freshwater sediments. The control, reference, and test sediments are placed in solvent cleaned 1 L glass jars fitted with PTFE-lined screw caps. At the laboratory the samples are stored at 4°C in the dark. The original sealed containers may be stored for up to 8 weeks prior to testing, depending on the testing requirements. If jars are not not full when received or if sediment is removed for testing, headspaces should be filled with nitrogen to retard deterioration. A negative control sediment is collected from a clean site. In addition, a reference sediment, a clean sediment with physical characteristics similar to the test sediments, may be employed as a comparison station.

4. TEST WATER

Test water (overlying water) at NAS is normally dechlorinated tap water or moderately hard synthetic water. Synthetic dilution water is prepared from Milli-Q reagent grade water and reagent grade chemicals. Test water may also be well water, surface water, site water, or other water depending on the study design. The hardness or other water quality parameters of the dilution water may need to be adjusted to meet the study design.

5. TEST ORGANISMS

5.1 Species: amphipod, *Hyalella azteca*.

5.2 Source: Cultured at NAS. Alternatively, animals may be purchased from a reputable commercial supplier.

5.3 Age: 7-8 days old at start of test

5.4 Acclimation and Pretest Observation: Cultures are maintained at 23 ± 1°C under a 16:8 L:D photoperiod. Cultured amphipods are fed dried maple leaves with YTC. Rabbit chow, Tetramin® or TetraFin® flakes may also be used. Acclimation of test organisms to the test water may be desirable, depending on culture water, but it is not required. If test organisms are to be acclimated, fifty percent of the holding water is changed daily with the addition of test water.

6. DESCRIPTION OF TEST SYSTEM

6.1 Test Chambers and Environmental Control: Test chambers used in the toxicity test are 300-mL high-form lipless glass beakers. Test chambers are maintained at constant temperature by partial immersion in a temperature-controlled water bath or by placement in a temperature-controlled room. Aeration is not empolyed unless dissolved oxygen drops below 2.5 mg/L. The test is conducted under an illuminance of 100-1000 lux with a 16L:8D photoperiod.

6.2 Cleaning: All laboratory glassware, including test chambers, is cleaned as described in EPA/600/4-90/027F. New glassware and test systems are soaked 15 minutes in tap water and scrubbed with detergent (or cleaned in automatic dishwasher); rinsed twice with tap water; carefully rinsed once with fresh, dilute (10%, V:V) hydrochloric or nitric acid to remove scale, metals, and bases; rinsed twice with deionized water; rinsed once with acetone to remove organic compounds (using a fume hood or canopy); and rinsed three times with deionized water. Test systems and chambers are rinsed again with dilution water just before use.

7. EXPERIMENTAL DESIGN AND TEST PROCEDURES

7.1 Experimental Design: The test involves exposure of amphipods to test, control, and reference sediments. The sediments are placed on the bottom of the test containers and are overlain with test water. The test exposure is for 28 days. The renewal of overlying water consists of two volume additions per day, either continuous or intermittent. Each treatment consists of eight replicate test containers, each containing 10 organisms. Test chamber positions are completely randomized. Test organisms are randomly distributed to the test chambers. Blind testing is normally used.

7.2 Setup of Test Containers: Sediments are homogenized and placed in test chambers on the day before addition of test organisms. Sediment (100 ml) is placed into each of eight replicate beakers. After addition of the sediment, 175 ml of test water is gently added to each beaker in a manner to prevent resuspension. The overlying water is replaced twice daily. The test begins when amphipods are introduced to the test chambers. Initial water quality measurements are taken prior to the addition of test organisms.

7.3 Effect Criterion: The effect criteria used in the 28-day amphipod bioassay are mortality and growth. Death is defined as the lack of movement of body or appendages on response to tactile stimulation. Growth is measured as change in dry weight.

7.4 Test Conditions: No aeration is employed unless dissoved oxygen falls below 2.5 mg/L. The test temperature employed is 23 ± 1°C. A 16:8, L:D photoperiod is used. Illumination is supplied by daylight fluorescent lamps at 100-1000lux. The overlying water is replaced twice daily.

7.5 Beginning the Test: On the day the test begins, amphipods are impartially counted into small containers of test water (10/container). The test is begun by rinsing test organisms into the equilibrated test containers. For the growth endpoint, time-zero weight data should be collected.

7.6 Feeding: Amphipods are fed 1.0 mL of YCT daily per test chamber. A feeding may be skipped if there is a build up of excess food. However, all beakers must be treated similarly.

7.7 Test Duration, Type and Frequency of Observations, and Methods: The duration of the toxicity test is 28 days. The type and frequency of observations to be made are summarized as follows:

TYPE OF OBSERVATION	TIMES OF OBSERVATION
BIOLOGICAL DATA	
Survival, growth	Day 28
PHYSICAL AND CHEMICAL DATA	
Hardness, alkalinity, conductivity, and ammonia-N	Beginning and end of test in overlying water of one replicate beaker from each treatment.
Temperature	Daily in overlying water of one replicate beaker from each treatment.
Conductivity	Weekly
Dissolved oxygen and pH	3X/week
Optional pore water ammonia and/or sulfide	In test sediments prior to initiating the tests. Optionally in sediments from sacrificial test chambers at test beginning and/or end.

Dissolved oxygen is measured using a polarographic oxygen probe calibrated according to the manufacturer's recommendations. The pH is measured using a pH probe and a properly calibrated meter with seale divisions of 0.1 pH units. Temperature is measured with a ealibrated mercury thermometer or telethermometer. Conductivity is measured with a conductivity meter. Hardness and alkalinity are measured using titrometric methods. Total soluble sulfide and total ammonia-N were

measured using Hach test kits based on the methylene blue (EPA Method 376.2) and salicylate (Clin. Chim. Acta 14:403, 1996) colorimetric methods, respectively; samples were not distilled prior to analysis.

Overlying water should be sampled just before water renewal from about 1 to 2 cm above the sediment surface using a pipet. It may be necessay to pool water samples from individual replicates. The pipet should be checked to make sure no organisms are removed during sampling of overlying water.

7.8 Test Termination: At test termination, the contents of each test container are sieved through a #35 (500 µm mesh) sieve to recover the amphipods. Amphipods from each replicate are put into a 30 mL plastic cup, rinsed with DI water, gently blotted and place into the appropriate tared aluminum weighing pan. The number of survivors for each container is recorded on the datasheet.

7.9 Growth Measurement: Growth is measured as average dry weight of animals in a test replicate at the end of the test on day 28. Pooled animals from each test replicate are gently blotted and placed into tared aluminum weigh pans. The pans are dried at 60-90°C to constant weight. The dried amphipods are placed into a dessicator and weighed as soon as possible to the nearest 0.01 mg (desirable to use 0.001 mg). The total weight of the dried amphipods in each pan is divided by the number of amphipods weighed to obtain an average dry weight per surviving amphipod per replicate.

8. CRITERIA OF TEST ACCEPTANCE

The test results are acceptable if the minimum survival of organisms in the control treatment at the end of the test is at least 80%.

9. DATA ANALYSIS

The endpoints of the toxicity test are survival and growth. Survival is obtained as a direct count of living organisms in each test container at the end of the test. Average amphipod dry weight, also measured at the end of the test, may be used to compare growth between treatment sediments and the control or reference sediment. Ordinarily the following data analysis is performed. Due to special requirements, alternative methods may be used. The means and standard deviations are calculated for each treatment level. Identification of toxic sediments is established by statistical comparison of test endpoints between test and control or reference sediments. Between treatment comparisons may be made using a Student's t-test or Wilcoxon's Two-Sample test, where each treatment is compared to the control or the reference sediment. An arcsine-square root transformation of proportional data, and tests for normality and heterogeneity of variances, are performed prior to statistical comparisons.

10. REPORTING

The final report of the test results must include all of the following standard information at a minimum: name and identification of the test; the investigator and laboratory; date and time of test beginning and end; information on the test material; information on the source and quality of the overlying/test water; detailed information about the test organisms including acclimation conditions; a description of the experimental design and test chambers and other test conditions including feeding, if any, and water quality; definition of the effect criteria and other observations; responses, if any, in the control treatment; tabulation and statistical analysis of measured responses and a summary table of endpoints; a description of the statistical methods used; any unusual information about the test or deviations from procedures; reference toxicant testing information.

11. STUDY DESIGN ALTERATION

Amendments made to the protocol must be approved by the sponsor and study direetor and should include a deseription of the change, the reason for the change, the date the ehange took effect and the dated signatures of the study director and sponsor. Any deviations in the protocol must be described and recorded in the study raw data.

12. REFERENCE TOXICANT

The reference toxicant test is a standard multi-concentration toxicity test using a specified chemical toxicant to evaluate the performance of test organisms used in the study. Reference toxicant tests are 96-hour, water only exposures, not 28-day sediment exposures. The reference toxicant test is run concurrently. Performance is evaluated by comparing the results of the reference toxicant test with historical results (e.g., control charts) obtained at the laboratory.

13. REFERENCED GUIDELINES

ASTM. 2001. Standard Test Methods for Measuring the Toxicity of Sediment-Associated Contaminants with Fresh Water Invertebrates. ASTM Standard Method No. E 1706-00. Am. Soc. Test. Mat., Philadelphia, PA.

U.S. EPA. 2000. Section 11, Test Method 100.1, *Hyalella azteca* 10-d Survival and Growth Test for Sediments, pp. 47-54 In: Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates (Second Edition). EPA/600/R-99/064.

Weber, C.I. (Ed.) 1993. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms (Fourth Edition). EPA/600/4-90/027F.

14. APPROVALS

_____ for _____
Name Date

_____ for **Northwestern Aquatic Sciences**
Name Date

Appendix A
Test Conditions Summary

1. Test type	whole sediment toxicity test with renewal of overlying water
2. Test duration	28 days
3. Temperature	23 ± 1°C
4. Light quality	daylight fluorescent light
5. Illuminance	100-1000 lux
6. Photoperiod	16L:8D
7. Test chamber size	300-mL high-form lipless beakers, (Pyrex® 1040 or equivalent)
8. Sediment volume	100 mL
9. Overlying water volume	175 mL
10. Renewal overlying water	2 volume additions/day (continuous or intermittent)
11. Age of test organisms	7-8 days old at test initiation
12. Organisms per test chamber	10
13. Replicates per treatment	8 recommended for routine testing (depends on design)
14. Organisms per treatment	80
15. Feeding regime	YCT food, fed 1.0 mL daily/chamber
16. Cleaning	if screens are used, clean as needed
17. Aeration	None, unless DO falls below 2.5 mg/L
18. Overlying (test) water	Dechlorinated tap water, culture water, well water, surface water, site water or reconstituted water, depending on study design.
19. Water quality	Hardness, alkalinity, conductivity, ammonia-N beginning and end; temperature daily; conductivity weekly; DO & pH 3X/wk
20. Endpoints	Survival & growth (based on weight)
21. Test acceptability criteria	Minimum control survival of 80%
22. Sample holding	14 days at 4°C in the dark (recommended)
23. Sample volume required	1L (800 mL per sediment)
24. Reference toxicant	Concurrent testing required

APPENDIX II

RAW DATA

TEST DESCRIPTION, MONITORING, AND RESULTS BENCHSHEETS

Test No. 727-2 Client CH2M Hill Investigator ____________

STUDY MANAGEMENT

Client: CH2M Hill, Inc., 2300 NW Walnut Blvd., Corvallis, OR 97330
Client's Study Monitor: Mr. Dennis Shelton
Testing Laboratory: Northwestern Aquatic Sciences
Test Location: Newport Laboratory
Laboratory's Study Personnel:
Proj. Man./Study Dir. G.J. Irissarri GJI
QA Officer L.K. Nemeth
1. Susan Gage SG 2. Bill Montgomery WTM
3. B.B. Pridgeon BBP 4. EAB WVB
Study Schedule: 5. M.S. Redmond MSR 6. RS Caldwell RSC
Test Beginning: 5-5-05 10:45 Test Ending: 6-2-05 11:30

TEST MATERIAL

General description (see sample logbook/chain-of-custody for details):

NAS Sample No.:	9952F	9983F	9985F	9986F	9987F
Description:	Contol	05164470	05164472	05164473	05164474
Collection Date:	4/22/05	4/22/05	4/22/05	4/22/05	4/22/05
Receipt Date:	4/22/05	4/26/05	4/26/05	4/26/05	4/26/05
:					

NAS Sample No.:	9988F	9989F	9990F	9991F	9992F
Description:	05164475	05164478	05164476	05164479	05164483
Collection Date:	4/22/05	4/22/05	4/22/05	4/22/05	4/22/05
Receipt Date:	4/26/05	4/26/05	4/26/05	4/26/05	4/26/05
:					

NAS Sample No.:	9993F	9994F	9995F	9996F	9997F
Description:	05164485	05164486	05164487	05164494	05164407
Collection Date:	4/22/05	4/23/05	4/23/05	4/23/05	4/23/05
Receipt Date:	4/26/05	4/26/05	4/26/05	4/26/05	4/26/05
:					

NAS Sample No.:	9998F	9999F	0001G	0002G	0032G
Description:	05164489	05164491	05164493	05164496	05174405
Collection Date:	4/23/05	4/23/05	4/23/05	4/23/05	4/26/05
Receipt Date:	4/26/05	4/26/05	4/26/05	4/26/05	4/28/05
:					

NAS Sample No.:	0033G	0034G	0035G	0036G	0037G
Description:	05174406	05174408	05174412	05174413	05174407
Collection Date:	4/26/05	4/26/05	4/26/05	4/26/05	4/26/05
Receipt Date:	4/28/05	4/28/05	4/28/05	4/28/05	4/28/05
:					

NAS Sample No.:	0038G	0039G	0040G	0041G	0042G
Description:	05174409	05174410	05174411	05174415	05174423
Collection Date:	4/26/05	4/26/05	4/26/05	4/26/05	4/28/05
Receipt Date:	4/28/05	4/28/05	4/28/05	4/28/05	4/30/05
:					

Error codes: 1) correction of handwriting error
2) written in wrong location; entry deleted
3) wrong date deleted, replaced with corrrect date
4) error found in measurement; measurement repeated

Test No. 727-2 Client CH2M Hill Investigator ____

TEST MATERIAL CONTINUATION SHEET

NAS Sample No.:	0043G	0044G			
Description:	05174424	05174427			
Collection Date:	4/28/05	4/28/05			
Receipt Date:	4/30/05	4/30/05			
____:					

NAS Sample No.:					
Description:					
Collection Date:					
Receipt Date:					
____:					

NAS Sample No.:					
Description:					
Collection Date:					
Receipt Date:					
____:					

NAS Sample No.:					
Description:					
Collection Date:					
Receipt Date:					
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NAS Sample No.:					
Description:					
Collection Date:					
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Receipt Date:					
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NAS Sample No.:					
Description:					
Collection Date:					
Receipt Date:					
____:					

NAS Sample No.:					
Description:					
Collection Date:					
Receipt Date:					
____:					

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator

SEDIMENT DESCRIPTIONS -- SUPPLEMENTAL NOTES

Sample No.	Description
9952F	BLACK FINE MUD
9983F	Fine light brown sand with plant roots, shells, some worms
9985F	Coarse sand, dark with light sand mixed
9986F	COARSE SAND, GRAY/BROWN
9987F	Fine sandy mud, plant roots, shoots, some snails
9988F	GRAY BROWN SAND
9989F	Dark Gray mud with woody debris
9990F	Dark Gray brown Fine sand with plant debris
9991F	Brown Fine sand
9992F	DARK OLIVE GREEN SAND W/ SMALL ROCKS
9993F	Light brown soupy clay
9994F	Brown sandy mud W/ wood debris
9995F	Olive green & brown fine sandy mud (w sm. pepples
9996F	Coarse brown sand, small gravly rocks
9997F	Dark Olive green sandy mud with small rocks
9998F	~~Olive green & brown sandy (fine) (w sm pepples~~ dark brown sand
9999F	Dark brown sandy mud with small pieces of organic debris.
0001G	Dark brown Wet sand
0002G	Dark brown mud with woody plant debris
0032G	DARK GOLDEN BROWN SANDY MUD W/ SMALL ROCKS
0033G	Course sand (w lg. & small pepples
0034G	Fine Grey mud
0035G	Gray-green mud. with chironomid larva
0036G	Dark Golden Brown sandy mud w/ small rocks
0037G	Course sand (w a few pepples (golden color)
0038G	Coarse Sand w/ multi color stones (small to medium size stones)
0039G	DARK GRAY/GREEN MUDDY SAND W/ SMALL ROCKS
0040G	Med. Course Golden brown sand (w a few sm pepples
0041G	Coarse sand with gravel
0042G	TAN Muddy Sand W/ ROCKS
0043G	Dark Brown sandy mud
0044G	TAN MUDDY SAND w/ GRAVEL

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator

TEST WATER

Source: Modified dechlorinated municipal water

Date of Collection/Preparation:

pH SEE MODIFIED TAP WATER RECORD

Cond (umhos/cm2)

Hardness (mg/La0

Alkalinity (mg/L)

Treatments: Aerated ≥ 24 hrs

TEST ORGANISMS

Species: *Hyalella azteca* Age: 7-8 DAYS Date received: 5-3-05

Source: Chesapeake Cultures, Hayes, VA

Acclimation Data:

Date	Temp. (deg.C)	DO (mg/L)	pH	Cond umhos/cm	Feeding * amount	Feeding description	Water changes	Hardness (mg/L)	Alkalinity (mg/L)
5-3-05	19.9	11.4	7.1	370	20 mL	YTC	YES	162	190
5-4-05	22.6	8.4	8.1	420	10 mL	YTC	YES	171	210
5-6-05	22.8	8.0	7.6	350	10 mL	YTC	—	119	110
	21.8		7.6	380					
Mean	~~20.6~~	9.3	~~7.7~~	~~375~~				~~127~~ 151	~~143~~ 170
S.D.	~~0.4~~ 1.9	~~1.2~~ 1.9	~~0.6~~ 0.5	~~66~~ 36				~~34~~ 28	~~87~~ 53
(N)	3	3	3	3				3	3

9-29-0 GJL TRANSPOSITION ERROR

Photoperiod during acclimation: 16:8, L:D * PER PAN

TEST PROCEDURES AND CONDITIONS

Test chambers: 300 ml glass beakers

Test volumes: 100 ml of test sediment; 275 ml total volume

Replicates/treatment: (8) 8 Organisms/treatment: (80) 80 (10/REP)

Test water changes: Twice daily

Aeration: only if DO falls below 2.5 mg/L

Feeding: everyday beginning with day zero

Test temperature (deg.C): 23

Beaker placement: Total randomization

Photoperiod: 16:8, L:D

Control Sediment:

Source: From an area approximately one mile east of the Hwy. 101 bridge at Beaver Creek, approx. 8 miles south of Newport, OR.

Date collected: 4/22/05

Sieved through 0.5 -mm screen NAS# 9952F

Storage: 4°C in the dark in closed containers.

MISCELLANEOUS NOTES

Date:	Light Intensity (ft-candles*) Site A	Site B	Comments	Initials
5-9-05	62	66		GJL
5-20-05	67	72		GJL

*To convert ft-candles to lux divide by ~~0.0929~~ 0.0929 GJL 5-6-05 10-25-05 ORIGINAL ENTRY CORRECT

MODIFIED TAP WATER RECORD

BATCH #	LOCATION	DATE	VOLUME (gal.)	$MgSO_4$* Lot #	KCl* Lot #	$NaHCO_3$* Lot #	$CaSO_4$* Lot #	Total Chlorine (mg/L)	HARD (mg/L)	ALK (mg/L)	COND (µmhos/cm)	pH	Init.
1	ROOM #1	4-25-05	100	034818	020565A	041522	A0174037O1	<0.02	68	60	260	7.5	GJ
2	ROOM #1	4-29-05	100	"	"	"	"	<0.02	68	60	260	7.5	GJ
3	"	5-2-05	"	"	"	"	"	<0.02	68	60	275	7.4	GJ
4	"	5-5-05	"	"	"	"	"	<0.02	68	70	270	7.4	GJ
5	"	5-8-05	"	"	"	"	"	<0.02	68	70	280	7.3	GJ
6	"	5-11-05	"	"	"	"	"	<0.02	68	70	280	7.3	GJ
7	"	5-13-05	"	"	"	"	"	<0.02	68	60	280	7.5	GJ
8	"	5-16-05	"	"	"	"	"	<0.02	68	60	280	7.3	GJ
9	"	5-19-05	"	"	"	"	"	<0.02	68	60	270	7.5	GJ
10	"	5-20-05	"	"	"	"	"	<0.02	68	70	270	7.4	GJ
11	"	5-24-05	"	"	"	"	"	<0.02	68	60	270	7.4	GJ
12	"	5-26-05	"	"	"	"	"	<0.02	68	60	270	7.5	GJ

*Amounts of reagents per 100 gals: $MgSO_4$ = 9.46g, KCl = 0.64g, $NaHCO_3$ = 15.1g, $CaSO_4 \cdot 2\ 1/2H_2O$ = 9.46g.

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator _____

Test conducted in (circle one): (room 1) room 2 trailer water bath other: _____

Randomization chart: TOP FAR SHELF

5									50
4									49
3									48
2									47
1									46

Randomization chart: TOP NEAR SHELF

55								255	
54								254	
53								253	
52								252	
51								251	256

Randomization chart:

Randomization chart:

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 0 (5/5/05) 651/UB3/BBP

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond.* (umhos/cm)	pH*	Hardness* (mg/L)	Alkalinity* (mg/L	NH3* (ppm)	Comments
3	23.5	8.2	275	7.5	77	60		Each beaker fed 1.0 ml
12	23.3	6.6	330	7.2	103	90		YTC suspension
21	23.3	6.6	270	6.8	86	70		Initials: WTH
29	23.4	6.7	325	7.2	120	110		
31	23.4	6.8	300	7.0	103	80		
37	23.3	7.9	270	7.5	77	70		
40	23.5	8.0	285	7.5	86	70		
41	23.4	8.0	285	7.5	86	80		
43	23.4	7.3	290	7.2	86	80		
51	23.5	6.8	285	7.1	86	70		
52	23.5	7.0	350	7.1	68	60		
60	23.9	7.1	280	6.7	86	80		
76	23.4	7.0	335	6.9	120	110		
78	23.4	6.9	345	7.2	111	120		
80	23.5	7.2	300	7.3	103	90		
94	23.5	6.6	300	6.9	94	90		
100	23.8	6.8	290	6.9	94	70		
121	23.5	7.0	255	6.7	68	60		
137	23.4	7.0	340	7.3	128	150		
143	23.4	7.2	290	7.3	86	70		
145	23.8	7.0	275	7.0	86	80		
159	23.5	7.0	275	6.8	86	80		
170	23.7	7.8	275	7.4	77	70		
179	23.4	7.9	290	7.5	103	80		
204	23.5	6.4	305	7.1	111	90		
216	23.5	6.8	285	7.4	86	80		
217	23.5	7.8	300	7.4	94	80		
221	23.5	7.8	345	7.5	94	80		
227	23.5	7.8	290	7.2	128	120		
229	23.5	7.0	345	7.3	137	140		
250	23.8	7.2	~~350~~ 305	7.1	103	90		
255	23.9	7.1	305	7.3	103	90		
								Water changed in all
								beakers.
								Time: 0720
								Initials: [illegible]
								Water changed in all
								beakers.
								Time: 1715
								Initials: [illegible]

*Water quality measurements to be taken.

Test No. 727-2 Client CH2M Hill Investigator ______

DAILY RECORD SHEET

Day 1 (5/6/05) wrm/BBP/AJ

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.4	7.7		7.1				Each beaker fed 1.0 ml
12	23.1	5.8		7.1				YTC suspension
21	23.2	6.7		6.9				Initials: wrm
29	23.2	6.9		7.0				
31	23.2	7.0		7.0				
37	23.0	7.4		7.2				
40	23.4	7.4		7.2				
41	23.2	7.3		7.2				
43	23.1	7.2		7.1				
51	23.3	7.1		7.1				
52	23.3	6.9		7.0				
60	23.6	6.9		6.9				
76	23.3	7.0		6.9				
78	23.2	7.0		7.1				
80	23.6	7.1		7.1				
94	23.4	6.6		6.9				
100	23.6	7.0		7.0				
121	23.4	7.1		6.9				
137	23.3	6.8		7.3				
143	23.3	7.1		7.1				
145	23.6	6.8		6.9				
159	23.3	6.9		6.9				
170	23.5	7.4		7.1				
179	23.3	7.5		7.3				
204	23.4	7.3		7.1				
216	23.5	7.5		7.2				
217	23.4	7.4		7.2				
221	23.5	6.8		7.2				
227	23.4	6.9		7.1				
229	23.4	6.8		7.2				
250	23.8	7.3		7.1				
255	23.9	7.4		7.2				
								Water changed in all
								beakers.
								Time: 0615
								Initials: wrm
								Water changed in all
								beakers.
								Time: 1652
								Initials: AJ

*Water quality measurements to be taken.

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 2 (5/7/05) MB

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.2							Each beaker fed 1.0 ml
12	22.9							YTC suspension
21	22.9							Initials: MB
29	22.9							
31	22.9							
37	22.9							
40	23.0							
41	22.9							
43	23.0							
51	23.1							
52	23.1							
60	23.3							
76	23.0							
78	23.0							
80	23.3							
94	23.2							
100	23.3							
121	23.0							
137	22.9							
143	22.9							
145	23.2							
159	23.0							
170	23.2							
179	23.0							
204	23.0							
216	23.1							
217	23.1							
221	23.0							
227	23.0							
229	23.0							
250	23.2							
255	23.4							
								Water changed in all
								beakers.
								Time: 0650
								Initials: MB
								Water changed in all
								beakers.
								Time: 1800
								Initials: AJ

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 3 (5/8 65) GJL

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.2							Each beaker fed 1.0 ml
12	22.9							YTC suspension
21	22.9							Initials: GJL
29	22.9							
31	22.9							
37	23.0							
40	23.0							
41	22.9							
43	22.9							
51	23.0							
52	22.9							
60	23.2							
76	23.0							
78	22.9							
80	23.2							
94	23.0							
100	23.2							
121	22.9							
137	22.9							
143	22.9							
145	23.1							
159	22.9							
170	23.1							
179	22.9							
204	22.9							
216	23.0							
217	22.9							
221	22.9							
227	22.9							
229	23.0							
250	23.3							
255	23.4							
								Water changed in all
								beakers.
								Time: 0715
								Initials: GJL
								Water changed in all
								beakers.
								Time: 1755
								Initials: BSP

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 4 (5/9/05) BBP/mom

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.9	6.7		7.2				Each beaker fed 1.0 ml
12	22.7	6.9		7.3				YTC suspension
21	22.7	7.1		7.2				Initials: BBP
29	22.7	7.1		7.1				
31	22.7	7.3		7.2				
37	22.6	7.6		7.3				
40	22.8	7.5		7.2				
41	22.7	7.6		7.1				
43	22.6	7.5		7.2				
51	22.9	7.3		7.2				
52	22.8	7.2		7.1				
60	23.0	7.2		7.0				
76	22.8	7.1		7.0				
78	22.7	7.1		7.1				
80	23.0	7.0		7.1				
94	22.8	6.7		7.0				
100	23.1	7.1		7.0				
121	22.8	7.3		7.0				
137	22.7	6.8		7.2				
143	22.7	7.0		7.2				
145	23.0	7.1		7.1				
159	22.7	7.0		7.0				
170	22.9	7.3		7.1				
179	22.8	7.3		7.2				
204	22.8	7.2		7.1				
216	22.8	7.4		7.1				
217	22.8	7.2		7.1				
221	22.8	6.7		7.1				
227	22.7	6.9		7.1				
229	22.8	6.8		7.2				
250	23.2	7.1		7.1				
255	23.2	7.1		7.2				
								Water changed in all
								beakers.
								Time: 0655
								Initials: BBP
								Water changed in all
								beakers.
								Time: 1700
								Initials: AJ

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator ______

DAILY RECORD SHEET

Day 5 (5/12/05) VD/BBP

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.9							Each beaker fed 1.0 ml
12	22.7							YTC suspension
21	22.7							Initials: GJI
29	22.7							
31	22.7							
37	22.6							
40	22.8							
41	22.7							
43	22.7							
51	22.8							
52	22.8							
60	23.0							
76	22.9							
78	22.8							
80	23.0							
94	22.8							
100	23.1							
121	22.9							
137	22.8							
143	22.8							
145	23.0							
159	22.9							
170	23.0							
179	22.8							
204	22.9							
216	22.9							
217	22.7							
221	22.9							
227	22.8							
229	22.9							
250	23.2							
255	23.3							
								Water changed in all
								beakers.
								Time: 0650
								Initials: EB
								Water changed in all
								beakers.
								Time: 1730
								Initials: DJ

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 6 (5/11 05) MB/DS/BBP

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond.* (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.9	6.2	285	7.1				Each beaker fed 1.0 ml
12	22.7	5.3	300	7.1				YTC suspension
21	22.7	6.3	285	7.1				Initials: ds
29	22.7	6.4	290	7.1				
31	22.7	6.5	290	7.1				
37	22.6	6.6	290	7.1				
40	22.8	6.7	290	7.2				
41	22.7	6.8	285	7.2				
43	22.7	6.8	285	7.1				
51	22.8	6.8	285	7.1				
52	22.9	6.6	285	7.1				
60	22.8	6.2	285	7.0				
76	22.9	6.2	295	7.0				
78	22.8	6.3	285	7.1				
80	23.2	6.1	290	7.1				
94	22.9	6.2	285	7.1				
100	23.2	6.3	285	7.0				
121	22.9	6.4	280	7.0				
137	22.8	6.4	295	7.3				
143	22.8	6.4	285	7.2				
145	23.1	6.5	285	7.1				
159	22.8	6.6	280	7.1				
170	22.9	6.7	285	7.1				
179	22.8	6.6	290	7.2				
204	22.9	6.7	285	7.1				
216	22.9	6.9	285	7.2				
217	22.8	6.7	285	7.2				
221	22.9	6.1	300	7.4				
227	22.8	6.6	280	7.2				
229	22.9	6.3	295	7.2				
250	23.3	6.4	290	7.1				
255	23.4	6.3	295	7.2				
								Water changed in all
								beakers.
								Time: 0640
								Initials: MB
								Water changed in all
								beakers.
								Time: 1655
								Initials: DS

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 7 (5 / 12 /05) DF

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.9							Each beaker fed 1.0 ml
12	22.8							YTC suspension
21	22.8							Initials: GJL
29	22.8							
31	22.8							
37	22.7							
40	22.9							
41	22.8							
43	22.7							
51	23.0							
52	23.0							
60	23.2							
76	22.9							
78	22.8							
80	23.2							
94	23.0							
100	23.2							
121	23.0							
137	22.9							
143	22.9							
145	23.1							
159	22.9							
170	23.0							
179	22.9							
204	23.0							
216	23.0							
217	23.0							
221	23.0							
227	22.9							
229	23.0							
250	23.3							
255	23.4							
								Water changed in all beakers.
								Time: 0640
								Initials: CB
								Water changed in all beakers.
								Time: 1655
								Initials: DF

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator _____

DAILY RECORD SHEET

Day 8 (5/13/05) [illegible]/BBP

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.9	7.8		7.1				Each beaker fed 1.0 ml
12	22.7	6.8		7.1				YTC suspension
21	22.8	7.1		7.0				Initials: LB3
29	22.8	7.2		7.0				
31	22.8	7.3		7.0				
37	22.7	7.4		7.0				
40	22.9	7.6 @BBP 5/13/05		7.1				
41	22.8	7.6		7.1				
43	22.7	7.5		7.1				
51	22.9	7.2		7.0				
52	22.8	7.1		7.0				
60	23.0	6.8		7.0				
76	22.9	6.5		6.9				
78	22.8	6.8		6.9				
80	23.0	7.0		7.0				
94	22.9	6.6		6.9				
100	23.0	6.8		6.9				
121	22.9	7.0		6.9				
137	22.8	6.7		7.4				
143	22.7	7.0		7.1				
145	22.9	6.9		7.0				
159	22.8	6.9		6.9				
170	23.0	7.2		7.0				
179	22.8	7.3		7.1				
204	22.9	7.1		7.0				
216	22.9	7.0		7.0				
217	22.9	6.9		7.0				
221	22.9	6.6		7.4				
227	22.8	7.1		6.9				
229	22.9	6.7		7.1				
250	23.2	6.8		7.0				
255	23.3	6.8		7.0				
								Water changed in all
								beakers.
								Time: 0655
								Initials: GJ
								Water changed in all
								beakers.
								Time: 1705
								Initials: AF

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator _____

DAILY RECORD SHEET

Day 9 (5/14/05) GJL

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.1							Each beaker fed 1.0 ml
12	22.8							YTC suspension
21	22.9							Initials: GJL
29	22.9							
31	22.9							
37	22.8							
40	23.0							
41	22.9							
43	22.9							
51	22.9							
52	22.9							
60	23.2							
76	22.9							
78	22.9							
80	23.2							
94	22.9							
100	23.2							
121	22.9							
137	22.9							
143	22.9							
145	23.1							
159	22.9							
170	23.0							
179	22.9							
204	23.0							
216	23.0							
217	23.0							
221	22.9							
227	22.9							
229	23.0							
250	23.3							
255	23.4							
								Water changed in all
								beakers.
								Time: 0725
								Initials: GJL
								Water changed in all
								beakers.
								Time: 18:10
								Initials: mdl

*Water quality measurements to be taken.

Test No. 727-2 Client CH2M Hill Investigator ______

DAILY RECORD SHEET

Day 10 (5/15/06) ww

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.4							Each beaker fed 1.0 ml
12	23.4							YTC suspension
21	23.2							Initials: ww
29	23.2							
31	23.2							
37	23.2							
40	23.3							
41	23.2							
43	23.2							
51	23.2							
52	23.2							
60	23.3							
76	23.2							
78	23.2							
80	23.3							
94	23.2							
100	23.4							
121	23.2							
137	23.2							
143	23.2							
145	23.2							
159	23.2							
170	23.3							
179	23.2							
204	23.2							
216	23.3							
217	23.3							
221	23.3							
227	23.2							
229	23.3							
250	23.4							
255	23.5							
								Water changed in all
								beakers.
								Time: 0730
								Initials: ww
								Water changed in all
								beakers.
								Time: 1730
								Initials: [illegible]

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 11 (1/16/05) CB/BBP/mrm

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.1	7.2		7.0				Each beaker fed 1.0 ml
12	23.0	6.5		7.0				YTC suspension
21	23.0	6.5		7.0				Initials: GJ
29	23.0	6.7		6.9				
31	23.0	6.8		6.9				
37	23.0	7.1		6.9				
40	23.8	7.1		7.0				
41	23.0	7.0		7.0				
43	23.0	7.0		6.9				
51	23.1	7.2		7.0				
52	23.1	6.7		6.9				
60	23.2	6.5		7.0				
76	23.1	6.4		6.9				
78	23.0	6.3		7.1				
80	23.2	6.6		7.0				
94	23.1	6.4		6.9				
100	23.2	6.6		6.9				
121	23.1	6.8		6.8				
137	23.0	5.7		7.6				
143	23.0	6.5		7.0				
145	23.2	6.4		7.1				
159	23.0	6.7		6.9				
170	23.2	6.8		7.0				
179	23.1	6.8		7.0				
204	23.1	6.8		6.9				
216	23.1	7.0		6.9				
217	23.1	7.0		6.9				
221	23.2	6.0		7.4				
227	23.1	6.7		7.0				
229	23.1	6.1		7.2				
250	23.4	6.6		6.9				
255	23.4	6.6		7.0				
								Water changed in all
								beakers.
								Time: 0640
								Initials: CB
								Water changed in all
								beakers.
								Time: 1710
								Initials: CB

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator _____

DAILY RECORD SHEET

Day 12 (5/17/05)

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.0							Each beaker fed 1.0 ml
12	22.8							YTC suspension
21	22.8							Initials: GJL
29	22.8							
31	22.8							
37	22.7							
40	22.9							
41	22.9							
43	22.7							
51	22.9							
52	22.9							
60	23.1							
76	22.9							
78	22.8							
80	23.1							
94	22.9							
100	23.1							
121	22.9							
137	22.9							
143	22.8							
145	23.0							
159	22.8							
170	23.0							
179	22.8							
204	22.9							
216	23.0							
217	23.0							
221	22.9							
227	22.9							
229	22.9							
250	23.1							
255	23.2							
								Water changed in all
								beakers.
								Time: 0650
								Initials: MB
								Water changed in all
								beakers.
								Time: 1705
								Initials: MB

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 13 (5 /18 /05) ~~MM~~/BBP

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond.* (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.9	7.5	285	7.2				Each beaker fed 1.0 ml
12	22.7	6.6	300	7.1				YTC suspension
21	22.8	7.0	290	7.2				Initials: GSI
29	22.7	7.0	290	7.0				
31	22.8	7.1	290	7.0				
37	22.7	7.2	290	7.0				
40	22.9	7.3	290	7.1				
41	22.8	7.3	290	7.1				
43	22.7	7.3	285	7.1				
51	22.9	7.2	295	7.0				
52	22.8	7.0	295	7.1				
60	23.1	6.7	295	7.1				
76	22.8	6.8	295	6.9				
78	22.7	6.8	295	7.1				
5-14-05 80	23.1	6.9	295	7.0				
94	22.8	7.0	295	7.0				
100	23.1	6.9	290	7.0				
22.8 5-14-05 121	22.8	7.2	285	6.8				
137	22.7	6.4	320	7.5				
143	22.7	6.8	295	7.0				
145	23.0	6.8	295	7.1				
159	22.7	7.0	285	6.9				
170	22.9	7.1	290	6.9				
179	22.7	7.2	290	7.0				
204	22.8	7.2	295	6.9				
216	22.9	7.3	295	6.9				
217	22.9	7.1	290	6.9				
221	22.9	6.4	315	7.8				
227	22.8	7.1	285	7.0				
229	22.8	6.5	300	7.6				
250	23.1	6.8	300	7.0				
255	23.2	6.9	300	7.1				
								Water changed in all
								beakers.
								Time: 0655
								Initials: MB
								Water changed in all
								beakers.
								Time: 1700
								Initials: BBP

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator _____

DAILY RECORD SHEET

Day 14 (5/19/05 Sun

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.0							Each beaker fed 1.0 ml
12	22.9							YTC suspension
21	22.9							Initials: EJL
29	22.9							
31	22.9							
37	23.0							
40	22.9							
41	22.8							
43	22.8							
51	22.9							
52	22.9							
60	23.1							
76	22.9							
78	22.9							
80	23.1							
94	23.0							
100	23.1							
121	23.0							
137	22.9							
143	22.9							
145	23.1							
159	23.0							
170	23.0							
179	22.9							
204	22.9							
216	23.0							
217	22.9							
221	23.0							
227	22.9							
229	22.9							
250	23.2							
255	23.3							
								Water changed in all
								beakers.
								Time: 0635
								Initials: UB
								Water changed in all
								beakers.
								Time: 700
								Initials: BBP

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 15 (5 /20 /05)

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.1	7.6		7.1				Each beaker fed 1.0 ml
12	23.0	6.6		7.1				YTC suspension
21	23.0	6.8		7.1				Initials: GB
29	22.9	6.9		7.0				
31	23.0	7.0		7.0				
37	22.9	7.4		7.0				
40	23.0	7.4		7.0				
41	23.0	7.4		7.1				
43	22.9	7.4		7.0				
51	22.9	7.5		7.0				
52	23.0	7.4		7.0				
60	23.2	6.6		7.0				
76	23.0	6.6		7.0				
78	23.0	6.7		7.1				
80	23.2	7.0		7.0				
94	23.1	7.0		6.9				
100	23.2	7.0		7.0				
121	23.0	7.4		7.0				
137	23.0	6.6		7.5				
143	22.9	6.8		7.1				
145	23.1	6.9		7.2				
159	23.0	7.1		7.0				
170	23.2	7.2		7.1				
179	23.0	7.4		7.1				
204	23.0	7.4		7.0				
216	23.0	7.4		7.1				
217	23.1	7.4		7.1				
221	23.1	6.3		7.8				
227	23.0	7.1		7.0				
229	23.0	6.6		7.8				
250	23.3	7.0		7.1				
255	23.4	7.1		7.2				
								Water changed in all
								beakers.
								Time: 0655
								Initials: GJ
								Water changed in all
								beakers.
								Time: 1715
								Initials: AJ

*Water quality measurements to be taken.

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 16 (5/21/05)MD

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.9							Each beaker fed 1.0 ml
12	22.9							YTC suspension
21	22.8							Initials: MB
29	22.6							
31	22.6							
37	22.6							
40	22.5							
41	22.6							
43	22.6							
51	22.5							
52	22.5							
60	22.7							
76	22.5							
78	22.5							
80	22.5							
94	22.7							
100	22.6							
121	22.6							
137	22.5							
143	22.4							
145	22.4							
159	22.5							
170	22.5							
179	22.4							
204	22.5							
216	22.5							
217	22.5							
221	22.6							
227	22.5							
229	22.7							
250	22.9							
255	22.8							
								Water changed in all
								beakers.
								Time: 0715
								Initials: MB
								Water changed in all
								beakers.
								Time: 1800
								Initials: MB

*Water quality measurements to be taken.

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 17 (5/22/08)

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.8							Each beaker fed 1.0 ml
12	22.9							YTC suspension
21	22.7							Initials: MB
29	22.7							
31	22.7							
37	22.8							
40	22.9							
41	22.8							
43	22.7							
51	22.8							
52	22.9							
60	22.9							
76	22.9							
78	22.8							
80	23.1							
94	23.0							
100	23.1							
121	22.9							
137	22.9							
143	22.8							
145	23.0							
159	22.8							
170	23.0							
179	22.5							
204	22.9							
216	22.9							
217	22.9							
221	22.9							
227	22.9							
229	22.9							
250	23.2							
255	23.4							
								Water changed in all
								beakers.
								Time: 0720
								Initials: MB
								Water changed in all
								beakers.
								Time: 1810
								Initials: DJ

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 18 (5 23 65) MB/GJL

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.1	7.6		7.0				Each beaker fed 1.0 ml
12	22.9	6.6		7.0				YTC suspension
21	22.9	7.0		7.0				Initials: GJL
29	22.9	7.1		6.9				
31	22.9	7.2		6.9				
37	22.9	7.3		6.9				
40	23.1	7.4		6.9				
41	22.9	7.5		6.9				
43	22.9	7.6		6.9				
51	23.1	7.5		6.9				
52	23.0	7.4		6.9				
60	23.3	6.7		6.8				
76	23.0	6.6		6.8				
78	23.0	6.9		6.9				
80	23.3	7.4	6510 5-23-05	6.9				
94	23.1	7.0		6.8				
100	23.2	7.2		6.8				
121	23.1	7.6		6.8				
137	23.0	7.2		7.4				
143	23.0	7.3		7.0				
145	23.2	7.3		7.0				
159	23.0	7.4		6.9				
170	23.2	7.6		6.9				
179	23.0	7.7		7.0				
204	23.0	7.8		7.0				
216	23.1	7.8		6.9				
217	23.0	7.8		7.0				
221	23.0	6.8		6.9				
227	22.9	7.5		6.9				
229	23.0	7.2		7.5				
250	23.3	7.4		7.0				
255	23.4	7.5		7.1				
								Water changed in all
								beakers. 0650 5-23-05
								Time: 0750
								Initials: MB
								Water changed in all
								beakers.
								Time: 1705
								Initials: DJ

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator _____

DAILY RECORD SHEET

Day 19 (5/24/05) MB/GJ

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.9							Each beaker fed 1.0 ml
12	22.8							YTC suspension
21	22.9							Initials: GJL
29	22.8							
31	22.9							
37	22.8							
40	22.8							
41	22.8							
43	22.8							
51	22.9							
52	22.8							
60	23.0							
76	22.8							
78	22.8							
80	23.0							
94	22.8							
100	22.9							
121	22.9							
137	22.7							
143	22.7							
145	23.0							
159	22.8							
170	22.9							
179	22.9							
204	22.8							
216	22.9							
217	22.8							
221	22.9							
227	22.8							
229	22.8							
250	23.0							
255	23.2							
								Water changed in all
								beakers.
								Time: 0645
								Initials: MB
								Water changed in all
								beakers.
								Time: 1715
								Initials: GJ

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 20 (5 125 05) BBP/mm

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond.* (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.0	6.1	285	6.9				Each beaker fed 1.0 ml
12	22.9	4.5	300	6.8				YTC suspension
21	22.9	5.4	285	6.8				Initials: VB
29	22.9	5.3	285	6.8				
31	22.9	5.6	285	6.8				
37	22.8	6.0	310	6.9				
40	23.0	6.0	290	6.9				
41	22.9	5.8	285	6.9				
43	22.9	5.9	280	6.8				
51	23.1	6.0	285	6.8				
52	23.0	5.4	285	6.8				
60	23.0	5.0	285	6.8				
76	23.1	4.8	290	6.8				
78	22.9	5.5	280	6.8				
80	23.1	6.2	280	6.9				
94	22.9	5.1	280	6.7				
100	23.2	5.7	280	6.8				
121	22.9	6.5	280	6.8				
137	22.9	5.8	295	7.2				
143	22.8	5.3	285	6.8				
145	23.1	5.8	280	6.9				
159	22.9	6.7	280	6.9				
170	23.0	6.2	280	6.9				
179	22.9	6.4	280	7.0				
204	23.0	6.6	280	7.0				
216	23.0	6.6	280	6.9				
@BBP 5-27-05 217	22.0 23.0	6.3	280	7.0				
221	23.0	5.2	300	7.4				
227	22.9	6.1	280	7.0				
229	23.0	5.5	295	7.2				
250	23.2	6.0	285	7.0				
255	23.4	6.5	290	7.1				
								Water changed in all
								beakers.
								Time: 0650
								Initials: GSL
								Water changed in all
								beakers.
								Time: 1720
								Initials: BBP

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 21 (5/26/05) VB

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.4							Each beaker fed 1.0 ml
12	23.3							YTC suspension
21	23.2							Initials: GJT
29	23.3							
31	23.3							
37	23.4							
40	23.4							
41	23.3							
43	23.3							
51	23.3							
52	23.3							
60	23.4							
76	23.2							
78	23.2							
80	23.4							
94	23.3							
100	23.4							
121	23.3							
137	23.2							
143	23.2							
145	23.2							
159	23.3							
170	23.2							
179	23.3							
204	23.2							
216	23.2							
217	23.2							
221	23.2							
227	23.2							
229	23.2							
250	23.4							
255	23.5							
								Water changed in all
								beakers.
								Time: 0720
								Initials: VB
								Water changed in all
								beakers.
								Time: 1700
								Initials: VB

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 22 (5/27/05)

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.1	6.2		6.9				Each beaker fed 1.0 ml
12	22.9	4.5		6.9				YTC suspension
21	22.9	5.3		6.9				Initials: GJZ
29	22.9	5.4		7.0				
31	22.9	5.2		7.0				
37	22.8	5.7		7.0				
40	23.0	5.6		7.1				
41	22.9	5.6		7.1				
43	22.8	5.5		7.0				
51	22.9	6.0		7.2				
52	22.9	5.2		7.1				
60	23.1	5.2		7.1				
76	22.9	5.1		7.1				
78	22.8	5.1		7.1				
80	23.0	5.7		7.2				
94	22.9	4.6		7.0				
100	23.0	5.6		7.2				
121	22.9	6.2		7.2				
137	22.7	5.3		7.4				
143	22.7	5.0		7.2				
145	23.0	5.3		7.1				
159	22.8	5.6		7.2				
170	22.9	5.9		7.2				
179	22.8	6.0		7.2				
204	22.8	5.6		7.2				
216	22.9	6.0		7.2				
217	22.9	6.0		7.2				
221	22.9	4.8		7.5				
227	22.8	5.8		7.2				
229	22.8	5.3		7.3				
250	23.0	6.8		7.2				
255	23.2	6.3		7.4				
								Water changed in all
								beakers.
								Time: 0625
								Initials: GJZ
								Water changed in all
								beakers.
								Time: 1655
								Initials: BBP

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator _____

DAILY RECORD SHEET

Day 23 (5/28/15) MS

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.3							Each beaker fed 1.0 ml
12	23.2							YTC suspension
21	23.2							Initials: MS
29	23.0							
31	23.0							
37	23.0							
40	23.1							
41	23.1							
43	23.0							
51	23.1							
52	23.1							
60	23.1							
76	23.2							
78	23.0							
80	23.2							
94	23.1							
100	23.2							
121	23.1							
137	23.0							
143	23.0							
145	23.1							
159	23.0							
170	23.1							
179	23.0							
204	23.1							
216	23.1							
217	23.1							
221	23.1							
227	23.0							
229	23.0							
250	23.3							
255	23.4							
								Water changed in all
								beakers.
								Time: 0635
								Initials: MS
								Water changed in all
								beakers.
								Time: 1730
								Initials: MS

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 24 (5/29/05) GJ

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.0							Each beaker fed 1.0 ml
12	22.9							YTC suspension
21	22.8							Initials: GJ
29	22.8							
31	22.8							
37	22.7							
40	22.8							
41	22.8							
43	22.7							
51	22.8							
52	22.8							
60	23.0							
76	22.8							
78	22.7							
80	23.0							
94	22.8							
100	23.0							
121	22.9							
137	22.8							
143	22.7							
145	22.9							
159	22.7							
170	22.9							
179	22.7							
204	22.8							
216	22.8							
217	22.8							
221	22.8							
227	22.8							
229	22.8							
250	23.1							
255	23.2							
								Water changed in all
								beakers.
								Time: 0645
								Initials: GJ
								Water changed in all
								beakers.
								Time: 1740
								Initials: BBP

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 25 (5/30/05) GJ

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.4	5.6		6.9				Each beaker fed 1.0 ml
12	23.0	4.2		7.0				YTC suspension
21	22.9	5.3		6.9				Initials: GJ
29	22.9	5.2		6.9				
31	22.9	5.6		7.0				
37	22.8	6.0		7.0				
40	23.0	5.8		7.0				
41	22.9	5.8		7.1				
43	22.9	5.9		6.9				
51	23.0	6.6		7.1				
52	22.9	5.5		7.0				
60	23.2	4.7		6.9				
76	23.0	3.8		6.8				
78	22.9	5.0		7.0				
80	23.2	5.8		7.1				
94	23.0	4.5		6.8				
100	23.1	5.6		7.0				
121	22.9	7.1		7.1				
137	22.8	5.6		7.3				
143	22.8	5.1		7.0				
145	22.8	5.8		7.1				
159	22.8	5.9		7.1				
170	22.9	6.2		7.0				
179	22.8	6.4		7.2				
204	22.9	6.9		7.1				
216	22.9	5.7		7.0				
217	22.9	6.4		7.1				
221	22.9	5.2		7.4				
227	22.9	6.1		7.1				
229	22.9	5.5		7.1				
250	23.2	6.1		7.2				
255	23.3	6.9		7.4				
								Water changed in all
								beakers.
								Time: 0640
								Initials: GJ
								Water changed in all
								beakers.
								Time: 19:00
								Initials: MR

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator _____

DAILY RECORD SHEET

Day 26 (5/31/05 UB/mm

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.0							Each beaker fed 1.0 ml
12	22.9							YTC suspension
21	22.9							Initials: EJT
29	22.8							
31	22.9							
37	22.8							
40	23.0							
41	22.9							
43	22.9							
51	23.0							
52	22.9							
60	23.1							
76	22.9							
78	22.8							
80	23.0							
94	22.9							
100	23.1							
121	22.9							
137	22.8							
143	22.8							
145	23.0							
159	22.9							
170	22.9							
179	22.8							
204	22.9							
216	22.9							
217	22.9							
221	22.9							
227	22.8							
229	22.9							
250	23.1							
255	23.2							
								Water changed in all
								beakers.
								Time: 0635
								Initials: UB
								Water changed in all
								beakers.
								Time: 1700
								Initials: AF

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 27 (6/11/05) DJ

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond.* (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.2	6.7	275	6.9				Each beaker fed 1.0 ml
12	22.9	4.2	290	6.8				YTC suspension
21	22.9	5.6	275	6.8				Initials: GJL
29	22.8	5.2	275	6.7				
31	22.8	5.4	280	6.8				
37	22.6	5.9	275	6.8				
40	22.9	5.8	275	6.9				
41	22.8	5.7	275	6.9				
43	22.7	5.5	275	6.9				
51	22.9	7.1	275	7.0				
52	22.8	5.6	275	6.9				
60	23.0	4.8	275	6.8				
76	22.8	3.9	280	6.8				
78	22.7	5.0	275	6.8				
80	23.0	6.2	280	7.0				
94	22.8	4.6	275	6.7				
100	23.0	5.8	275	6.9				
121	22.8	7.2	270	7.1				
137	22.7	5.4	300	7.3				
143	22.6	5.0	280	6.9				
145	23.0	5.7	275	6.9				
159	22.7	5.9	275	7.2				
170	22.9	5.9	275	7.0				
179	22.7	6.3	275	7.1				
204	22.8	7.0	275	7.2				
216	22.9	5.8	275	7.0				
217	22.8	6.4	275	7.1				
221	22.8	5.2	290	7.3				
227	22.7	6.2	275	7.0				
229	22.8	5.6	285	7.1				
250	23.1	6.4	280	7.2				
255	23.2	6.3	280	7.4				
								Water changed in all beakers.
								Time: 0635
								Initials: GJL
								Water changed in all beakers.
								Time: 1730
								Initials: DJ

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator

DAILY RECORD SHEET

Day 28 (12 05) VB/BBP

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond.* (umhos/cm)	pH*	Hardness* (mg/L)	Alkalinity* (mg/L	NH3* (ppm)	Comments
3	23.2	6.8	280	7.0	86	70		Each beaker fed 1.0 ml
12	22.9	3.5	315	6.7	103	90		YTC suspension
21	22.8	4.8	280	6.6	86	70		Initials:
29	22.7	5.0	285	6.6	94	70		
31	22.7	5.6	290	6.5	103	60		
37	22.8	6.2	280	6.6	86	60		
40	22.7	5.8	280	6.7	94	60		
41	22.8	5.8	285	6.7	86	70		
43	22.8	5.5	280	6.6	86	60		
51	22.9	6.1	280	6.7	77	60		
52	22.8	5.2	280	6.8	77	70		
60	22.8	5.2	280	6.6	86	70		
76	22.9	3.0	300	6.5	94	80		
78	22.7	4.8	285	6.6	77	60		
80	22.9	6.0	285	6.7	77	60		
94	22.7	5.2	275	6.5	77	70		
100	22.9	6.0	280	6.7	77	60		
121	22.7	6.1	275	6.7	86	70		
137	22.6	5.4	320	7.1	120	90		
143	22.6	5.5	290	6.8	86	60		
145	22.8	6.1	280	6.7	77	60		
159	22.6	5.0	280	6.9	77	60		
170	22.7	5.7	280	6.9	77	60		
179	22.6	6.0	285	6.9	86	70		
204	22.6	6.6	280	6.9	77	70		
216	22.7	6.2	285	6.9	86	70		
217	22.7	6.5	285	7.0	86	70		
221	22.7	6.6	325	7.0	111	90		
227	22.6	6.0	280	6.8	77	60		
229	22.7	5.8	305	6.9	94	80		
250	22.9	5.4	295	6.9	94	70		
255	22.9	5.9	295	7.0	94	80		
								Water changed in all
								beakers.
								Time: 0645
								Initials: VB
								Water changed in all
								beakers.
								Time:
								Initials:

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator _____

DAY 28 TEST TERMINATION SHEET

Beaker No.	Number of survivors	Initials
1	10	UB
2	9	UB
3	9	GJL
4	9	UB
5	8	GJL
6	10	UB
7	10	GJL
8	10	UB
9	9	GJL
10	10	UB
11	8	GJL
12	10	UB
13	10	UB
14	8	GJL
15	10	UB
16	10	GJL
17	10	UB
18	10	GJL
19	10	UB
20	10	GJL
21	10	UB
22	3	GJL
23	10	UB
24	0	UB
25	9	GJL
26	10	UB
27	10	GJL
28	10	UB
29	10	GJL
30	6-1-05 10 6	GJL
31	10	GJL
32	8	GJL
33	10	LWM
34	9	UB
35	10	LWM
36	10	GJL
37	8	LWM
38	8	GJL
39	10	UB
40	10	UB
41	10	GJL
42	10	UB
43	9	LWM
44	9	GJL
45	10	UB

Beaker No.	Number of survivors	Initials	
46	9	UB	
47	10	UB	
48	10	UB	
49	9	LWM	
50	8	LWM	
51	10	GJL	
52	10	GJL	
53	10	UB	
54	10	GJL	
55	10	LWM	
56	10	UB	
57	10	GJL	
58	10	UB	
59	10	GJL	
60	UB 6-1-05 10 8	LWM	
61	10	UB	
62	10	GJL	
63	8	LWM	
64	10	GJL	
65	6	UB	
66	9	GJL	
67	8	UB	
68	8	GJL	
69	10	LWM	
70	10	LWM	
71	10	UB	
72	9	GJL	
73	9	LWM	
74	8	UB	
75	9	GJL	
76	10	UB	
77	6-1-05 GJL 10 9 10	LWM	corrected count 6-16-05 LWM
78	10	GJL	
79	9	UB	
80	9	GJL	
81	10	LWM	
82	9	UB	
83	10	GJL	
84	6-1-05 9 10	LWM	
85	9	UB	
86	10	GJL	
87	10	LWM	
88	10	GJL	
89	10	UB	
90	10	LWM	

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator _____

DAY 28 TEST TERMINATION SHEET

Beaker No.	Number of survivors	Initials
91	10	UB
92	9	GJL
93	10	UB
94	9	GJL
95	10	WPM
96	9	GJL
97	10	WPM
98	10	UB
99	10	WPM
100	10	GJL
101	10	UB
102	10	GJL
103	10	UB
104	10	WPM
105	6	GJL
106	9	UB
107	10	WPM
108	9	GJL
109	11	WPM
110	10	UB
111	9	GJL
112	10	WPM
113	9	GJL
114	10	UB
115	10	UB
116	9	GJL
117	9	WPM
118	10	UB
119	10	UB
120	10	GJL
121	10	UB
122	10	GJL
123	9	UB
124	10	GJL
125	9	GJL
126	68 WPM @ 10	UB
127	8	UB
128	9	GJL
129	10	UB
130	10	GJL
131	10	UB
132	10	GJL
133	9	UB
134	8	GJL
135	10	WPM

Beaker No.	Number of survivors	Initials
136	9	WPM
137	9	UB
138	10	GJL
139	9	GJL
140	10	UB
141	10	WPM
142	8	UB
143	8	GJL
144	10	WPM
145	10	UB
146	10	GJL
147	10	WPM
148	9	GJL
149	9	WPM
150	9	UB
151	9	GJL
152	9	WPM
153	9	UB
154	8	GJL
155	10	UB
156	9	WPM
157	10	UB
158	10	GJL
159	10	UB
160	9	GJL
161	10	GJL
162	10	WPM
163	10	UB
164	9	GJL
165	10	UB
166	7	WPM
167	9	UB
168	10	GJL
169	9	WPM
170	10	UB
171	10	GJL
172	10	GJL
173	9	GJL
174	9	UB
175	9	WPM
176	10	GJL
177	9	UB
178	10	GJL
179	10	WPM
180	9	GJL

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 6J2 Client CH2M Hill Investigator

DAY 28 TEST TERMINATION SHEET

Beaker No.	Number of survivors	Initials
181	10	UB
182	10	UB
183	7	UB
184	9	UB
185	10	UB
186	10	UB
187	10	MM
188	10	UB
189	8	UB
190	10	UB
191	10	6J1
192	9	UB
193	9	MM
194	10	6J1
195	10	6J1
196	10	UB
197	11	6J1
198	8	UB
199	10	6J1
200	9	MM
201	10	6J1
202	10	6J1
203	10	UB
204	10	MM
205	8	6J1
206	10	UB
207	10	6J1
208	9	UB
209	10	MM
210	10	6J1
211	10	UB
212	10	MM
213	10	6J1
214	9	UB
215	9	6J1
216	10	MM
217	10	UB
218	5	6J1
219	10	UB
220	9	MM
221	10	UB
222	10	6J1
223	9	UB
224	10	MM

Beaker No.	Number of survivors	Initials
225	10	6J1
226	8	6J1
227	10	MM
228	9	UB
229	9	MM
230	10	6J1
231	10	UB
232	10	6J1
233	8	UB
234	9	MM
235	10	6J1
236	10	6J1
237	10	MM
238	10	UB
239	9	6J1
240	10	UB
241	10	MM
242	7	6J1
243	10	UB
244	10	MM
245	10	6J1
246	8	UB
247	10	6J1
248	9	MM
249	9	UB
250	7	6J1
251	7	UB
252	10	MM
253	10	6J1
254	10	6J1
255	10	UB
256	10	MM
257		
258		
259		
260		
261		
262		
263		
264		
265		
266		
267		
268		

Test No. 727-2 Client CH2M Hill Investigator

ZERO-TIME WEIGHING DATA SHEET

Tare: Date 4-26-05 Oven temp (C.) 62 Drying time (hr.) 48 Initials GJL
Standard Weights: 10 mg: 10.006 100mg: 100.016

Final: Date 5-2-05 Oven temp (C.) 64 Drying time (hr.) 24 Initials GJL
Standard Weights: 10 mg: 10.006 100mg: 100.018

Equip. used: Oven: BLUE M #1 Balance: SARTORIUS M3P

(Dry overnight at 60-90 degrees C)

Pan #	Tare wt. (mg)	Total wt. (mg)	#weighed	Comments
1	28.872	29.519	20	
2	32.641	33.324	20	
3	29.956	30.606	20	
4	31.208	31.826	20	
5	29.216	29.809	20	

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 Client CH2M Hill Investigator

WEIGHING DATA SHEET

Tare: Date 5-26-05 Oven temp (C.) 63 Drying time (hr.) 48 Initials JRF
Standard Weights: 10 mg: 10.008 100mg: 100.013

Final #1: Date 6-6-05 Oven temp (C.) 62 Drying time (hr.) 24 Initials JRF
Standard Weights: 10 mg: 10.006 100mg: 100.012

Final #2: Date 6-9-05 Oven temp (C.) 63 Drying time (hr.) 24 Initials JRF
Standard Weights: 10 mg: 10.005 100mg: 100.012

Equip. used: Oven BLUE M #1 Balance SARTORIUS M3P
(Dry overnight at 60-90 degrees C)

Bkr. #	Pan #	Tare wt. (mg)	Total wt. (mg) 1	Total wt. (mg) 2	no. weighed	put into pans-initials	Comments
1	1	28.111	32.603	32.571	10	MSR	
2	2	31.655	34.759	34.745	9	MSR	
3	3	29.162	33.063	33.035	9	MSR	
4	4	28.522	31.292	31.272	9	MSR	
5	5	27.816	30.463	30.444	8	MSR	
6	6	30.710	33.720	33.702	10	MSR	
7	7	28.214	32.901	32.878	10	MSR	
8	8	28.788	31.624	31.609	10	MSR	
9	9	29.006	32.000	31.978	9	MSR	
10	10	28.479	30.539	30.530	10	MSR	
11	11	29.621	32.559	32.537	8	MSR	
12	12	26.531	31.068	31.039	10	MSR	
13	13	26.366	29.162	29.142	10	MSR	
14	14	30.595	33.602	32.972	8	MSR	
15	15	28.291	31.593	31.536	10	MSR	
16	16	28.239	30.497	30.450	10	MSR	
17	17	28.763	32.800	32.746	10	MSR	
18	18	29.542	33.122	33.070	10	MSR	
19	19	28.185	30.628	30.574	9	MSR	1 missing
20	20	28.998	32.764	32.708	10	MSR	
21	21	29.118	32.085	32.070	10	MSR	
22	22	27.956	29.328	29.319	3	MSR	
23	23	29.424	33.707	33.667	10	MSR	
24	24	30.351	—	—	—	—	
25	25	27.898	31.555	31.541	9	MSR	
26	26	28.316	31.064	31.054	10	MSR	
27	27	29.488	33.296	33.280	10	MSR	
28	28	29.610	33.594	33.573	10	MSR	
29	29	28.818	32.522	32.502	10	MSR	
30	30	29.097	30.798	30.786	6	MSR	
31	31	28.097	31.567	31.546	10	BBP	
32	32	28.713	30.855	30.836	8	BBP	
33	33	29.505	33.556	33.529	10	BBP	

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-7 2 632 Client CH2M Hill Investigator

WEIGHING DATA SHEET

See page _____ for information on drying times and temperatures, standard weights,etc.

Bkr. #	Pan #	Tare wt. (mg)	Total wt. (mg) 1	Total wt. (mg) 2	no. weighed	put into pans-initials	Comments
34	34	29.361	34.283	34.258	9	BBP	
35	35	29.124	33.030	33.011	10	BBP	
36	36	26.318	32.657	32.634	10	BBP	
37	37	26.284	32.654	32.633	8	BBP	
38	38	29.622	32.724	32.711	8	BBP	
39	39	28.456	32.232	32.217	10	BBP	
40	40	27.778	30.877	30.865	10	BBP	
41	41	29.988	33.304	33.291	10	BBP	
42	42	26.557	31.763	31.754	9	BBP	
43	43	27.575	32.459	32.438	9	BBP	
44	44	28.986	34.172	34.155	9	BBP	
45	45	28.968	31.866	31.860	10	BBP	
46	46	28.413	30.591	30.588	9	BBP	
47	47	29.287	32.953	32.941	10	BBP	
48	48	31.283	34.115	34.103	9	BBP	
49	49	26.033	31.000	30.987	9	BBP	
50	50	27.671	30.433	30.430	8	BBP	
51	51	28.828	32.882	32.864	10	BBP	
52	52	27.888	31.591	31.578	10	BBP	
53	53	28.236	31.715	31.710	10	BBP	
54	54	28.795	32.403	32.414	10	BBP	
55	55	30.058	33.814	33.798	10	AJ	
56	56	30.207	34.284	34.282	10	AJ	
57	57	27.779	32.427	32.419	10	AJ	
58	58	27.559	32.960	32.948	10	AJ	
59	59	28.131	33.004	32.994	10	AJ	
60	60	28.083	31.946	31.927	8	AJ	
61	61	27.654	31.590	31.582	10	AJ	
62	62	29.238	33.232	33.226	10	AJ	
63	63	28.617	30.024	30.025	8	AJ	
64	64	29.330	33.477	33.467	10	AJ	
65	65	27.907	31.354	31.341	6	AJ	
66	66	27.956	32.713	32.697	9	AJ	
67	67	27.774	30.839	30.826	8	AJ	
68	68	28.183	31.867	31.848	8	AJ	
69	69	27.444	31.127	31.112	10	AJ	
70	70	30.077	33.917	33.902	10	AJ	
71	71	29.507	33.319	33.303	10	AJ	
72	72	30.394	33.644	33.625	9	AJ	
73	73	28.851	31.929	31.911	9	AJ	
74	74	28.764	31.001	30.986	8	AJ	
75	75	29.579	33.806	33.787	9	AJ	
76	76	28.591	31.900	31.883	10	AJ	

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2631 Client CH2M Hill Investigator ______

WEIGHING DATA SHEET

See page ______ for information on drying times and temperatures, standard weights,etc.

Bkr. #	Pan #	Tare wt. (mg)	Total wt. (mg)		no. weighed	put into pans-initials	Comments
			1	2			
77	77	28.929	32.384	32.368	10	AJ	
78	78	28.902	35.268	35.241	10	AJ	
79	79	29.326	33.538	33.521	9	AJ	
80	80	28.167	33.211	33.191	9	AJ	
81	81	29.340	33.105	33.089	10	AJ	
82	82	28.037	32.549	32.531	9	AJ	
83	83	27.066	29.808	29.793	10	AJ	
84	84	29.961	33.162	33.145	10	AJ	
85	85	28.553	29.886	29.872	9	AJ	
86	86	28.851	34.8263	34.802	10	AJ	
87	87	28.208	32.865	32.842	10	AJ	
88	88	29.397	34.383	34.360	10	AJ	
89	89	28.808	34.205	34.161	10	AJ	
90	90	28.670	32.024	31.993	10	AJ	
91	91	27.742	31.788	31.762	10	AJ	
92	92	28.152	30.845	30.820	9	AJ	
93	93	29.787	34.560	34.536	10	AJ	
94	94	28.396	33.571	33.544	9	AJ	
95	95	30.429	34.208	34.194	10	AJ	
96	96	28.114	32.331	32.316	9	AJ	
97	97	30.017	34.545	34.542	10	AJ	
98	98	27.640	31.349	31.329	10	AJ	
99	99	27.449	32.514	32.495	10	AJ	
100	100	27.563	30.508	30.494	10	AJ	
101	101	29.956	33.775	33.763	10	AJ	
102	102	27.924	31.570	31.555	10	AJ	
103	103	29.486	33.511	33.503	10	AJ	
104	104	28.214	33.576	33.559	10	AJ	
105	105	26.645	27.911	27.904	6	AJ	
106	106	29.335	34.763	34.745	9	AJ	
107	107	29.423	34.546	34.520	10	AJ	
108	108	28.833	33.064	33.050	9	AJ	
109	109	27.700	33.282	33.261	11	AJ	
110	110	28.563	34.087	34.069	10	AJ	
111	111	27.067	32.709	32.690	9	AJ	
112	112	29.547	33.685	33.651	10	AJ	
113	113	31.287	33.591	33.565	9	AJ	
114	114	28.198	32.202	32.170	10	AJ	
115	115	30.942	36.272	36.206	10	BBP	
116	116	28.292	30.449	30.412	9	BBP	
117	117	27.752	31.915	31.849	9	BBP	
118	118	29.509	33.623	33.567	10	BBP	
119	119	28.994	32.702	32.657	10	BBP	

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-2 632 Client CH2M Hill Investigator

WEIGHING DATA SHEET

See page _____ for information on drying times and temperatures, standard weights,etc.

Bkr. #	Pan #	Tare wt. (mg)	Total wt. (mg) 1	Total wt. (mg) 2	no. weighed	put into pans-initials	Comments
120	120	29.434	33.714	33.660	10	BBP	
121	121	29.978	32.747	32.704	10	BBP	
122	122	29.499	33.346	33.301	10	BBP	
123	123	30.054	32.833	32.787	9	BBP	
124	124	28.177	30.724	30.678	10	BBP	
125	125	30.190	33.104	33.065	9	BBP	
126	126	30.279	34.665	34.635	10	BBP	
127	127	28.949	31.552	31.543	8	BBP	
128	128	29.734	32.499	32.483	9	BBP	
129	129	28.190	JF 31.894 894	31.872	10	BBP	
130	130	30.185	35.404	35.387	10	BBP	
131	131	29.456	36.023	35.986	10	BBP	
132	132	29.974	33.943	33.923	10	BBP	
133	133	28.728	32.772	32.748	9	BBP	
134	134	27.060	30.324	30.296	8	BBP	
135	135	28.233	33.188	33.147	10	BBP	
136	136	28.626	32.051	32.030	9	BBP	
137	137	25.899	30.480	30.461	9	BBP	
138	138	27.536	31.065	31.047	10	BBP	
139	139	27.822	31.278	31.268	9	BBP	
140	140	29.405	32.821	32.809	10	BBP	
141	141	28.623	32.445	32.440	10	BBP	
142	142	28.958	33.817	33.794	8	BBP	
143	143	28.735	32.300	32.276	8	BBP	
144	144	28.259	31.634	31.616	10	BBP	
145	145	28.282	32.856	32.831	10	BBP	
146	146	29.316	33.647	33.621	10	BBP	
147	147	29.580	32.716	32.708	10	BBP	
148	148	28.708	32.130	32.123	9	BBP	
149	149	28.223	33.556	33.529	9	BBP	
150	150	29.427	32.842	32.849	9	BBP	
151	151	29.200	32.492	32.488	9	AH	
152	152	27.844	31.068	31.068	9	AH	
153	153	28.955	35.299	35.270	9	AH	
154	154	28.139	31.071	31.064	8	AH	
155	155	27.154	31.501	31.472	10	AH	
156	156	28.503	30.516	30.524	9	AH	
157	157	30.762 28.181	32.410	32.398	10	AH	Tare=28.181
158	158	30.762	33.810	33.802	10	AH	
159	159	29.102	32.517	32.509	10	AH	
160	160	26.760	30.520	30.507	9	AH	
161	161	27.320	32.664	32.639	10	AH	
162	162	27.930	32.351	32.338	10	AH	

Test No. 727-~~1~~ 2 [illegible] Client CH2M Hill Investigator ______

WEIGHING DATA SHEET

See page ______ for information on drying times and temperatures, standard weights,etc.

Bkr. #	Pan #	Tare wt. (mg)	Total wt. (mg) 1	Total wt. (mg) 2	no. weighed	put into pans-initials	Comments
163	163	28.298	31.968	31.953	10	AL	
164	164	28.172	32.569	32.541	9	AL	
165	165	28.588	33.554	33.521	10	AL	
166	166	28.705	32.700	32.685	7	AL	
167	167	28.979	32.135	32.125	9	AL	
168	168	28.001	30.725	30.715	10	AL	
169	169	27.782	30.120	30.117	9	AL	
170	170	27.127	28.854	28.853	10	AL	
171	171	27.441	30.986	30.968	10	AL	
172	172	27.856	34.576	34.537	10	AL	
173	173	28.267	33.105	33.088	9	AL	
174	174	30.056	34.316	34.292	9	AL	
175	175	28.778	~~34.316~~ 35.004	35.009	9	AL	
176	176	28.755	33.559	33.569	10	AL	
177	177	27.810	31.529	31.544	9	AL	
178	178	28.680	32.306	32.319	10	AL	
179	179	29.832	33.473	33.477	10	AL	
180	180	28.713	32.492	32.493	9	AL	
181	181	28.207	32.572	32.581	10	AL	
182	182	28.647	33.006	33.018	10	AL	
183	183	30.364	31.591	31.607	7	AL	
184	184	29.748	31.108	31.124	9	AL	
185	185	27.209	32.380	32.385	10	AL	
186	186	29.242	33.134	33.137	10	AL	
187	187	29.176	33.796	33.804	10	AL	
188	188	29.478	32.362	32.375	10	AL	
189	189	29.199	31.140	31.152	8	AL	
190	190	28.705	32.195	32.204	10	AL	
191	191	27.350	32.823	32.823	10	AL	
192	192	29.428	34.107	34.114	9	AL	
193	193	29.989	33.403	33.409	9	AL	
194	194	28.954	~~35.629~~	34.983	10	AL	TOTAL WT #1 = 34.978
195	195	29.610	35.629	35.635	10	AL	
196	196	30.339	35.609	35.613	10	AL	
197	197	26.888	29.621	29.633	11	AL	
198	198	28.358	31.269	31.273	8	AL	
199	199	29.720	33.276	33.280	~~9~~ 10 (2) [illegible]	AL	
200	200	27.844	32.608	32.597	~~10~~ 9 [illegible]	AL	
201	201	28.989	30.807	30.816	10	(2) BBP 6-2-05 10 BBP	
202	202	28.958	32.765	32.773	10	10 BBP	
203	203	29.144	33.690	33.695	10	10 BBP	
204	204	28.482	31.837	31.847	10	10 BBP	
205	205	30.073	33.970	33.981	8	8 BBP	

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-3 651 Client CH2M Hill Investigator

WEIGHING DATA SHEET

See page _____ for information on drying times and temperatures, standard weights,etc.

Bkr. #	Pan #	Tare wt. (mg)	Total wt. (mg) 1	Total wt. (mg) 2	no. weighed	put into pans-initials	Comments
206	206	28.628	33.756	33.760	10	BBP	
207	207	30.247	34.463	34.472	10	BBP	
208	208	28.989	32.917	32.931	9	BBP	
209	209	28.709	31.702	31.711	10	BBP	
210	210	28.240	32.805	32.808	10	BBP	
211	211	30.185	34.373	34.381	10	BBP	
212	212	33.125	38.061	38.062	10	BBP	
213	213	30.184	34.499	34.508	10	BBP	
214	214	28.071	31.624	31.611	9	BBP	
215	215	27.702	31.365	31.340	9	BBP	
216	216	28.333	31.130	31.126	10	BBP	
217	217	29.026	33.267	33.265	10	BBP	
218	218	26.574	29.545	29.545	5	BBP	
219	219	30.161	34.326	34.318	10	BBP	
220	220	29.618	33.627	33.624	9	BBP	
221	221	26.384	32.030	32.017	10	AJ	
222	222	28.701	33.828	33.817	10	AJ	
223	223	30.986	34.985	34.971	9	AJ	
224	224	29.237	33.663	33.640	10	AJ	
225	225	28.430	33.502	33.495	10	AJ	
226	226	28.606	31.056	31.038	8	AJ	
227	227	30.477	34.061	34.048	10	AJ	
228	228	29.263	33.026	33.010	9	AJ	
229	229	28.966	32.776	32.762	9	AJ	
230	230	27.710	32.607	32.592	10	AJ	
231	231	31.153	35.491	35.471	10	AJ	
232	232	29.897	33.160	33.148	10	AJ	
233	233	27.756	32.226	32.209	8	AJ	
234	234	28.051	34.602	34.578	9	AJ	
235	235	28.932	34.487	34.453	10	AJ	
236	236	28.591	34.4371 JF	34.340	10	AJ	
237	237	29.249	33.740	33.713	10	AJ	
238	238	29.874	35.118	35.087	10	AJ	
239	239	29.177	33.323	33.318	9	BBP	
240	240	28.817	35.614	35.602	10	BBP	
241	241	27.753	33.355	33.346	10	BBP	
242	242	28.730	30.903	30.904	7	BBP	
243	243	28.826	34.914	34.906	10	BBP	
244	244	30.330	34.515	34.512	10	BBP	
245	245	30.086	34.825	34.818	10	BBP	
246	246	28.906	32.241	32.240	8	BBP	
247	247	28.977	31.780	31.780	10	BBP	
248	248	27.179	31.094	31.090	9	BBP	
249	249	28.169	32.705	32.703	9	BBP	
250	250	29.454	33.439	33.436	7	BBP	

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 727-Y2 631 Client CH2M Hill Investigator

WEIGHING DATA SHEET

See page _____ for information on drying times and temperatures, standard weights,etc.

Bkr. #	Pan #	Tare wt. (mg)	Total wt. (mg) 1	Total wt. (mg) 2	no. weighed	put into pans-initials	Comments
251	251	28.898	31.282	31.279	7	BBP	
252	252	27.724	32.195	32.183	10	BBP	
253	253	28.458	33.149	33.143	10	BBP	
254	254	28.309	33.467	33.469	10	BBP	
255	255	26.553	32.829	32.831	10	BBP	
256	256	27.372	32.171	32.167	10	BBP	
257	257						
258	258						
259	259						
260	260						
261	261						
262	262						
263	263						
264	264						
265	265						
266	266						
267	267						
268	268						
269	269						
270	270						
271	271						
272	272						
273	273						
274	274						
275	275						
276	276						
277	277						
278	278						
279	279						
280	280						
281	281						
282	282						
283	283						
284	284						
285	285						
286	286						
287	287						
288	288						
289	289						
290	290						
291	291						
292	292						
293	293						
294	294						
295	295						

Chesapeake Cultures

P.O. Box 507 Hayes, VA 23072 (804) 693-4046 (804)694-4704 fax
www.c-cultures.com
e-mail growfish@c-cultures.com

NAS

Shipment Information

Species *Hyalella azteca* Date *5/2/05*

Age *~4-5 days 1.5 mm* P.O. No. *verbal*

Quanitity *3,400+* Invoice No. *5021*

Temperature *24°C* Salinity *—* pH *7.94*

Notes

RECEIVED 5-3-05
631

Biologist *SV Mann*

Please inspect shipment and report any problem immediately

BKR	NAS SMPL	CLIENT DESCRIP	REPL	
71	9952F	Contol	1	
9	9952F	Contol	2	
77	9952F	Contol	3	
102	9952F	Contol	4	
160	9952F	Contol	5	
91	9952F	Contol	6	
252	9952F	Contol	7	
52	9952F	Contol	8	wq replicate
44	9983F	05164470	1	
213	9983F	05164470	2	
99	9983F	05164470	3	
7	9983F	05164470	4	
89	9983F	05164470	5	
249	9983F	05164470	6	
133	9983F	05164470	7	
137	9983F	05164470	8	wq replicate
85	9985F	05164472	1	
184	9985F	05164472	2	
105	9985F	05164472	3	
169	9985F	05164472	4	
201	9985F	05164472	5	
10	9985F	05164472	6	
156	9985F	05164472	7	
170	9985F	05164472	8	wq replicate
131	9986F	05164473	1	
172	9986F	05164473	2	
195	9986F	05164473	3	
234	9986F	05164473	4	
194	9986F	05164473	5	
111	9986F	05164473	6	
153	9986F	05164473	7	
78	9986F	05164473	8	wq replicate
113	9987F	05164474	1	
251	9987F	05164474	2	
226	9987F	05164474	3	
70	9987F	05164474	4	
72	9987F	05164474	5	
198	9987F	05164474	6	
199	9987F	05164474	7	
76	9987F	05164474	8	wq replicate
157	9988F	05164475	1	
79	9988F	05164475	2	
38	9988F	05164475	3	
238	9988F	05164475	4	
245	9988F	05164475	5	
4	9988F	05164475	6	
162	9988F	05164475	7	
29	9988F	05164475	8	wq replicate
57	9989F	05164478	1	
161	9989F	05164478	2	
23	9989F	05164478	3	
177	9989F	05164478	4	
236	9989F	05164478	5	
212	9989F	05164478	6	
175	9989F	05164478	7	
221	9989F	05164478	8	wq replicate

BKR	NAS SMPL	CLIENT DESCRIP	REPL	
237	9990F	05164476	1	
138	9990F	05164476	2	
228	9990F	05164476	3	
244	9990F	05164476	4	
15	9990F	05164476	5	
39	9990F	05164476	6	
20	9990F	05164476	7	
229	9990F	05164476	8	wq replicate
74	9991F	05164479	1	
183	9991F	05164479	2	
46	9991F	05164479	3	
32	9991F	05164479	4	
116	9991F	05164479	5	
63	9991F	05164479	6	
168	9991F	05164479	7	
216	9991F	05164479	8	wq replicate
147	9992F	05164483	1	
73	9992F	05164483	2	
163	9992F	05164483	3	
2	9992F	05164483	4	
54	9992F	05164483	5	
141	9992F	05164483	6	
6	9992F	05164483	7	
227	9992F	05164483	8	wq replicate
256	9993F	05164485	1	
150	9993F	05164485	2	
187	9993F	05164485	3	
55	9993F	05164485	4	
126	9993F	05164485	5	
132	9993F	05164485	6	
98	9993F	05164485	7	
51	9993F	05164485	8	wq replicate
130	9994F	05164486	1	
235	9994F	05164486	2	
59	9994F	05164486	3	
86	9994F	05164486	4	
185	9994F	05164486	5	
66	9994F	05164486	6	
109	9994F	05164486	7	
94	9994F	05164486	8	wq replicate
53	9995F	05164487	1	
90	9995F	05164487	2	
18	9995F	05164487	3	
24	9995F	05164487	4	
211	9995F	05164487	5	
13	9995F	05164487	6	
48	9995F	05164487	7	
100	9995F	05164487	8	wq replicate
200	9996F	05164494	1	
219	9996F	05164494	2	
36	9996F	05164494	3	
114	9996F	05164494	4	
25	9996F	05164494	5	
164	9996F	05164494	6	
154	9996F	05164494	7	
43	9996F	05164494	8	wq replicate

BKR	NAS SMPL	CLIENT DESCRIP	REPL	
101	9997F	05164507	1	
17	9997F	05164507	2	
224	9997F	05164507	3	
223	9997F	05164507	4	
33	9997F	05164507	5	
220	9997F	05164507	6	
146	9997F	05164507	7	
31	9997F	05164507	8	wq replicate
87	9998F	05164489	1	
208	9998F	05164489	2	
202	9998F	05164489	3	
30	9998F	05164489	4	
118	9998F	05164489	5	
210	9998F	05164489	6	
93	9998F	05164489	7	
145	9998F	05164489	8	wq replicate
144	9999F	05164491	1	
50	9999F	05164491	2	
128	9999F	05164491	3	
242	9999F	05164491	4	
123	9999F	05164491	5	
84	9999F	05164491	6	
127	9999F	05164491	7	
143	9999F	05164491	8	wq replicate
134	0001G	05164493	1	
149	0001G	05164493	2	
106	0001G	05164493	3	
61	0001G	05164493	4	
107	0001G	05164493	5	
191	0001G	05164493	6	
27	0001G	05164493	7	
250	0001G	05164493	8	wq replicate
120	0002G	05164496	1	
243	0002G	05164496	2	
97	0002G	05164496	3	
117	0002G	05164496	4	
68	0002G	05164496	5	
155	0002G	05164496	6	
96	0002G	05164496	7	
12	0002G	05164496	8	wq replicate
151	0032G	05164405	1	
47	0032G	05164405	2	
232	0032G	05164405	3	
218	0032G	05164405	4	
42	0032G	05164405	5	
103	0032G	05164405	6	
186	0032G	05164405	7	
41	0032G	05164405	8	wq replicate
192	0033G	05164406	1	
62	0033G	05164406	2	
180	0033G	05164406	3	
176	0033G	05164406	4	
182	0033G	05164406	5	
225	0033G	05164406	6	
64	0033G	05164406	7	
3	0033G	05164406	8	wq replicate

Freshwater Sediment Test
28-day Hyalella azteca

BKR	NAS SMPL	CLIENT DESCRIP	REPL	
231	0034G	05164408	1	
83	0034G	05164408	2	
189	0034G	05164408	3	
124	0034G	05164408	4	
26	0034G	05164408	5	
178	0034G	05164408	6	
92	0034G	05164408	7	
121	0034G	05164408	8	wq replicate
209	0035G	05164412	1	
248	0035G	05164412	2	
190	0035G	05164412	3	
5	0035G	05164412	4	
152	0035G	05164412	5	
207	0035G	05164412	6	
197	0035G	05164412	7	
159	0035G	05164412	8	wq replicate
69	0036G	05164413	1	
56	0036G	05164413	2	
205	0036G	05164413	3	
239	0036G	05164413	4	
230	0036G	05164413	5	
247	0036G	05164413	6	
122	0036G	05164413	7	
204	0036G	05164413	8	wq replicate
181	0037G	05164407	1	
215	0037G	05164407	2	
49	0037G	05164407	3	
167	0037G	05164407	4	
246	0037G	05164407	5	
67	0037G	05164407	6	
45	0037G	05164407	7	
179	0037G	05164407	8	wq replicate
203	0038G	05164409	1	
174	0038G	05164409	2	
112	0038G	05164409	3	
233	0038G	05164409	4	
58	0038G	05164409	5	
119	0038G	05164409	6	
34	0038G	05164409	7	
37	0038G	05164409	8	wq replicate
35	0039G	05164410	1	
196	0039G	05164410	2	
75	0039G	05164410	3	
125	0039G	05164410	4	
148	0039G	05164410	5	
140	0039G	05164410	6	
253	0039G	05164410	7	
60	0039G	05164410	8	wq replicate
165	0040G	05164411	1	
129	0040G	05164411	2	
206	0040G	05164411	3	
108	0040G	05164411	4	
222	0040G	05164411	5	
142	0040G	05164411	6	
135	0040G	05164411	7	
217	0040G	05164411	8	wq replicate

BKR	NAS SMPL	CLIENT DESCRIP	REPL	
1	0041G	05164415	1	
65	0041G	05164415	2	
254	0041G	05164415	3	
22	0041G	05164415	4	
241	0041G	05164415	5	
173	0041G	05164415	6	
110	0041G	05164415	7	
80	0041G	05164415	8	wq replicate
81	0042G	05164423	1	
188	0042G	05164423	2	
171	0042G	05164423	3	
136	0042G	05164423	4	
16	0042G	05164423	5	
158	0042G	05164423	6	
11	0042G	05164423	7	
40	0042G	05164423	8	wq replicate
95	0043G	05164424	1	
14	0043G	05164424	2	
193	0043G	05164424	3	
139	0043G	05164424	4	
19	0043G	05164424	5	
8	0043G	05164424	6	
214	0043G	05164424	7	
21	0043G	05164424	8	wq replicate
115	0044G	05164427	1	
104	0044G	05164427	2	
82	0044G	05164427	3	
240	0044G	05164427	4	
166	0044G	05164427	5	
88	0044G	05164427	6	
28	0044G	05164427	7	
255	0044G	05164427	8	wq replicate

Gerald Irissarri

From: Dennis.Shelton@CH2M.com
Sent: Wednesday, April 27, 2005 9:33 AM
To: Mike.Stanaway@CH2M.com; girissarri@nwaquatic.com
Subject: Hardness at Upper Columbia

rad98FC2(1).xls

Mike and Gerald - Attached are the hardness data I had available for the Upper Columbia. The hardness ranges from 53 to 88 mg/kg as CaCO3. Given that metals are a main focus, we should use similar hardness water for the bioassays. Please use water with hardness of 70 + or - 5 mg/kg as CaCO3. Please disregard my earlier email regarding hardness. Thanks - Dennis

Gerald Irissarri

From: Mike.Stanaway@CH2M.com
Sent: Friday, April 22, 2005 11:28 AM
To: girissarri@nwaquatic.com
Cc: Nahide.Gulensoy@CH2M.com
Subject: RE: Recommended Test Conditions for Conducting a 28-day Sediment Toxicity Test with hyalella

Hi Gerald,

The reference sites (labeled as stations on chain of custody) are:

9983F RM 732R1
9989F RM 726R1 These will be shipped first
990CF RM 721R1

9994F RM 705R1
9998F RM 686R1 These will arrive on Tuesday
0002G RM 685R1

I also need to talk to you about the reconstituted water hardness in the test.

Thanks
Mike

-----Original Message-----
From: Gerald Irissarri [mailto:girissarri@nwaquatic.com]
Sent: Monday, February 28, 2005 9:59 AM
To: Stanaway, Mike/CVO
Subject: RE: Recommended Test Conditions for Conducting a 28-day Sediment Toxicity Test with hyalella

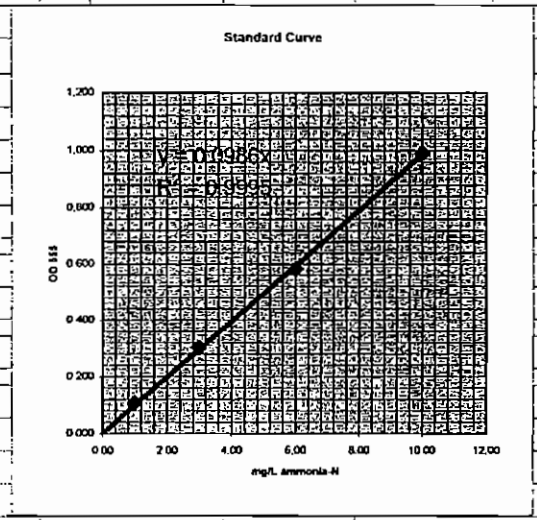
AMMONIA EXPOSURE BENCHSHEETS AND ANALYSIS

Total Ammonia-N in Water: Computation Worksheet

Salicylate Method (SOP #5492)

Result

	Sample description	Dilution factor	OD_{655}	NH_3-N (mg/L)
	Blank	----	----	----
	1.0 mg/L NH_3-N Std.	----	0.107	1.00
	3.0 mg/L NH_3-N Std.	----	0.302	3.00
	6.0 mg/L NH_3-N Std.	----	0.581	6.00
	10.0 mg/L NH_3-N Std.	----	0.990	10.00
	3.0 mg/L spike	----	0.287	2.91
	3.0 mg/L spike dupl.	----	0.291	2.95
	5.0 mg/L 2nd source	----	0.417	4.23
1.	3	1	0.014	0.14
2.	12	1	0.047	0.48
3.	21	1	0.027	0.27
4.	29	1	0.030	0.30
5.	31	1	0.057	0.58
6.	37	1	0.011	0.11
7.	40	1	0.020	0.20
8.	41	1	0.018	0.18
9.	53	1	0.022	0.22
10.	51	1	0.026	0.26
11.	52	1	0.021	0.21
12.	60	1	0.042	0.43
13.	76	1	0.092	0.93
14.	78	1	0.048	0.49
15.	80	1	0.013	0.13
16.	94	1	0.058	0.59
17.	100	1	0.072	0.73
18.	121	1	0.040	0.41
19.	137	1	0.057	0.58
20.	143	1	0.019	0.19
21.	145	1	0.040	0.41
22.	159	1	0.032	0.32
23.	170	1	0.017	0.17
24.	179	1	0.016	0.16
25.	204	1	0.032	0.32
26.	216	1	0.033	0.33
27.	217	1	0.027	0.27
28.	221	1	0.037	0.38
29.	227	1	0.026	0.26
30.	229	1	0.028	0.28
31.	250	1	0.025	0.25
32.	255	1	0.012	0.12
33.				
34.				
35.				
36.				



Reporting limit (mg/L) =	0.1
Recovery (%) =	97.7
Precision (RPD) =	-1.38
2nd source (%) =	84.6
Sample volume (ml):	0.50
Dilution factor	1

Sample Set Description:

Test No.: 727-2
Test Day: 0 (5-5-05)
Species: *Hyalella*

Overlying water

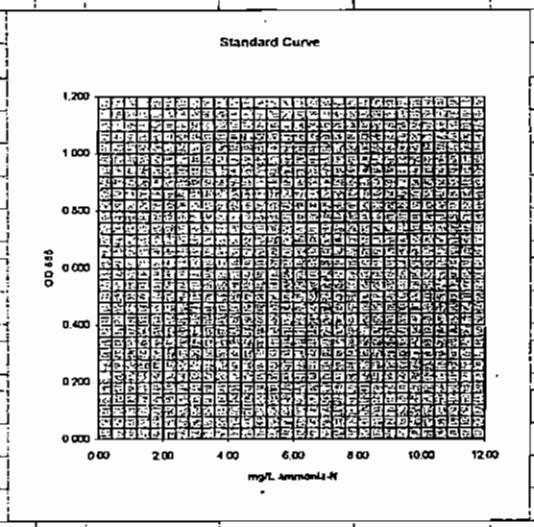
Analyst: RSC
Date analysed: 5/9/2005

Total Ammonia-N in Water: Computation Worksheet

Salicylate Method (SOP #5492)

Result

	Sample description	Dilution factor	OD655	NH_3-N (mg/L)
	Blank	——	——	——
	1.0 mg/L NH_3-N Std.	——	.107	1.00
	3.0 mg/L NH_3-N Std.	——	.302	3.00
	6.0 mg/L NH_3-N Std.	——	.581	6.00
	10.0 mg/L NH_3-N Std.	——	.990	10.00
	3.0 mg/L spike	——	.287	
	3.0 mg/L spike dupl.	——	.291	
	5.0 mg/L 2nd source	——	.417	
1.	3	1	.014	
2.	12	1	.047	
3.	21	1	.027	
4.	29	1	.030	
5.	31	1	.057	
6.	37	1	.011	
7.	40	1	.020	
8.	41	1	.018	
9.	53	1	.022	
10.	51	1	.026	
11.	52	1	.021	
12.	60	1	.042	
13.	76	1	.092	
14.	78	1	.048	
15.	80	1	.013	
16.	94	1	.058	
17.	100	1	.072	
18.	121	1	.040	
19.	137	1	.057	
20.	143	1	.019	
21.	145	1	.040	
22.	159	1	.072	
23.	170	1	.017	
24.	179	1	.016	
25.	204	1	.032	
26.	216	1	.033	
27.	217	1	.027	
28.	221	1	.037	
29.	227	1	.026	
30.	229	1	.028	
31.	250	1	.025	
32.	255	1	.012	
33.				
34.				
35.				
36.				



Reporting limit (mg/L) =	0.1
Recovery (%) =	#VALUE!
Precision (RPD) =	#VALUE!
2nd source (%) =	#VALUE!
Sample volume (ml):	0.50
Dilution factor	1

Sample Set Description:

Test No.: 727-2
Test Day: 0 (5-5-05)
Species: *Hyalella*

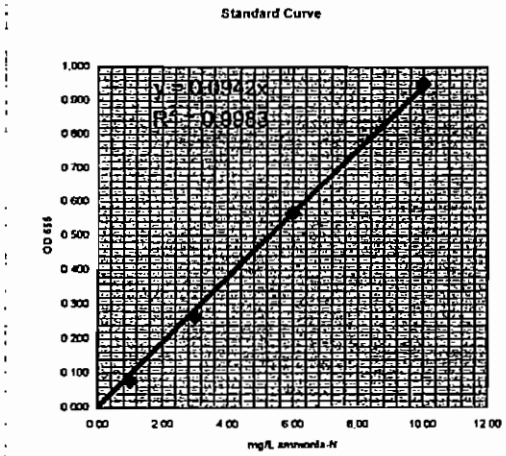
Overlying water

Analyst:	RSC
Date analysed:	5/9/2005

Total Ammonia-N in Water: Computation Worksheet
Salicylate Method (SOP #5492)

Result

	Sample description	Dilution factor	OD_{655}	NH_3-N (mg/L)
	Blank	----	----	----
	1.0 mg/L NH_3-N Std.	----	0.077	1.00
	3.0 mg/L NH_3-N Std.	----	0.263	3.00
	6.0 mg/L NH_3-N Std.	----	0.565	6.00
	10.0 mg/L NH_3-N Std.	----	0.950	10.00
	3.0 mg/L spike	----	0.278	2.95
	3.0 mg/L spike dupl.	----	0.278	2.95
	5.0 mg/L 2nd source	----	0.390	4.14
1.	3	1	0.008	ND
2.	12	1	0.000	ND
3.	21	1	0.000	ND
4.	29	1	0.000	ND
5.	31	1	0.000	ND
6.	37	1	0.000	ND
7.	40	1	0.000	ND
8.	41	1	0.000	ND
9.	53	1	0.000	ND
10.	51	1	0.000	ND
11.	52	1	0.000	ND
12.	60	1	0.000	ND
13.	76	1	0.071	0.75
14.	78	1	0.010	0.11
15.	80	1	0.000	ND
16.	94	1	0.000	ND
17.	100	1	0.000	ND
18.	121	1	0.000	ND
19.	137	1	0.000	ND
20.	143	1	0.000	ND
21.	145	1	0.000	ND
22.	159	1	0.000	ND
23.	170	1	0.000	ND
24.	179	1	0.001	ND
25.	204	1	0.001	ND
26.	216	1	0.008	ND
27.	217	1	0.001	ND
28.	221	1	0.000	ND
29.	227	1	0.000	ND
30.	229	1	0.000	ND
31.	250	1	0.007	ND
32.	255	1	0.000	ND
33.				
34.				
35.				
36.				



Reporting limit (mg/L) =	0.1
Recovery (%) =	98.3
Precision (RPD) =	0.00
2nd source (%) =	82.7
Sample volume (ml):	0.50
Dilution factor	1

Sample Set Description:
Test No.: 727-2
Test Day: 28 (6-2-05)
Species: *Hyalella*

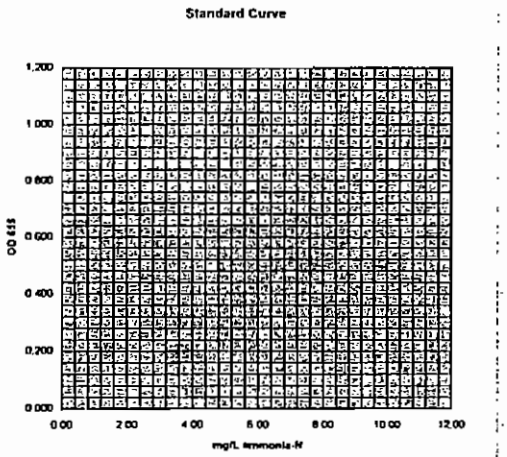
Overlying water

Analyst: RSC
Date analysed: 6/7/2005

Total Ammonia-N in Water: Computation Worksheet
Salicylate Method (SOP #5492)

Result

	Sample description	Dilution factor	OD_{655}	NH_3-N (mg/L)
	Blank	-----	-----	-----
	1.0 mg/L NH_3-N Std.	-----	.117	1.00
	3.0 mg/L NH_3-N Std.	-----	.263	3.00
	6.0 mg/L NH_3-N Std.	-----	.565	6.00
	10.0 mg/L NH_3-N Std.	-----	.950	10.00
	3.0 mg/L spike	-----	.278	
	3.0 mg/L spike dupl.	-----	.278	
	5.0 mg/L 2nd source	-----	.390	
1.	3	1	.008	
2.	12	1	.000	
3.	21	1	.000	
4.	29	1	.000	
5.	31	1	.000	
6.	37	1	.000	
7.	40	1	.000	
8.	41	1	.000	
9.	53	1	.000	
10.	51	1	.000	
11.	52	1	.000	
12.	60	1	.000	
13.	76	1	.071	
14.	78	1	.010	
15.	80	1	.000	
16.	94	1	.000	
17.	100	1	.000	
18.	121	1	.000	
19.	137	1	.000	
20.	143	1	.000	
21.	145	1	.000	
22.	159	1	.000	
23.	170	1	.000	
24.	179	1	.001	
25.	204	1	.001	
26.	216	1	.008	
27.	217	1	.001	
28.	221	1	.001	
29.	227	1	.000	
30.	229	1	.000	
31.	250	1	.001	
32.	255	1	.000	
33.				
34.				
35.				
36.				



Reporting limit (mg/L) =	0.1
Recovery (%) =	#VALUE!
Precision (RPD) =	#VALUE!
2nd source (%) =	#VALUE!
Sample volume (ml):	0.50
Dilution factor	1

Sample Set Description:
Test No.: 727-2
Test Day: 28 (6-2-05)
Species: *Hyalella*

Overlying water

Analyst: RSC
Date analysed: 6/7/2005

TEST DATA ANALYSIS RECORDS

Test Number: P727-2

Freshwater Sediment Test
28-day Hyalella azteca

Endpoints Data Entry and Calculations File

BKR=beaker number
INIT=initial number
SURV=number survivors
MORT=number dead=INIT-SURV
PSURV=%survival=100(SURV/INIT)
PMORT=%mortality=100(MORT/INIT)

TARE WT= ashed weight of pan used for that replicate at test termination (mg), or dry weight of pan if ash-free dry weight is not an endpoint
WT COUNT= number of test organisms weighed at test end
DRY WT= TARE WT + dry weight of test organisms recovered at test termination (mg)
TWT=total dry weight=DRY WT-TARE WT
WT=average individual dry weight=TWT/WT COUNT

Data entry verified for tare wt., dry wt., and wt count by LKN 6-14-05

Survival verified 6-17-05 by GJI

pan #	INITIAL WEIGHT tare wt (mg)	final wt (mg)	wt count	avg. wt/ organism
1	28.872	29.519	20	0.032
2	32.641	33.324	20	0.034
3	29.956	30.606	20	0.033
4	31.208	31.826	20	0.031
5	29.216	29.809	20	0.030

INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL		INIT	SURV	MORT	PSURV	PMORT	TARE WT (mg)	WT COUNT	DRY WT (mg)	TWT (mg)	WT (mg)
1	71	9952F	Contol	1		10	10	0	100.0	0.0	29.507	10	33.303	3.80	0.38
2	9	9952F	Contol	2		10	9	1	90.0	10.0	29.006	9	31.978	2.97	0.33
3	77	9952F	Contol	3		10	10	0	100.0	0.0	28.929	10	32.368	3.44	0.34
4	102	9952F	Contol	4		10	10	0	100.0	0.0	27.924	10	31.555	3.63	0.36
5	160	9952F	Contol	5		10	9	1	90.0	10.0	26.760	9	30.507	3.75	0.42
6	91	9952F	Contol	6		10	10	0	100.0	0.0	27.742	10	31.762	4.02	0.40
7	252	9952F	Contol	7		10	10	0	100.0	0.0	27.724	10	32.183	4.46	0.45
8	52	9952F	Contol	8	wq replicate	10	10	0	100.0	0.0	27.888	10	31.578	3.69	0.37
9	44	9983F	05164470	1		10	9	1	90.0	10.0	28.986	9	34.155	5.17	0.57
10	213	9983F	05164470	2		10	10	0	100.0	0.0	30.184	10	34.508	4.32	0.43
11	99	9983F	05164470	3		10	10	0	100.0	0.0	27.449	10	32.499	5.05	0.51
12	7	9983F	05164470	4		10	10	0	100.0	0.0	28.214	10	32.878	4.66	0.47
13	89	9983F	05164470	5		10	10	0	100.0	0.0	28.808	10	34.181	5.37	0.54
14	249	9983F	05164470	6		10	9	1	90.0	10.0	28.169	9	32.703	4.53	0.50
15	133	9983F	05164470	7		10	9	1	90.0	10.0	28.728	9	32.748	4.02	0.45
16	137	9983F	05164470	8	wq replicate	10	9	1	90.0	10.0	25.899	9	30.461	4.56	0.51
17	85	9985F	05164472	1		10	9	1	90.0	10.0	28.553	9	29.872	1.32	0.15
18	184	9985F	05164472	2		10	9	1	90.0	10.0	29.748	9	31.124	1.38	0.15
19	105	9985F	05164472	3		10	6	4	60.0	40.0	26.645	6	27.904	1.26	0.21
20	169	9985F	05164472	4		10	9	1	90.0	10.0	27.782	9	30.117	2.34	0.26
21	201	9985F	05164472	5		10	10	0	100.0	0.0	28.989	10	30.816	1.83	0.18
22	10	9985F	05164472	6		10	10	0	100.0	0.0	28.479	10	30.530	2.05	0.21
23	156	9985F	05164472	7		10	9	1	90.0	10.0	28.503	9	30.524	2.02	0.22
24	170	9985F	05164472	8	wq replicate	10	10	0	100.0	0.0	27.127	10	28.853	1.73	0.17
25	131	9986F	05164473	1		10	10	0	100.0	0.0	29.456	10	35.986	6.53	0.65
26	172	9986F	05164473	2		10	10	0	100.0	0.0	27.856	10	34.537	6.68	0.67
27	195	9986F	05164473	3		10	10	0	100.0	0.0	29.610	10	35.635	6.03	0.60
28	234	9986F	05164473	4		10	9	1	90.0	10.0	28.051	9	34.578	6.53	0.73
29	194	9986F	05164473	5		10	10	0	100.0	0.0	28.954	10	34.983	6.03	0.60
30	111	9986F	05164473	6		10	9	1	90.0	10.0	27.067	9	32.690	5.62	0.62
31	153	9986F	05164473	7		10	9	1	90.0	10.0	28.955	9	35.270	6.32	0.70
32	78	9986F	05164473	8	wq replicate	10	10	0	100.0	0.0	28.902	10	35.241	6.34	0.63

	INDEX	SURV	MORT	PSURV	PMORT	WT
Mean		9.8	0.3	97.5	2.5	0.38
SD		0.5	0.5	4.6	4.6	0.04
n		8	8	8	8	8
Mean		9.5	0.5	95.0	5.0	0.50
SD		0.5	0.5	5.3	5.3	0.05
n		8	8	8	8	8
Mean		9.0	1.0	90.0	10.0	0.19
SD		1.3	1.3	13.1	13.1	0.04
n		8	8	8	8	8
Mean		9.6	0.4	96.3	3.8	0.65
SD		0.5	0.5	5.2	5.2	0.04
n		8	8	8	8	8

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Freshwater Sediment Test
28-day Hyalella azteca

INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL		INIT	SURV	MORT	PSURV	PMORT	TARE WT (mg)	WT COUNT	DRY WT (mg)	TWT (mg)	WT (mg)		SURV	MORT	PSURV	PMORT	WT
33	113	9987F	05164474	1		10	9	1	90.0	10.0	31.287	9	33.565	2.28	0.25						
34	251	9987F	05164474	2		10	7	3	70.0	30.0	28.898	7	31.279	2.38	0.34						
35	226	9987F	05164474	3		10	8	2	80.0	20.0	28.606	8	31.038	2.43	0.30						
36	70	9987F	05164474	4		10	10	0	100.0	0.0	30.077	10	33.902	3.83	0.38						
37	72	9987F	05164474	5		10	9	1	90.0	10.0	30.394	9	33.625	3.23	0.36	Mean	8.9	1.1	88.8	11.3	0.34
38	198	9987F	05164474	6		10	8	2	80.0	20.0	28.358	8	31.273	2.92	0.36	SD	1.1	1.1	11.3	11.3	0.04
39	199	9987F	05164474	7		10	10	0	100.0	0.0	29.720	10	33.280	3.56	0.36	n	8	8	8	8	8
40	76	9987F	05164474	8	wq replicate	10	10	0	100.0	0.0	28.591	10	31.883	3.29	0.33						
41	157	9988F	05164475	1		10	10	0	100.0	0.0	28.181	10	32.398	4.22	0.42						
42	79	9988F	05164475	2		10	9	1	90.0	10.0	29.326	9	33.521	4.20	0.47						
43	38	9988F	05164475	3		10	8	2	80.0	20.0	29.622	8	32.711	3.09	0.39						
44	238	9988F	05164475	4		10	10	0	100.0	0.0	29.874	10	35.087	5.21	0.52						
45	245	9988F	05164475	5		10	10	0	100.0	0.0	30.086	10	34.818	4.73	0.47	Mean	9.5	0.5	95.0	5.0	0.42
46	4	9988F	05164475	6		10	9	1	90.0	10.0	28.522	9	31.272	2.75	0.31	SD	0.8	0.8	7.6	7.6	0.07
47	162	9988F	05164475	7		10	10	0	100.0	0.0	27.930	10	32.338	4.41	0.44	n	8	8	8	8	8
48	29	9988F	05164475	8	wq replicate	10	10	0	100.0	0.0	28.818	10	32.502	3.68	0.37						
49	57	9989F	05164478	1		10	10	0	100.0	0.0	27.779	10	32.419	4.64	0.46						
50	161	9989F	05164478	2		10	10	0	100.0	0.0	27.320	10	32.639	5.32	0.53						
51	23	9989F	05164478	3		10	10	0	100.0	0.0	29.424	10	33.678	4.25	0.43						
52	177	9989F	05164478	4		10	9	1	90.0	10.0	27.810	9	31.544	3.73	0.41						
53	236	9989F	05164478	5		10	10	0	100.0	0.0	28.591	10	34.340	5.75	0.57	Mean	9.8	0.3	97.5	2.5	0.52
54	212	9989F	05164478	6		10	10	0	100.0	0.0	33.125	10	38.062	4.94	0.49	SD	0.5	0.5	4.6	4.6	0.09
55	175	9989F	05164478	7		10	9	1	90.0	10.0	28.778	9	35.009	6.23	0.69	n	8	8	8	8	8
56	221	9989F	05164478	8	wq replicate	10	10	0	100.0	0.0	26.384	10	32.017	5.63	0.56						
57	237	9990F	05164476	1		10	10	0	100.0	0.0	29.249	10	33.713	4.46	0.45						
58	138	9990F	05164476	2		10	10	0	100.0	0.0	27.536	10	31.047	3.51	0.35						
59	228	9990F	05164476	3		10	9	1	90.0	10.0	29.263	9	33.010	3.75	0.42						
60	244	9990F	05164476	4		10	10	0	100.0	0.0	30.330	10	34.512	4.18	0.42						
61	15	9990F	05164476	5		10	10	0	100.0	0.0	28.291	10	31.536	3.25	0.32	Mean	9.8	0.3	97.5	2.5	0.39
62	39	9990F	05164476	6		10	10	0	100.0	0.0	28.456	10	32.217	3.76	0.38	SD	0.5	0.5	4.6	4.6	0.04
63	20	9990F	05164476	7		10	10	0	100.0	0.0	28.998	10	32.708	3.71	0.37	n	8	8	8	8	8
64	229	9990F	05164476	8	wq replicate	10	9	1	90.0	10.0	28.966	9	32.762	3.80	0.42						
65	74	9991F	05164479	1		10	8	2	80.0	20.0	28.764	8	30.986	2.22	0.28						
66	183	9991F	05164479	2		10	7	3	70.0	30.0	30.364	7	31.607	1.24	0.18						
67	46	9991F	05164479	3		10	9	1	90.0	10.0	28.413	9	30.588	2.18	0.24						
68	32	9991F	05164479	4		10	8	2	80.0	20.0	28.713	8	30.838	2.13	0.27						
69	116	9991F	05164479	5		10	9	1	90.0	10.0	29.292	9	30.412	1.12	0.12	Mean	8.6	1.4	86.3	13.8	0.23
70	63	9991F	05164479	6		10	8	2	80.0	20.0	28.617	8	30.025	1.41	0.18	SD	1.1	1.1	10.6	10.6	0.06
71	168	9991F	05164479	7		10	10	0	100.0	0.0	28.001	10	30.715	2.71	0.27	n	8	8	8	8	8
72	216	9991F	05164479	8	wq replicate	10	10	0	100.0	0.0	28.333	10	31.126	2.79	0.28						
73	147	9992F	05164483	1		10	10	0	100.0	0.0	29.580	10	32.708	3.13	0.31						
74	73	9992F	05164483	2		10	9	1	90.0	10.0	28.851	9	31.911	3.06	0.34						
75	163	9992F	05164483	3		10	10	0	100.0	0.0	28.298	10	31.953	3.66	0.37						
76	2	9992F	05164483	4		10	9	1	90.0	10.0	31.655	9	34.745	3.09	0.34						
77	54	9992F	05164483	5		10	10	0	100.0	0.0	28.795	10	32.414	3.62	0.36	Mean	9.8	0.3	97.5	2.5	0.35
78	141	9992F	05164483	6		10	10	0	100.0	0.0	28.623	10	32.440	3.82	0.38	SD	0.5	0.5	4.6	4.6	0.03
79	6	9992F	05164483	7		10	10	0	100.0	0.0	30.710	10	33.702	2.99	0.30	n	8	8	8	8	8
80	227	9992F	05164483	8	wq replicate	10	10	0	100.0	0.0	30.477	10	34.048	3.57	0.36						

Test Number: P727-2

Freshwater Sediment Test
28-day Hyalella azteca

INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL		INIT	SURV	MORT	PSURV	PMORT	TARE WT (mg)	WT COUNT	DRY WT (mg)	TWT (mg)	WT (mg)		SURV	MORT	PSURV	PMORT	WT
81	256	9993F	05164485	1		10	10	0	100.0	0.0	27.372	10	32.167	4.80	0.48						
82	150	9993F	05164485	2		10	9	1	90.0	10.0	29.427	9	32.849	3.42	0.38						
83	187	9993F	05164485	3		10	10	0	100.0	0.0	29.176	10	33.804	4.63	0.46						
84	55	9993F	05164485	4		10	10	0	100.0	0.0	30.058	10	33.798	3.74	0.37						
85	126	9993F	05164485	5		10	10	0	100.0	0.0	30.279	10	34.635	4.36	0.44	Mean	9.9	0.1	98.8	1.3	0.41
86	132	9993F	05164485	6		10	10	0	100.0	0.0	29.974	10	33.923	3.95	0.39	SD	0.4	0.4	3.5	3.5	0.04
87	98	9993F	05164485	7		10	10	0	100.0	0.0	27.640	10	31.329	3.69	0.37	n	8	8	8	8	8
88	51	9993F	05164485	8	wq replicate	10	10	0	100.0	0.0	28.828	10	32.864	4.04	0.40						
89	130	9994F	05164486	1		10	10	0	100.0	0.0	30.185	10	35.387	5.20	0.52						
90	235	9994F	05164486	2		10	10	0	100.0	0.0	28.932	10	34.453	5.52	0.55						
91	59	9994F	05164486	3		10	10	0	100.0	0.0	28.131	10	32.994	4.86	0.49						
92	86	9994F	05164486	4		10	10	0	100.0	0.0	28.851	10	34.802	5.95	0.60						
93	185	9994F	05164486	5		10	10	0	100.0	0.0	27.209	10	32.385	5.18	0.52	Mean	9.9	0.3	97.5	2.5	0.53
94	66	9994F	05164486	6		10	9	1	90.0	10.0	27.956	9	32.697	4.74	0.53	SD	0.6	0.5	4.6	4.6	0.04
95	109	9994F	05164486	7		11	11	0	100.0	0.0	27.700	11	33.261	5.56	0.51	n	8	8	8	8	8
96	94	9994F	05164486	8	wq replicate	10	9	1	90.0	10.0	28.396	9	33.544	5.15	0.57						
97	53	9995F	05164487	1		10	10	0	100.0	0.0	28.236	10	31.710	3.47	0.35						
98	90	9995F	05164487	2		10	10	0	100.0	0.0	28.670	10	31.993	3.32	0.33						
99	18	9995F	05164487	3		10	10	0	100.0	0.0	29.542	10	33.070	3.53	0.35						
100	24	9995F	05164487	4		NO SURVIVING ANIMALS FOUND --- CONSIDERED TO BE ABERRANT RESULT AND DELETED FROM ANALYSIS															
101	211	9995F	05164487	5		10	10	0	100.0	0.0	30.185	10	34.381	4.20	0.42	Mean	10.0	0.0	100.0	0.0	0.33
102	13	9995F	05164487	6		10	10	0	100.0	0.0	26.366	10	29.142	2.78	0.28	SD	0.0	0.0	0.0	0.0	0.05
103	48	9995F	05164487	7		10	10	0	100.0	0.0	31.283	9	34.103	2.82	0.31	n	7	7	7	7	7
104	100	9995F	05164487	8	wq replicate	10	10	0	100.0	0.0	27.563	10	30.494	2.93	0.29						
105	200	9996F	05164494	1		10	9	1	90.0	10.0	27.844	9	32.597	4.75	0.53						
106	219	9996F	05164494	2		10	10	0	100.0	0.0	30.161	10	34.318	4.16	0.42						
107	36	9996F	05164494	3		10	10	0	100.0	0.0	28.318	10	32.834	4.52	0.45						
108	114	9996F	05164494	4		10	10	0	100.0	0.0	28.198	10	32.170	3.97	0.40						
109	25	9996F	05164494	5		10	9	1	90.0	10.0	27.898	9	31.541	3.64	0.40	Mean	9.3	0.8	92.5	7.5	0.45
110	164	9996F	05164494	6		10	9	1	90.0	10.0	28.172	9	32.541	4.37	0.49	SD	0.7	0.7	7.1	7.1	0.06
111	154	9996F	05164494	7		10	8	2	80.0	20.0	28.139	8	31.064	2.93	0.37	n	8	8	8	8	8
112	43	9996F	05164494	8	wq replicate	10	9	1	90.0	10.0	27.575	9	32.438	4.86	0.54						
113	101	9997F	05164507	1		10	10	0	100.0	0.0	29.956	10	33.763	3.81	0.38						
114	17	9997F	05164507	2		10	10	0	100.0	0.0	28.763	10	32.746	3.98	0.40						
115	224	9997F	05164507	3		10	10	0	100.0	0.0	29.237	10	33.640	4.40	0.44						
116	223	9997F	05164507	4		10	9	1	90.0	10.0	30.986	9	34.971	3.99	0.44						
117	33	9997F	05164507	5		10	10	0	100.0	0.0	29.505	10	33.529	4.02	0.40	Mean	9.8	0.3	97.5	2.5	0.41
118	220	9997F	05164507	6		10	9	1	90.0	10.0	29.618	9	33.624	4.01	0.45	SD	0.5	0.5	4.6	4.6	0.03
119	146	9997F	05164507	7		10	10	0	100.0	0.0	29.316	10	33.621	4.31	0.43	n	8	8	8	8	8
120	31	9997F	05164507	8	wq replicate	10	10	0	100.0	0.0	28.017	10	31.546	3.53	0.35						
121	87	9998F	05164489	1		10	10	0	100.0	0.0	28.208	10	32.842	4.63	0.46						
122	208	9998F	05164489	2		10	9	1	90.0	10.0	28.989	9	32.931	3.94	0.44						
123	202	9998F	05164489	3		10	10	0	100.0	0.0	28.958	10	32.773	3.82	0.38						
124	30	9998F	05164489	4		10	6	4	60.0	40.0	29.097	6	30.786	1.69	0.28						
125	118	9998F	05164489	5		10	10	0	100.0	0.0	29.509	10	33.567	4.06	0.41	Mean	9.4	0.6	93.8	6.3	0.42
126	210	9998F	05164489	6		10	10	0	100.0	0.0	28.240	10	32.808	4.57	0.46	SD	1.4	1.4	14.1	14.1	0.06
127	93	9998F	05164489	7		10	10	0	100.0	0.0	29.787	10	34.536	4.75	0.47	n	8	8	8	8	8
128	145	9998F	05164489	8	wq replicate	10	10	0	100.0	0.0	28.282	10	32.831	4.55	0.45						

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Freshwater Sediment Test
28-day Hyalella azteca

INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL		INIT	SURV	MORT	PSURV	PMORT	TARE WT (mg)	WT COUNT	DRY WT (mg)	TWT (mg)	WT (mg)			SURV	MORT	PSURV	PMORT	WT
129	144	9999F	05164491	1		10	10	0	100.0	0.0	28.259	10	31.616	3.36	0.34							
130	50	9999F	05164491	2		10	8	2	80.0	20.0	27.671	8	30.430	2.76	0.34							
131	128	9999F	05164491	3		10	9	1	90.0	10.0	29.734	9	32.483	2.75	0.31							
132	242	9999F	05164491	4		10	7	3	70.0	30.0	28.730	7	30.904	2.17	0.31							
133	123	9999F	05164491	5		10	9	1	90.0	10.0	30.054	9	32.789	2.74	0.30	Mean		8.6	1.4	86.3	13.8	0.34
134	84	9999F	05164491	6		10	10	0	100.0	0.0	29.961	10	33.145	3.18	0.32	SD		1.1	1.1	10.6	10.6	0.05
135	127	9999F	05164491	7		10	8	2	80.0	20.0	28.949	8	31.543	2.59	0.32	n		8	8	8	8	8
136	143	9999F	05164491	8	wq replicate	10	8	2	80.0	20.0	28.735	8	32.276	3.54	0.44							
137	134	0001G	05164493	1		10	8	2	80.0	20.0	27.060	8	30.296	3.24	0.40							
138	149	0001G	05164493	2		10	9	1	90.0	10.0	28.223	9	33.529	5.31	0.59							
139	106	0001G	05164493	3		10	9	1	90.0	10.0	29.335	9	34.745	5.41	0.60							
140	61	0001G	05164493	4		10	10	0	100.0	0.0	27.654	10	31.582	3.93	0.39							
141	107	0001G	05164493	5		10	10	0	100.0	0.0	29.423	10	34.520	5.10	0.51	Mean		9.1	0.9	91.3	8.8	0.50
142	191	0001G	05164493	6		10	10	0	100.0	0.0	27.350	10	32.823	5.47	0.55	SD		1.1	1.1	11.3	11.3	0.09
143	27	0001G	05164493	7		10	10	0	100.0	0.0	29.488	10	33.280	3.79	0.38	n		8	8	8	8	8
144	250	0001G	05164493	8	wq replicate	10	7	3	70.0	30.0	29.454	7	33.436	3.98	0.57							
145	120	0002G	05164496	1		10	10	0	100.0	0.0	29.434	10	33.660	4.23	0.42							
146	243	0002G	05164496	2		10	10	0	100.0	0.0	28.826	10	34.906	6.08	0.61							
147	97	0002G	05164496	3		10	10	0	100.0	0.0	30.017	10	34.542	4.53	0.45							
148	117	0002G	05164496	4		10	9	1	90.0	10.0	27.752	9	31.849	4.10	0.46							
149	68	0002G	05164496	5		10	8	2	80.0	20.0	28.183	8	31.848	3.67	0.46	Mean		9.5	0.5	95.0	5.0	0.47
150	155	0002G	05164496	6		10	10	0	100.0	0.0	27.154	10	31.472	4.32	0.43	SD		0.8	0.8	7.6	7.6	0.06
151	96	0002G	05164496	7		10	9	1	90.0	10.0	28.114	9	32.316	4.20	0.47	n		8	8	8	8	8
152	12	0002G	05164496	8	wq replicate	10	10	0	100.0	0.0	26.531	10	31.039	4.51	0.45							
153	151	0032G	05164405	1		10	9	1	90.0	10.0	29.200	9	32.488	3.29	0.37							
154	47	0032G	05164405	2		10	10	0	100.0	0.0	29.287	10	32.941	3.65	0.37							
155	232	0032G	05164405	3		10	10	0	100.0	0.0	29.897	10	33.148	3.25	0.33							
156	218	0032G	05164405	4		10	5	5	50.0	50.0	28.574	5	29.545	0.97	0.19							
157	42	0032G	05164405	5		10	10	0	100.0	0.0	28.557	9	31.754	3.20	0.36	Mean		9.3	0.8	92.5	7.5	0.34
158	103	0032G	05164405	6		10	10	0	100.0	0.0	29.486	10	33.503	4.02	0.40	SD		1.8	1.8	17.5	17.5	0.06
159	186	0032G	05164405	7		10	10	0	100.0	0.0	29.242	10	33.137	3.90	0.39	n		8	8	8	8	8
160	41	0032G	05164405	8	wq replicate	10	10	0	100.0	0.0	29.988	10	33.291	3.30	0.33							
161	192	0033G	05164406	1		10	9	1	90.0	10.0	29.428	9	34.114	4.69	0.52							
162	62	0033G	05164406	2		10	10	0	100.0	0.0	29.238	10	33.226	3.99	0.40							
163	180	0033G	05164406	3		10	9	1	90.0	10.0	28.713	9	32.493	3.78	0.42							
164	176	0033G	05164406	4		10	10	0	100.0	0.0	28.755	10	33.569	4.81	0.48							
165	182	0033G	05164406	5		10	10	0	100.0	0.0	28.647	10	33.018	4.37	0.44	Mean		9.6	0.4	96.3	3.8	0.45
166	225	0033G	05164406	6		10	10	0	100.0	0.0	28.430	10	33.495	5.07	0.51	SD		0.5	0.5	5.2	5.2	0.05
167	64	0033G	05164406	7		10	10	0	100.0	0.0	29.330	10	33.467	4.14	0.41	n		8	8	8	8	8
168	3	0033G	05164406	8	wq replicate	10	9	1	90.0	10.0	29.162	9	33.035	3.87	0.43							
169	231	0034G	05164408	1		10	10	0	100.0	0.0	31.153	10	35.471	4.32	0.43							
170	83	0034G	05164408	2		10	10	0	100.0	0.0	27.066	10	29.793	2.73	0.27							
171	189	0034G	05164408	3		10	8	2	80.0	20.0	29.199	8	31.152	1.95	0.24							
172	124	0034G	05164408	4		10	10	0	100.0	0.0	28.177	10	30.678	2.50	0.25							
173	26	0034G	05164408	5		10	10	0	100.0	0.0	28.316	10	31.054	2.74	0.27	Mean		9.6	0.4	96.3	3.8	0.30
174	178	0034G	05164408	6		10	10	0	100.0	0.0	28.680	10	32.319	3.64	0.36	SD		0.7	0.7	7.4	7.4	0.06
175	92	0034G	05164408	7		10	9	1	90.0	10.0	28.152	9	30.820	2.67	0.30	n		8	8	8	8	8
176	121	0034G	05164408	8	wq replicate	10	10	0	100.0	0.0	29.978	10	32.704	2.73	0.27							

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177	209	0035G	05164412	1		10	10	0	100.0	0.0	28.709	10	31.711	3.00	0.30							
178	248	0035G	05164412	2		10	9	1	90.0	10.0	27.179	9	31.090	3.91	0.43							
179	190	0035G	05164412	3		10	10	0	100.0	0.0	28.705	10	32.204	3.50	0.35							
180	5	0035G	05164412	4		10	8	2	80.0	20.0	27.816	8	30.444	2.63	0.33							
181	152	0035G	05164412	5		10	9	1	90.0	10.0	27.844	9	31.068	3.22	0.36	Mean		9.6	0.5	95.0	5.0	0.35
182	207	0035G	05164412	6		10	10	0	100.0	0.0	30.247	10	34.472	4.23	0.42	SD		0.9	0.8	7.6	7.6	0.06
183	197	0035G	05164412	7		11	11	0	100.0	0.0	26.888	11	29.633	2.75	0.25	n		8	8	8	8	8
184	159	0035G	05164412	8	wq replicate	10	10	0	100.0	0.0	29.102	10	32.509	3.41	0.34							
185	69	0036G	05164413	1		10	10	0	100.0	0.0	27.444	10	31.112	3.67	0.37							
186	56	0036G	05164413	2		10	10	0	100.0	0.0	30.207	10	34.282	4.08	0.41							
187	205	0036G	05164413	3		10	8	2	80.0	20.0	30.073	8	33.981	3.91	0.49							
188	239	0036G	05164413	4		10	9	1	90.0	10.0	29.177	9	33.318	4.14	0.46							
189	230	0036G	05164413	5		10	10	0	100.0	0.0	27.710	10	32.592	4.88	0.49	Mean		9.6	0.4	96.3	3.8	0.40
190	247	0036G	05164413	6		10	10	0	100.0	0.0	28.977	10	31.780	2.80	0.28	SD		0.7	0.7	7.4	7.4	0.07
191	122	0036G	05164413	7		10	10	0	100.0	0.0	29.499	10	33.301	3.80	0.38	n		8	8	8	8	8
192	204	0036G	05164413	8	wq replicate	10	10	0	100.0	0.0	28.482	10	31.847	3.37	0.34							
193	181	0037G	05164407	1		10	10	0	100.0	0.0	28.207	10	32.581	4.37	0.44							
194	215	0037G	05164407	2		10	9	1	90.0	10.0	27.702	9	31.340	3.64	0.40							
195	49	0037G	05164407	3		10	9	1	90.0	10.0	28.033	9	30.987	2.95	0.33							
196	167	0037G	05164407	4		10	9	1	90.0	10.0	28.979	9	32.125	3.15	0.35							
197	246	0037G	05164407	5		10	8	2	80.0	20.0	28.906	8	32.240	3.33	0.42	Mean		9.1	0.9	91.3	8.8	0.37
198	67	0037G	05164407	6		10	8	2	80.0	20.0	27.774	8	30.826	3.05	0.38	SD		0.8	0.8	8.3	8.3	0.05
199	45	0037G	05164407	7		10	10	0	100.0	0.0	28.968	10	31.860	2.89	0.29	n		8	8	8	8	8
200	179	0037G	05164407	8	wq replicate	10	10	0	100.0	0.0	29.832	10	33.477	3.65	0.36							
201	203	0038G	05164409	1		10	10	0	100.0	0.0	29.144	10	33.695	4.55	0.46							
202	174	0038G	05164409	2		10	9	1	90.0	10.0	30.056	9	34.292	4.24	0.47							
203	112	0038G	05164409	3		10	10	0	100.0	0.0	29.547	10	33.651	4.10	0.41							
204	233	0038G	05164409	4		10	8	2	80.0	20.0	27.756	8	32.209	4.45	0.56							
205	58	0038G	05164409	5		10	10	0	100.0	0.0	27.559	10	32.948	5.39	0.54	Mean		9.3	0.8	92.5	7.5	0.49
206	119	0038G	05164409	6		10	10	0	100.0	0.0	28.994	10	32.657	3.66	0.37	SD		0.9	0.9	8.9	8.9	0.07
207	34	0038G	05164409	7		10	9	1	90.0	10.0	29.361	9	34.258	4.90	0.54	n		8	8	8	8	8
208	37	0038G	05164409	8	wq replicate	10	8	2	80.0	20.0	28.284	8	32.633	4.35	0.54							
209	35	0039G	05164410	1		10	10	0	100.0	0.0	29.124	10	33.011	3.89	0.39							
210	196	0039G	05164410	2		10	10	0	100.0	0.0	30.339	10	35.613	5.27	0.53							
211	75	0039G	05164410	3		10	9	1	90.0	10.0	29.579	9	33.787	4.21	0.47							
212	125	0039G	05164410	4		10	9	1	90.0	10.0	30.190	9	33.065	2.88	0.32							
213	148	0039G	05164410	5		10	9	1	90.0	10.0	28.708	9	32.123	3.42	0.38	Mean		9.4	0.6	93.8	6.3	0.42
214	140	0039G	05164410	6		10	10	0	100.0	0.0	29.405	10	32.809	3.40	0.34	SD		0.7	0.7	7.4	7.4	0.07
215	253	0039G	05164410	7		10	10	0	100.0	0.0	28.458	10	33.143	4.69	0.47	n		8	8	8	8	8
216	60	0039G	05164410	8	wq replicate	10	8	2	80.0	20.0	28.083	8	31.927	3.84	0.48							
217	165	0040G	05164411	1		10	10	0	100.0	0.0	28.588	10	33.521	4.93	0.49							
218	129	0040G	05164411	2		10	10	0	100.0	0.0	28.190	10	31.872	3.68	0.37							
219	206	0040G	05164411	3		10	10	0	100.0	0.0	28.628	10	33.760	5.13	0.51							
220	108	0040G	05164411	4		10	9	1	90.0	10.0	28.833	9	33.050	4.22	0.47							
221	222	0040G	05164411	5		10	10	0	100.0	0.0	28.701	10	33.817	5.12	0.51	Mean		9.6	0.4	96.3	3.8	0.48
222	142	0040G	05164411	6		10	8	2	80.0	20.0	28.958	8	33.794	4.84	0.60	SD		0.7	0.7	7.4	7.4	0.07
223	135	0040G	05164411	7		10	10	0	100.0	0.0	28.233	10	33.147	4.91	0.49	n		8	8	8	8	8
224	217	0040G	05164411	8	wq replicate	10	10	0	100.0	0.0	29.028	10	33.265	4.24	0.42							

Test Number: P727-2

Freshwater Sediment Test
28-day Hyalella azteca

INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL		INIT	SURV	MORT	PSURV	PMORT	TARE WT (mg)	WT COUNT	DRY WT (mg)	TWT (mg)	WT (mg)		SURV	MORT	PSURV	PMORT	WT
225	1	0041G	05164415	1		10	10	0	100.0	0.0	28.111	10	32.571	4.46	0.45						
226	65	0041G	05164415	2		10	6	4	60.0	40.0	27.907	6	31.341	3.43	0.57						
227	254	0041G	05164415	3		10	10	0	100.0	0.0	28.309	10	33.469	5.16	0.52						
228	22	0041G	05164415	4		10	3	7	30.0	70.0	27.956	3	29.319	1.36	0.45						
229	241	0041G	05164415	5		10	10	0	100.0	0.0	27.753	10	33.346	5.59	0.56	Mean	8.4	1.6	83.8	16.3	0.52
230	173	0041G	05164415	6		10	9	1	90.0	10.0	28.267	9	33.088	4.82	0.54	SD	2.6	2.6	25.6	25.6	0.05
231	110	0041G	05164415	7		10	10	0	100.0	0.0	28.563	10	34.069	5.51	0.55	n	8	8	8	8	8
232	80	0041G	05164415	8	wq replicate	10	9	1	90.0	10.0	28.167	9	33.191	5.02	0.56						
233	81	0042G	05164423	1		10	10	0	100.0	0.0	29.340	10	33.089	3.75	0.37						
234	188	0042G	05164423	2		10	10	0	100.0	0.0	29.478	10	32.375	2.90	0.29						
235	171	0042G	05164423	3		10	10	0	100.0	0.0	27.441	10	30.968	3.53	0.35						
236	136	0042G	05164423	4		10	9	1	90.0	10.0	28.626	9	32.030	3.40	0.38						
237	16	0042G	05164423	5		10	10	0	100.0	0.0	28.239	10	30.450	2.21	0.22	Mean	9.6	0.4	96.3	3.8	0.32
238	158	0042G	05164423	6		10	10	0	100.0	0.0	30.762	10	33.802	3.04	0.30	SD	0.7	0.7	7.4	7.4	0.05
239	11	0042G	05164423	7		10	8	2	80.0	20.0	29.621	8	32.537	2.92	0.36	n	8	8	8	8	8
240	40	0042G	05164423	8	wq replicate	10	10	0	100.0	0.0	27.778	10	30.865	3.09	0.31						
241	95	0043G	05164424	1		10	10	0	100.0	0.0	30.429	10	34.194	3.77	0.38						
242	14	0043G	05164424	2		10	8	2	80.0	20.0	30.595	8	32.972	2.38	0.30						
243	193	0043G	05164424	3		10	9	1	90.0	10.0	29.989	9	33.409	3.42	0.38						
244	139	0043G	05164424	4		10	9	1	90.0	10.0	27.822	9	31.268	3.45	0.38						
245	19	0043G	05164424	5		10	10	0	100.0	0.0	28.185	9	30.574	2.39	0.27	Mean	9.4	0.6	93.8	6.3	0.33
246	8	0043G	05164424	6		10	10	0	100.0	0.0	28.788	10	31.609	2.82	0.28	SD	0.7	0.7	7.4	7.4	0.05
247	214	0043G	05164424	7		10	9	1	90.0	10.0	28.071	9	31.611	3.54	0.39	n	8	8	8	8	8
248	21	0043G	05164424	8	wq replicate	10	10	0	100.0	0.0	29.118	10	32.070	2.95	0.30						
249	115	0044G	05164427	1		10	10	0	100.0	0.0	30.942	10	36.206	5.26	0.53						
250	104	0044G	05164427	2		10	10	0	100.0	0.0	28.214	10	33.559	5.35	0.53						
251	82	0044G	05164427	3		10	9	1	90.0	10.0	28.037	9	32.531	4.49	0.50						
252	240	0044G	05164427	4		10	10	0	100.0	0.0	28.817	10	35.602	6.79	0.68						
253	166	0044G	05164427	5		10	7	3	70.0	30.0	28.705	7	32.685	3.98	0.57	Mean	9.5	0.5	95.0	5.0	0.52
254	88	0044G	05164427	6		10	10	0	100.0	0.0	29.397	10	34.360	4.96	0.50	SD	1.1	1.1	10.7	10.7	0.09
255	28	0044G	05164427	7		10	10	0	100.0	0.0	29.610	10	33.573	3.96	0.40	n	8	8	8	8	8
256	255	0044G	05164427	8	wq replicate	10	10	0	100.0	0.0	28.553	10	32.831	4.28	0.43						

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164472
Alias:	NAS# 9985F
Replicates:	8
Mean:	10
SD:	13.093
Tr Mean:	14.121
Trans SD:	13.644

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	10.591	Statistic:	Mann-Whitney
Residual SD:	10.216	Test Residual SD:	7.614	Balanced Design:	Yes
SS:	1982.872	Ref. Residual Mean:	9.217	Transformation:	rank-order
K:	8	Ref. Residual SD:	0		
b:	41.802	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8812	Calculated Value:	0.5102	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	38
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	11.5	10	11.5	4.314	9.217	0		-14.121
2	10	11.5	0	4	4.314	9.217	0		-14.121
3	40	16	0	4	25.11	9.217	0		-14.121
4	10	11.5	0	4	4.314	9.217	0		-9.217
5	0	4	0	4	14.121	9.217	0		-9.217
6	0	4	10	11.5	14.121	9.217	0		-9.217
7	10	11.5	10	11.5	4.314	9.217	0		-9.217
8	0	4	10	11.5	14.121	9.217	18.435		4.314
9							18.435		4.314
10							18.435		4.314
11							18.435		4.314
12							18.435		9.217
13							18.435		9.217
14							18.435		9.217
15							18.435		9.217
16							39.231		25.11

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164473
Alias:	NAS# 9986F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.641	Statistic:	Mann-Whitney
Residual SD:	8.325	Test Residual SD:	2.385	Balanced Design:	Yes
SS:	1316.902	Ref. Residual Mean:	9.217	Transformation:	rank-order
K:	8	Ref. Residual SD:	0		
b:	31.024	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7309	Calculated Value:	0.6831	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	28
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5	10	13	6.913	9.217	0		-9.217
2	0	5	0	5	6.913	9.217	0		-9.217
3	0	5	0	5	6.913	9.217	0		-9.217
4	10	13	0	5	11.522	9.217	0		-9.217
5	0	5	0	5	6.913	9.217	0		-6.913
6	10	13	10	13	11.522	9.217	0		-6.913
7	10	13	10	13	11.522	9.217	0		-6.913
8	0	5	10	13	6.913	9.217	0		-6.913
9							0		-6.913
10							18.435		9.217
11							18.435		9.217
12							18.435		9.217
13							18.435		9.217
14							18.435		11.522
15							18.435		11.522
16							18.435		11.522

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164474
Alias:	NAS# 9987F
Replicates:	8
Mean:	11.25
SD:	11.26
Tr Mean:	15.401
Trans SD:	13.609

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	11.551	Statistic:	Mann-Whitney
Residual SD:	10.198	Test Residual SD:	5.72	Balanced Design:	Yes
SS:	1976.133	Ref. Residual Mean:	9.217	Transformation:	rank-order
K:	8	Ref. Residual SD:	0		
b:	41.416	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.868	Calculated Value:	1.1539	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	42
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	10.5	10	10.5	3.034	9.217	0		-15.401
2	30	16	0	4	17.81	9.217	0		-15.401
3	20	14.5	0	4	11.164	9.217	0		-15.401
4	0	4	0	4	15.401	9.217	0		-9.217
5	10	10.5	0	4	3.034	9.217	0		-9.217
6	20	14.5	10	10.5	11.164	9.217	0		-9.217
7	0	4	10	10.5	15.401	9.217	0		-9.217
8	0	4	10	10.5	15.401	9.217	18.435		3.034
9							18.435		3.034
10							18.435		9.217
11							18.435		9.217
12							18.435		9.217
13							18.435		9.217
14							26.565		11.164
15							26.565		11.164
16							33.211		17.81

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164475
Alias:	NAS# 9988F
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.912	Statistic:	Mann-Whitney
Residual SD:	9.067	Test Residual SD:	3.712	Balanced Design:	Yes
SS:	1562.085	Ref. Residual Mean:	9.217	Transformation:	rank-order
K:	8	Ref. Residual SD:	0		
b:	34.339	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7549	Calculated Value:	0.529	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	30
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5	10	12.5	7.929	9.217	0		-9.217
2	10	12.5	0	5	10.506	9.217	0		-9.217
3	20	16	0	5	18.636	9.217	0		-9.217
4	0	5	0	5	7.929	9.217	0		-9.217
5	0	5	0	5	7.929	9.217	0		-7.929
6	10	12.5	10	12.5	10.506	9.217	0		-7.929
7	0	5	10	12.5	7.929	9.217	0		-7.929
8	0	5	10	12.5	7.929	9.217	0		-7.929
9							0		-7.929
10							18.435		9.217
11							18.435		9.217
12							18.435		9.217
13							18.435		9.217
14							18.435		10.506
15							18.435		10.506
16							26.565		18.636

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164479
Alias:	NAS# 9991F
Replicates:	8
Mean:	13.75
SD:	10.607
Tr Mean:	18.722
Trans SD:	12.511

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.504	Statistic:	Mann-Whitney
Residual SD:	9.666	Test Residual SD:	7.299	Balanced Design:	Yes
SS:	1775.347	Ref. Residual Mean:	9.217	Transformation:	rank-order
K:	8	Ref. Residual SD:	0		
b:	39.229	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8668	Calculated Value:	0.1112	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	48
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	14	10	9.5	7.843	9.217	0		-18.722
2	30	16	0	3.5	14.489	9.217	0		-18.722
3	10	9.5	0	3.5	0.287	9.217	0		-9.217
4	20	14	0	3.5	7.843	9.217	0		-9.217
5	10	9.5	0	3.5	0.287	9.217	0		-9.217
6	20	14	10	9.5	7.843	9.217	0		-9.217
7	0	3.5	10	9.5	18.722	9.217	18.435		-0.287
8	0	3.5	10	9.5	18.722	9.217	18.435		-0.287
9							18.435		7.843
10							18.435		7.843
11							18.435		7.843
12							18.435		9.217
13							26.565		9.217
14							26.565		9.217
15							26.565		9.217
16							33.211		14.489

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164483
Alias:	NAS# 9992F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	6.913	Statistic:	Mann-Whitney
Residual SD:	7.912	Test Residual SD:	4.267	Balanced Design:	Yes
SS:	1189.46	Ref. Residual Mean:	9.217	Transformation:	rank-order
K:	8	Ref. Residual SD:	0		
b:	30.844	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7998	Calculated Value:	1.5275	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	24
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	10	13.5	4.609	9.217	0		-9.217
2	10	13.5	0	5.5	13.826	9.217	0		-9.217
3	0	5.5	0	5.5	4.609	9.217	0		-9.217
4	10	13.5	0	5.5	13.826	9.217	0		-9.217
5	0	5.5	0	5.5	4.609	9.217	0		-4.609
6	0	5.5	10	13.5	4.609	9.217	0		-4.609
7	0	5.5	10	13.5	4.609	9.217	0		-4.609
8	0	5.5	10	13.5	4.609	9.217	0		-4.609
9							0		-4.609
10							0		-4.609
11							18.435		9.217
12							18.435		9.217
13							18.435		9.217
14							18.435		9.217
15							18.435		13.826
16							18.435		13.826

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164485
Alias:	NAS# 9993F
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	-0.293
Trans SD:	0.553

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	0.293
Trans SD:	0.836

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.342	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.415	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.782	Transformation:	Rankits
K:		Ref. Residual SD:	0		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	3	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally		Variances		Degrees of Freedom:	12
Distributed:	N/A	Homogeneous:	No	Experimental Alpha Level:	0.05
				Calculated Value:	-1.655
Override Option:	Not Invoked			Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.489	10	1.075	0.195	0.782		0	
2	10	1.075	0	-0.489	1.368	0.782		0	
3	0	-0.489	0	-0.489	0.195	0.782		0	
4	0	-0.489	0	-0.489	0.195	0.782		0	
5	0	-0.489	0	-0.489	0.195	0.782		0	
6	0	-0.489	10	1.075	0.195	0.782		0	
7	0	-0.489	10	1.075	0.195	0.782		0	
8	0	-0.489	10	1.075	0.195	0.782		0	
9								0	
10								0	
11								0	
12								10	
13								10	
14								10	
15								10	
16								10	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164487
Alias:	NAS# 9995F
Replicates:	7
Mean:	0
SD:	0
Tr Mean:	0
Trans SD:	0

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0	Statistic:	Mann-Whitney
Residual SD:	5.981	Test Residual SD:	0	Balanced Design:	Yes
SS:	679.691	Ref. Residual Mean:	9.217	Transformation:	rank-order
K:	7	Ref. Residual SD:	0		
b:	23.65	Deg. of Freedom:	13		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8229	Calculated Value:	0	Alternate:	x1 > x2
Critical Value:	<= 0.881	Critical Value:	>= 1.771		
				Mann-Whitney N1:	7
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	14
Override Option:	Not Invoked			Critical Value:	>= 43.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	10	13.5	0	9.217	0		-9.217
2	0	6	0	6	0	9.217	0		-9.217
3	0	6	0	6	0	9.217	0		-9.217
4	0	6	0	6	0	9.217	0		-9.217
5	0	6	0	6	0	9.217	0		0
6	0	6	10	13.5	0	9.217	0		0
7	0	6	10	13.5	0	9.217	0		0
8			10	13.5		9.217	0		0
9							0		0
10							0		0
11							0		0
12							18.435		9.217
13							18.435		9.217
14							18.435		9.217
15							18.435		9.217

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164494
Alias:	NAS# 9996F
Replicates:	8
Mean:	7.5
SD:	7.071
Tr Mean:	12.538
Trans SD:	10.74

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.404	Statistic:	Mann-Whitney
Residual SD:	8.847	Test Residual SD:	3.78	Balanced Design:	Yes
SS:	1487.146	Ref. Residual Mean:	9.217	Transformation:	rank-order
K:	8	Ref. Residual SD:	0		
b:	34.731	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8111	Calculated Value:	0.1392	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	38
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	11.5	10	11.5	5.897	9.217	0		-12.538
2	0	4	0	4	12.538	9.217	0		-12.538
3	0	4	0	4	12.538	9.217	0		-12.538
4	0	4	0	4	12.538	9.217	0		-9.217
5	10	11.5	0	4	5.897	9.217	0		-9.217
6	10	11.5	10	11.5	5.897	9.217	0		-9.217
7	20	16	10	11.5	14.027	9.217	0		-9.217
8	10	11.5	10	11.5	5.897	9.217	18.435		5.897
9							18.435		5.897
10							18.435		5.897
11							18.435		5.897
12							18.435		9.217
13							18.435		9.217
14							18.435		9.217
15							18.435		9.217
16							26.565		14.027

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164507
Alias:	NAS# 9997F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	6.913	Statistic:	Mann-Whitney
Residual SD:	7.912	Test Residual SD:	4.267	Balanced Design:	Yes
SS:	1189.46	Ref. Residual Mean:	9.217	Transformation:	rank-order
K:	8	Ref. Residual SD:	0		
b:	30.844	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7998	Calculated Value:	1.5275	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	24
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	10	13.5	4.609	9.217	0		-9.217
2	0	5.5	0	5.5	4.609	9.217	0		-9.217
3	0	5.5	0	5.5	4.609	9.217	0		-9.217
4	10	13.5	0	5.5	13.826	9.217	0		-9.217
5	0	5.5	0	5.5	4.609	9.217	0		-4.609
6	10	13.5	10	13.5	13.826	9.217	0		-4.609
7	0	5.5	10	13.5	4.609	9.217	0		-4.609
8	0	5.5	10	13.5	4.609	9.217	0		-4.609
9							0		-4.609
10							0		-4.609
11							18.435		9.217
12							18.435		9.217
13							18.435		9.217
14							18.435		9.217
15							18.435		13.826
16							18.435		13.826

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164491
Alias:	NAS# 9999F
Replicates:	8
Mean:	13.75
SD:	10.607
Tr Mean:	18.722
Trans SD:	12.511

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.504	Statistic:	Mann-Whitney
Residual SD:	9.666	Test Residual SD:	7.299	Balanced Design:	Yes
SS:	1775.347	Ref. Residual Mean:	9.217	Transformation:	rank-order
K:	8	Ref. Residual SD:	0		
b:	39.229	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8668	Calculated Value:	0.1112	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	48
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	3.5	10	9.5	18.722	9.217	0		-18.722
2	20	14	0	3.5	7.843	9.217	0		-18.722
3	10	9.5	0	3.5	0.287	9.217	0		-9.217
4	30	16	0	3.5	14.489	9.217	0		-9.217
5	10	9.5	0	3.5	0.287	9.217	0		-9.217
6	0	3.5	10	9.5	18.722	9.217	0		-9.217
7	20	14	10	9.5	7.843	9.217	18.435		-0.287
8	20	14	10	9.5	7.843	9.217	18.435		-0.287
9							18.435		7.843
10							18.435		7.843
11							18.435		7.843
12							18.435		9.217
13							26.565		9.217
14							26.565		9.217
15							26.565		9.217
16							33.211		14.489

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164493
Alias:	NAS# 0001G
Replicates:	8
Mean:	8.75
SD:	11.26
Tr Mean:	12.081
Trans SD:	13.736

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	12.081	Statistic:	Mann-Whitney
Residual SD:	10.261	Test Residual SD:	4.679	Balanced Design:	Yes
SS:	2000.494	Ref. Residual Mean:	9.217	Transformation:	rank-order
K:	8	Ref. Residual SD:	0		
b:	40.779	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8313	Calculated Value:	1.7308	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	36
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	15	10	11.5	14.484	9.217	0		-12.081
2	10	11.5	0	4.5	6.354	9.217	0		-12.081
3	10	11.5	0	4.5	6.354	9.217	0		-12.081
4	0	4.5	0	4.5	12.081	9.217	0		-12.081
5	0	4.5	0	4.5	12.081	9.217	0		-9.217
6	0	4.5	10	11.5	12.081	9.217	0		-9.217
7	0	4.5	10	11.5	12.081	9.217	0		-9.217
8	30	16	10	11.5	21.13	9.217	0		-9.217
9							18.435		6.354
10							18.435		6.354
11							18.435		9.217
12							18.435		9.217
13							18.435		9.217
14							18.435		9.217
15							26.565		14.484
16							33.211		21.13

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164405
Alias:	NAS# 0032G
Replicates:	8
Mean:	7.5
SD:	17.525
Tr Mean:	7.929
Trans SD:	16.309

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	11.894	Statistic:	Mann-Whitney
Residual SD:	11.566	Test Residual SD:	10.213	Balanced Design:	Yes
SS:	2541.531	Ref. Residual Mean:	9.217	Transformation:	rank-order
K:	8	Ref. Residual SD:	0		
b:	42.318	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7046	Calculated Value:	0.7413	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	26
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	13	10	13	10.506	9.217	0		-9.217
2	0	5.5	0	5.5	7.929	9.217	0		-9.217
3	0	5.5	0	5.5	7.929	9.217	0		-9.217
4	50	16	0	5.5	37.071	9.217	0		-9.217
5	0	5.5	0	5.5	7.929	9.217	0		-7.929
6	0	5.5	10	13	7.929	9.217	0		-7.929
7	0	5.5	10	13	7.929	9.217	0		-7.929
8	0	5.5	10	13	7.929	9.217	0		-7.929
9							0		-7.929
10							0		-7.929
11							18.435		9.217
12							18.435		9.217
13							18.435		9.217
14							18.435		9.217
15							18.435		10.506
16							45		37.071

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164406
Alias:	NAS# 0033G
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.641	Statistic:	Mann-Whitney
Residual SD:	8.325	Test Residual SD:	2.385	Balanced Design:	Yes
SS:	1316.902	Ref. Residual Mean:	9.217	Transformation:	rank-order
K:	8	Ref. Residual SD:	0		
b:	31.024	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7309	Calculated Value:	0.6831	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	28
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	13	10	13	11.522	9.217	0		-9.217
2	0	5	0	5	6.913	9.217	0		-9.217
3	10	13	0	5	11.522	9.217	0		-9.217
4	0	5	0	5	6.913	9.217	0		-9.217
5	0	5	0	5	6.913	9.217	0		-6.913
6	0	5	10	13	6.913	9.217	0		-6.913
7	0	5	10	13	6.913	9.217	0		-6.913
8	10	13	10	13	11.522	9.217	0		-6.913
9							0		-6.913
10							18.435		9.217
11							18.435		9.217
12							18.435		9.217
13							18.435		9.217
14							18.435		11.522
15							18.435		11.522
16							18.435		11.522

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164408
Alias:	NAS# 0034G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.437	Statistic:	Mann-Whitney
Residual SD:	8.802	Test Residual SD:	5.643	Balanced Design:	Yes
SS:	1472.112	Ref. Residual Mean:	9.217	Transformation:	rank-order
K:	8	Ref. Residual SD:	0		
b:	34.356	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8018	Calculated Value:	0.391	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	26
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	10	13	5.625	9.217	0		-9.217
2	0	5.5	0	5.5	5.625	9.217	0		-9.217
3	20	16	0	5.5	20.94	9.217	0		-9.217
4	0	5.5	0	5.5	5.625	9.217	0		-9.217
5	0	5.5	0	5.5	5.625	9.217	0		-5.625
6	0	5.5	10	13	5.625	9.217	0		-5.625
7	10	13	10	13	12.81	9.217	0		-5.625
8	0	5.5	10	13	5.625	9.217	0		-5.625
9							0		-5.625
10							0		-5.625
11							18.435		9.217
12							18.435		9.217
13							18.435		9.217
14							18.435		9.217
15							18.435		12.81
16							26.565		20.94

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164412
Alias:	NAS# 0035G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.912	Statistic:	Mann-Whitney
Residual SD:	9.067	Test Residual SD:	3.712	Balanced Design:	Yes
SS:	1562.085	Ref. Residual Mean:	9.217	Transformation:	rank-order
K:	8	Ref. Residual SD:	0		
b:	34.339	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7549	Calculated Value:	0.529	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	30
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5	10	12.5	7.929	9.217	0		-9.217
2	10	12.5	0	5	10.506	9.217	0		-9.217
3	0	5	0	5	7.929	9.217	0		-9.217
4	20	16	0	5	18.636	9.217	0		-9.217
5	10	12.5	0	5	10.506	9.217	0		-7.929
6	0	5	10	12.5	7.929	9.217	0		-7.929
7	0	5	10	12.5	7.929	9.217	0		-7.929
8	0	5	10	12.5	7.929	9.217	0		-7.929
9							0		-7.929
10							18.435		9.217
11							18.435		9.217
12							18.435		9.217
13							18.435		9.217
14							18.435		10.506
15							18.435		10.506
16							26.565		18.636

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164413
Alias:	NAS# 0036G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.437	Statistic:	Mann-Whitney
Residual SD:	8.802	Test Residual SD:	5.643	Balanced Design:	Yes
SS:	1472.112	Ref. Residual Mean:	9.217	Transformation:	rank-order
K:	8	Ref. Residual SD:	0		
b:	34.356	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8018	Calculated Value:	0.391	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	26
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	10	13	5.625	9.217	0		-9.217
2	0	5.5	0	5.5	5.625	9.217	0		-9.217
3	20	16	0	5.5	20.94	9.217	0		-9.217
4	10	13	0	5.5	12.81	9.217	0		-9.217
5	0	5.5	0	5.5	5.625	9.217	0		-5.625
6	0	5.5	10	13	5.625	9.217	0		-5.625
7	0	5.5	10	13	5.625	9.217	0		-5.625
8	0	5.5	10	13	5.625	9.217	0		-5.625
9							0		-5.625
10							0		-5.625
11							18.435		9.217
12							18.435		9.217
13							18.435		9.217
14							18.435		9.217
15							18.435		12.81
16							26.565		20.94

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164407
Alias:	NAS# 0037G
Replicates:	8
Mean:	8.75
SD:	8.345
Tr Mean:	13.554
Trans SD:	11.718

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	10.166	Statistic:	Mann-Whitney
Residual SD:	9.293	Test Residual SD:	4.382	Balanced Design:	Yes
SS:	1640.866	Ref. Residual Mean:	9.217	Transformation:	rank-order
K:	8	Ref. Residual SD:	0		
b:	36.843	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8272	Calculated Value:	0.612	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	40
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	4	10	11	13.554	9.217	0		-13.554
2	10	11	0	4	4.881	9.217	0		-13.554
3	10	11	0	4	4.881	9.217	0		-13.554
4	10	11	0	4	4.881	9.217	0		-9.217
5	20	15.5	0	4	13.011	9.217	0		-9.217
6	20	15.5	10	11	13.011	9.217	0		-9.217
7	0	4	10	11	13.554	9.217	0		-9.217
8	0	4	10	11	13.554	9.217	18.435		4.881
9							18.435		4.881
10							18.435		4.881
11							18.435		9.217
12							18.435		9.217
13							18.435		9.217
14							18.435		9.217
15							26.565		13.011
16							26.565		13.011

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164409
Alias:	NAS# 0038G
Replicates:	8
Mean:	7.5
SD:	8.864
Tr Mean:	0.128
Trans SD:	1.024

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	-0.128
Trans SD:	0.676

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.888	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.386	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.633	Transformation:	Rankits
K:		Ref. Residual SD:	0		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	1.8708	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally		Variances		Degrees of Freedom:	12
Distributed:	N/A	Homogeneous:	No	Experimental Alpha Level:	0.05
				Calculated Value:	0.5879
Override Option:	Not Invoked			Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.76	10	0.505	0.888	0.633		0	
2	10	0.505	0	-0.76	0.377	0.633		0	
3	0	-0.76	0	-0.76	0.888	0.633		0	
4	20	1.526	0	-0.76	1.398	0.633		0	
5	0	-0.76	0	-0.76	0.888	0.633		0	
6	0	-0.76	10	0.505	0.888	0.633		0	
7	10	0.505	10	0.505	0.377	0.633		0	
8	20	1.526	10	0.505	1.398	0.633		0	
9								10	
10								10	
11								10	
12								10	
13								10	
14								10	
15								20	
16								20	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164410
Alias:	NAS# 0039G
Replicates:	8
Mean:	6.25
SD:	7.44
Tr Mean:	10.234
Trans SD:	11.259

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	10.234	Statistic:	Mann-Whitney
Residual SD:	9.082	Test Residual SD:	2.661	Balanced Design:	Yes
SS:	1567.096	Ref. Residual Mean:	9.217	Transformation:	rank-order
K:	8	Ref. Residual SD:	0		
b:	34.298	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7507	Calculated Value:	1.0801	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	34
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	4.5	10	12	10.234	9.217	0		-10.234
2	0	4.5	0	4.5	10.234	9.217	0		-10.234
3	10	12	0	4.5	8.201	9.217	0		-10.234
4	10	12	0	4.5	8.201	9.217	0		-10.234
5	10	12	0	4.5	8.201	9.217	0		-9.217
6	0	4.5	10	12	10.234	9.217	0		-9.217
7	0	4.5	10	12	10.234	9.217	0		-9.217
8	20	16	10	12	16.331	9.217	0		-9.217
9							18.435		8.201
10							18.435		8.201
11							18.435		8.201
12							18.435		9.217
13							18.435		9.217
14							18.435		9.217
15							18.435		9.217
16							26.565		16.331

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164411
Alias:	NAS# 0040G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.437	Statistic:	Mann-Whitney
Residual SD:	8.802	Test Residual SD:	5.643	Balanced Design:	Yes
SS:	1472.112	Ref. Residual Mean:	9.217	Transformation:	rank-order
K:	8	Ref. Residual SD:	0		
b:	34.356	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8018	Calculated Value:	0.391	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	26
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	10	13	5.625	9.217	0		-9.217
2	0	5.5	0	5.5	5.625	9.217	0		-9.217
3	0	5.5	0	5.5	5.625	9.217	0		-9.217
4	10	13	0	5.5	12.81	9.217	0		-9.217
5	0	5.5	0	5.5	5.625	9.217	0		-5.625
6	20	16	10	13	20.94	9.217	0		-5.625
7	0	5.5	10	13	5.625	9.217	0		-5.625
8	0	5.5	10	13	5.625	9.217	0		-5.625
9							0		-5.625
10							0		-5.625
11							18.435		9.217
12							18.435		9.217
13							18.435		9.217
14							18.435		9.217
15							18.435		12.81
16							26.565		20.94

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164415
Alias:	NAS# 0041G
Replicates:	8
Mean:	16.25
SD:	25.6
Tr Mean:	16.611
Trans SD:	21.502

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	14.356
SS:	3915.998
K:	8
b:	58.531
Alpha Level:	0.05
Calculated Value:	0.8748
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	16.611
Test Residual SD:	12.123
Ref. Residual Mean:	9.217
Ref. Residual SD:	0
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.725
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	36
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	4.5	10	11.5	16.611	9.217	0		-16.611
2	40	15	0	4.5	22.62	9.217	0		-16.611
3	0	4.5	0	4.5	16.611	9.217	0		-16.611
4	70	16	0	4.5	40.178	9.217	0		-16.611
5	0	4.5	0	4.5	16.611	9.217	0		-9.217
6	10	11.5	10	11.5	1.824	9.217	0		-9.217
7	0	4.5	10	11.5	16.611	9.217	0		-9.217
8	10	11.5	10	11.5	1.824	9.217	0		-9.217
9							18.435		1.824
10							18.435		1.824
11							18.435		9.217
12							18.435		9.217
13							18.435		9.217
14							18.435		9.217
15							39.231		22.62
16							56.789		40.178

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164423
Alias:	NAS# 0042G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.437	Statistic:	Mann-Whitney
Residual SD:	8.802	Test Residual SD:	5.643	Balanced Design:	Yes
SS:	1472.112	Ref. Residual Mean:	9.217	Transformation:	rank-order
K:	8	Ref. Residual SD:	0		
b:	34.356	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8018	Calculated Value:	0.391	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	26
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	10	13	5.625	9.217	0		-9.217
2	0	5.5	0	5.5	5.625	9.217	0		-9.217
3	0	5.5	0	5.5	5.625	9.217	0		-9.217
4	10	13	0	5.5	12.81	9.217	0		-9.217
5	0	5.5	0	5.5	5.625	9.217	0		-5.625
6	0	5.5	10	13	5.625	9.217	0		-5.625
7	20	16	10	13	20.94	9.217	0		-5.625
8	0	5.5	10	13	5.625	9.217	0		-5.625
9							0		-5.625
10							0		-5.625
11							18.435		9.217
12							18.435		9.217
13							18.435		9.217
14							18.435		9.217
15							18.435		12.81
16							26.565		20.94

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164424
Alias:	NAS# 0043G
Replicates:	8
Mean:	6.25
SD:	7.44
Tr Mean:	10.234
Trans SD:	11.259

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	10.234	Statistic:	Mann-Whitney
Residual SD:	9.082	Test Residual SD:	2.661	Balanced Design:	Yes
SS:	1567.096	Ref. Residual Mean:	9.217	Transformation:	rank-order
K:	8	Ref. Residual SD:	0		
b:	34.298	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7507	Calculated Value:	1.0801	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	34
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	4.5	10	12	10.234	9.217	0		-10.234
2	20	16	0	4.5	16.331	9.217	0		-10.234
3	10	12	0	4.5	8.201	9.217	0		-10.234
4	10	12	0	4.5	8.201	9.217	0		-10.234
5	0	4.5	0	4.5	10.234	9.217	0		-9.217
6	0	4.5	10	12	10.234	9.217	0		-9.217
7	10	12	10	12	8.201	9.217	0		-9.217
8	0	4.5	10	12	10.234	9.217	0		-9.217
9							18.435		8.201
10							18.435		8.201
11							18.435		8.201
12							18.435		9.217
13							18.435		9.217
14							18.435		9.217
15							18.435		9.217
16							26.565		16.331

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164427
Alias:	NAS# 0044G
Replicates:	8
Mean:	5
SD:	10.69
Tr Mean:	6.456
Trans SD:	12.589

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	5
SD:	5.345
Tr Mean:	9.217
Trans SD:	9.854

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	9.704
SS:	1789.086
K:	8
b:	37.226
Alpha Level:	0.05
Calculated Value:	0.7746
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	9.684
Test Residual SD:	7.164
Ref. Residual Mean:	9.217
Ref. Residual SD:	0
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.184
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	26
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	10	13	6.456	9.217	0		-9.217
2	0	5.5	0	5.5	6.456	9.217	0		-9.217
3	10	13	0	5.5	11.979	9.217	0		-9.217
4	0	5.5	0	5.5	6.456	9.217	0		-9.217
5	30	16	0	5.5	26.755	9.217	0		-6.456
6	0	5.5	10	13	6.456	9.217	0		-6.456
7	0	5.5	10	13	6.456	9.217	0		-6.456
8	0	5.5	10	13	6.456	9.217	0		-6.456
9							0		-6.456
10							0		-6.456
11							18.435		9.217
12							18.435		9.217
13							18.435		9.217
14							18.435		9.217
15							18.435		11.979
16							33.211		26.755

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164472
Alias:	NAS# 9985F
Replicates:	8
Mean:	10
SD:	13.093
Tr Mean:	14.121
Trans SD:	13.644

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	9.768
SS:	1812.949
K:	8
b:	40.523
Alpha Level:	0.05
Calculated Value:	0.9058
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	10.591
Test Residual SD:	7.614
Ref. Residual Mean:	6.913
Ref. Residual SD:	4.267
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.1919
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	ArcSin
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	1.6719
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	0	0	4.314	4.609			-14.121
2	10	18.435	0	0	4.314	4.609			-14.121
3	40	39.231	0	0	25.11	4.609			-14.121
4	10	18.435	10	18.435	4.314	13.826			-4.609
5	0	0	0	0	14.121	4.609			-4.609
6	0	0	0	0	14.121	4.609			-4.609
7	10	18.435	10	18.435	4.314	13.826			-4.609
8	0	0	0	0	14.121	4.609			-4.609
9									-4.609
10									4.314
11									4.314
12									4.314
13									4.314
14									13.826
15									13.826
16									25.11

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164473
Alias:	NAS# 9986F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	7.77
SS:	1146.979
K:	8
b:	28.198
Alpha Level:	0.05
Calculated Value:	0.6933
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	8.641
Test Residual SD:	2.385
Ref. Residual Mean:	6.913
Ref. Residual SD:	4.267
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	36
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	6.913	4.609	0		-6.913
2	0	6	0	6	6.913	4.609	0		-6.913
3	0	6	0	6	6.913	4.609	0		-6.913
4	10	14	10	14	11.522	13.826	0		-6.913
5	0	6	0	6	6.913	4.609	0		-6.913
6	10	14	0	6	11.522	4.609	0		-4.609
7	10	14	10	14	11.522	13.826	0		-4.609
8	0	6	0	6	6.913	4.609	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							18.435		11.522
13							18.435		11.522
14							18.435		11.522
15							18.435		13.826
16							18.435		13.826

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164474
Alias:	NAS# 9987F
Replicates:	8
Mean:	11.25
SD:	11.26
Tr Mean:	15.401
Trans SD:	13.609

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	11.551	Statistic:	Approximate t
Residual SD:	9.75	Test Residual SD:	5.72	Balanced Design:	Yes
SS:	1806.21	Ref. Residual Mean:	6.913	Transformation:	ArcSin
K:	8	Ref. Residual SD:	4.267		
b:	40.337	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.9008	Calculated Value:	1.8382	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	12
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	1.9004
				Critical Value:	>= 1.782
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	0	0	3.034	4.609			-15.401
2	30	33.211	0	0	17.81	4.609			-15.401
3	20	26.565	0	0	11.164	4.609			-15.401
4	0	0	10	18.435	15.401	13.826			-4.609
5	10	18.435	0	0	3.034	4.609			-4.609
6	20	26.565	0	0	11.164	4.609			-4.609
7	0	0	10	18.435	15.401	13.826			-4.609
8	0	0	0	0	15.401	4.609			-4.609
9									-4.609
10									3.034
11									3.034
12									11.164
13									11.164
14									13.826
15									13.826
16									17.81

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164475
Alias:	NAS# 9988F
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.912	Statistic:	Mann-Whitney
Residual SD:	8.56	Test Residual SD:	3.712	Balanced Design:	Yes
SS:	1392.162	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	32.315	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7501	Calculated Value:	1.4996	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	37
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	7.929	4.609	0		-7.929
2	10	13.5	0	6	10.506	4.609	0		-7.929
3	20	16	0	6	18.636	4.609	0		-7.929
4	0	6	10	13.5	7.929	13.826	0		-7.929
5	0	6	0	6	7.929	4.609	0		-7.929
6	10	13.5	0	6	10.506	4.609	0		-4.609
7	0	6	10	13.5	7.929	13.826	0		-4.609
8	0	6	0	6	7.929	4.609	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							18.435		10.506
13							18.435		10.506
14							18.435		13.826
15							18.435		13.826
16							26.565		18.636

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164479
Alias:	NAS# 9991F
Replicates:	8
Mean:	13.75
SD:	10.607
Tr Mean:	18.722
Trans SD:	12.511

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.504	Statistic:	Student's t
Residual SD:	9.192	Test Residual SD:	7.299	Balanced Design:	Yes
SS:	1605.424	Ref. Residual Mean:	6.913	Transformation:	ArcSin
K:	8	Ref. Residual SD:	4.267		
b:	37.956	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8974	Calculated Value:	0.8669	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	2.6359
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	26.565	0	0	7.843	4.609			-18.722
2	30	33.211	0	0	14.489	4.609			-18.722
3	10	18.435	0	0	0.287	4.609			-4.609
4	20	26.565	10	18.435	7.843	13.826			-4.609
5	10	18.435	0	0	0.287	4.609			-4.609
6	20	26.565	0	0	7.843	4.609			-4.609
7	0	0	10	18.435	18.722	13.826			-4.609
8	0	0	0	0	18.722	4.609			-4.609
9									-0.287
10									-0.287
11									7.843
12									7.843
13									7.843
14									13.826
15									13.826
16									14.489

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164483
Alias:	NAS# 9992F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	6.913	Statistic:	Mann-Whitney
Residual SD:	7.325	Test Residual SD:	4.267	Balanced Design:	Yes
SS:	1019.537	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	23.608	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.5466	Calculated Value:	0	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	32
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	4.609	4.609	0		-4.609
2	10	14.5	0	6.5	13.826	4.609	0		-4.609
3	0	6.5	0	6.5	4.609	4.609	0		-4.609
4	10	14.5	10	14.5	13.826	13.826	0		-4.609
5	0	6.5	0	6.5	4.609	4.609	0		-4.609
6	0	6.5	0	6.5	4.609	4.609	0		-4.609
7	0	6.5	10	14.5	4.609	13.826	0		-4.609
8	0	6.5	0	6.5	4.609	4.609	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		13.826
14							18.435		13.826
15							18.435		13.826
16							18.435		13.826

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164485
Alias:	NAS# 9993F
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	2.304
Trans SD:	6.518

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	4.033	Statistic:	Mann-Whitney
Residual SD:	6.518	Test Residual SD:	4.888	Balanced Design:	Yes
SS:	807.134	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	22.21	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6112	Calculated Value:	1.2556	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	28
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	7	0	7	2.304	4.609	0		-4.609
2	10	15	0	7	16.131	4.609	0		-4.609
3	0	7	0	7	2.304	4.609	0		-4.609
4	0	7	10	15	2.304	13.826	0		-4.609
5	0	7	0	7	2.304	4.609	0		-4.609
6	0	7	0	7	2.304	4.609	0		-4.609
7	0	7	10	15	2.304	13.826	0		-2.304
8	0	7	0	7	2.304	4.609	0		-2.304
9							0		-2.304
10							0		-2.304
11							0		-2.304
12							0		-2.304
13							0		-2.304
14							18.435		13.826
15							18.435		13.826
16							18.435		16.131

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164487
Alias:	NAS# 9995F
Replicates:	7
Mean:	0
SD:	0
Tr Mean:	-0.23
Trans SD:	0

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	0.201
Trans SD:	0.797

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.646	Transformation:	Rankits
K:		Ref. Residual SD:	0.398		
b:		Deg. of Freedom:	13		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	4.2661	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.771		
Normally		Variances		Degrees of Freedom:	7
Distributed:	N/A	Homogeneous:	No.	Experimental Alpha Level:	0.05
				Calculated Value:	-1.5275
Override Option:	Not Invoked			Critical Value:	>= 1.895
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.23	0	-0.23	0	0.43		0	
2	0	-0.23	0	-0.23	0	0.43		0	
3	0	-0.23	0	-0.23	0	0.43		0	
4	0	-0.23	10	1.492	0	1.291		0	
5	0	-0.23	0	-0.23	0	0.43		0	
6	0	-0.23	0	-0.23	0	0.43		0	
7	0	-0.23	10	1.492	0	1.291		0	
8			0	-0.23		0.43		0	
9								0	
10								0	
11								0	
12								0	
13								0	
14								10	
15								10	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164494
Alias:	NAS# 9996F
Replicates:	8
Mean:	7.5
SD:	7.071
Tr Mean:	12.538
Trans SD:	10.74

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.404	Statistic:	Mann-Whitney
Residual SD:	8.326	Test Residual SD:	3.78	Balanced Design:	Yes
SS:	1317.223	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	33.987	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.877	Calculated Value:	1.2357	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	45
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	12.5	0	5	5.897	4.609	0		-12.538
2	0	5	0	5	12.538	4.609	0		-12.538
3	0	5	0	5	12.538	4.609	0		-12.538
4	0	5	10	12.5	12.538	13.826	0		-4.609
5	10	12.5	0	5	5.897	4.609	0		-4.609
6	10	12.5	0	5	5.897	4.609	0		-4.609
7	20	16	10	12.5	14.027	13.826	0		-4.609
8	10	12.5	0	5	5.897	4.609	0		-4.609
9							0		-4.609
10							18.435		5.897
11							18.435		5.897
12							18.435		5.897
13							18.435		5.897
14							18.435		13.826
15							18.435		13.826
16							26.565		14.027

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164507
Alias:	NAS# 9997F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	7.325
SS:	1019.537
K:	8
b:	23.608
Alpha Level:	0.05
Calculated Value:	0.5466
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	6.913
Test Residual SD:	4.267
Ref. Residual Mean:	6.913
Ref. Residual SD:	4.267
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	32
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	4.609	4.609	0		-4.609
2	0	6.5	0	6.5	4.609	4.609	0		-4.609
3	0	6.5	0	6.5	4.609	4.609	0		-4.609
4	10	14.5	10	14.5	13.826	13.826	0		-4.609
5	0	6.5	0	6.5	4.609	4.609	0		-4.609
6	10	14.5	0	6.5	13.826	4.609	0		-4.609
7	0	6.5	10	14.5	4.609	13.826	0		-4.609
8	0	6.5	0	6.5	4.609	4.609	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		13.826
14							18.435		13.826
15							18.435		13.826
16							18.435		13.826

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164491
Alias:	NAS# 9999F
Replicates:	8
Mean:	13.75
SD:	10.607
Tr Mean:	18.722
Trans SD:	12.511

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.504	Statistic:	Student's t
Residual SD:	9.192	Test Residual SD:	7.299	Balanced Design:	Yes
SS:	1605.424	Ref. Residual Mean:	6.913	Transformation:	ArcSin
K:	8	Ref. Residual SD:	4.267		
b:	37.956	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8974	Calculated Value:	0.8669	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	2.6359
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	0	0	0	18.722	4.609			-18.722
2	20	26.565	0	0	7.843	4.609			-18.722
3	10	18.435	0	0	0.287	4.609			-4.609
4	30	33.211	10	18.435	14.489	13.826			-4.609
5	10	18.435	0	0	0.287	4.609			-4.609
6	0	0	0	0	18.722	4.609			-4.609
7	20	26.565	10	18.435	7.843	13.826			-4.609
8	20	26.565	0	0	7.843	4.609			-4.609
9									-0.287
10									-0.287
11									7.843
12									7.843
13									7.843
14									13.826
15									13.626
16									14.489

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164493
Alias:	NAS# 0001G
Replicates:	8
Mean:	8.75
SD:	11.26
Tr Mean:	0.263
Trans SD:	0.962

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	-0.263
Trans SD:	0.582

Shapiro-Wilk Results:

Residual Mean:	
Residual SD:	
SS:	
K:	
b:	
Alpha Level:	N/A
Calculated Value:	N/A
Critical Value:	N/A
Normally Distributed:	N/A
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.84
Test Residual SD:	0.345
Ref. Residual Mean:	0.471
Ref. Residual SD:	0.291
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.3117
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	Rankits
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	12
Experimental Alpha Level:	0.05
Calculated Value:	1.3228
Critical Value:	>= 1.782
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	1.285	0	-0.577	1.022	0.314		0	
2	10	0.68	0	-0.577	0.417	0.314		0	
3	10	0.68	0	-0.577	0.417	0.314		0	
4	0	-0.577	10	0.68	0.84	0.943		0	
5	0	-0.577	0	-0.577	0.84	0.314		0	
6	0	-0.577	0	-0.577	0.84	0.314		0	
7	0	-0.577	10	0.68	0.84	0.943		0	
8	30	1.766	0	-0.577	1.503	0.314		0	
9								0	
10								0	
11								10	
12								10	
13								10	
14								10	
15								20	
16								30	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164405
Alias:	NAS# 0032G
Replicates:	8
Mean:	7.5
SD:	17.525
Tr Mean:	7.929
Trans SD:	16.309

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	11.894	Statistic:	Mann-Whitney
Residual SD:	11.172	Test Residual SD:	10.213	Balanced Design:	Yes
SS:	2371.608	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	39.783	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6673	Calculated Value:	1.2729	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	33
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	14	0	6.5	10.506	4.609	0		-7.929
2	0	6.5	0	6.5	7.929	4.609	0		-7.929
3	0	6.5	0	6.5	7.929	4.609	0		-7.929
4	50	16	10	14	37.071	13.826	0		-7.929
5	0	6.5	0	6.5	7.929	4.609	0		-7.929
6	0	6.5	0	6.5	7.929	4.609	0		-7.929
7	0	6.5	10	14	7.929	13.826	0		-4.609
8	0	6.5	0	6.5	7.929	4.609	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		10.506
14							18.435		13.826
15							18.435		13.826
16							45		37.071

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164406
Alias:	NAS# 0033G
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.641	Statistic:	Mann-Whitney
Residual SD:	7.77	Test Residual SD:	2.385	Balanced Design:	Yes
SS:	1146.979	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	28.198	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6933	Calculated Value:	1	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	36
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	14	0	6	11.522	4.609	0		-6.913
2	0	6	0	6	6.913	4.609	0		-6.913
3	10	14	0	6	11.522	4.609	0		-6.913
4	0	6	10	14	6.913	13.826	0		-6.913
5	0	6	0	6	6.913	4.609	0		-6.913
6	0	6	0	6	6.913	4.609	0		-4.609
7	0	6	10	14	6.913	13.826	0		-4.609
8	10	14	0	6	11.522	4.609	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							18.435		11.522
13							18.435		11.522
14							18.435		11.522
15							18.435		13.826
16							18.435		13.826

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164408
Alias:	NAS# 0034G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	8.279
SS:	1302.189
K:	8
b:	28.558
Alpha Level:	0.05
Calculated Value:	0.6263
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	8.437
Test Residual SD:	5.643
Ref. Residual Mean:	6.913
Ref. Residual SD:	4.267
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.6095
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transfomation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	33
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	5.625	4.609	0		-5.625
2	0	6.5	0	6.5	5.625	4.609	0		-5.625
3	20	16	0	6.5	20.94	4.609	0		-5.625
4	0	6.5	10	14	5.625	13.826	0		-5.625
5	0	6.5	0	6.5	5.625	4.609	0		-5.625
6	0	6.5	0	6.5	5.625	4.609	0		-5.625
7	10	14	10	14	12.81	13.826	0		-4.609
8	0	6.5	0	6.5	5.625	4.609	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		12.81
14							18.435		13.826
15							18.435		13.826
16							26.565		20.94

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164412
Alias:	NAS# 0035G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	8.56
SS:	1392.162
K:	8
b:	32.315
Alpha Level:	0.05
Calculated Value:	0.7501
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	9.912
Test Residual SD:	3.712
Ref. Residual Mean:	6.913
Ref. Residual SD:	4.267
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.4996
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	37
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	7.929	4.609	0		-7.929
2	10	13.5	0	6	10.506	4.609	0		-7.929
3	0	6	0	6	7.929	4.609	0		-7.929
4	20	16	10	13.5	18.636	13.826	0		-7.929
5	10	13.5	0	6	10.506	4.609	0		-7.929
6	0	6	0	6	7.929	4.609	0		-4.609
7	0	6	10	13.5	7.929	13.826	0		-4.609
8	0	6	0	6	7.929	4.609	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							18.435		10.506
13							18.435		10.506
14							18.435		13.826
15							18.435		13.826
16							26.565		18.636

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164413
Alias:	NAS# 0036G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.437	Statistic:	Mann-Whitney
Residual SD:	8.279	Test Residual SD:	5.643	Balanced Design:	Yes
SS:	1302.189	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	28.558	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6263	Calculated Value:	0.6095	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	33
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	5.625	4.609	0		-5.625
2	0	6.5	0	6.5	5.625	4.609	0		-5.625
3	20	16	0	6.5	20.94	4.609	0		-5.625
4	10	14	10	14	12.81	13.826	0		-5.625
5	0	6.5	0	6.5	5.625	4.609	0		-5.625
6	0	6.5	0	6.5	5.625	4.609	0		-5.625
7	0	6.5	10	14	5.625	13.826	0		-4.609
8	0	6.5	0	6.5	5.625	4.609	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		12.81
14							18.435		13.826
15							18.435		13.826
16							26.565		20.94

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164407
Alias:	NAS# 0037G
Replicates:	8
Mean:	8.75
SD:	8.345
Tr Mean:	13.554
Trans SD:	11.718

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	10.166	Statistic:	Mann-Whitney
Residual SD:	8.799	Test Residual SD:	4.382	Balanced Design:	Yes
SS:	1470.943	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	35.855	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.874	Calculated Value:	1.5041	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	46
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5	0	5	13.554	4.609	0		-13.554
2	10	12	0	5	4.881	4.609	0		-13.554
3	10	12	0	5	4.881	4.609	0		-13.554
4	10	12	10	12	4.881	13.826	0		-4.609
5	20	15.5	0	5	13.011	4.609	0		-4.609
6	20	15.5	0	5	13.011	4.609	0		-4.609
7	0	5	10	12	13.554	13.826	0		-4.609
8	0	5	0	5	13.554	4.609	0		-4.609
9							0		-4.609
10							18.435		4.881
11							18.435		4.881
12							18.435		4.881
13							18.435		13.011
14							18.435		13.011
15							26.565		13.826
16							26.565		13.826

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164409
Alias:	NAS# 0038G
Replicates:	8
Mean:	7.5
SD:	8.864
Tr Mean:	0.263
Trans SD:	0.953

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	-0.263
Trans SD:	0.582

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.84	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.32	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.471	Transformation:	Rankits
K:		Ref. Residual SD:	0.291		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	2.4118	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally		Variances		Degrees of Freedom:	12
Distributed:	N/A	Homogeneous:	No	Experimental Alpha Level:	0.05
				Calculated Value:	1.3315
Override Option:	Not Invoked			Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.577	0	-0.577	0.84	0.314		0	
2	10	0.68	0	-0.577	0.417	0.314		0	
3	0	-0.577	0	-0.577	0.84	0.314		0	
4	20	1.526	10	0.68	1.263	0.943		0	
5	0	-0.577	0	-0.577	0.84	0.314		0	
6	0	-0.577	0	-0.577	0.84	0.314		0	
7	10	0.68	10	0.68	0.417	0.943		0	
8	20	1.526	0	-0.577	1.263	0.314		0	
9								0	
10								0	
11								10	
12								10	
13								10	
14								10	
15								20	
16								20	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164410
Alias:	NAS# 0039G
Replicates:	8
Mean:	6.25
SD:	7.44
Tr Mean:	0.233
Trans SD:	0.921

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	-0.233
Trans SD:	0.638

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.81	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.316	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.517	Transformation:	Rankits
K:		Ref. Residual SD:	0.319		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	1.8453	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally		Variances		Degrees of Freedom:	12
Distributed:	N/A	Homogeneous:	No	Experimental Alpha Level:	0.05
				Calculated Value:	1.174
Override Option:	Not Invoked			Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.577	0	-0.577	0.81	0.344		0	
2	0	-0.577	0	-0.577	0.81	0.344		0	
3	10	0.801	0	-0.577	0.568	0.344		0	
4	10	0.801	10	0.801	0.568	1.033		0	
5	10	0.801	0	-0.577	0.568	0.344		0	
6	0	-0.577	0	-0.577	0.81	0.344		0	
7	0	-0.577	10	0.801	0.81	1.033		0	
8	20	1.766	0	-0.577	1.533	0.344		0	
9								0	
10								0	
11								10	
12								10	
13								10	
14								10	
15								10	
16								20	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164411
Alias:	NAS# 0040G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.437	Statistic:	Mann-Whitney
Residual SD:	8.279	Test Residual SD:	5.643	Balanced Design:	Yes
SS:	1302.189	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	28.558	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6263	Calculated Value:	0.6095	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	33
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	5.625	4.609	0		-5.625
2	0	6.5	0	6.5	5.625	4.609	0		-5.625
3	0	6.5	0	6.5	5.625	4.609	0		-5.625
4	10	14	10	14	12.81	13.826	0		-5.625
5	0	6.5	0	6.5	5.625	4.609	0		-5.625
6	20	16	0	6.5	20.94	4.609	0		-5.625
7	0	6.5	10	14	5.625	13.826	0		-4.609
8	0	6.5	0	6.5	5.625	4.609	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		12.81
14							18.435		13.826
15							18.435		13.826
16							26.565		20.94

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164415
Alias:	NAS# 0041G
Replicates:	8
Mean:	16.25
SD:	25.6
Tr Mean:	0.263
Trans SD:	0.962

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	-0.263
Trans SD:	0.582

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.84	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.345	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.471	Transformation:	Rankits
K:		Ref. Residual SD:	0.291		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	2.3117	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally		Variances		Degrees of Freedom:	12
Distributed:	N/A	Homogeneous:	No	Experimental Alpha Level:	0.05
				Calculated Value:	1.3228
Override Option:	Not Invoked			Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.577	0	-0.577	0.84	0.314		0	
2	40	1.285	0	-0.577	1.022	0.314		0	
3	0	-0.577	0	-0.577	0.84	0.314		0	
4	70	1.766	10	0.68	1.503	0.943		0	
5	0	-0.577	0	-0.577	0.84	0.314		0	
6	10	0.68	0	-0.577	0.417	0.314		0	
7	0	-0.577	10	0.68	0.84	0.943		0	
8	10	0.68	0	-0.577	0.417	0.314		0	
9								0	
10								0	
11								10	
12								10	
13								10	
14								10	
15								40	
16								70	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164423
Alias:	NAS# 0042G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.437	Statistic:	Mann-Whitney
Residual SD:	8.279	Test Residual SD:	5.643	Balanced Design:	Yes
SS:	1302.189	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	28.558	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6263	Calculated Value:	0.6095	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	33
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	5.625	4.609	0		-5.625
2	0	6.5	0	6.5	5.625	4.609	0		-5.625
3	0	6.5	0	6.5	5.625	4.609	0		-5.625
4	10	14	10	14	12.81	13.826	0		-5.625
5	0	6.5	0	6.5	5.625	4.609	0		-5.625
6	0	6.5	0	6.5	5.625	4.609	0		-5.625
7	20	16	10	14	20.94	13.826	0		-4.609
8	0	6.5	0	6.5	5.625	4.609	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		12.81
14							18.435		13.826
15							18.435		13.826
16							26.565		20.94

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164424
Alias:	NAS# 0043G
Replicates:	8
Mean:	6.25
SD:	7.44
Tr Mean:	0.233
Trans SD:	0.921

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	-0.233
Trans SD:	0.638

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.81	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.316	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.517	Transformation:	Rankits
K:		Ref. Residual SD:	0.319		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	1.8453	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally		Variances		Degrees of Freedom:	12
Distributed:	N/A	Homogeneous:	No	Experimental Alpha Level:	0.05
				Calculated Value:	1.174
Override Option:	Not Invoked			Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.577	0	-0.577	0.81	0.344		0	
2	20	1.766	0	-0.577	1.533	0.344		0	
3	10	0.801	0	-0.577	0.568	0.344		0	
4	10	0.801	10	0.801	0.568	1.033		0	
5	0	-0.577	0	-0.577	0.81	0.344		0	
6	0	-0.577	0	-0.577	0.81	0.344		0	
7	10	0.801	10	0.801	0.568	1.033		0	
8	0	-0.577	0	-0.577	0.81	0.344		0	
9								0	
10								0	
11								10	
12								10	
13								10	
14								10	
15								10	
16								20	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164427
Alias:	NAS# 0044G
Replicates:	8
Mean:	5
SD:	10.69
Tr Mean:	6.456
Trans SD:	12.589

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.684	Statistic:	Mann-Whitney
Residual SD:	9.231	Test Residual SD:	7.164	Balanced Design:	Yes
SS:	1619.164	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	32.605	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6565	Calculated Value:	0.9398	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	33
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	6.456	4.609	0		-6.456
2	0	6.5	0	6.5	6.456	4.609	0		-6.456
3	10	14	0	6.5	11.979	4.609	0		-6.456
4	0	6.5	10	14	6.456	13.826	0		-6.456
5	30	16	0	6.5	26.755	4.609	0		-6.456
6	0	6.5	0	6.5	6.456	4.609	0		-6.456
7	0	6.5	10	14	6.456	13.826	0		-4.609
8	0	6.5	0	6.5	6.456	4.609	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		11.979
14							18.435		13.826
15							18.435		13.826
16							33.211		26.755

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164472
Alias:	NAS# 9985F
Replicates:	8
Mean:	10
SD:	13.093
Tr Mean:	14.121
Trans SD:	13.644

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	10.591	Statistic:	Student's t
Residual SD:	9.768	Test Residual SD:	7.614	Balanced Design:	Yes
SS:	1812.949	Ref. Residual Mean:	6.913	Transformation:	ArcSin
K:	8	Ref. Residual SD:	4.267		
b:	40.523	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.9058	Calculated Value:	1.1919	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	1.6719
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	0	0	4.314	4.609			-14.121
2	10	18.435	0	0	4.314	4.609			-14.121
3	40	39.231	10	18.435	25.11	13.826			-14.121
4	10	18.435	0	0	4.314	4.609			-4.609
5	0	0	0	0	14.121	4.609			-4.609
6	0	0	0	0	14.121	4.609			-4.609
7	10	18.435	0	0	4.314	4.609			-4.609
8	0	0	10	18.435	14.121	13.826			-4.609
9									-4.609
10									4.314
11									4.314
12									4.314
13									4.314
14									13.826
15									13.826
16									25.11

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164473
Alias:	NAS# 9986F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.641	Statistic:	Mann-Whitney
Residual SD:	7.77	Test Residual SD:	2.385	Balanced Design:	Yes
SS:	1146.979	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	28.198	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6933	Calculated Value:	1	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	36
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	6.913	4.609	0		-6.913
2	0	6	0	6	6.913	4.609	0		-6.913
3	0	6	10	14	6.913	13.826	0		-6.913
4	10	14	0	6	11.522	4.609	0		-6.913
5	0	6	0	6	6.913	4.609	0		-6.913
6	10	14	0	6	11.522	4.609	0		-4.609
7	10	14	0	6	11.522	4.609	0		-4.609
8	0	6	10	14	6.913	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							18.435		11.522
13							18.435		11.522
14							18.435		11.522
15							18.435		13.826
16							18.435		13.826

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164474
Alias:	NAS# 9987F
Replicates:	8
Mean:	11.25
SD:	11.26
Tr Mean:	15.401
Trans SD:	13.609

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	11.551	Statistic:	Approximate t
Residual SD:	9.75	Test Residual SD:	5.72	Balanced Design:	Yes
SS:	1806.21	Ref. Residual Mean:	6.913	Transformation:	ArcSin
K:	8	Ref. Residual SD:	4.267		
b:	40.337	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.9008	Calculated Value:	1.8382	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	12
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	1.9004
				Critical Value:	>= 1.782
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	0	0	3.034	4.609			-15.401
2	30	33.211	0	0	17.81	4.609			-15.401
3	20	26.565	10	18.435	11.164	13.826			-15.401
4	0	0	0	0	15.401	4.609			-4.609
5	10	18.435	0	0	3.034	4.609			-4.609
6	20	26.565	0	0	11.164	4.609			-4.609
7	0	0	0	0	15.401	4.609			-4.609
8	0	0	10	18.435	15.401	13.826			-4.609
9									-4.609
10									3.034
11									3.034
12									11.164
13									11.164
14									13.826
15									13.826
16									17.81

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164475
Alias:	NAS# 9988F
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	8.56
SS:	1392.162
K:	8
b:	32.315
Alpha Level:	0.05
Calculated Value:	0.7501
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	9.912
Test Residual SD:	3.712
Ref. Residual Mean:	6.913
Ref. Residual SD:	4.267
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.4996
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	37
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	7.929	4.609	0		-7.929
2	10	13.5	0	6	10.506	4.609	0		-7.929
3	20	16	10	13.5	18.636	13.826	0		-7.929
4	0	6	0	6	7.929	4.609	0		-7.929
5	0	6	0	6	7.929	4.609	0		-7.929
6	10	13.5	0	6	10.506	4.609	0		-4.609
7	0	6	0	6	7.929	4.609	0		-4.609
8	0	6	10	13.5	7.929	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							18.435		10.506
13							18.435		10.506
14							18.435		13.826
15							18.435		13.826
16							26.565		18.636

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164479
Alias:	NAS# 9991F
Replicates:	8
Mean:	13.75
SD:	10.607
Tr Mean:	18.722
Trans SD:	12.511

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	9.192
SS:	1605.424
K:	8
b:	37.956
Alpha Level:	0.05
Calculated Value:	0.8974
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	9.504
Test Residual SD:	7.299
Ref. Residual Mean:	6.913
Ref. Residual SD:	4.267
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.8669
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	ArcSin
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	2.6359
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	26.565	0	0	7.843	4.609			-18.722
2	30	33.211	0	0	14.489	4.609			-18.722
3	10	18.435	10	18.435	0.287	13.826			-4.609
4	20	26.565	0	0	7.843	4.609			-4.609
5	10	18.435	0	0	0.287	4.609			-4.609
6	20	26.565	0	0	7.843	4.609			-4.609
7	0	0	0	0	18.722	4.609			-4.609
8	0	0	10	18.435	18.722	13.826			-4.609
9									-0.287
10									-0.287
11									7.843
12									7.843
13									7.843
14									13.826
15									13.826
16									14.489

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164483
Alias:	NAS# 9992F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	6.913	Statistic:	Mann-Whitney
Residual SD:	7.325	Test Residual SD:	4.267	Balanced Design:	Yes
SS:	1019.537	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	23.608	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.5466	Calculated Value:	0	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	32
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	4.609	4.609	0		-4.609
2	10	14.5	0	6.5	13.826	4.609	0		-4.609
3	0	6.5	10	14.5	4.609	13.826	0		-4.609
4	10	14.5	0	6.5	13.826	4.609	0		-4.609
5	0	6.5	0	6.5	4.609	4.609	0		-4.609
6	0	6.5	0	6.5	4.609	4.609	0		-4.609
7	0	6.5	0	6.5	4.609	4.609	0		-4.609
8	0	6.5	10	14.5	4.609	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		13.826
14							18.435		13.826
15							18.435		13.826
16							18.435		13.826

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164485
Alias:	NAS# 9993F
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	2.304
Trans SD:	6.518

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	6.518
SS:	807.134
K:	8
b:	22.21
Alpha Level:	0.05
Calculated Value:	0.6112
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	4.033
Test Residual SD:	4.888
Ref. Residual Mean:	6.913
Ref. Residual SD:	4.267
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.2556
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	28
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	7	0	7	2.304	4.609	0		-4.609
2	10	15	0	7	16.131	4.609	0		-4.609
3	0	7	10	15	2.304	13.826	0		-4.609
4	0	7	0	7	2.304	4.609	0		-4.609
5	0	7	0	7	2.304	4.609	0		-4.609
6	0	7	0	7	2.304	4.609	0		-4.609
7	0	7	0	7	2.304	4.609	0		-2.304
8	0	7	10	15	2.304	13.826	0		-2.304
9							0		-2.304
10							0		-2.304
11							0		-2.304
12							0		-2.304
13							0		-2.304
14							18.435		13.826
15							18.435		13.826
16							18.435		16.131

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164487
Alias:	NAS# 9995F
Replicates:	7
Mean:	0
SD:	0
Tr Mean:	-0.23
Trans SD:	0

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	0.201
Trans SD:	0.797

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.646	Transformation:	Rankits
K:		Ref. Residual SD:	0.398		
b:		Deg. of Freedom:	13		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	4.2661	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.771		
Normally		Variances		Degrees of Freedom:	7
Distributed:	N/A	Homogeneous:	No	Experimental Alpha Level:	0.05
				Calculated Value:	-1.5275
Override Option:	Not Invoked			Critical Value:	>= 1.895
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.23	0	-0.23	0	0.43		0	
2	0	-0.23	0	-0.23	0	0.43		0	
3	0	-0.23	10	1.492	0	1.291		0	
4	0	-0.23	0	-0.23	0	0.43		0	
5	0	-0.23	0	-0.23	0	0.43		0	
6	0	-0.23	0	-0.23	0	0.43		0	
7	0	-0.23	0	-0.23	0	0.43		0	
8			10	1.492		1.291		0	
9								0	
10								0	
11								0	
12								0	
13								0	
14								10	
15								10	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164494
Alias:	NAS# 9996F
Replicates:	8
Mean:	7.5
SD:	7.071
Tr Mean:	12.538
Trans SD:	10.74

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.404	Statistic:	Mann-Whitney
Residual SD:	8.326	Test Residual SD:	3.78	Balanced Design:	Yes
SS:	1317.223	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	33.987	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.877	Calculated Value:	1.2357	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	45
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	12.5	0	5	5.897	4.609	0		-12.538
2	0	5	0	5	12.538	4.609	0		-12.538
3	0	5	10	12.5	12.538	13.826	0		-12.538
4	0	5	0	5	12.538	4.609	0		-4.609
5	10	12.5	0	5	5.897	4.609	0		-4.609
6	10	12.5	0	5	5.897	4.609	0		-4.609
7	20	16	0	5	14.027	4.609	0		-4.609
8	10	12.5	10	12.5	5.897	13.826	0		-4.609
9							0		-4.609
10							18.435		5.897
11							18.435		5.897
12							18.435		5.897
13							18.435		5.897
14							18.435		13.826
15							18.435		13.826
16							26.565		14.027

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164507
Alias:	NAS# 9997F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	7.325
SS:	1019.537
K:	8
b:	23.608
Alpha Level:	0.05
Calculated Value:	0.5466
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	6.913
Test Residual SD:	4.267
Ref. Residual Mean:	6.913
Ref. Residual SD:	4.267
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	32
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	4.609	4.609	0		-4.609
2	0	6.5	0	6.5	4.609	4.609	0		-4.609
3	0	6.5	10	14.5	4.609	13.826	0		-4.609
4	10	14.5	0	6.5	13.826	4.609	0		-4.609
5	0	6.5	0	6.5	4.609	4.609	0		-4.609
6	10	14.5	0	6.5	13.826	4.609	0		-4.609
7	0	6.5	0	6.5	4.609	4.609	0		-4.609
8	0	6.5	10	14.5	4.609	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		13.826
14							18.435		13.826
15							18.435		13.826
16							18.435		13.826

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164491
Alias:	NAS# 9999F
Replicates:	8
Mean:	13.75
SD:	10.607
Tr Mean:	18.722
Trans SD:	12.511

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	9.192
SS:	1605.424
K:	8
b:	37.956
Alpha Level:	0.05
Calculated Value:	0.8974
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	9.504
Test Residual SD:	7.299
Ref. Residual Mean:	6.913
Ref. Residual SD:	4.267
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.8669
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	ArcSin
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	2.6359
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	0	0	0	18.722	4.609			-18.722
2	20	26.565	0	0	7.843	4.609			-18.722
3	10	18.435	10	18.435	0.287	13.826			-4.609
4	30	33.211	0	0	14.489	4.609			-4.609
5	10	18.435	0	0	0.287	4.609			-4.609
6	0	0	0	0	18.722	4.609			-4.609
7	20	26.565	0	0	7.843	4.609			-4.609
8	20	26.565	10	18.435	7.843	13.826			-4.609
9									-0.287
10									-0.287
11									7.843
12									7.843
13									7.843
14									13.826
15									13.826
16									14.489

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164493
Alias:	NAS# 0001GF
Replicates:	8
Mean:	8.75
SD:	11.26
Tr Mean:	0.263
Trans SD:	0.962

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	-0.263
Trans SD:	0.582

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.84	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.345	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.471	Transformation:	Rankits
K:		Ref. Residual SD:	0.291		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	2.3117	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally		Variances		Degrees of Freedom:	12
Distributed:	N/A	Homogeneous:	No	Experimental Alpha Level:	0.05
				Calculated Value:	1.3228
Override Option:	Not Invoked			Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	1.285	0	-0.577	1.022	0.314		0	
2	10	0.68	0	-0.577	0.417	0.314		0	
3	10	0.68	10	0.68	0.417	0.943		0	
4	0	-0.577	0	-0.577	0.84	0.314		0	
5	0	-0.577	0	-0.577	0.84	0.314		0	
6	0	-0.577	0	-0.577	0.84	0.314		0	
7	0	-0.577	0	-0.577	0.84	0.314		0	
8	30	1.766	10	0.68	1.503	0.943		0	
9								0	
10								0	
11								10	
12								10	
13								10	
14								10	
15								20	
16								30	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164405
Alias:	NAS# 0032GF RSR 7/26
Replicates:	8
Mean:	7.5
SD:	17.525
Tr Mean:	7.929
Trans SD:	16.309

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	11.894	Statistic:	Mann-Whitney
Residual SD:	11.172	Test Residual SD:	10.213	Balanced Design:	Yes
SS:	2371.608	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	39.783	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6673	Calculated Value:	1.2729	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	33
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10.	14	0	6.5	10.506	4.609	0		-7.929
2	0	6.5	0	6.5	7.929	4.609	0		-7.929
3	0	6.5	10	14	7.929	13.826	0		-7.929
4	50	16	0	6.5	37.071	4.609	0		-7.929
5	0	6.5	0	6.5	7.929	4.609	0		-7.929
6	0	6.5	0	6.5	7.929	4.609	0		-7.929
7	0	6.5	0	6.5	7.929	4.609	0		-4.609
8	0	6.5	10	14	7.929	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		10.506
14							18.435		13.826
15							18.435		13.826
16							45		37.071

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164406
Alias:	NAS# 0033GF
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

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Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	7.77
SS:	1146.979
K:	8
b:	28.198
Alpha Level:	0.05
Calculated Value:	0.6933
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	8.641
Test Residual SD:	2.385
Ref. Residual Mean:	6.913
Ref. Residual SD:	4.267
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	36
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	14	0	6	11.522	4.609	0		-6.913
2	0	6	0	6	6.913	4.609	0		-6.913
3	10	14	10	14	11.522	13.826	0		-6.913
4	0	6	0	6	6.913	4.609	0		-6.913
5	0	6	0	6	6.913	4.609	0		-6.913
6	0	6	0	6	6.913	4.609	0		-4.609
7	0	6	0	6	6.913	4.609	0		-4.609
8	10	14	10	14	11.522	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							18.435		11.522
13							18.435		11.522
14							18.435		11.522
15							18.435		13.826
16							18.435		13.826

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164408
Alias:	NAS# 0034G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	8.279
SS:	1302.189
K:	8
b:	28.558
Alpha Level:	0.05
Calculated Value:	0.6263
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	8.437
Test Residual SD:	5.643
Ref. Residual Mean:	6.913
Ref. Residual SD:	4.267
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.6095
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	33
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	5.625	4.609	0		-5.625
2	0	6.5	0	6.5	5.625	4.609	0		-5.625
3	20	16	10	14	20.94	13.826	0		-5.625
4	0	6.5	0	6.5	5.625	4.609	0		-5.625
5	0	6.5	0	6.5	5.625	4.609	0		-5.625
6	0	6.5	0	6.5	5.625	4.609	0		-5.625
7	10	14	0	6.5	12.81	4.609	0		-4.609
8	0	6.5	10	14	5.625	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		12.81
14							18.435		13.826
15							18.435		13.826
16							26.565		20.94

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164412
Alias:	NAS# 0035G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.912	Statistic:	Mann-Whitney
Residual SD:	8.56	Test Residual SD:	3.712	Balanced Design:	Yes
SS:	1392.162	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	32.315	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7501	Calculated Value:	1.4996	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	37
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	7.929	4.609	0		-7.929
2	10	13.5	0	6	10.506	4.609	0		-7.929
3	0	6	10	13.5	7.929	13.826	0		-7.929
4	20	16	0	6	18.636	4.609	0		-7.929
5	10	13.5	0	6	10.506	4.609	0		-7.929
6	0	6	0	6	7.929	4.609	0		-4.609
7	0	6	0	6	7.929	4.609	0		-4.609
8	0	6	10	13.5	7.929	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							18.435		10.506
13							18.435		10.506
14							18.435		13.826
15							18.435		13.826
16							26.565		18.636

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164413
Alias:	NAS# 0036G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.437	Statistic:	Mann-Whitney
Residual SD:	8.279	Test Residual SD:	5.643	Balanced Design:	Yes
SS:	1302.189	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	28.558	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6263	Calculated Value:	0.6095	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	33
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	5.625	4.609	0		-5.625
2	0	6.5	0	6.5	5.625	4.609	0		-5.625
3	20	16	10	14	20.94	13.826	0		-5.625
4	10	14	0	6.5	12.81	4.609	0		-5.625
5	0	6.5	0	6.5	5.625	4.609	0		-5.625
6	0	6.5	0	6.5	5.625	4.609	0		-5.625
7	0	6.5	0	6.5	5.625	4.609	0		-4.609
8	0	6.5	10	14	5.625	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		12.81
14							18.435		13.826
15							18.435		13.826
16							26.565		20.94

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164407
Alias:	NAS# 0037G
Replicates:	8
Mean:	8.75
SD:	8.345
Tr Mean:	13.554
Trans SD:	11.718

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	10.166	Statistic:	Mann-Whitney
Residual SD:	8.799	Test Residual SD:	4.382	Balanced Design:	Yes
SS:	1470.943	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	35.855	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.874	Calculated Value:	1.5041	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	46
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5	0	5	13.554	4.609	0		-13.554
2	10	12	0	5	4.881	4.609	0		-13.554
3	10	12	10	12	4.881	13.826	0		-13.554
4	10	12	0	5	4.881	4.609	0		-4.609
5	20	15.5	0	5	13.011	4.609	0		-4.609
6	20	15.5	0	5	13.011	4.609	0		-4.609
7	0	5	0	5	13.554	4.609	0		-4.609
8	0	5	10	12	13.554	13.826	0		-4.609
9							0		-4.609
10							18.435		4.881
11							18.435		4.881
12							18.435		4.881
13							18.435		13.011
14							18.435		13.011
15							26.565		13.826
16							26.565		13.826

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164409
Alias:	NAS# 0038G
Replicates:	8
Mean:	7.5
SD:	8.864
Tr Mean:	0.263
Trans SD:	0.953

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	-0.263
Trans SD:	0.582

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.84	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.32	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.471	Transformation:	Rankits
K:		Ref. Residual SD:	0.291		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	2.4118	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally		Variances		Degrees of Freedom:	12
Distributed:	N/A	Homogeneous:	No	Experimental Alpha Level:	0.05
				Calculated Value:	1.3315
Override Option:	Not Invoked			Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.577	0	-0.577	0.84	0.314		0	
2	10	0.68	0	-0.577	0.417	0.314		0	
3	0	-0.577	10	0.68	0.84	0.943		0	
4	20	1.526	0	-0.577	1.263	0.314		0	
5	0	-0.577	0	-0.577	0.84	0.314		0	
6	0	-0.577	0	-0.577	0.84	0.314		0	
7	10	0.68	0	-0.577	0.417	0.314		0	
8	20	1.526	10	0.68	1.263	0.943		0	
9								0	
10								0	
11								10	
12								10	
13								10	
14								10	
15								20	
16								20	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164410
Alias:	NAS# 0039G
Replicates:	8
Mean:	6.25
SD:	7.44
Tr Mean:	0.233
Trans SD:	0.921

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	-0.233
Trans SD:	0.638

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.81	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.316	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.517	Transformation:	Rankits
K:		Ref. Residual SD:	0.319		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	1.8453	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally		Variances		Degrees of Freedom:	12
Distributed:	N/A	Homogeneous:	No	Experimental Alpha Level:	0.05
				Calculated Value:	1.174
Override Option:	Not Invoked			Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.577	0	-0.577	0.81	0.344		0	
2	0	-0.577	0	-0.577	0.81	0.344		0	
3	10	0.801	10	0.801	0.568	1.033		0	
4	10	0.801	0	-0.577	0.568	0.344		0	
5	10	0.801	0	-0.577	0.568	0.344		0	
6	0	-0.577	0	-0.577	0.81	0.344		0	
7	0	-0.577	0	-0.577	0.81	0.344		0	
8	20	1.766	10	0.801	1.533	1.033		0	
9								0	
10								0	
11								10	
12								10	
13								10	
14								10	
15								10	
16								20	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164411
Alias:	NAS# 0040G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	8.279
SS:	1302.189
K:	8
b:	28.558
Alpha Level:	0.05
Calculated Value:	0.6263
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	8.437
Test Residual SD:	5.643
Ref. Residual Mean:	6.913
Ref. Residual SD:	4.267
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.6095
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	33
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	5.625	4.609	0		-5.625
2	0	6.5	0	6.5	5.625	4.609	0		-5.625
3	0	6.5	10	14	5.625	13.826	0		-5.625
4	10	14	0	6.5	12.81	4.609	0		-5.625
5	0	6.5	0	6.5	5.625	4.609	0		-5.625
6	20	16	0	6.5	20.94	4.609	0		-5.625
7	0	6.5	0	6.5	5.625	4.609	0		-4.609
8	0	6.5	10	14	5.625	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		12.81
14							18.435		13.826
15							18.435		13.826
16							26.565		20.94

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164415
Alias:	NAS# 0041G
Replicates:	8
Mean:	16.25
SD:	25.6
Tr Mean:	0.263
Trans SD:	0.962

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	-0.263
Trans SD:	0.582

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.84	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.345	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.471	Transformation:	Rankits
K:		Ref. Residual SD:	0.291		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	2.3117	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally Distributed:	N/A	Variances Homogeneous:	No	Degrees of Freedom:	12
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	1.3228
				Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.577	0	-0.577	0.84	0.314		0	
2	40	1.285	0	-0.577	1.022	0.314		0	
3	0	-0.577	10	0.68	0.84	0.943		0	
4	70	1.766	0	-0.577	1.503	0.314		0	
5	0	-0.577	0	-0.577	0.84	0.314		0	
6	10	0.68	0	-0.577	0.417	0.314		0	
7	0	-0.577	0	-0.577	0.84	0.314		0	
8	10	0.68	10	0.68	0.417	0.943		0	
9								0	
10								0	
11								10	
12								10	
13								10	
14								10	
15								40	
16								70	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164423
Alias:	NAS# 0042G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	8.279
SS:	1302.189
K:	8
b:	28.558
Alpha Level:	0.05
Calculated Value:	0.6263
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	8.437
Test Residual SD:	5.643
Ref. Residual Mean:	6.913
Ref. Residual SD:	4.267
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.6095
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	33
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	5.625	4.609	0		-5.625
2	0	6.5	0	6.5	5.625	4.609	0		-5.625
3	0	6.5	10	14	5.625	13.826	0		-5.625
4	10	14	0	6.5	12.81	4.609	0		-5.625
5	0	6.5	0	6.5	5.625	4.609	0		-5.625
6	0	6.5	0	6.5	5.625	4.609	0		-5.625
7	20	16	0	6.5	20.94	4.609	0		-4.609
8	0	6.5	10	14	5.625	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		12.81
14							18.435		13.826
15							18.435		13.826
16							26.565		20.94

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164424
Alias:	NAS# 0043G
Replicates:	8
Mean:	6.25
SD:	7.44
Tr Mean:	0.233
Trans SD:	0.921

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	-0.233
Trans SD:	0.638

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.81	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.316	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.517	Transformation:	Rankits
K:		Ref. Residual SD:	0.319		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	1.8453	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally		Variances		Degrees of Freedom:	12
Distributed:	N/A	Homogeneous:	No	Experimental Alpha Level:	0.05
				Calculated Value:	1.174
Override Option:	Not Invoked			Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.577	0	-0.577	0.81	0.344		0	
2	20	1.766	0	-0.577	1.533	0.344		0	
3	10	0.801	10	0.801	0.568	1.033		0	
4	10	0.801	0	-0.577	0.568	0.344		0	
5	0	-0.577	0	-0.577	0.81	0.344		0	
6	0	-0.577	0	-0.577	0.81	0.344		0	
7	10	0.801	0	-0.577	0.568	0.344		0	
8	0	-0.577	10	0.801	0.81	1.033		0	
9								0	
10								0	
11								10	
12								10	
13								10	
14								10	
15								10	
16								20	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164427
Alias:	NAS# 0044G
Replicates:	8
Mean:	5
SD:	10.69
Tr Mean:	6.456
Trans SD:	12.589

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.684	Statistic:	Mann-Whitney
Residual SD:	9.231	Test Residual SD:	7.164	Balanced Design:	Yes
SS:	1619.164	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	32.605	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6565	Calculated Value:	0.9398	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	33
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	6.456	4.609	0		-6.456
2	0	6.5	0	6.5	6.456	4.609	0		-6.456
3	10	14	10	14	11.979	13.826	0		-6.456
4	0	6.5	0	6.5	6.456	4.609	0		-6.456
5	30	16	0	6.5	26.755	4.609	0		-6.456
6	0	6.5	0	6.5	6.456	4.609	0		-6.456
7	0	6.5	0	6.5	6.456	4.609	0		-4.609
8	0	6.5	10	14	6.456	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		11.979
14							18.435		13.826
15							18.435		13.826
16							33.211		26.755

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164472
Alias:	NAS# 9985F
Replicates:	8
Mean:	10
SD:	13.093
Tr Mean:	14.121
Trans SD:	13.644

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	10.591	Statistic:	Student's t
Residual SD:	9.768	Test Residual SD:	7.614	Balanced Design:	Yes
SS:	1812.949	Ref. Residual Mean:	6.913	Transformation:	ArcSin
K:	8	Ref. Residual SD:	4.267		
b:	40.523	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.9058	Calculated Value:	1.1919	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	1.6719
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	0	0	4.314	4.609			-14.121
2	10	18.435	0	0	4.314	4.609			-14.121
3	40	39.231	0	0	25.11	4.609			-14.121
4	10	18.435	0	0	4.314	4.609			-4.609
5	0	0	0	0	14.121	4.609			-4.609
6	0	0	10	18.435	14.121	13.826			-4.609
7	10	18.435	0	0	4.314	4.609			-4.609
8	0	0	10	18.435	14.121	13.826			-4.609
9									-4.609
10									4.314
11									4.314
12									4.314
13									4.314
14									13.826
15									13.826
16									25.11

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164473
Alias:	NAS# 9986F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	7.77
SS:	1146.979
K:	8
b:	28.198
Alpha Level:	0.05
Calculated Value:	0.6933
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	8.641
Test Residual SD:	2.385
Ref. Residual Mean:	6.913
Ref. Residual SD:	4.267
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	36
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	6.913	4.609	0		-6.913
2	0	6	0	6	6.913	4.609	0		-6.913
3	0	6	0	6	6.913	4.609	0		-6.913
4	10	14	0	6	11.522	4.609	0		-6.913
5	0	6	0	6	6.913	4.609	0		-6.913
6	10	14	10	14	11.522	13.826	0		-4.609
7	10	14	0	6	11.522	4.609	0		-4.609
8	0	6	10	14	6.913	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							18.435		11.522
13							18.435		11.522
14							18.435		11.522
15							18.435		13.826
16							18.435		13.826

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164474
Alias:	NAS# 9987F
Replicates:	8
Mean:	11.25
SD:	11.26
Tr Mean:	15.401
Trans SD:	13.609

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	11.551	Statistic:	Approximate t
Residual SD:	9.75	Test Residual SD:	5.72	Balanced Design:	Yes
SS:	1806.21	Ref. Residual Mean:	6.913	Transformation:	ArcSin
K:	8	Ref. Residual SD:	4.267		
b:	40.337	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.9008	Calculated Value:	1.8382	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	12
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	1.9004
				Critical Value:	>= 1.782
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	0	0	3.034	4.609			-15.401
2	30	33.211	0	0	17.81	4.609			-15.401
3	20	26.565	0	0	11.164	4.609			-15.401
4	0	0	0	0	15.401	4.609			-4.609
5	10	18.435	0	0	3.034	4.609			-4.609
6	20	26.565	10	18.435	11.164	13.826			-4.609
7	0	0	0	0	15.401	4.609			-4.609
8	0	0	10	18.435	15.401	13.826			-4.609
9									-4.609
10									3.034
11									3.034
12									11.164
13									11.164
14									13.826
15									13.826
16									17.81

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164475
Alias:	NAS# 9988F
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	8.56
SS:	1392.162
K:	8
b:	32.315
Alpha Level:	0.05
Calculated Value:	0.7501
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	9.912
Test Residual SD:	3.712
Ref. Residual Mean:	6.913
Ref. Residual SD:	4.267
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.4996
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	37
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	7.929	4.609	0		-7.929
2	10	13.5	0	6	10.506	4.609	0		-7.929
3	20	16	0	6	18.636	4.609	0		-7.929
4	0	6	0	6	7.929	4.609	0		-7.929
5	0	6	0	6	7.929	4.609	0		-7.929
6	10	13.5	10	13.5	10.506	13.826	0		-4.609
7	0	6	0	6	7.929	4.609	0		-4.609
8	0	6	10	13.5	7.929	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							18.435		10.506
13							18.435		10.506
14							18.435		13.826
15							18.435		13.826
16							26.565		18.636

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164479
Alias:	NAS# 9991F
Replicates:	8
Mean:	13.75
SD:	10.607
Tr Mean:	18.722
Trans SD:	12.511

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.504	Statistic:	Student's t
Residual SD:	9.192	Test Residual SD:	7.299	Balanced Design:	Yes
SS:	1605.424	Ref. Residual Mean:	6.913	Transformation:	ArcSin
K:	8	Ref. Residual SD:	4.267		
b:	37.956	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8974	Calculated Value:	0.8669	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	2.6359
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	26.565	0	0	7.843	4.609			-18.722
2	30	33.211	0	0	14.489	4.609			-18.722
3	10	18.435	0	0	0.287	4.609			-4.609
4	20	26.565	0	0	7.843	4.609			-4.609
5	10	18.435	0	0	0.287	4.609			-4.609
6	20	26.565	10	18.435	7.843	13.826			-4.609
7	0	0	0	0	18.722	4.609			-4.609
8	0	0	10	18.435	18.722	13.826			-4.609
9									-0.287
10									-0.287
11									7.843
12									7.843
13									7.843
14									13.826
15									13.826
16									14.489

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164483
Alias:	NAS# 9992F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	6.913	Statistic:	Mann-Whitney
Residual SD:	7.325	Test Residual SD:	4.267	Balanced Design:	Yes
SS:	1019.537	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	23.608	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.5466	Calculated Value:	0	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	32
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	4.609	4.609	0		-4.609
2	10	14.5	0	6.5	13.826	4.609	0		-4.609
3	0	6.5	0	6.5	4.609	4.609	0		-4.609
4	10	14.5	0	6.5	13.826	4.609	0		-4.609
5	0	6.5	0	6.5	4.609	4.609	0		-4.609
6	0	6.5	10	14.5	4.609	13.826	0		-4.609
7	0	6.5	0	6.5	4.609	4.609	0		-4.609
8	0	6.5	10	14.5	4.609	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		13.826
14							18.435		13.826
15							18.435		13.826
16							18.435		13.826

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164485
Alias:	NAS# 9993F
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	2.304
Trans SD:	6.518

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	6.518
SS:	807.134
K:	8
b:	22.21
Alpha Level:	0.05
Calculated Value:	0.6112
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	4.033
Test Residual SD:	4.888
Ref. Residual Mean:	6.913
Ref. Residual SD:	4.267
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.2556
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	28
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	7	0	7	2.304	4.609	0		-4.609
2	10	15	0	7	16.131	4.609	0		-4.609
3	0	7	0	7	2.304	4.609	0		-4.609
4	0	7	0	7	2.304	4.609	0		-4.609
5	0	7	0	7	2.304	4.609	0		-4.609
6	0	7	10	15	2.304	13.826	0		-4.609
7	0	7	0	7	2.304	4.609	0		-2.304
8	0	7	10	15	2.304	13.826	0		-2.304
9							0		-2.304
10							0		-2.304
11							0		-2.304
12							0		-2.304
13							0		-2.304
14							18.435		13.826
15							18.435		13.826
16							18.435		16.131

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164487
Alias:	NAS# 9995F
Replicates:	7
Mean:	0
SD:	0
Tr Mean:	-0.23
Trans SD:	0

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	0.201
Trans SD:	0.797

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.646	Transformation:	Rankits
K:		Ref. Residual SD:	0.398		
b:		Deg. of Freedom:	13		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	4.2661	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.771		
Normally		Variances		Degrees of Freedom:	7
Distributed:	N/A	Homogeneous:	No	Experimental Alpha Level:	0.05
				Calculated Value:	-1.5275
Override Option:	Not Invoked			Critical Value:	>= 1.895
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.23	0	-0.23	0	0.43		0	
2	0	-0.23	0	-0.23	0	0.43		0	
3	0	-0.23	0	-0.23	0	0.43		0	
4	0	-0.23	0	-0.23	0	0.43		0	
5	0	-0.23	0	-0.23	0	0.43		0	
6	0	-0.23	10	1.492	0	1.291		0	
7	0	-0.23	0	-0.23	0	0.43		0	
8			10	1.492		1.291		0	
9								0	
10								0	
11								0	
12								0	
13								0	
14								10	
15								10	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164494
Alias:	NAS# 9996F
Replicates:	8
Mean:	7.5
SD:	7.071
Tr Mean:	12.538
Trans SD:	10.74

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	8.326
SS:	1317.223
K:	8
b:	33.987
Alpha Level:	0.05
Calculated Value:	0.877
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	9.404
Test Residual SD:	3.78
Ref. Residual Mean:	6.913
Ref. Residual SD:	4.267
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.2357
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	45
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	12.5	0	5	5.897	4.609	0		-12.538
2	0	5	0	5	12.538	4.609	0		-12.538
3	0	5	0	5	12.538	4.609	0		-12.538
4	0	5	0	5	12.538	4.609	0		-4.609
5	10	12.5	0	5	5.897	4.609	0		-4.609
6	10	12.5	10	12.5	5.897	13.826	0		-4.609
7	20	16	0	5	14.027	4.609	0		-4.609
8	10	12.5	10	12.5	5.897	13.826	0		-4.609
9							0		-4.609
10							18.435		5.897
11							18.435		5.897
12							18.435		5.897
13							18.435		5.897
14							18.435		13.826
15							18.435		13.826
16							26.565		14.027

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164507
Alias:	NAS# 9997F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	6.913	Statistic:	Mann-Whitney
Residual SD:	7.325	Test Residual SD:	4.267	Balanced Design:	Yes
SS:	1019.537	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	23.608	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.5466	Calculated Value:	0	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	32
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	4.609	4.609	0		-4.609
2	0	6.5	0	6.5	4.609	4.609	0		-4.609
3	0	6.5	0	6.5	4.609	4.609	0		-4.609
4	10	14.5	0	6.5	13.826	4.609	0		-4.609
5	0	6.5	0	6.5	4.609	4.609	0		-4.609
6	10	14.5	10	14.5	13.826	13.826	0		-4.609
7	0	6.5	0	6.5	4.609	4.609	0		-4.609
8	0	6.5	10	14.5	4.609	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		13.826
14							18.435		13.826
15							18.435		13.826
16							18.435		13.826

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164491
Alias:	NAS# 9999F
Replicates:	8
Mean:	13.75
SD:	10.607
Tr Mean:	18.722
Trans SD:	12.511

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.504	Statistic:	Student's t
Residual SD:	9.192	Test Residual SD:	7.299	Balanced Design:	Yes
SS:	1605.424	Ref. Residual Mean:	6.913	Transformation:	ArcSin
K:	8	Ref. Residual SD:	4.267		
b:	37.956	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8974	Calculated Value:	0.8669	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	2.6359
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	0	0	0	18.722	4.609			-18.722
2	20	26.565	0	0	7.843	4.609			-18.722
3	10	18.435	0	0	0.287	4.609			-4.609
4	30	33.211	0	0	14.489	4.609			-4.609
5	10	18.435	0	0	0.287	4.609			-4.609
6	0	0	10	18.435	18.722	13.826			-4.609
7	20	26.565	0	0	7.843	4.609			-4.609
8	20	26.565	10	18.435	7.843	13.826			-4.609
9									-0.287
10									-0.287
11									7.843
12									7.843
13									7.843
14									13.826
15									13.826
16									14.489

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164493
Alias:	NAS# 0001G
Replicates:	8
Mean:	8.75
SD:	11.26
Tr Mean:	0.263
Trans SD:	0.962

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	-0.263
Trans SD:	0.582

Shapiro-Wilk Results:

Residual Mean:	
Residual SD:	
SS:	
K:	
b:	
Alpha Level:	N/A
Calculated Value:	N/A
Critical Value:	N/A
Normally Distributed:	N/A
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.84
Test Residual SD:	0.345
Ref. Residual Mean:	0.471
Ref. Residual SD:	0.291
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.3117
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	Rankits
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	12
Experimental Alpha Level:	0.05
Calculated Value:	1.3228
Critical Value:	>= 1.782
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	1.285	0	-0.577	1.022	0.314		0	
2	10	0.68	0	-0.577	0.417	0.314		0	
3	10	0.68	0	-0.577	0.417	0.314		0	
4	0	-0.577	0	-0.577	0.84	0.314		0	
5	0	-0.577	0	-0.577	0.84	0.314		0	
6	0	-0.577	10	0.68	0.84	0.943		0	
7	0	-0.577	0	-0.577	0.84	0.314		0	
8	30	1.766	10	0.68	1.503	0.943		0	
9								0	
10								0	
11								10	
12								10	
13								10	
14								10	
15								20	
16								30	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164405
Alias:	NAS# 0032G
Replicates:	8
Mean:	7.5
SD:	17.525
Tr Mean:	7.929
Trans SD:	16.309

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	11.894	Statistic:	Mann-Whitney
Residual SD:	11.172	Test Residual SD:	10.213	Balanced Design:	Yes
SS:	2371.608	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	39.783	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6673	Calculated Value:	1.2729	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	33
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	14	0	6.5	10.506	4.609	0		-7.929
2	0	6.5	0	6.5	7.929	4.609	0		-7.929
3	0	6.5	0	6.5	7.929	4.609	0		-7.929
4	50	16	0	6.5	37.071	4.609	0		-7.929
5	0	6.5	0	6.5	7.929	4.609	0		-7.929
6	0	6.5	10	14	7.929	13.826	0		-7.929
7	0	6.5	0	6.5	7.929	4.609	0		-4.609
8	0	6.5	10	14	7.929	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		10.506
14							18.435		13.826
15							18.435		13.826
16							45		37.071

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164406
Alias:	NAS# 0033G
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.641	Statistic:	Mann-Whitney
Residual SD:	7.77	Test Residual SD:	2.385	Balanced Design:	Yes
SS:	1146.979	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	28.198	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6933	Calculated Value:	1	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	36
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	14	0	6	11.522	4.609	0		-6.913
2	0	6	0	6	6.913	4.609	0		-6.913
3	10	14	0	6	11.522	4.609	0		-6.913
4	0	6	0	6	6.913	4.609	0		-6.913
5	0	6	0	6	6.913	4.609	0		-6.913
6	0	6	10	14	6.913	13.826	0		-4.609
7	0	6	0	6	6.913	4.609	0		-4.609
8	10	14	10	14	11.522	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							18.435		11.522
13							18.435		11.522
14							18.435		11.522
15							18.435		13.826
16							18.435		13.826

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164408
Alias:	NAS# 0034G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	8.279
SS:	1302.189
K:	8
b:	28.558
Alpha Level:	0.05
Calculated Value:	0.6263
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	8.437
Test Residual SD:	5.643
Ref. Residual Mean:	6.913
Ref. Residual SD:	4.267
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.6095
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	33
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	5.625	4.609	0		-5.625
2	0	6.5	0	6.5	5.625	4.609	0		-5.625
3	20	16	0	6.5	20.94	4.609	0		-5.625
4	0	6.5	0	6.5	5.625	4.609	0		-5.625
5	0	6.5	0	6.5	5.625	4.609	0		-5.625
6	0	6.5	10	14	5.625	13.826	0		-5.625
7	10	14	0	6.5	12.81	4.609	0		-4.609
8	0	6.5	10	14	5.625	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		12.81
14							18.435		13.826
15							18.435		13.826
16							26.565		20.94

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164412
Alias:	NAS# 0035G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	8.56
SS:	1392.162
K:	8
b:	32.315
Alpha Level:	0.05
Calculated Value:	0.7501
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	9.912
Test Residual SD:	3.712
Ref. Residual Mean:	6.913
Ref. Residual SD:	4.267
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.4996
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	37
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	7.929	4.609	0		-7.929
2	10	13.5	0	6	10.506	4.609	0		-7.929
3	0	6	0	6	7.929	4.609	0		-7.929
4	20	16	0	6	18.636	4.609	0		-7.929
5	10	13.5	0	6	10.506	4.609	0		-7.929
6	0	6	10	13.5	7.929	13.826	0		-4.609
7	0	6	0	6	7.929	4.609	0		-4.609
8	0	6	10	13.5	7.929	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							18.435		10.506
13							18.435		10.506
14							18.435		13.826
15							18.435		13.826
16							26.565		18.636

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164413
Alias:	NAS# 0036G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.437	Statistic:	Mann-Whitney
Residual SD:	8.279	Test Residual SD:	5.643	Balanced Design:	Yes
SS:	1302.189	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	28.558	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6263	Calculated Value:	0.6095	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	33
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	5.625	4.609	0		-5.625
2	0	6.5	0	6.5	5.625	4.609	0		-5.625
3	20	16	0	6.5	20.94	4.609	0		-5.625
4	10	14	0	6.5	12.81	4.609	0		-5.625
5	0	6.5	0	6.5	5.625	4.609	0		-5.625
6	0	6.5	10	14	5.625	13.826	0		-5.625
7	0	6.5	0	6.5	5.625	4.609	0		-4.609
8	0	6.5	10	14	5.625	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		12.81
14							18.435		13.826
15							18.435		13.826
16							26.565		20.94

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164407
Alias:	NAS# 0037G
Replicates:	8
Mean:	8.75
SD:	8.345
Tr Mean:	13.554
Trans SD:	11.718

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	10.166	Statistic:	Mann-Whitney
Residual SD:	8.799	Test Residual SD:	4.382	Balanced Design:	Yes
SS:	1470.943	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	35.855	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.874	Calculated Value:	1.5041	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	46
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5	0	5	13.554	4.609	0		-13.554
2	10	12	0	5	4.881	4.609	0		-13.554
3	10	12	0	5	4.881	4.609	0		-13.554
4	10	12	0	5	4.881	4.609	0		-4.609
5	20	15.5	0	5	13.011	4.609	0		-4.609
6	20	15.5	10	12	13.011	13.826	0		-4.609
7	0	5	0	5	13.554	4.609	0		-4.609
8	0	5	10	12	13.554	13.826	0		-4.609
9							0		-4.609
10							18.435		4.881
11							18.435		4.881
12							18.435		4.881
13							18.435		13.011
14							18.435		13.011
15							26.565		13.826
16							26.565		13.826

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164409
Alias:	NAS# 0038G
Replicates:	8
Mean:	7.5
SD:	8.864
Tr Mean:	0.263
Trans SD:	0.953

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	-0.263
Trans SD:	0.582

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.84	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.32	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.471	Transformation:	Rankits
K:		Ref. Residual SD:	0.291		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	2.4118	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally Distributed:	N/A	Variances Homogeneous:	No	Degrees of Freedom:	12
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	1.3315
				Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.577	0	-0.577	0.84	0.314		0	
2	10	0.68	0	-0.577	0.417	0.314		0	
3	0	-0.577	0	-0.577	0.84	0.314		0	
4	20	1.526	0	-0.577	1.263	0.314		0	
5	0	-0.577	0	-0.577	0.84	0.314		0	
6	0	-0.577	10	0.68	0.84	0.943		0	
7	10	0.68	0	-0.577	0.417	0.314		0	
8	20	1.526	10	0.68	1.263	0.943		0	
9								0	
10								0	
11								10	
12								10	
13								10	
14								10	
15								20	
16								20	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164410
Alias:	NAS# 0039G
Replicates:	8
Mean:	6.25
SD:	7.44
Tr Mean:	0.233
Trans SD:	0.921

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	-0.233
Trans SD:	0.638

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.81	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.316	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.517	Transformation:	Rankits
K:		Ref. Residual SD:	0.319		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	1.8453	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally		Variances		Degrees of Freedom:	12
Distributed:	N/A	Homogeneous:	No	Experimental Alpha Level:	0.05
				Calculated Value:	1.174
Override Option:	Not Invoked			Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.577	0	-0.577	0.81	0.344		0	
2	0	-0.577	0	-0.577	0.81	0.344		0	
3	10	0.801	0	-0.577	0.568	0.344		0	
4	10	0.801	0	-0.577	0.568	0.344		0	
5	10	0.801	0	-0.577	0.568	0.344		0	
6	0	-0.577	10	0.801	0.81	1.033		0	
7	0	-0.577	0	-0.577	0.81	0.344		0	
8	20	1.766	10	0.801	1.533	1.033		0	
9								0	
10								0	
11								10	
12								10	
13								10	
14								10	
15								10	
16								20	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164411
Alias:	NAS# 0040G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.437	Statistic:	Mann-Whitney
Residual SD:	8.279	Test Residual SD:	5.643	Balanced Design:	Yes
SS:	1302.189	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	28.558	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6263	Calculated Value:	0.6095	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
				Calculated Value:	33
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	5.625	4.609	0		-5.625
2	0	6.5	0	6.5	5.625	4.609	0		-5.625
3	0	6.5	0	6.5	5.625	4.609	0		-5.625
4	10	14	0	6.5	12.81	4.609	0		-5.625
5	0	6.5	0	6.5	5.625	4.609	0		-5.625
6	20	16	10	14	20.94	13.826	0		-5.625
7	0	6.5	0	6.5	5.625	4.609	0		-4.609
8	0	6.5	10	14	5.625	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		12.81
14							18.435		13.826
15							18.435		13.826
16							26.565		20.94

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164415
Alias:	NAS# 0041G
Replicates:	8
Mean:	16.25
SD:	25.6
Tr Mean:	0.263
Trans SD:	0.962

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	-0.263
Trans SD:	0.582

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.84	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.345	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.471	Transformation:	Rankits
K:		Ref. Residual SD:	0.291		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	2.3117	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally		Variances		Degrees of Freedom:	12
Distributed:	N/A	Homogeneous:	No	Experimental Alpha Level:	0.05
				Calculated Value:	1.3228
Override Option:	Not Invoked			Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.577	0	-0.577	0.84	0.314		0	
2	40	1.285	0	-0.577	1.022	0.314		0	
3	0	-0.577	0	-0.577	0.84	0.314		0	
4	70	1.766	0	-0.577	1.503	0.314		0	
5	0	-0.577	0	-0.577	0.84	0.314		0	
6	10	0.68	10	0.68	0.417	0.943		0	
7	0	-0.577	0	-0.577	0.84	0.314		0	
8	10	0.68	10	0.68	0.417	0.943		0	
9								0	
10								0	
11								10	
12								10	
13								10	
14								10	
15								40	
16								70	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164423
Alias:	NAS# 0042G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	8.279
SS:	1302.189
K:	8
b:	28.558
Alpha Level:	0.05
Calculated Value:	0.6263
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	8.437
Test Residual SD:	5.643
Ref. Residual Mean:	6.913
Ref. Residual SD:	4.267
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.6095
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	33
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	5.625	4.609	0		-5.625
2	0	6.5	0	6.5	5.625	4.609	0		-5.625
3	0	6.5	0	6.5	5.625	4.609	0		-5.625
4	10	14	0	6.5	12.81	4.609	0		-5.625
5	0	6.5	0	6.5	5.625	4.609	0		-5.625
6	0	6.5	10	14	5.625	13.826	0		-5.625
7	20	16	0	6.5	20.94	4.609	0		-4.609
8	0	6.5	10	14	5.625	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		12.81
14							18.435		13.826
15							18.435		13.826
16							26.565		20.94

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164424
Alias:	NAS# 0043G
Replicates:	8
Mean:	6.25
SD:	7.44
Tr Mean:	0.233
Trans SD:	0.921

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	-0.233
Trans SD:	0.638

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.81	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.316	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.517	Transformation:	Rankits
K:		Ref. Residual SD:	0.319		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	1.8453	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally		Variances		Degrees of Freedom:	12
Distributed:	N/A	Homogeneous:	No	Experimental Alpha Level:	0.05
				Calculated Value:	1.174
Override Option:	Not Invoked			Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.577	0	-0.577	0.81	0.344		0	
2	20	1.766	0	-0.577	1.533	0.344		0	
3	10	0.801	0	-0.577	0.568	0.344		0	
4	10	0.801	0	-0.577	0.568	0.344		0	
5	0	-0.577	0	-0.577	0.81	0.344		0	
6	0	-0.577	10	0.801	0.81	1.033		0	
7	10	0.801	0	-0.577	0.568	0.344		0	
8	0	-0.577	10	0.801	0.81	1.033		0	
9								0	
10								0	
11								10	
12								10	
13								10	
14								10	
15								10	
16								20	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164427
Alias:	NAS# 0044G
Replicates:	8
Mean:	5
SD:	10.69
Tr Mean:	6.456
Trans SD:	12.589

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.684	Statistic:	Mann-Whitney
Residual SD:	9.231	Test Residual SD:	7.164	Balanced Design:	Yes
SS:	1619.164	Ref. Residual Mean:	6.913	Transformation:	rank-order
K:	8	Ref. Residual SD:	4.267		
b:	32.605	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6565	Calculated Value:	0.9398	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	33
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	6.456	4.609	0		-6.456
2	0	6.5	0	6.5	6.456	4.609	0		-6.456
3	10	14	0	6.5	11.979	4.609	0		-6.456
4	0	6.5	0	6.5	6.456	4.609	0		-6.456
5	30	16	0	6.5	26.755	4.609	0		-6.456
6	0	6.5	10	14	6.456	13.826	0		-6.456
7	0	6.5	0	6.5	6.456	4.609	0		-4.609
8	0	6.5	10	14	6.456	13.826	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		11.979
14							18.435		13.826
15							18.435		13.826
16							33.211		26.755

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164472
Alias:	NAS# 9985F
Replicates:	8
Mean:	10
SD:	13.093
Tr Mean:	14.121
Trans SD:	13.644

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	7.208
Trans SD:	14.458

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	10.591	Statistic:	Mann-Whitney
Residual SD:	12.067	Test Residual SD:	7.614	Balanced Design:	Yes
SS:	2766.456	Ref. Residual Mean:	10.812	Transformation:	rank-order
K:	8	Ref. Residual SD:	8.685		
b:	48.371	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8457	Calculated Value:	0.0542	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	42.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	12	0	5	4.314	7.208	0		-14.121
2	10	12	10	12	4.314	11.227	0		-14.121
3	40	15.5	0	5	25.11	7.208	0		-14.121
4	10	12	40	15.5	4.314	32.023	0		-7.208
5	0	5	0	5	14.121	7.208	0		-7.208
6	0	5	0	5	14.121	7.208	0		-7.208
7	10	12	0	5	4.314	7.208	0		-7.208
8	0	5	0	5	14.121	7.208	0		-7.208
9							0		-7.208
10							18.435		4.314
11							18.435		4.314
12							18.435		4.314
13							18.435		4.314
14							18.435		11.227
15							39.231		25.11
16							39.231		32.023

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164473
Alias:	NAS# 9986F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	7.208
Trans SD:	14.458

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.641	Statistic:	Mann-Whitney
Residual SD:	10.514	Test Residual SD:	2.385	Balanced Design:	Yes
SS:	2100.486	Ref. Residual Mean:	10.812	Transformation:	rank-order
K:	8	Ref. Residual SD:	8.685		
b:	37.048	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6535	Calculated Value:	0.6818	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	34.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	6.913	7.208	0		-7.208
2	0	6	10	13.5	6.913	11.227	0		-7.208
3	0	6	0	6	6.913	7.208	0		-7.208
4	10	13.5	40	16	11.522	32.023	0		-7.208
5	0	6	0	6	6.913	7.208	0		-7.208
6	10	13.5	0	6	11.522	7.208	0		-7.208
7	10	13.5	0	6	11.522	7.208	0		-6.913
8	0	6	0	6	6.913	7.208	0		-6.913
9							0		-6.913
10							0		-6.913
11							0		-6.913
12							18.435		11.227
13							18.435		11.522
14							18.435		11.522
15							18.435		11.522
16							39.231		32.023

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164474
Alias:	NAS# 9987F
Replicates:	8
Mean:	11.25
SD:	11.26
Tr Mean:	15.401
Trans SD:	13.609

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	7.208
Trans SD:	14.458

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	11.551	Statistic:	Mann-Whitney
Residual SD:	12.052	Test Residual SD:	5.72	Balanced Design:	Yes
SS:	2759.716	Ref. Residual Mean:	10.812	Transformation:	rank-order
K:	8	Ref. Residual SD:	8.685		
b:	49.474	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8869	Calculated Value:	0.2009	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	43
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	11	0	5	3.034	7.208	0		-15.401
2	30	15	10	11	17.81	11.227	0		-15.401
3	20	13.5	0	5	11.164	7.208	0		-15.401
4	0	5	40	16	15.401	32.023	0		-7.208
5	10	11	0	5	3.034	7.208	0		-7.208
6	20	13.5	0	5	11.164	7.208	0		-7.208
7	0	5	0	5	15.401	7.208	0		-7.208
8	0	5	0	5	15.401	7.208	0		-7.208
9							0		-7.208
10							18.435		3.034
11							18.435		3.034
12							18.435		11.164
13							26.565		11.164
14							26.565		11.227
15							33.211		17.81
16							39.231		32.023

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164474
Alias:	NAS# 9988F
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	7.208
Trans SD:	14.458

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.912	Statistic:	Mann-Whitney
Residual SD:	11.111	Test Residual SD:	3.712	Balanced Design:	Yes
SS:	2345.668	Ref. Residual Mean:	10.812	Transformation:	rank-order
K:	8	Ref. Residual SD:	8.685		
b:	40.011	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6825	Calculated Value:	0.2697	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	35
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	7.929	7.208	0		-7.929
2	10	13	10	13	10.506	11.227	0		-7.929
3	20	15	0	6	18.636	7.208	0		-7.929
4	0	6	40	16	7.929	32.023	0		-7.929
5	0	6	0	6	7.929	7.208	0		-7.929
6	10	13	0	6	10.506	7.208	0		-7.208
7	0	6	0	6	7.929	7.208	0		-7.208
8	0	6	0	6	7.929	7.208	0		-7.208
9							0		-7.208
10							0		-7.208
11							0		-7.208
12							18.435		10.506
13							18.435		10.506
14							18.435		11.227
15							26.565		18.636
16							39.231		32.023

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164479
Alias:	NAS# 9991F
Replicates:	8
Mean:	13.75
SD:	10.607
Tr Mean:	18.722
Trans SD:	12.511

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	7.208
Trans SD:	14.458

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.504	Statistic:	Student's t
Residual SD:	11.605	Test Residual SD:	7.299	Balanced Design:	Yes
SS:	2558.93	Ref. Residual Mean:	10.812	Transformation:	ArcSin
K:	8	Ref. Residual SD:	8.685		
b:	48.386	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.9149	Calculated Value:	0.3261	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	1.7032
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	26.565	0	0	7.843	7.208			-18.722
2	30	33.211	10	18.435	14.489	11.227			-18.722
3	10	18.435	0	0	0.287	7.208			-7.208
4	20	26.565	40	39.231	7.843	32.023			-7.208
5	10	18.435	0	0	0.287	7.208			-7.208
6	20	26.565	0	0	7.843	7.208			-7.208
7	0	0	0	0	18.722	7.208			-7.208
8	0	0	0	0	18.722	7.208			-7.208
9									-0.287
10									-0.287
11									7.843
12									7.843
13									7.843
14									11.227
15									14.489
16									32.023

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164483
Alias:	NAS# 9992F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	7.208
Trans SD:	14.458

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	10.19
SS:	1973.044
K:	8
b:	36.27
Alpha Level:	0.05
Calculated Value:	0.6668
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	6.913
Test Residual SD:	4.267
Ref. Residual Mean:	10.812
Ref. Residual SD:	8.685
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.1398
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	31
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	4.609	7.208	0		-7.208
2	10	14	10	14	13.826	11.227	0		-7.208
3	0	6.5	0	6.5	4.609	7.208	0		-7.208
4	10	14	40	16	13.826	32.023	0		-7.208
5	0	6.5	0	6.5	4.609	7.208	0		-7.208
6	0	6.5	0	6.5	4.609	7.208	0		-7.208
7	0	6.5	0	6.5	4.609	7.208	0		-4.609
8	0	6.5	0	6.5	4.609	7.208	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		11.227
14							18.435		13.826
15							18.435		13.826
16							39.231		32.023

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164485
Alias:	NAS# 9993F
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	-0.13
Trans SD:	0.512

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	0.13
Trans SD:	0.833

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.317	Statistic:	Student's t
Residual SD:		Test Residual SD:	0.384	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.661	Transformation:	Rankits
K:		Ref. Residual SD:	0.441		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	1.6641	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally Distributed:	N/A	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	-0.7509
Override Option:	Not Invoked			Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.311	0	-0.311	0.181	0.441		0	
2	10	1.138	10	1.138	1.267	1.008		0	
3	0	-0.311	0	-0.311	0.181	0.441		0	
4	0	-0.311	40	1.766	0.181	1.636		0	
5	0	-0.311	0	-0.311	0.181	0.441		0	
6	0	-0.311	0	-0.311	0.181	0.441		0	
7	0	-0.311	0	-0.311	0.181	0.441		0	
8	0	-0.311	0	-0.311	0.181	0.441		0	
9								0	
10								0	
11								0	
12								0	
13								0	
14								10	
15								10	
16								40	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164487
Alias:	NAS# 9995F
Replicates:	7
Mean:	0
SD:	0
Tr Mean:	-0.23
Trans SD:	0

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	0.201
Trans SD:	0.808

Shapiro-Wilk Results:

Residual Mean:	
Residual SD:	
SS:	
K:	
b:	
Alpha Level:	N/A
Calculated Value:	N/A
Critical Value:	N/A
Normally Distributed:	N/A
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0
Test Residual SD:	0
Ref. Residual Mean:	0.646
Ref. Residual SD:	0.419
Deg. of Freedom:	13
Alpha Level:	0.1
Calculated Value:	4.0545
Critical Value:	>= 1.771
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	Rankits
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	7
Experimental Alpha Level:	0.05
Calculated Value:	-1.5075
Critical Value:	>= 1.895
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.23	0	-0.23	0	0.43		0	
2	0	-0.23	10	1.248	0	1.047		0	
3	0	-0.23	0	-0.23	0	0.43		0	
4	0	-0.23	40	1.736	0	1.535		0	
5	0	-0.23	0	-0.23	0	0.43		0	
6	0	-0.23	0	-0.23	0	0.43		0	
7	0	-0.23	0	-0.23	0	0.43		0	
8			0	-0.23		0.43		0	
9								0	
10								0	
11								0	
12								0	
13								0	
14								10	
15								40	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164494
Alias:	NAS# 9996F
Replicates:	8
Mean:	7.5
SD:	7.071
Tr Mean:	12.538
Trans SD:	10.74

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	7.208
Trans SD:	14.458

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.404	Statistic:	Mann-Whitney
Residual SD:	10.932	Test Residual SD:	3.78	Balanced Design:	Yes
SS:	2270.73	Ref. Residual Mean:	10.812	Transformation:	rank-order
K:	8	Ref. Residual SD:	8.685		
b:	43.793	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8446	Calculated Value:	0.4207	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	42
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	12	0	5	5.897	7.208	0		-12.538
2	0	5	10	12	12.538	11.227	0		-12.538
3	0	5	0	5	12.538	7.208	0		-12.538
4	0	5	40	16	12.538	32.023	0		-7.208
5	10	12	0	5	5.897	7.208	0		-7.208
6	10	12	0	5	5.897	7.208	0		-7.208
7	20	15	0	5	14.027	7.208	0		-7.208
8	10	12	0	5	5.897	7.208	0		-7.208
9							0		-7.208
10							18.435		5.897
11							18.435		5.897
12							18.435		5.897
13							18.435		5.897
14							18.435		11.227
15							26.565		14.027
16							39.231		32.023

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164507
Alias:	NAS# 9997F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	7.208
Trans SD:	14.458

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	10.19
SS:	1973.044
K:	8
b:	36.27
Alpha Level:	0.05
Calculated Value:	0.6668
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	6.913
Test Residual SD:	4.267
Ref. Residual Mean:	10.812
Ref. Residual SD:	8.685
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.1398
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	31
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	4.609	7.208	0		-7.208
2	0	6.5	10	14	4.609	11.227	0		-7.208
3	0	6.5	0	6.5	4.609	7.208	0		-7.208
4	10	14	40	16	13.826	32.023	0		-7.208
5	0	6.5	0	6.5	4.609	7.208	0		-7.208
6	10	14	0	6.5	13.826	7.208	0		-7.208
7	0	6.5	0	6.5	4.609	7.208	0		-4.609
8	0	6.5	0	6.5	4.609	7.208	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							0		-4.609
13							18.435		11.227
14							18.435		13.826
15							18.435		13.826
16							39.231		32.023

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164491
Alias:	NAS# 9999F
Replicates:	8
Mean:	13.75
SD:	10.607
Tr Mean:	18.722
Trans SD:	12.511

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	7.208
Trans SD:	14.458

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.504	Statistic:	Student's t
Residual SD:	11.605	Test Residual SD:	7.299	Balanced Design:	Yes
SS:	2558.93	Ref. Residual Mean:	10.812	Transformation:	ArcSin
K:	8	Ref. Residual SD:	8.685		
b:	48.386	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.9149	Calculated Value:	0.3261	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	1.7032
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	0	0	0	18.722	7.208			-18.722
2	20	26.565	10	18.435	7.843	11.227			-18.722
3	10	18.435	0	0	0.287	7.208			-7.208
4	30	33.211	40	39.231	14.489	32.023			-7.208
5	10	18.435	0	0	0.287	7.208			-7.208
6	0	0	0	0	18.722	7.208			-7.208
7	20	26.565	0	0	7.843	7.208			-7.208
8	20	26.565	0	0	7.843	7.208			-7.208
9									-0.287
10									-0.287
11									7.843
12									7.843
13									7.843
14									11.227
15									14.489
16									32.023

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164493
Alias:	NAS# 0001G
Replicates:	8
Mean:	8.75
SD:	11.26
Tr Mean:	12.081
Trans SD:	13.736

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	7.208
Trans SD:	14.458

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	12.105
SS:	2784.077
K:	8
b:	47.767
Alpha Level:	0.05
Calculated Value:	0.8196
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	12.081
Test Residual SD:	4.679
Ref. Residual Mean:	10.812
Ref. Residual SD:	8.685
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.3636
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	39
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	14	0	5.5	14.484	7.208	0		-12.081
2	10	12	10	12	6.354	11.227	0		-12.081
3	10	12	0	5.5	6.354	7.208	0		-12.081
4	0	5.5	40	16	-12.081	32.023	0		-12.081
5	0	5.5	0	5.5	12.081	7.208	0		-7.208
6	0	5.5	0	5.5	12.081	7.208	0		-7.208
7	0	5.5	0	5.5	12.081	7.208	0		-7.208
8	30	15	0	5.5	21.13	7.208	0		-7.208
9							0		-7.208
10							0		-7.208
11							18.435		6.354
12							18.435		6.354
13							18.435		11.227
14							26.565		14.484
15							33.211		21.13
16							39.231		32.023

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164405
Alias:	NAS# 0032G
Replicates:	8
Mean:	7.5
SD:	17.525
Tr Mean:	7.929
Trans SD:	16.309

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	7.208
Trans SD:	14.458

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	13.229
SS:	3325.115
K:	8
b:	44.477
Alpha Level:	0.05
Calculated Value:	0.5949
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	11.894
Test Residual SD:	10.213
Ref. Residual Mean:	10.812
Ref. Residual SD:	8.685
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.2282
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	32.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	13.5	0	6.5	10.506	7.208	0		-7.929
2	0	6.5	10	13.5	7.929	11.227	0		-7.929
3	0	6.5	0	6.5	7.929	7.208	0		-7.929
4	50	16	40	15	37.071	32.023	0		-7.929
5	0	6.5	0	6.5	7.929	7.208	0		-7.929
6	0	6.5	0	6.5	7.929	7.208	0		-7.929
7	0	6.5	0	6.5	7.929	7.208	0		-7.208
8	0	6.5	0	6.5	7.929	7.208	0		-7.208
9							0		-7.208
10							0		-7.208
11							0		-7.208
12							0		-7.208
13							18.435		10.506
14							18.435		11.227
15							39.231		32.023
16							45		37.071

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164406
Alias:	NAS# 0033G
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	7.208
Trans SD:	14.458

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	10.514
SS:	2100.486
K:	8
b:	37.048
Alpha Level:	0.05
Calculated Value:	0.6535
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	8.641
Test Residual SD:	2.385
Ref. Residual Mean:	10.812
Ref. Residual SD:	8.685
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.6818
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	34.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	13.5	0	6	11.522	7.208	0		-7.208
2	0	6	10	13.5	6.913	11.227	0		-7.208
3	10	13.5	0	6	11.522	7.208	0		-7.208
4	0	6	40	16	6.913	32.023	0		-7.208
5	0	6	0	6	6.913	7.208	0		-7.208
6	0	6	0	6	6.913	7.208	0		-7.208
7	0	6	0	6	6.913	7.208	0		-6.913
8	10	13.5	0	6	11.522	7.208	0		-6.913
9							0		-6.913
10							0		-6.913
11							0		-6.913
12							18.435		11.227
13							18.435		11.522
14							18.435		11.522
15							18.435		11.522
16							39.231		32.023

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164408
Alias:	NAS# 0034G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	7.208
Trans SD:	14.458

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	10.896
SS:	2255.696
K:	8
b:	38.106
Alpha Level:	0.05
Calculated Value:	0.6437
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	8.437
Test Residual SD:	5.643
Ref. Residual Mean:	10.812
Ref. Residual SD:	8.685
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.6486
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	31.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	5.625	7.208	0		-7.208
2	0	6.5	10	13.5	5.625	11.227	0		-7.208
3	20	15	0	6.5	20.94	7.208	0		-7.208
4	0	6.5	40	16	5.625	32.023	0		-7.208
5	0	6.5	0	6.5	5.625	7.208	0		-7.208
6	0	6.5	0	6.5	5.625	7.208	0		-7.208
7	10	13.5	0	6.5	12.81	7.208	0		-5.625
8	0	6.5	0	6.5	5.625	7.208	0		-5.625
9							0		-5.625
10							0		-5.625
11							0		-5.625
12							0		-5.625
13							18.435		11.227
14							18.435		12.81
15							26.565		20.94
16							39.231		32.023

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164412
Alias:	NAS# 0035G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	7.208
Trans SD:	14.458

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	11.111
SS:	2345.668
K:	8
b:	40.011
Alpha Level:	0.05
Calculated Value:	0.6825
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	9.912
Test Residual SD:	3.712
Ref. Residual Mean:	10.812
Ref. Residual SD:	8.685
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.2697
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	35
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	-7.929	7.208	0		-7.929
2	10	13	10	13	10.506	11.227	0		-7.929
3	0	6	0	6	7.929	7.208	0		-7.929
4	20	15	40	16	18.636	32.023	0		-7.929
5	10	13	0	6	10.506	7.208	0		-7.929
6	0	6	0	6	7.929	7.208	0		-7.208
7	0	6	0	6	7.929	7.208	0		-7.208
8	0	6	0	6	7.929	7.208	0		-7.208
9							0		-7.208
10							0		-7.208
11							0		-7.208
12							18.435		10.506
13							18.435		10.506
14							18.435		11.227
15							26.565		18.636
16							39.231		32.023

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164413
Alias:	NAS# 0036G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	7.208
Trans SD:	14.458

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.437	Statistic:	Mann-Whitney
Residual SD:	10.896	Test Residual SD:	5.643	Balanced Design:	Yes
SS:	2255.696	Ref. Residual Mean:	10.812	Transformation:	rank-order
K:	8	Ref. Residual SD:	8.685		
b:	38.106	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6437	Calculated Value:	0.6486	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	31.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	5.625	7.208	0		-7.208
2	0	6.5	10	13.5	5.625	11.227	0		-7.208
3	20	15	0	6.5	20.94	7.208	0		-7.208
4	10	13.5	40	16	12.81	32.023	0		-7.208
5	0	6.5	0	6.5	5.625	7.208	0		-7.208
6	0	6.5	0	6.5	5.625	7.208	0		-7.208
7	0	6.5	0	6.5	5.625	7.208	0		-5.625
8	0	6.5	0	6.5	5.625	7.208	0		-5.625
9							0		-5.625
10							0		-5.625
11							0		-5.625
12							0		-5.625
13							18.435		11.227
14							18.435		12.81
15							26.565		20.94
16							39.231		32.023

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164407
Alias:	NAS# 0037G
Replicates:	8
Mean:	8.75
SD:	8.345
Tr Mean:	13.554
Trans SD:	11.718

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	7.208
Trans SD:	14.458

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	10.166	Statistic:	Mann-Whitney
Residual SD:	11.296	Test Residual SD:	4.382	Balanced Design:	Yes
SS:	2424.449	Ref. Residual Mean:	10.812	Transformation:	rank-order
K:	8	Ref. Residual SD:	8.685		
b:	45.736	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8628	Calculated Value:	0.188	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	42.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5	0	5	13.554	7.208	0		-13.554
2	10	11.5	10	11.5	4.881	11.227	0		-13.554
3	10	11.5	0	5	4.881	7.208	0		-13.554
4	10	11.5	40	16	4.881	32.023	0		-7.208
5	20	14.5	0	5	13.011	7.208	0		-7.208
6	20	14.5	0	5	13.011	7.208	0		-7.208
7	0	5	0	5	13.554	7.208	0		-7.208
8	0	5	0	5	13.554	7.208	0		-7.208
9							0		-7.208
10							18.435		4.881
11							18.435		4.881
12							18.435		4.881
13							18.435		11.227
14							26.565		13.011
15							26.565		13.011
16							39.231		32.023

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164409
Alias:	NAS# 0038G
Replicates:	8
Mean:	7.5
SD:	8.864
Tr Mean:	11.25
Trans SD:	12.413

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	7.208
Trans SD:	14.458

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	11.25	Statistic:	Mann-Whitney
Residual SD:	11.566	Test Residual SD:	3.073	Balanced Design:	Yes
SS:	2541.869	Ref. Residual Mean:	10.812	Transformation:	rank-order
K:	8	Ref. Residual SD:	8.685		
b:	45.203	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8039	Calculated Value:	0.1343	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	39
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	0	5.5	11.25	7.208	0		-11.25
2	10	12	10	12	7.185	11.227	0		-11.25
3	0	5.5	0	5.5	11.25	7.208	0		-11.25
4	20	14.5	40	16	15.315	32.023	0		-11.25
5	0	5.5	0	5.5	11.25	7.208	0		-7.208
6	0	5.5	0	5.5	11.25	7.208	0		-7.208
7	10	12	0	5.5	7.185	7.208	0		-7.208
8	20	14.5	0	5.5	15.315	7.208	0		-7.208
9							0		-7.208
10							0		-7.208
11							18.435		7.185
12							18.435		7.185
13							18.435		11.227
14							26.565		15.315
15							26.565		15.315
16							39.231		32.023

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164410
Alias:	NAS# 0039G
Replicates:	8
Mean:	6.25
SD:	7.44
Tr Mean:	10.234
Trans SD:	11.259

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	7.208
Trans SD:	14.458

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	10.234	Statistic:	Mann-Whitney
Residual SD:	11.123	Test Residual SD:	2.661	Balanced Design:	Yes
SS:	2350.68	Ref. Residual Mean:	10.812	Transformation:	rank-order
K:	8	Ref. Residual SD:	8.685		
b:	42.868	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7818	Calculated Value:	0.1802	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	38.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	0	5.5	10.234	7.208	0		-10.234
2	0	5.5	10	12.5	10.234	11.227	0		-10.234
3	10	12.5	0	5.5	8.201	7.208	0		-10.234
4	10	12.5	40	16	8.201	32.023	0		-10.234
5	10	12.5	0	5.5	8.201	7.208	0		-7.208
6	0	5.5	0	5.5	10.234	7.208	0		-7.208
7	0	5.5	0	5.5	10.234	7.208	0		-7.208
8	20	15	0	5.5	16.331	7.208	0		-7.208
9							0		-7.208
10							0		-7.208
11							18.435		8.201
12							18.435		8.201
13							18.435		8.201
14							18.435		11.227
15							26.565		16.331
16							39.231		32.023

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164411
Alias:	NAS# 0040G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	7.208
Trans SD:	14.458

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	10.896
SS:	2255.696
K:	8
b:	38.106
Alpha Level:	0.05
Calculated Value:	0.6437
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	8.437
Test Residual SD:	5.643
Ref. Residual Mean:	10.812
Ref. Residual SD:	8.685
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.6486
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	31.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	5.625	7.208	0		-7.208
2	0	6.5	10	13.5	5.625	11.227	0		-7.208
3	0	6.5	0	6.5	5.625	7.208	0		-7.208
4	10	13.5	40	16	12.81	32.023	0		-7.208
5	0	6.5	0	6.5	5.625	7.208	0		-7.208
6	20	15	0	6.5	20.94	7.208	0		-7.208
7	0	6.5	0	6.5	5.625	7.208	0		-5.625
8	0	6.5	0	6.5	5.625	7.208	0		-5.625
9							0		-5.625
10							0		-5.625
11							0		-5.625
12							0		-5.625
13							18.435		11.227
14							18.435		12.81
15							26.565		20.94
16							39.231		32.023

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164415
Alias:	NAS# 0041G
Replicates:	8
Mean:	16.25
SD:	25.6
Tr Mean:	16.611
Trans SD:	21.502

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	7.208
Trans SD:	14.458

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	15.727
SS:	4699.582
K:	8
b:	62.216
Alpha Level:	0.05
Calculated Value:	0.8237
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	16.611
Test Residual SD:	12.123
Ref. Residual Mean:	10.812
Ref. Residual SD:	8.685
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.0998
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	40.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	0	5.5	16.611	7.208	0		-16.611
2	40	14.5	10	12	22.62	11.227	0		-16.611
3	0	5.5	0	5.5	16.611	7.208	0		-16.611
4	70	16	40	14.5	40.178	32.023	0		-16.611
5	0	5.5	0	5.5	16.611	7.208	0		-7.208
6	10	12	0	5.5	1.824	7.208	0		-7.208
7	0	5.5	0	5.5	16.611	7.208	0		-7.208
8	10	12	0	5.5	1.824	7.208	0		-7.208
9							0		-7.208
10							0		-7.208
11							18.435		1.824
12							18.435		1.824
13							18.435		11.227
14							39.231		22.62
15							39.231		32.023
16							56.789		40.178

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164423
Alias:	NAS# 0042G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	7.208
Trans SD:	14.458

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	10.896
SS:	2255.696
K:	8
b:	38.106
Alpha Level:	0.05
Calculated Value:	0.6437
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	8.437
Test Residual SD:	5.643
Ref. Residual Mean:	10.812
Ref. Residual SD:	8.685
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.6486
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	31.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	5.625	7.208	0		-7.208
2	0	6.5	10	13.5	5.625	11.227	0		-7.208
3	0	6.5	0	6.5	5.625	7.208	0		-7.208
4	10	13.5	40	16	12.81	32.023	0		-7.208
5	0	6.5	0	6.5	5.625	7.208	0		-7.208
6	0	6.5	0	6.5	5.625	7.208	0		-7.208
7	20	15	0	6.5	20.94	7.208	0		-5.625
8	0	6.5	0	6.5	5.625	7.208	0		-5.625
9							0		-5.625
10							0		-5.625
11							0		-5.625
12							0		-5.625
13							18.435		11.227
14							18.435		12.81
15							26.565		20.94
16							39.231		32.023

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164424
Alias:	NAS# 0043G
Replicates:	8
Mean:	6.25
SD:	7.44
Tr Mean:	10.234
Trans SD:	11.259

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	7.208
Trans SD:	14.458

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	11.123
SS:	2350.68
K:	8
b:	42.868
Alpha Level:	0.05
Calculated Value:	0.7818
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	10.234
Test Residual SD:	2.661
Ref. Residual Mean:	10.812
Ref. Residual SD:	8.685
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.1802
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	38.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	0	5.5	10.234	7.208	0		-10.234
2	20	15	10	12.5	16.331	11.227	0		-10.234
3	10	12.5	0	5.5	8.201	7.208	0		-10.234
4	10	12.5	40	16	8.201	32.023	0		-10.234
5	0	5.5	0	5.5	10.234	7.208	0		-7.208
6	0	5.5	0	5.5	10.234	7.208	0		-7.208
7	10	12.5	0	5.5	8.201	7.208	0		-7.208
8	0	5.5	0	5.5	10.234	7.208	0		-7.208
9							0		-7.208
10							0		-7.208
11							18.435		8.201
12							18.435		8.201
13							18.435		8.201
14							18.435		11.227
15							26.565		16.331
16							39.231		32.023

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164427
Alias:	NAS# 0044G
Replicates:	8
Mean:	5
SD:	10.69
Tr Mean:	6.456
Trans SD:	12.589

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	6.25
SD:	14.079
Tr Mean:	7.208
Trans SD:	14.458

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	11.636
SS:	2572.67
K:	8
b:	39.606
Alpha Level:	0.05
Calculated Value:	0.6097
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	9.684
Test Residual SD:	7.164
Ref. Residual Mean:	10.812
Ref. Residual SD:	8.685
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.2836
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	31.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6.5	0	6.5	6.456	7.208	0		-7.208
2	0	6.5	10	13.5	6.456	11.227	0		-7.208
3	10	13.5	0	6.5	11.979	7.208	0		-7.208
4	0	6.5	40	16	6.456	32.023	0		-7.208
5	30	15	0	6.5	26.755	7.208	0		-7.208
6	0	6.5	0	6.5	6.456	7.208	0		-7.208
7	0	6.5	0	6.5	6.456	7.208	0		-6.456
8	0	6.5	0	6.5	6.456	7.208	0		-6.456
9							0		-6.456
10							0		-6.456
11							0		-6.456
12							0		-6.456
13							18.435		11.227
14							18.435		11.979
15							33.211		26.755
16							39.231		32.023

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164472
Alias:	NAS# 9985F
Replicates:	8
Mean:	10
SD:	13.093
Tr Mean:	14.121
Trans SD:	13.644

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	10.591	Statistic:	Student's t
Residual SD:	10.725	Test Residual SD:	7.614	Balanced Design:	Yes
SS:	2185.574	Ref. Residual Mean:	9.912	Transformation:	ArcSin
K:	8	Ref. Residual SD:	3.712		
b:	44.363	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.9005	Calculated Value:	0.2268	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	0.9912
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	0	0	4.314	7.929			-14.121
2	10	18.435	0	0	4.314	7.929			-14.121
3	40	39.231	0	0	25.11	7.929			-14.121
4	10	18.435	10	18.435	4.314	10.506			-7.929
5	0	0	20	26.565	14.121	18.636			-7.929
6	0	0	0	0	14.121	7.929			-7.929
7	10	18.435	10	18.435	4.314	10.506			-7.929
8	0	0	0	0	14.121	7.929			-7.929
9									4.314
10									4.314
11									4.314
12									4.314
13									10.506
14									10.506
15									18.636
16									25.11

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164473
Alias:	NAS# 9986F
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.641	Statistic:	Mann-Whitney
Residual SD:	8.943	Test Residual SD:	2.385	Balanced Design:	Yes
SS:	1519.604	Ref. Residual Mean:	9.912	Transformation:	rank-order
K:	8	Ref. Residual SD:	3.712		
b:	32.924	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7133	Calculated Value:	0.8143	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	30.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	0	5.5	6.913	7.929	0		-7.929
2	0	5.5	0	5.5	6.913	7.929	0		-7.929
3	0	5.5	0	5.5	6.913	7.929	0		-7.929
4	10	13	10	13	11.522	10.506	0		-7.929
5	0	5.5	20	16	6.913	18.636	0		-7.929
6	10	13	0	5.5	11.522	7.929	0		-6.913
7	10	13	10	13	11.522	10.506	0		-6.913
8	0	5.5	0	5.5	6.913	7.929	0		-6.913
9							0		-6.913
10							0		-6.913
11							18.435		10.506
12							18.435		10.506
13							18.435		11.522
14							18.435		11.522
15							18.435		11.522
16							26.565		18.636

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164474
Alias:	NAS# 9987F
Replicates:	8
Mean:	11.25
SD:	11.26
Tr Mean:	15.401
Trans SD:	13.609

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	11.551	Statistic:	Mann-Whitney
Residual SD:	10.709	Test Residual SD:	5.72	Balanced Design:	Yes
SS:	2178.834	Ref. Residual Mean:	9.912	Transformation:	rank-order
K:	8	Ref. Residual SD:	3.712		
b:	43.92	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8853	Calculated Value:	0.68	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	42.5
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	10.5	0	4.5	3.034	7.929	0		-15.401
2	30	16	0	4.5	17.81	7.929	0		-15.401
3	20	14	0	4.5	11.164	7.929	0		-15.401
4	0	4.5	10	10.5	15.401	10.506	0		-7.929
5	10	10.5	20	14	3.034	18.636	0		-7.929
6	20	14	0	4.5	11.164	7.929	0		-7.929
7	0	4.5	10	10.5	15.401	10.506	0		-7.929
8	0	4.5	0	4.5	15.401	7.929	0		-7.929
9							18.435		3.034
10							18.435		3.034
11							18.435		10.506
12							18.435		10.506
13							26.565		11.164
14							26.565		11.164
15							26.565		17.81
16							33.211		18.636

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164475
Alias:	NAS# 9988F
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.912	Statistic:	Mann-Whitney
Residual SD:	9.638	Test Residual SD:	3.712	Balanced Design:	Yes
SS:	1764.787	Ref. Residual Mean:	9.912	Transformation:	rank-order
K:	8	Ref. Residual SD:	3.712		
b:	34.913	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6907	Calculated Value:	0	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	32
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	0	5.5	7.929	7.929	0		-7.929
2	10	12.5	0	5.5	10.506	7.929	0		-7.929
3	20	15.5	0	5.5	18.636	7.929	0		-7.929
4	0	5.5	10	12.5	7.929	10.506	0		-7.929
5	0	5.5	20	15.5	7.929	18.636	0		-7.929
6	10	12.5	0	5.5	10.506	7.929	0		-7.929
7	0	5.5	10	12.5	7.929	10.506	0		-7.929
8	0	5.5	0	5.5	7.929	7.929	0		-7.929
9							0		-7.929
10							0		-7.929
11							18.435		10.506
12							18.435		10.506
13							18.435		10.506
14							18.435		10.506
15							26.565		18.636
16							26.565		18.636

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164479
Alias:	NAS# 9991F
Replicates:	8
Mean:	13.75
SD:	10.607
Tr Mean:	18.722
Trans SD:	12.511

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.504	Statistic:	Student's t
Residual SD:	10.203	Test Residual SD:	7.299	Balanced Design:	Yes
SS:	1978.049	Ref. Residual Mean:	9.912	Transformation:	ArcSin
K:	8	Ref. Residual SD:	3.712		
b:	42.839	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.9278	Calculated Value:	0.1406	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	1.8159
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	26.565	0	0	7.843	7.929			-18.722
2	30	33.211	0	0	14.489	7.929			-18.722
3	10	18.435	0	0	0.287	7.929			-7.929
4	20	26.565	10	18.435	7.843	10.506			-7.929
5	10	18.435	20	26.565	0.287	18.636			-7.929
6	20	26.565	0	0	7.843	7.929			-7.929
7	0	0	10	18.435	18.722	10.506			-7.929
8	0	0	0	0	18.722	7.929			-0.287
9									-0.287
10									7.843
11									7.843
12									7.843
13									10.506
14									10.506
15									14.489
16									18.636

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164483
Alias:	NAS# 9992F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	6.913	Statistic:	Mann-Whitney
Residual SD:	8.56	Test Residual SD:	4.267	Balanced Design:	Yes
SS:	1392.162	Ref. Residual Mean:	9.912	Transformation:	rank-order
K:	8	Ref. Residual SD:	3.712		
b:	32.315	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7501	Calculated Value:	1.4996	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	27
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	4.609	7.929	0		-7.929
2	10	13.5	0	6	13.826	7.929	0		-7.929
3	0	6	0	6	4.609	7.929	0		-7.929
4	10	13.5	10	13.5	13.826	10.506	0		-7.929
5	0	6	20	16	4.609	18.636	0		-7.929
6	0	6	0	6	4.609	7.929	0		-4.609
7	0	6	10	13.5	4.609	10.506	0		-4.609
8	0	6	0	6	4.609	7.929	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							18.435		10.506
13							18.435		10.506
14							18.435		13.826
15							18.435		13.826
16							26.565		18.636

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164485
Alias:	NAS# 9993F
Replicates:	8
Mean:	1.25
SD:	3.536
Tr Mean:	-0.224
Trans SD:	0.5

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	0.224
Trans SD:	0.892

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0.309	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0.375	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.78	Transformation:	Rankits
K:		Ref. Residual SD:	0.317		
b:		Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	2.7146	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.761		
Normally		Variances		Degrees of Freedom:	11
Distributed:	N/A	Homogeneous:	No	Experimental Alpha Level:	0.05
				Calculated Value:	-1.2377
Override Option:	Not Invoked			Critical Value:	>= 1.796
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.4	0	-0.4	0.177	0.624		0	
2	10	1.013	0	-0.4	1.236	0.624		0	
3	0	-0.4	0	-0.4	0.177	0.624		0	
4	0	-0.4	10	1.013	0.177	0.789		0	
5	0	-0.4	20	1.766	0.177	1.542		0	
6	0	-0.4	0	-0.4	0.177	0.624		0	
7	0	-0.4	10	1.013	0.177	0.789		0	
8	0	-0.4	0	-0.4	0.177	0.624		0	
9								0	
10								0	
11								0	
12								0	
13								10	
14								10	
15								10	
16								20	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164487
Alias:	NAS# 9995F
Replicates:	7
Mean:	0
SD:	0
Tr Mean:	-0.328
Trans SD:	0

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	0.287
Trans SD:	0.87

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:		Test Residual Mean:	0	Statistic:	Approximate t
Residual SD:		Test Residual SD:	0	Balanced Design:	Yes
SS:		Ref. Residual Mean:	0.768	Transformation:	Rankits
K:		Ref. Residual SD:	0.289		
b:		Deg. of Freedom:	13		
				Experimental Hypothesis	
Alpha Level:	N/A	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	N/A	Calculated Value:	6.9895	Alternate:	x1 > x2
Critical Value:	N/A	Critical Value:	>= 1.771		
Normally Distributed:	N/A	Variances Homogeneous:	No	Degrees of Freedom:	7
				Experimental Alpha Level:	0.05
				Calculated Value:	-1.9963
Override Option:	Not Invoked			Critical Value:	>= 1.895
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	-0.328	0	-0.328	0	0.614		0	
2	0	-0.328	0	-0.328	0	0.614		0	
3	0	-0.328	0	-0.328	0	0.614		0	
4	0	-0.328	10	1.098	0	0.811		0	
5	0	-0.328	20	1.736	0	1.449		0	
6	0	-0.328	0	-0.328	0	0.614		0	
7	0	-0.328	10	1.098	0	0.811		0	
8			0	-0.328		0.614		0	
9								0	
10								0	
11								0	
12								0	
13								10	
14								10	
15								20	

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164494
Alias:	NAS# 9996F
Replicates:	8
Mean:	7.5
SD:	7.071
Tr Mean:	12.538
Trans SD:	10.74

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.404	Statistic:	Mann-Whitney
Residual SD:	9.431	Test Residual SD:	3.78	Balanced Design:	Yes
SS:	1689.848	Ref. Residual Mean:	9.912	Transformation:	rank-order
K:	8	Ref. Residual SD:	3.712		
b:	38.366	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8711	Calculated Value:	0.2713	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	39
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	11.5	0	4.5	5.897	7.929	0		-12.538
2	0	4.5	0	4.5	12.538	7.929	0		-12.538
3	0	4.5	0	4.5	12.538	7.929	0		-12.538
4	0	4.5	10	11.5	12.538	10.506	0		-7.929
5	10	11.5	20	15.5	5.897	18.636	0		-7.929
6	10	11.5	0	4.5	5.897	7.929	0		-7.929
7	20	15.5	10	11.5	14.027	10.506	0		-7.929
8	10	11.5	0	4.5	5.897	7.929	0		-7.929
9							18.435		5.897
10							18.435		5.897
11							18.435		5.897
12							18.435		5.897
13							18.435		10.506
14							18.435		10.506
15							26.565		14.027
16							26.565		18.636

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164507
Alias:	NAS# 9997F
Replicates:	8
Mean:	2.5
SD:	4.629
Tr Mean:	4.609
Trans SD:	8.534

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	6.913	Statistic:	Mann-Whitney
Residual SD:	8.56	Test Residual SD:	4.267	Balanced Design:	Yes
SS:	1392.162	Ref. Residual Mean:	9.912	Transformation:	rank-order
K:	8	Ref. Residual SD:	3.712		
b:	32.315	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7501	Calculated Value:	1.4996	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	27
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	4.609	7.929	0		-7.929
2	0	6	0	6	4.609	7.929	0		-7.929
3	0	6	0	6	4.609	7.929	0		-7.929
4	10	13.5	10	13.5	13.826	10.506	0		-7.929
5	0	6	20	16	4.609	18.636	0		-7.929
6	10	13.5	0	6	13.826	7.929	0		-4.609
7	0	6	10	13.5	4.609	10.506	0		-4.609
8	0	6	0	6	4.609	7.929	0		-4.609
9							0		-4.609
10							0		-4.609
11							0		-4.609
12							18.435		10.506
13							18.435		10.506
14							18.435		13.826
15							18.435		13.826
16							26.565		18.636

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164491
Alias:	NAS# 9999F
Replicates:	8
Mean:	13.75
SD:	10.607
Tr Mean:	18.722
Trans SD:	12.511

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.504	Statistic:	Student's t
Residual SD:	10.203	Test Residual SD:	7.299	Balanced Design:	Yes
SS:	1978.049	Ref. Residual Mean:	9.912	Transformation:	ArcSin
K:	8	Ref. Residual SD:	3.712		
b:	42.839	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.9278	Calculated Value:	0.1406	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	1.8159
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	0	0	0	18.722	7.929			-18.722
2	20	26.565	0	0	7.843	7.929			-18.722
3	10	18.435	0	0	0.287	7.929			-7.929
4	30	33.211	10	18.435	14.489	10.506			-7.929
5	10	18.435	20	26.565	0.287	18.636			-7.929
6	0	0	0	0	18.722	7.929			-7.929
7	20	26.565	10	18.435	7.843	10.506			-7.929
8	20	26.565	0	0	7.843	7.929			-0.287
9									-0.287
10									7.843
11									7.843
12									7.843
13									10.506
14									10.506
15									14.489
16									18.636

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164493
Alias:	NAS# 0001G
Replicates:	8
Mean:	8.75
SD:	11.26
Tr Mean:	12.081
Trans SD:	13.736

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	12.081	Statistic:	Mann-Whitney
Residual SD:	10.768	Test Residual SD:	4.679	Balanced Design:	Yes
SS:	2203.196	Ref. Residual Mean:	9.912	Transformation:	rank-order
K:	8	Ref. Residual SD:	3.712		
b:	42.924	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8363	Calculated Value:	1.0271	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	37.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	20	14.5	0	5	14.484	7.929	0		-12.081
2	10	11.5	0	5	6.354	7.929	0		-12.081
3	10	11.5	0	5	6.354	7.929	0		-12.081
4	0	5	10	11.5	12.081	10.506	0		-12.081
5	0	5	20	14.5	12.081	18.636	0		-7.929
6	0	5	0	5	12.081	7.929	0		-7.929
7	0	5	10	11.5	12.081	10.506	0		-7.929
8	30	16	0	5	21.13	7.929	0		-7.929
9							0		-7.929
10							18.435		6.354
11							18.435		6.354
12							18.435		10.506
13							18.435		10.506
14							26.565		14.484
15							26.565		18.636
16							33.211		21.13

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164405
Alias:	NAS# 0032G
Replicates:	8
Mean:	7.5
SD:	17.525
Tr Mean:	7.929
Trans SD:	16.309

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	11.894	Statistic:	Mann-Whitney
Residual SD:	12.018	Test Residual SD:	10.213	Balanced Design:	Yes
SS:	2744.233	Ref. Residual Mean:	9.912	Transformation:	rank-order
K:	8	Ref. Residual SD:	3.712		
b:	42.381	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.6545	Calculated Value:	0.516	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	29
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	13	0	6	10.506	7.929	0		-7.929
2	0	6	0	6	7.929	7.929	0		-7.929
3	0	6	0	6	7.929	7.929	0		-7.929
4	50	16	10	13	37.071	10.506	0		-7.929
5	0	6	20	15	7.929	18.636	0		-7.929
6	0	6	0	6	7.929	7.929	0		-7.929
7	0	6	10	13	7.929	10.506	0		-7.929
8	0	6	0	6	7.929	7.929	0		-7.929
9							0		-7.929
10							0		-7.929
11							0		-7.929
12							18.435		10.506
13							18.435		10.506
14							18.435		10.506
15							26.565		18.636
16							45		37.071

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164406
Alias:	NAS# 0033G
Replicates:	8
Mean:	3.75
SD:	5.175
Tr Mean:	6.913
Trans SD:	9.541

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.641	Statistic:	Mann-Whitney
Residual SD:	8.943	Test Residual SD:	2.385	Balanced Design:	Yes
SS:	1519.604	Ref. Residual Mean:	9.912	Transformation:	rank-order
K:	8	Ref. Residual SD:	3.712		
b:	32.924	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7133	Calculated Value:	0.8143	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	30.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	13	0	5.5	11.522	7.929	0		-7.929
2	0	5.5	0	5.5	6.913	7.929	0		-7.929
3	10	13	0	5.5	11.522	7.929	0		-7.929
4	0	5.5	10	13	6.913	10.506	0		-7.929
5	0	5.5	20	16	6.913	18.636	0		-7.929
6	0	5.5	0	5.5	6.913	7.929	0		-6.913
7	0	5.5	10	13	6.913	10.506	0		-6.913
8	10	13	0	5.5	11.522	7.929	0		-6.913
9							0		-6.913
10							0		-6.913
11							18.435		10.506
12							18.435		10.506
13							18.435		11.522
14							18.435		11.522
15							18.435		11.522
16							26.565		18.636

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164408
Alias:	NAS# 0034G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.437	Statistic:	Mann-Whitney
Residual SD:	9.389	Test Residual SD:	5.643	Balanced Design:	Yes
SS:	1674.814	Ref. Residual Mean:	9.912	Transformation:	rank-order
K:	8	Ref. Residual SD:	3.712		
b:	34.807	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7234	Calculated Value:	0.6173	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	28.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	5.625	7.929	0		-7.929
2	0	6	0	6	5.625	7.929	0		-7.929
3	20	15.5	0	6	20.94	7.929	0		-7.929
4	0	6	10	13	5.625	10.506	0		-7.929
5	0	6	20	15.5	5.625	18.636	0		-7.929
6	0	6	0	6	5.625	7.929	0		-5.625
7	10	13	10	13	12.81	10.506	0		-5.625
8	0	6	0	6	5.625	7.929	0		-5.625
9							0		-5.625
10							0		-5.625
11							0		-5.625
12							18.435		10.506
13							18.435		10.506
14							18.435		12.81
15							26.565		18.636
16							26.565		20.94

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164412
Alias:	NAS# 0035G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	9.638
SS:	1764.787
K:	8
b:	34.913
Alpha Level:	0.05
Calculated Value:	0.6907
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	9.912
Test Residual SD:	3.712
Ref. Residual Mean:	9.912
Ref. Residual SD:	3.712
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	32
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5.5	0	5.5	7.929	7.929	0		-7.929
2	10	12.5	0	5.5	10.506	7.929	0		-7.929
3	0	5.5	0	5.5	7.929	7.929	0		-7.929
4	20	15.5	10	12.5	18.636	10.506	0		-7.929
5	10	12.5	20	15.5	10.506	18.636	0		-7.929
6	0	5.5	0	5.5	7.929	7.929	0		-7.929
7	0	5.5	10	12.5	7.929	10.506	0		-7.929
8	0	5.5	0	5.5	7.929	7.929	0		-7.929
9							0		-7.929
10							0		-7.929
11							18.435		10.506
12							18.435		10.506
13							18.435		10.506
14							18.435		10.506
15							26.565		18.636
16							26.565		18.636

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164413
Alias:	NAS# 0036G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	9.389
SS:	1674.814
K:	8
b:	34.807
Alpha Level:	0.05
Calculated Value:	0.7234
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	8.437
Test Residual SD:	5.643
Ref. Residual Mean:	9.912
Ref. Residual SD:	3.712
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.6173
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	28.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	5.625	7.929	0		-7.929
2	0	6	0	6	5.625	7.929	0		-7.929
3	20	15.5	0	6	20.94	7.929	0		-7.929
4	10	13	10	13	12.81	10.506	0		-7.929
5	0	6	20	15.5	5.625	18.636	0		-7.929
6	0	6	0	6	5.625	7.929	0		-5.625
7	0	6	10	13	5.625	10.506	0		-5.625
8	0	6	0	6	5.625	7.929	0		-5.625
9							0		-5.625
10							0		-5.625
11							0		-5.625
12							18.435		10.506
13							18.435		10.506
14							18.435		12.81
15							26.565		18.636
16							26.565		20.94

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164407
Alias:	NAS# 0037G
Replicates:	8
Mean:	8.75
SD:	8.345
Tr Mean:	13.554
Trans SD:	11.718

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	10.166	Statistic:	Mann-Whitney
Residual SD:	9.85	Test Residual SD:	4.382	Balanced Design:	Yes
SS:	1843.568	Ref. Residual Mean:	9.912	Transformation:	rank-order
K:	8	Ref. Residual SD:	3.712		
b:	40.252	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8789	Calculated Value:	0.1251	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	40.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	4.5	0	4.5	13.554	7.929	0		-13.554
2	10	11	0	4.5	4.881	7.929	0		-13.554
3	10	11	0	4.5	4.881	7.929	0		-13.554
4	10	11	10	11	4.881	10.506	0		-7.929
5	20	15	20	15	13.011	18.636	0		-7.929
6	20	15	0	4.5	13.011	7.929	0		-7.929
7	0	4.5	10	11	13.554	10.506	0		-7.929
8	0	4.5	0	4.5	13.554	7.929	0		-7.929
9							18.435		4.881
10							18.435		4.881
11							18.435		4.881
12							18.435		10.506
13							18.435		10.506
14							26.565		13.011
15							26.565		13.011
16							26.565		18.636

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164409
Alias:	NAS# 0038G
Replicates:	8
Mean:	7.5
SD:	8.864
Tr Mean:	11.25
Trans SD:	12.413

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	11.25	Statistic:	Mann-Whitney
Residual SD:	10.159	Test Residual SD:	3.073	Balanced Design:	Yes
SS:	1960.987	Ref. Residual Mean:	9.912	Transformation:	rank-order
K:	8	Ref. Residual SD:	3.712		
b:	39.848	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8097	Calculated Value:	0.7855	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	37
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5	0	5	11.25	7.929	0		-11.25
2	10	11.5	0	5	7.185	7.929	0		-11.25
3	0	5	0	5	11.25	7.929	0		-11.25
4	20	15	10	11.5	15.315	10.506	0		-11.25
5	0	5	20	15	11.25	18.636	0		-7.929
6	0	5	0	5	11.25	7.929	0		-7.929
7	10	11.5	10	11.5	7.185	10.506	0		-7.929
8	20	15	0	5	15.315	7.929	0		-7.929
9							0		-7.929
10							18.435		7.185
11							18.435		7.185
12							18.435		10.506
13							18.435		10.506
14							26.565		15.315
15							26.565		15.315
16							26.565		18.636

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164410
Alias:	NAS# 0039G
Replicates:	8
Mean:	6.25
SD:	7.44
Tr Mean:	10.234
Trans SD:	11.259

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	10.234	Statistic:	Mann-Whitney
Residual SD:	9.651	Test Residual SD:	2.661	Balanced Design:	Yes
SS:	1769.798	Ref. Residual Mean:	9.912	Transformation:	rank-order
K:	8	Ref. Residual SD:	3.712		
b:	37.498	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7945	Calculated Value:	0.1994	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	35.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5	0	5	10.234	7.929	0		-10.234
2	0	5	0	5	10.234	7.929	0		-10.234
3	10	12	0	5	8.201	7.929	0		-10.234
4	10	12	10	12	8.201	10.506	0		-10.234
5	10	12	20	15.5	8.201	18.636	0		-7.929
6	0	5	0	5	10.234	7.929	0		-7.929
7	0	5	10	12	10.234	10.506	0		-7.929
8	20	15.5	0	5	16.331	7.929	0		-7.929
9							0		-7.929
10							18.435		8.201
11							18.435		8.201
12							18.435		8.201
13							18.435		10.506
14							18.435		10.506
15							26.565		16.331
16							26.565		18.636

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164411
Alias:	NAS# 0040G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.437	Statistic:	Mann-Whitney
Residual SD:	9.389	Test Residual SD:	5.643	Balanced Design:	Yes
SS:	1674.814	Ref. Residual Mean:	9.912	Transformation:	rank-order
K:	8	Ref. Residual SD:	3.712		
b:	34.807	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7234	Calculated Value:	0.6173	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	28.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	5.625	7.929	0		-7.929
2	0	6	0	6	5.625	7.929	0		-7.929
3	0	6	0	6	5.625	7.929	0		-7.929
4	10	13	10	13	12.81	10.506	0		-7.929
5	0	6	20	15.5	5.625	18.636	0		-7.929
6	20	15.5	0	6	20.94	7.929	0		-5.625
7	0	6	10	13	5.625	10.506	0		-5.625
8	0	6	0	6	5.625	7.929	0		-5.625
9							0		-5.625
10							0		-5.625
11							0		-5.625
12							18.435		10.506
13							18.435		10.506
14							18.435		12.81
15							26.565		18.636
16							26.565		20.94

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164415
Alias:	NAS# 0041G
Replicates:	8
Mean:	16.25
SD:	25.6
Tr Mean:	16.611
Trans SD:	21.502

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	16.611	Statistic:	Mann-Whitney
Residual SD:	14.723	Test Residual SD:	12.123	Balanced Design:	Yes
SS:	4118.7	Ref. Residual Mean:	9.912	Transformation:	rank-order
K:	8	Ref. Residual SD:	3.712		
b:	59.989	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.8738	Calculated Value:	1.4945	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	38
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5	0	5	16.611	7.929	0		-16.611
2	40	15	0	5	22.62	7.929	0		-16.611
3	0	5	0	5	16.611	7.929	0		-16.611
4	70	16	10	11.5	40.178	10.506	0		-16.611
5	0	5	20	14	16.611	18.636	0		-7.929
6	10	11.5	0	5	1.824	7.929	0		-7.929
7	0	5	10	11.5	16.611	10.506	0		-7.929
8	10	11.5	0	5	1.824	7.929	0		-7.929
9							0		-7.929
10							18.435		1.824
11							18.435		1.824
12							18.435		10.506
13							18.435		10.506
14							26.565		18.636
15							39.231		22.62
16							56.789		40.178

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164423
Alias:	NAS# 0042G
Replicates:	8
Mean:	3.75
SD:	7.44
Tr Mean:	5.625
Trans SD:	10.64

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	8.437	Statistic:	Mann-Whitney
Residual SD:	9.389	Test Residual SD:	5.643	Balanced Design:	Yes
SS:	1674.814	Ref. Residual Mean:	9.912	Transformation:	rank-order
K:	8	Ref. Residual SD:	3.712		
b:	34.807	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7234	Calculated Value:	0.6173	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	28.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	5.625	7.929	0		-7.929
2	0	6	0	6	5.625	7.929	0		-7.929
3	0	6	0	6	5.625	7.929	0		-7.929
4	10	13	10	13	12.81	10.506	0		-7.929
5	0	6	20	15.5	5.625	18.636	0		-7.929
6	0	6	0	6	5.625	7.929	0		-5.625
7	20	15.5	10	13	20.94	10.506	0		-5.625
8	0	6	0	6	5.625	7.929	0		-5.625
9							0		-5.625
10							0		-5.625
11							0		-5.625
12							18.435		10.506
13							18.435		10.506
14							18.435		12.81
15							26.565		18.636
16							26.565		20.94

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164424
Alias:	NAS# 0043G
Replicates:	8
Mean:	6.25
SD:	7.44
Tr Mean:	10.234
Trans SD:	11.259

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	10.234	Statistic:	Mann-Whitney
Residual SD:	9.651	Test Residual SD:	2.661	Balanced Design:	Yes
SS:	1769.798	Ref. Residual Mean:	9.912	Transformation:	rank-order
K:	8	Ref. Residual SD:	3.712		
b:	37.498	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7945	Calculated Value:	0.1994	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	35.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	5	0	5	10.234	7.929	0		-10.234
2	20	15.5	0	5	16.331	7.929	0		-10.234
3	10	12	0	5	8.201	7.929	0		-10.234
4	10	12	10	12	8.201	10.506	0		-10.234
5	0	5	20	15.5	10.234	18.636	0		-7.929
6	0	5	0	5	10.234	7.929	0		-7.929
7	10	12	10	12	8.201	10.506	0		-7.929
8	0	5	0	5	10.234	7.929	0		-7.929
9							0		-7.929
10							18.435		8.201
11							18.435		8.201
12							18.435		8.201
13							18.435		10.506
14							18.435		10.506
15							26.565		16.331
16							26.565		18.636

Project Name: P727-2 Hyalella 28-day Mortality

Sample:	x1
Samp ID:	5164427
Alias:	NAS# 0044G
Replicates:	8
Mean:	5
SD:	10.69
Tr Mean:	6.456
Trans SD:	12.589

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	5
SD:	7.559
Tr Mean:	7.929
Trans SD:	11.227

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	9.684	Statistic:	Mann-Whitney
Residual SD:	10.239	Test Residual SD:	7.164	Balanced Design:	Yes
SS:	1991.788	Ref. Residual Mean:	9.912	Transformation:	rank-order
K:	8	Ref. Residual SD:	3.712		
b:	37.537	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 <= x2
Calculated Value:	0.7074	Calculated Value:	0.08	Alternate:	x1 > x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	29
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	6	0	6	6.456	7.929	0		-7.929
2	0	6	0	6	6.456	7.929	0		-7.929
3	10	13	0	6	11.979	7.929	0		-7.929
4	0	6	10	13	6.456	10.506	0		-7.929
5	30	16	20	15	26.755	18.636	0		-7.929
6	0	6	0	6	6.456	7.929	0		-6.456
7	0	6	10	13	6.456	10.506	0		-6.456
8	0	6	0	6	6.456	7.929	0		-6.456
9							0		-6.456
10							0		-6.456
11							0		-6.456
12							18.435		10.506
13							18.435		10.506
14							18.435		11.979
15							26.565		18.636
16							33.211		26.755

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164472
Alias:	NAS# 9985F
Replicates:	8
Mean:	0.194
SD:	0.038
Tr Mean:	0.194
Trans SD:	0.038

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.036
SS:	0.025
K:	8
b:	0.156
Alpha Level:	0.05
Calculated Value:	0.9635
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.031
Test Residual SD:	0.018
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.026
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.3866
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	14.3367
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.15	0.15	0.57	0.57	0.044	0.073			-0.068
2	0.15	0.15	0.43	0.43	0.044	0.068			-0.048
3	0.21	0.21	0.51	0.51	0.016	0.013			-0.044
4	0.26	0.26	0.47	0.47	0.066	0.028			-0.044
5	0.18	0.18	0.54	0.54	0.014	0.043			-0.028
6	0.21	0.21	0.5	0.5	0.016	0.003			-0.024
7	0.22	0.22	0.45	0.45	0.026	0.048			-0.014
8	0.17	0.17	0.51	0.51	0.024	0.013			0.003
9									0.013
10									0.013
11									0.016
12									0.016
13									0.026
14									0.043
15									0.066
16									0.073

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164473
Alias:	NAS# 9986F
Replicates:	8
Mean:	0.65
SD:	0.047
Tr Mean:	0.65
Trans SD:	0.047

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.038	Statistic:	Student's t
Residual SD:	0.04	Test Residual SD:	0.025	Balanced Design:	Yes
SS:	0.031	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.026		
b:	0.171	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9546	Calculated Value:	0.1467	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	-6.5292
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.65	0.65	0.57	0.57	0	0.073			-0.068
2	0.67	0.67	0.43	0.43	0.02	0.068			-0.05
3	0.6	0.6	0.51	0.51	0.05	0.013			-0.05
4	0.73	0.73	0.47	0.47	0.08	0.028			-0.048
5	0.6	0.6	0.54	0.54	0.05	0.043			-0.03
6	0.62	0.62	0.5	0.5	0.03	0.003			-0.028
7	0.7	0.7	0.45	0.45	0.05	0.048			-0.02
8	0.63	0.63	0.51	0.51	0.02	0.013			0
9									0.003
10									0.013
11									0.013
12									0.02
13									0.043
14									0.05
15									0.073
16									0.08

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164474
Alias:	NAS# 9987F
Replicates:	8
Mean:	0.335
SD:	0.042
Tr Mean:	0.335
Trans SD:	0.042

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.031	Statistic:	Student's t
Residual SD:	0.038	Test Residual SD:	0.026	Balanced Design:	Yes
SS:	0.027	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.026		
b:	0.162	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9633	Calculated Value:	0.338	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	7.3531
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.25	0.25	0.57	0.57	0.085	0.073			-0.085
2	0.34	0.34	0.43	0.43	0.005	0.068			-0.068
3	0.3	0.3	0.51	0.51	0.035	0.013			-0.048
4	0.38	0.38	0.47	0.47	0.045	0.028			-0.035
5	0.36	0.36	0.54	0.54	0.025	0.043			-0.028
6	0.36	0.36	0.5	0.5	0.025	0.003			-0.005
7	0.36	0.36	0.45	0.45	0.025	0.048			0.003
8	0.33	0.33	0.51	0.51	0.005	0.013			0.005
9									0.013
10									0.013
11									0.025
12									0.025
13									0.025
14									0.043
15									0.045
16									0.073

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164475
Alias:	NAS# 9988F
Replicates:	8
Mean:	0.424
SD:	0.066
Tr Mean:	0.424
Trans SD:	0.066

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.049
SS:	0.046
K:	8
b:	0.212
Alpha Level:	0.05
Calculated Value:	0.9846
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.051
Test Residual SD:	0.037
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.026
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.9686
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	2.5806
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.42	0.42	0.57	0.57	0.004	0.073			-0.114
2	0.47	0.47	0.43	0.43	0.046	0.068			-0.068
3	0.39	0.39	0.51	0.51	0.034	0.013			-0.054
4	0.52	0.52	0.47	0.47	0.096	0.028			-0.048
5	0.47	0.47	0.54	0.54	0.046	0.043			-0.034
6	0.31	0.31	0.5	0.5	0.114	0.003			-0.028
7	0.44	0.44	0.45	0.45	0.016	0.048			-0.004
8	0.37	0.37	0.51	0.51	0.054	0.013			0.003
9									0.013
10									0.013
11									0.016
12									0.043
13									0.046
14									0.046
15									0.073
16									0.096

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164479
Alias:	NAS# 9991F
Replicates:	8
Mean:	0.228
SD:	0.06
Tr Mean:	0.228
Trans SD:	0.06

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.051	Statistic:	Student's t
Residual SD:	0.046	Test Residual SD:	0.026	Balanced Design:	Yes
SS:	0.04	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.026		
b:	0.194	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.932	Calculated Value:	1.143	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	10.0648
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.28	0.28	0.57	0.57	0.053	0.073			-0.108
2	0.18	0.18	0.43	0.43	0.048	0.068			-0.068
3	0.24	0.24	0.51	0.51	0.013	0.013			-0.048
4	0.27	0.27	0.47	0.47	0.043	0.028			-0.048
5	0.12	0.12	0.54	0.54	0.108	0.043			-0.048
6	0.18	0.18	0.5	0.5	0.048	0.003			-0.028
7	0.27	0.27	0.45	0.45	0.043	0.048			0.003
8	0.28	0.28	0.51	0.51	0.053	0.013			0.013
9									0.013
10									0.013
11									0.043
12									0.043
13									0.043
14									0.053
15									0.053
16									0.073

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164483
Alias:	NAS# 9992F
Replicates:	8
Mean:	0.345
SD:	0.028
Tr Mean:	0.345
Trans SD:	0.028

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.033
SS:	0.021
K:	8
b:	0.142
Alpha Level:	0.05
Calculated Value:	0.9756
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.023
Test Residual SD:	0.015
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.026
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.2329
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	7.9608
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.31	0.31	0.57	0.57	0.035	0.073			-0.068
2	0.34	0.34	0.43	0.43	0.005	0.068			-0.048
3	0.37	0.37	0.51	0.51	0.025	0.013			-0.045
4	0.34	0.34	0.47	0.47	0.005	0.028			-0.035
5	0.36	0.36	0.54	0.54	0.015	0.043			-0.028
6	0.38	0.38	0.5	0.5	0.035	0.003			-0.005
7	0.3	0.3	0.45	0.45	0.045	0.048			-0.005
8	0.36	0.36	0.51	0.51	0.015	0.013			0.003
9									0.013
10									0.013
11									0.015
12									0.015
13									0.025
14									0.035
15									0.043
16									0.073

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164485
Alias:	NAS# 9993F
Replicates:	8
Mean:	0.411
SD:	0.043
Tr Mean:	0.411
Trans SD:	0.043

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.038
SS:	0.028
K:	8
b:	0.163
Alpha Level:	0.05
Calculated Value:	0.9536
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.037
Test Residual SD:	0.018
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.026
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.0839
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	3.8685
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.48	0.48	0.57	0.57	0.069	0.073			-0.068
2	0.38	0.38	0.43	0.43	0.031	0.068			-0.048
3	0.46	0.46	0.51	0.51	0.049	0.013			-0.041
4	0.37	0.37	0.47	0.47	0.041	0.028			-0.041
5	0.44	0.44	0.54	0.54	0.029	0.043			-0.031
6	0.39	0.39	0.5	0.5	0.021	0.003			-0.028
7	0.37	0.37	0.45	0.45	0.041	0.048			-0.021
8	0.4	0.4	0.51	0.51	0.011	0.013			-0.011
9									0.003
10									0.013
11									0.013
12									0.029
13									0.043
14									0.049
15									0.069
16									0.073

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164487
Alias:	NAS# 9995F
Replicates:	7
Mean:	0.333
SD:	0.047
Tr Mean:	0.333
Trans SD:	0.047

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.039
SS:	0.028
K:	7
b:	0.165
Alpha Level:	0.05
Calculated Value:	0.9579
Critical Value:	<= 0.881
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.035
Test Residual SD:	0.029
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.026
Deg. of Freedom:	13
Alpha Level:	0.1
Calculated Value:	0.0658
Critical Value:	>= 1.771
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	13
Experimental Alpha Level:	0.05
Calculated Value:	6.8191
Critical Value:	>= 1.771
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.35	0.35	0.57	0.57	0.017	0.073			-0.068
2	0.33	0.33	0.43	0.43	0.003	0.068			-0.053
3	0.35	0.35	0.51	0.51	0.017	0.013			-0.048
4	0.42	0.42	0.47	0.47	0.087	0.028			-0.043
5	0.28	0.28	0.54	0.54	0.053	0.043			-0.028
6	0.31	0.31	0.5	0.5	0.023	0.003			-0.023
7	0.29	0.29	0.45	0.45	0.043	0.048			-0.003
8			0.51	0.51		0.013			0.003
9									0.013
10									0.013
11									0.017
12									0.017
13									0.043
14									0.073
15									0.087

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164494
Alias:	NAS# 9996F
Replicates:	8
Mean:	0.45
SD:	0.064
Tr Mean:	0.45
Trans SD:	0.064

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.048
SS:	0.043
K:	8
b:	0.203
Alpha Level:	0.05
Calculated Value:	0.9473
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.053
Test Residual SD:	0.03
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.026
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.1961
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	1.7072
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.53	0.53	0.57	0.57	0.08	0.073			-0.08
2	0.42	0.42	0.43	0.43	0.03	0.068			-0.068
3	0.45	0.45	0.51	0.51	0	0.013			-0.05
4	0.4	0.4	0.47	0.47	0.05	0.028			-0.05
5	0.4	0.4	0.54	0.54	0.05	0.043			-0.048
6	0.49	0.49	0.5	0.5	0.04	0.003			-0.03
7	0.37	0.37	0.45	0.45	0.08	0.048			-0.028
8	0.54	0.54	0.51	0.51	0.09	0.013			0
9									0.003
10									0.013
11									0.013
12									0.04
13									0.043
14									0.073
15									0.08
16									0.09

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164507
Alias:	NAS# 9997F
Replicates:	8
Mean:	0.411
SD:	0.035
Tr Mean:	0.411
Trans SD:	0.035

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.035
SS:	0.023
K:	8
b:	0.151
Alpha Level:	0.05
Calculated Value:	0.9735
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.029
Test Residual SD:	0.016
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.026
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.6299
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	4.216
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.38	0.38	0.57	0.57	0.031	0.073			-0.068
2	0.4	0.4	0.43	0.43	0.011	0.068			-0.061
3	0.44	0.44	0.51	0.51	0.029	0.013			-0.048
4	0.44	0.44	0.47	0.47	0.029	0.028			-0.031
5	0.4	0.4	0.54	0.54	0.011	0.043			-0.028
6	0.45	0.45	0.5	0.5	0.039	0.003			-0.011
7	0.43	0.43	0.45	0.45	0.019	0.048			-0.011
8	0.35	0.35	0.51	0.51	0.061	0.013			0.003
9									0.013
10									0.013
11									0.019
12									0.029
13									0.029
14									0.039
15									0.043
16									0.073

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164491
Alias:	NAS# 9999F
Replicates:	8
Mean:	0.335
SD:	0.045
Tr Mean:	0.335
Trans SD:	0.045

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.039
SS:	0.029
K:	8
b:	0.164
Alpha Level:	0.05
Calculated Value:	0.9286
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.029
Test Residual SD:	0.032
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.026
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.4661
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	7.147
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.57	0.57	0.005	0.073			-0.068
2	0.34	0.34	0.43	0.43	0.005	0.068			-0.048
3	0.31	0.31	0.51	0.51	0.025	0.013			-0.035
4	0.31	0.31	0.47	0.47	0.025	0.028			-0.028
5	0.3	0.3	0.54	0.54	0.035	0.043			-0.025
6	0.32	0.32	0.5	0.5	0.015	0.003			-0.025
7	0.32	0.32	0.45	0.45	0.015	0.048			-0.015
8	0.44	0.44	0.51	0.51	0.105	0.013			-0.015
9									0.003
10									0.005
11									0.005
12									0.013
13									0.013
14									0.043
15									0.073
16									0.105

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164493
Alias:	NAS# 0001G
Replicates:	8
Mean:	0.499
SD:	0.094
Tr Mean:	0.499
Trans SD:	0.094

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.082	Statistic:	Approximate t
Residual SD:	0.064	Test Residual SD:	0.036	Balanced Design:	Yes
SS:	0.077	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.026		
b:	0.269	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9396	Calculated Value:	2.9408	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	10
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	-0.0337
				Critical Value:	>= 1.812
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.4	0.4	0.57	0.57	0.099	0.073			-0.119
2	0.59	0.59	0.43	0.43	0.091	0.068			-0.109
3	0.6	0.6	0.51	0.51	0.101	0.013			-0.099
4	0.39	0.39	0.47	0.47	0.109	0.028			-0.068
5	0.51	0.51	0.54	0.54	0.011	0.043			-0.048
6	0.55	0.55	0.5	0.5	0.051	0.003			-0.028
7	0.38	0.38	0.45	0.45	0.119	0.048			0.003
8	0.57	0.57	0.51	0.51	0.071	0.013			0.011
9									0.013
10									0.013
11									0.043
12									0.051
13									0.071
14									0.073
15									0.091
16									0.101

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164405
Alias:	NAS# 0032G
Replicates:	8
Mean:	0.343
SD:	0.066
Tr Mean:	0.343
Trans SD:	0.066

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.044	Statistic:	Student's t
Residual SD:	0.049	Test Residual SD:	0.047	Balanced Design:	Yes
SS:	0.046	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.026		
b:	0.203	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.8987	Calculated Value:	0.4631	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	5.414
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.37	0.37	0.57	0.57	0.028	0.073			-0.153
2	0.37	0.37	0.43	0.43	0.028	0.068			-0.068
3	0.33	0.33	0.51	0.51	0.013	0.013			-0.048
4	0.19	0.19	0.47	0.47	0.153	0.028			-0.028
5	0.36	0.36	0.54	0.54	0.018	0.043			-0.013
6	0.4	0.4	0.5	0.5	0.058	0.003			-0.013
7	0.39	0.39	0.45	0.45	0.048	0.048			0.003
8	0.33	0.33	0.51	0.51	0.013	0.013			0.013
9									0.013
10									0.018
11									0.028
12									0.028
13									0.043
14									0.048
15									0.058
16									0.073

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164406
Alias:	NAS# 0033G
Replicates:	8
Mean:	0.451
SD:	0.046
Tr Mean:	0.451
Trans SD:	0.046

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.04
SS:	0.03
K:	8
b:	0.168
Alpha Level:	0.05
Calculated Value:	0.9489
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.039
Test Residual SD:	0.02
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.026
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.2975
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	2.0037
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.52	0.52	0.57	0.57	0.069	0.073			-0.068
2	0.4	0.4	0.43	0.43	0.051	0.068			-0.051
3	0.42	0.42	0.51	0.51	0.031	0.013			-0.048
4	0.48	0.48	0.47	0.47	0.029	0.028			-0.041
5	0.44	0.44	0.54	0.54	0.011	0.043			-0.031
6	0.51	0.51	0.5	0.5	0.059	0.003			-0.028
7	0.41	0.41	0.45	0.45	0.041	0.048			-0.021
8	0.43	0.43	0.51	0.51	0.021	0.013			-0.011
9									0.003
10									0.013
11									0.013
12									0.029
13									0.043
14									0.059
15									0.069
16									0.073

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164408
Alias:	NAS# 0034G
Replicates:	8
Mean:	0.299
SD:	0.065
Tr Mean:	0.299
Trans SD:	0.065

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.048	Statistic:	Student's t
Residual SD:	0.048	Test Residual SD:	0.039	Balanced Design:	Yes
SS:	0.044	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.026		
b:	0.201	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9168	Calculated Value:	0.7748	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	7.0714
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.43	0.43	0.57	0.57	0.131	0.073			-0.068
2	0.27	0.27	0.43	0.43	0.029	0.068			-0.059
3	0.24	0.24	0.51	0.51	0.059	0.013			-0.049
4	0.25	0.25	0.47	0.47	0.049	0.028			-0.048
5	0.27	0.27	0.54	0.54	0.029	0.043			-0.029
6	0.36	0.36	0.5	0.5	0.061	0.003			-0.029
7	0.3	0.3	0.45	0.45	0.001	0.048			-0.029
8	0.27	0.27	0.51	0.51	0.029	0.013			-0.028
9									0.001
10									0.003
11									0.013
12									0.013
13									0.043
14									0.061
15									0.073
16									0.131

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164412
Alias:	NAS# 0035G
Replicates:	8
Mean:	0.348
SD:	0.059
Tr Mean:	0.348
Trans SD:	0.059

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.043	Statistic:	Student's t
Residual SD:	0.045	Test Residual SD:	0.038	Balanced Design:	Yes
SS:	0.039	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.026		
b:	0.195	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9652	Calculated Value:	0.4244	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	5.6622
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.3	0.3	0.57	0.57	0.048	0.073			-0.098
2	0.43	0.43	0.43	0.43	0.083	0.068			-0.068
3	0.35	0.35	0.51	0.51	0.003	0.013			-0.048
4	0.33	0.33	0.47	0.47	0.018	0.028			-0.048
5	0.36	0.36	0.54	0.54	0.013	0.043			-0.028
6	0.42	0.42	0.5	0.5	0.073	0.003			-0.018
7	0.25	0.25	0.45	0.45	0.098	0.048			-0.007
8	0.34	0.34	0.51	0.51	0.007	0.013			0.003
9									0.003
10									0.013
11									0.013
12									0.013
13									0.043
14									0.073
15									0.073
16									0.083

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164413
Alias:	NAS# 0036G
Replicates:	8
Mean:	0.403
SD:	0.075
Tr Mean:	0.403
Trans SD:	0.075

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.053
SS:	0.054
K:	8
b:	0.229
Alpha Level:	0.05
Calculated Value:	0.966
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.06
Test Residual SD:	0.038
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.026
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.4821
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	3.0565
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.37	0.37	0.57	0.57	0.033	0.073			-0.123
2	0.41	0.41	0.43	0.43	0.007	0.068			-0.068
3	0.49	0.49	0.51	0.51	0.088	0.013			-0.063
4	0.46	0.46	0.47	0.47	0.058	0.028			-0.048
5	0.49	0.49	0.54	0.54	0.088	0.043			-0.033
6	0.28	0.28	0.5	0.5	0.123	0.003			-0.028
7	0.38	0.38	0.45	0.45	0.023	0.048			-0.023
8	0.34	0.34	0.51	0.51	0.063	0.013			0.003
9									0.007
10									0.013
11									0.013
12									0.043
13									0.058
14									0.073
15									0.088
16									0.088

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164407
Alias:	NAS# 0037G
Replicates:	8
Mean:	0.371
SD:	0.049
Tr Mean:	0.371
Trans SD:	0.049

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.039	Statistic:	Student's t
Residual SD:	0.041	Test Residual SD:	0.026	Balanced Design:	Yes
SS:	0.032	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.026		
b:	0.176	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9744	Calculated Value:	0.2378	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	5.2949
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.44	0.44	0.57	0.57	0.069	0.073			-0.081
2	0.4	0.4	0.43	0.43	0.029	0.068			-0.068
3	0.33	0.33	0.51	0.51	0.041	0.013			-0.048
4	0.35	0.35	0.47	0.47	0.021	0.028			-0.041
5	0.42	0.42	0.54	0.54	0.049	0.043			-0.028
6	0.38	0.38	0.5	0.5	0.009	0.003			-0.021
7	0.29	0.29	0.45	0.45	0.081	0.048			-0.011
8	0.36	0.36	0.51	0.51	0.011	0.013			0.003
9									0.009
10									0.013
11									0.013
12									0.029
13									0.043
14									0.049
15									0.069
16									0.073

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164409
Alias:	NAS# 0038G
Replicates:	8
Mean:	0.486
SD:	0.07
Tr Mean:	0.486
Trans SD:	0.07

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.059	Statistic:	Student's t
Residual SD:	0.051	Test Residual SD:	0.031	Balanced Design:	Yes
SS:	0.049	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.026		
b:	0.216	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9436	Calculated Value:	1.6087	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	0.379
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.46	0.46	0.57	0.57	0.026	0.073			-0.116
2	0.47	0.47	0.43	0.43	0.016	0.068			-0.076
3	0.41	0.41	0.51	0.51	0.076	0.013			-0.068
4	0.56	0.56	0.47	0.47	0.074	0.028			-0.048
5	0.54	0.54	0.54	0.54	0.054	0.043			-0.028
6	0.37	0.37	0.5	0.5	0.116	0.003			-0.026
7	0.54	0.54	0.45	0.45	0.054	0.048			-0.016
8	0.54	0.54	0.51	0.51	0.054	0.013			0.003
9									0.013
10									0.013
11									0.043
12									0.054
13									0.054
14									0.054
15									0.073
16									0.074

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164410
Alias:	NAS# 0039G
Replicates:	8
Mean:	0.423
SD:	0.075
Tr Mean:	0.423
Trans SD:	0.075

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.054
SS:	0.055
K:	8
b:	0.23
Alpha Level:	0.05
Calculated Value:	0.9726
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.065
Test Residual SD:	0.029
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.026
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.1405
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	12
Experimental Alpha Level:	0.05
Calculated Value:	2.4041
Critical Value:	>= 1.782
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.39	0.39	0.57	0.57	0.033	0.073			-0.103
2	0.53	0.53	0.43	0.43	0.108	0.068			-0.083
3	0.47	0.47	0.51	0.51	0.048	0.013			-0.068
4	0.32	0.32	0.47	0.47	0.103	0.028			-0.048
5	0.38	0.38	0.54	0.54	0.043	0.043			-0.043
6	0.34	0.34	0.5	0.5	0.083	0.003			-0.033
7	0.47	0.47	0.45	0.45	0.048	0.048			-0.028
8	0.48	0.48	0.51	0.51	0.058	0.013			0.003
9									0.013
10									0.013
11									0.043
12									0.048
13									0.048
14									0.058
15									0.073
16									0.108

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164411
Alias:	NAS# 0040G
Replicates:	8
Mean:	0.483
SD:	0.068
Tr Mean:	0.483
Trans SD:	0.068

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.047	Statistic:	Student's t
Residual SD:	0.05	Test Residual SD:	0.046	Balanced Design:	Yes
SS:	0.047	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.026		
b:	0.214	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9762	Calculated Value:	0.6049	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	0.5172
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.49	0.49	0.57	0.57	0.008	0.073			-0.113
2	0.37	0.37	0.43	0.43	0.113	0.068			-0.068
3	0.51	0.51	0.51	0.51	0.028	0.013			-0.063
4	0.47	0.47	0.47	0.47	0.013	0.028			-0.048
5	0.51	0.51	0.54	0.54	0.028	0.043			-0.028
6	0.6	0.6	0.5	0.5	0.118	0.003			-0.013
7	0.49	0.49	0.45	0.45	0.008	0.048			0.003
8	0.42	0.42	0.51	0.51	0.063	0.013			0.008
9									0.008
10									0.013
11									0.013
12									0.028
13									0.028
14									0.043
15									0.073
16									0.118

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164415
Alias:	NAS# 0041G
Replicates:	8
Mean:	0.525
SD:	0.049
Tr Mean:	0.525
Trans SD:	0.049

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.041
SS:	0.032
K:	8
b:	0.171
Alpha Level:	0.05
Calculated Value:	0.9223
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.039
Test Residual SD:	0.026
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.026
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.2414
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	-1.1586
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.45	0.45	0.57	0.57	0.075	0.073			-0.075
2	0.57	0.57	0.43	0.43	0.045	0.068			-0.075
3	0.52	0.52	0.51	0.51	0.005	0.013			-0.068
4	0.45	0.45	0.47	0.47	0.075	0.028			-0.048
5	0.56	0.56	0.54	0.54	0.035	0.043			-0.028
6	0.54	0.54	0.5	0.5	0.015	0.003			-0.005
7	0.55	0.55	0.45	0.45	0.025	0.048			0.003
8	0.56	0.56	0.51	0.51	0.035	0.013			0.013
9									0.013
10									0.015
11									0.025
12									0.035
13									0.035
14									0.043
15									0.045
16									0.073

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164423
Alias:	NAS# 0042G
Replicates:	8
Mean:	0.323
SD:	0.053
Tr Mean:	0.323
Trans SD:	0.053

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.043
SS:	0.035
K:	8
b:	0.184
Alpha Level:	0.05
Calculated Value:	0.9723
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.043
Test Residual SD:	0.028
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.026
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.507
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	7.01
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.37	0.37	0.57	0.57	0.048	0.073			-0.103
2	0.29	0.29	0.43	0.43	0.033	0.068			-0.068
3	0.35	0.35	0.51	0.51	0.028	0.013			-0.048
4	0.38	0.38	0.47	0.47	0.058	0.028			-0.033
5	0.22	0.22	0.54	0.54	0.103	0.043			-0.028
6	0.3	0.3	0.5	0.5	0.023	0.003			-0.023
7	0.36	0.36	0.45	0.45	0.038	0.048			-0.013
8	0.31	0.31	0.51	0.51	0.013	0.013			0.003
9									0.013
10									0.013
11									0.028
12									0.038
13									0.043
14									0.048
15									0.058
16									0.073

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164424
Alias:	NAS# 0043G
Replicates:	8
Mean:	0.335
SD:	0.052
Tr Mean:	0.335
Trans SD:	0.052

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.042
SS:	0.034
K:	8
b:	0.175
Alpha Level:	0.05
Calculated Value:	0.911
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.048
Test Residual SD:	0.01
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.026
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.1932
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	6.6193
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.38	0.38	0.57	0.57	0.045	0.073			-0.068
2	0.3	0.3	0.43	0.43	0.035	0.068			-0.065
3	0.38	0.38	0.51	0.51	0.045	0.013			-0.055
4	0.38	0.38	0.47	0.47	0.045	0.028			-0.048
5	0.27	0.27	0.54	0.54	0.065	0.043			-0.035
6	0.28	0.28	0.5	0.5	0.055	0.003			-0.035
7	0.39	0.39	0.45	0.45	0.055	0.048			-0.028
8	0.3	0.3	0.51	0.51	0.035	0.013			0.003
9									0.013
10									0.013
11									0.043
12									0.045
13									0.045
14									0.045
15									0.055
16									0.073

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164427
Alias:	NAS# 0044G
Replicates:	8
Mean:	0.518
SD:	0.086
Tr Mean:	0.518
Trans SD:	0.086

Ref Samp:	x2
Ref ID:	5164470
Alias:	NAS# 9983F
Replicates:	8
Mean:	0.498
SD:	0.046
Tr Mean:	0.498
Trans SD:	0.046

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.059
SS:	0.067
K:	8
b:	0.253
Alpha Level:	0.05
Calculated Value:	0.9602
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.06
Test Residual SD:	0.057
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.026
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.099
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	-0.5804
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.53	0.53	0.57	0.57	0.013	0.073			-0.118
2	0.53	0.53	0.43	0.43	0.013	0.068			-0.088
3	0.5	0.5	0.51	0.51	0.018	0.013			-0.068
4	0.68	0.68	0.47	0.47	0.163	0.028			-0.048
5	0.57	0.57	0.54	0.54	0.053	0.043			-0.028
6	0.5	0.5	0.5	0.5	0.018	0.003			-0.018
7	0.4	0.4	0.45	0.45	0.118	0.048			-0.018
8	0.43	0.43	0.51	0.51	0.088	0.013			0.003
9									0.013
10									0.013
11									0.013
12									0.013
13									0.043
14									0.053
15									0.073
16									0.163

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164472
Alias:	NAS# 9985f
Replicates:	8
Mean:	0.194
SD:	0.038
Tr Mean:	0.194
Trans SD:	0.038

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.06
SS:	0.068
K:	8
b:	0.254
Alpha Level:	0.05
Calculated Value:	0.9498
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.031
Test Residual SD:	0.018
Ref. Residual Mean:	0.07
Ref. Residual SD:	0.051
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.0046
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	9
Experimental Alpha Level:	0.05
Calculated Value:	9.295
Critical Value:	>= 1.833
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.15	0.15	0.46	0.46	0.044	0.057			-0.108
2	0.15	0.15	0.53	0.53	0.044	0.013			-0.088
3	0.21	0.21	0.43	0.43	0.016	0.088			-0.057
4	0.26	0.26	0.41	0.41	0.066	0.108			-0.044
5	0.18	0.18	0.57	0.57	0.014	0.053			-0.044
6	0.21	0.21	0.49	0.49	0.016	0.028			-0.028
7	0.22	0.22	0.69	0.69	0.026	0.173			-0.024
8	0.17	0.17	0.56	0.56	0.024	0.043			-0.014
9									0.013
10									0.016
11									0.016
12									0.026
13									0.043
14									0.053
15									0.066
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164473
Alias:	NAS# 9986F
Replicates:	8
Mean:	0.65
SD:	0.047
Tr Mean:	0.65
Trans SD:	0.047

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.062
SS:	0.073
K:	8
b:	0.265
Alpha Level:	0.05
Calculated Value:	0.9572
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.038
Test Residual SD:	0.025
Ref. Residual Mean:	0.07
Ref. Residual SD:	0.051
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.6072
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	-3.6611
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.65	0.65	0.46	0.46	0	0.057			-0.108
2	0.67	0.67	0.53	0.53	0.02	0.013			-0.088
3	0.6	0.6	0.43	0.43	0.05	0.088			-0.057
4	0.73	0.73	0.41	0.41	0.08	0.108			-0.05
5	0.6	0.6	0.57	0.57	0.05	0.053			-0.05
6	0.62	0.62	0.49	0.49	0.03	0.028			-0.03
7	0.7	0.7	0.69	0.69	0.05	0.173			-0.028
8	0.63	0.63	0.56	0.56	0.02	0.043			-0.02
9									0
10									0.013
11									0.02
12									0.043
13									0.05
14									0.053
15									0.08
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164474
Alias:	NAS# 9987F
Replicates:	8
Mean:	0.335
SD:	0.042
Tr Mean:	0.335
Trans SD:	0.042

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.061
SS:	0.07
K:	8
b:	0.256
Alpha Level:	0.05
Calculated Value:	0.9319
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.031
Test Residual SD:	0.026
Ref. Residual Mean:	0.07
Ref. Residual SD:	0.051
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.9064
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	10
Experimental Alpha Level:	0.05
Calculated Value:	5.1564
Critical Value:	>= 1.812
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.25	0.25	0.46	0.46	0.085	0.057			-0.108
2	0.34	0.34	0.53	0.53	0.005	0.013			-0.088
3	0.3	0.3	0.43	0.43	0.035	0.088			-0.085
4	0.38	0.38	0.41	0.41	0.045	0.108			-0.057
5	0.36	0.36	0.57	0.57	0.025	0.053			-0.035
6	0.36	0.36	0.49	0.49	0.025	0.028			-0.028
7	0.36	0.36	0.69	0.69	0.025	0.173			-0.005
8	0.33	0.33	0.56	0.56	0.005	0.043			0.005
9									0.013
10									0.025
11									0.025
12									0.025
13									0.043
14									0.045
15									0.053
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164475
Alias:	NAS# 9988F
Replicates:	8
Mean:	0.424
SD:	0.066
Tr Mean:	0.424
Trans SD:	0.066

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.051	Statistic:	Student's t
Residual SD:	0.068	Test Residual SD:	0.037	Balanced Design:	Yes
SS:	0.089	Ref. Residual Mean:	0.07	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.051		
b:	0.292	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9645	Calculated Value:	0.8337	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	2.3578
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.42	0.42	0.46	0.46	0.004	0.057			-0.114
2	0.47	0.47	0.53	0.53	0.046	0.013			-0.108
3	0.39	0.39	0.43	0.43	0.034	0.088			-0.088
4	0.52	0.52	0.41	0.41	0.096	0.108			-0.057
5	0.47	0.47	0.57	0.57	0.046	0.053			-0.054
6	0.31	0.31	0.49	0.49	0.114	0.028			-0.034
7	0.44	0.44	0.69	0.69	0.016	0.173			-0.028
8	0.37	0.37	0.56	0.56	0.054	0.043			-0.004
9									0.013
10									0.016
11									0.043
12									0.046
13									0.046
14									0.053
15									0.096
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164479
Alias:	NAS# 9991F
Replicates:	8
Mean:	0.228
SD:	0.06
Tr Mean:	0.228
Trans SD:	0.06

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.051	Statistic:	Student's t
Residual SD:	0.066	Test Residual SD:	0.026	Balanced Design:	Yes
SS:	0.083	Ref. Residual Mean:	0.07	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.051		
b:	0.277	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9237	Calculated Value:	0.9479	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	7.5282
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.28	0.28	0.46	0.46	0.053	0.057			-0.108
2	0.18	0.18	0.53	0.53	0.048	0.013			-0.108
3	0.24	0.24	0.43	0.43	0.013	0.088			-0.088
4	0.27	0.27	0.41	0.41	0.043	0.108			-0.057
5	0.12	0.12	0.57	0.57	0.108	0.053			-0.048
6	0.18	0.18	0.49	0.49	0.048	0.028			-0.048
7	0.27	0.27	0.69	0.69	0.043	0.173			-0.028
8	0.28	0.28	0.56	0.56	0.053	0.043			0.013
9									0.013
10									0.043
11									0.043
12									0.043
13									0.053
14									0.053
15									0.053
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164483
Alias:	NAS# 9992F
Replicates:	8
Mean:	0.345
SD:	0.028
Tr Mean:	0.345
Trans SD:	0.028

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.058
SS:	0.063
K:	8
b:	0.243
Alpha Level:	0.05
Calculated Value:	0.9308
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.023
Test Residual SD:	0.015
Ref. Residual Mean:	0.07
Ref. Residual SD:	0.051
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.5072
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	5.1287
Critical Value:	>= 1.86
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.31	0.31	0.46	0.46	0.035	0.057			-0.108
2	0.34	0.34	0.53	0.53	0.005	0.013			-0.088
3	0.37	0.37	0.43	0.43	0.025	0.088			-0.057
4	0.34	0.34	0.41	0.41	0.005	0.108			-0.045
5	0.36	0.36	0.57	0.57	0.015	0.053			-0.035
6	0.38	0.38	0.49	0.49	0.035	0.028			-0.028
7	0.3	0.3	0.69	0.69	0.045	0.173			-0.005
8	0.36	0.36	0.56	0.56	0.015	0.043			-0.005
9									0.013
10									0.015
11									0.015
12									0.025
13									0.035
14									0.043
15									0.053
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164485
Alias:	NAS# 9993F
Replicates:	8
Mean:	0.411
SD:	0.043
Tr Mean:	0.411
Trans SD:	0.043

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.037	Statistic:	Student's t
Residual SD:	0.061	Test Residual SD:	0.018	Balanced Design:	Yes
SS:	0.071	Ref. Residual Mean:	0.07	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.051		
b:	0.259	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9487	Calculated Value:	1.7374	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	2.9916
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.48	0.48	0.46	0.46	0.069	0.057			-0.108
2	0.38	0.38	0.53	0.53	0.031	0.013			-0.088
3	0.46	0.46	0.43	0.43	0.049	0.088			-0.057
4	0.37	0.37	0.41	0.41	0.041	0.108			-0.041
5	0.44	0.44	0.57	0.57	0.029	0.053			-0.041
6	0.39	0.39	0.49	0.49	0.021	0.028			-0.031
7	0.37	0.37	0.69	0.69	0.041	0.173			-0.028
8	0.4	0.4	0.56	0.56	0.011	0.043			-0.021
9									-0.011
10									0.013
11									0.029
12									0.043
13									0.049
14									0.053
15									0.069
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164487
Alias:	NAS# 9995F
Replicates:	7
Mean:	0.333
SD:	0.047
Tr Mean:	0.333
Trans SD:	0.047

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.061
SS:	0.071
K:	7
b:	0.261
Alpha Level:	0.05
Calculated Value:	0.9572
Critical Value:	<= 0.881
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.035
Test Residual SD:	0.029
Ref. Residual Mean:	0.07
Ref. Residual SD:	0.051
Deg. of Freedom:	13
Alpha Level:	0.1
Calculated Value:	1.6056
Critical Value:	>= 1.771
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	13
Experimental Alpha Level:	0.05
Calculated Value:	4.8244
Critical Value:	>= 1.771
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.35	0.35	0.46	0.46	0.017	0.057			-0.108
2	0.33	0.33	0.53	0.53	0.003	0.013			-0.088
3	0.35	0.35	0.43	0.43	0.017	0.088			-0.057
4	0.42	0.42	0.41	0.41	0.087	0.108			-0.053
5	0.28	0.28	0.57	0.57	0.053	0.053			-0.043
6	0.31	0.31	0.49	0.49	0.023	0.028			-0.028
7	0.29	0.29	0.69	0.69	0.043	0.173			-0.023
8			0.56	0.56		0.043			-0.003
9									0.013
10									0.017
11									0.017
12									0.043
13									0.053
14									0.087
15									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164494
Alias:	NAS# 9996F
Replicates:	8
Mean:	0.45
SD:	0.064
Tr Mean:	0.45
Trans SD:	0.064

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.067
SS:	0.086
K:	8
b:	0.287
Alpha Level:	0.05
Calculated Value:	0.9569
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.053
Test Residual SD:	0.03
Ref. Residual Mean:	0.07
Ref. Residual SD:	0.051
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.8299
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	1.721
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.53	0.53	0.46	0.46	0.08	0.057			-0.108
2	0.42	0.42	0.53	0.53	0.03	0.013			-0.088
3	0.45	0.45	0.43	0.43	0	0.088			-0.08
4	0.4	0.4	0.41	0.41	0.05	0.108			-0.057
5	0.4	0.4	0.57	0.57	0.05	0.053			-0.05
6	0.49	0.49	0.49	0.49	0.04	0.028			-0.05
7	0.37	0.37	0.69	0.69	0.08	0.173			-0.03
8	0.54	0.54	0.56	0.56	0.09	0.043			-0.028
9									0
10									0.013
11									0.04
12									0.043
13									0.053
14									0.08
15									0.09
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164507
Alias:	NAS# 9997F
Replicates:	8
Mean:	0.411
SD:	0.035
Tr Mean:	0.411
Trans SD:	0.035

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.059
SS:	0.066
K:	8
b:	0.249
Alpha Level:	0.05
Calculated Value:	0.9362
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.029
Test Residual SD:	0.016
Ref. Residual Mean:	0.07
Ref. Residual SD:	0.051
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.1599
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	9
Experimental Alpha Level:	0.05
Calculated Value:	3.0894
Critical Value:	>= 1.833
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.38	0.38	0.46	0.46	0.031	0.057			-0.108
2	0.4	0.4	0.53	0.53	0.011	0.013			-0.088
3	0.44	0.44	0.43	0.43	0.029	0.088			-0.061
4	0.44	0.44	0.41	0.41	0.029	0.108			-0.057
5	0.4	0.4	0.57	0.57	0.011	0.053			-0.031
6	0.45	0.45	0.49	0.49	0.039	0.028			-0.028
7	0.43	0.43	0.69	0.69	0.019	0.173			-0.011
8	0.35	0.35	0.56	0.56	0.061	0.043			-0.011
9									0.013
10									0.019
11									0.029
12									0.029
13									0.039
14									0.043
15									0.053
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164491
Alias:	NAS# 9999F
Replicates:	8
Mean:	0.335
SD:	0.045
Tr Mean:	0.335
Trans SD:	0.045

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.061
SS:	0.072
K:	8
b:	0.258
Alpha Level:	0.05
Calculated Value:	0.9295
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.029
Test Residual SD:	0.032
Ref. Residual Mean:	0.07
Ref. Residual SD:	0.051
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.9167
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	10
Experimental Alpha Level:	0.05
Calculated Value:	5.0985
Critical Value:	>= 1.812
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.46	0.46	0.005	0.057			-0.108
2	0.34	0.34	0.53	0.53	0.005	0.013			-0.088
3	0.31	0.31	0.43	0.43	0.025	0.088			-0.057
4	0.31	0.31	0.41	0.41	0.025	0.108			-0.035
5	0.3	0.3	0.57	0.57	0.035	0.053			-0.028
6	0.32	0.32	0.49	0.49	0.015	0.028			-0.025
7	0.32	0.32	0.69	0.69	0.015	0.173			-0.025
8	0.44	0.44	0.56	0.56	0.105	0.043			-0.015
9									-0.015
10									0.005
11									0.005
12									0.013
13									0.043
14									0.053
15									0.105
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164493
Alias:	NAS# 0001G
Replicates:	8
Mean:	0.499
SD:	0.094
Tr Mean:	0.499
Trans SD:	0.094

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.079
SS:	0.12
K:	8
b:	0.335
Alpha Level:	0.05
Calculated Value:	0.9352
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.082
Test Residual SD:	0.036
Ref. Residual Mean:	0.07
Ref. Residual SD:	0.051
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.5226
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	0.4053
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.4	0.4	0.46	0.46	0.099	0.057			-0.119
2	0.59	0.59	0.53	0.53	0.091	0.013			-0.109
3	0.6	0.6	0.43	0.43	0.101	0.088			-0.108
4	0.39	0.39	0.41	0.41	0.109	0.108			-0.099
5	0.51	0.51	0.57	0.57	0.011	0.053			-0.088
6	0.55	0.55	0.49	0.49	0.051	0.028			-0.057
7	0.38	0.38	0.69	0.69	0.119	0.173			-0.028
8	0.57	0.57	0.56	0.56	0.071	0.043			0.011
9									0.013
10									0.043
11									0.051
12									0.053
13									0.071
14									0.091
15									0.101
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164405
Alias:	NAS# 0032G
Replicates:	8
Mean:	0.343
SD:	0.066
Tr Mean:	0.343
Trans SD:	0.066

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.068
SS:	0.089
K:	8
b:	0.291
Alpha Level:	0.05
Calculated Value:	0.9539
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.044
Test Residual SD:	0.047
Ref. Residual Mean:	0.07
Ref. Residual SD:	0.051
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.0439
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	4.3971
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.37	0.37	0.46	0.46	0.028	0.057			-0.153
2	0.37	0.37	0.53	0.53	0.028	0.013			-0.108
3	0.33	0.33	0.43	0.43	0.013	0.088			-0.088
4	0.19	0.19	0.41	0.41	0.153	0.108			-0.057
5	0.36	0.36	0.57	0.57	0.018	0.053			-0.028
6	0.4	0.4	0.49	0.49	0.058	0.028			-0.013
7	0.39	0.39	0.69	0.69	0.048	0.173			-0.013
8	0.33	0.33	0.56	0.56	0.013	0.043			0.013
9									0.018
10									0.028
11									0.028
12									0.043
13									0.048
14									0.053
15									0.058
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164406
Alias:	NAS# 0033G
Replicates:	8
Mean:	0.451
SD:	0.046
Tr Mean:	0.451
Trans SD:	0.046

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.062
SS:	0.073
K:	8
b:	0.263
Alpha Level:	0.05
Calculated Value:	0.9531
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.039
Test Residual SD:	0.02
Ref. Residual Mean:	0.07
Ref. Residual SD:	0.051
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.5889
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	1.8395
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.52	0.52	0.46	0.46	0.069	0.057			-0.108
2	0.4	0.4	0.53	0.53	0.051	0.013			-0.088
3	0.42	0.42	0.43	0.43	0.031	0.088			-0.057
4	0.48	0.48	0.41	0.41	0.029	0.108			-0.051
5	0.44	0.44	0.57	0.57	0.011	0.053			-0.041
6	0.51	0.51	0.49	0.49	0.059	0.028			-0.031
7	0.41	0.41	0.69	0.69	0.041	0.173			-0.028
8	0.43	0.43	0.56	0.56	0.021	0.043			-0.021
9									-0.011
10									0.013
11									0.029
12									0.043
13									0.053
14									0.059
15									0.069
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164408
Alias:	NAS# 0034G
Replicates:	8
Mean:	0.299
SD:	0.065
Tr Mean:	0.299
Trans SD:	0.065

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.068
SS:	0.087
K:	8
b:	0.284
Alpha Level:	0.05
Calculated Value:	0.9284
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.048
Test Residual SD:	0.039
Ref. Residual Mean:	0.07
Ref. Residual SD:	0.051
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.9464
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	5.5487
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.43	0.43	0.46	0.46	0.131	0.057			-0.108
2	0.27	0.27	0.53	0.53	0.029	0.013			-0.088
3	0.24	0.24	0.43	0.43	0.059	0.088			-0.059
4	0.25	0.25	0.41	0.41	0.049	0.108			-0.057
5	0.27	0.27	0.57	0.57	0.029	0.053			-0.049
6	0.36	0.36	0.49	0.49	0.061	0.028			-0.029
7	0.3	0.3	0.69	0.69	0.001	0.173			-0.029
8	0.27	0.27	0.56	0.56	0.029	0.043			-0.029
9									-0.028
10									0.001
11									0.013
12									0.043
13									0.053
14									0.061
15									0.131
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight .

Sample:	x1
Samp ID:	5164412
Alias:	NAS# 0035G
Replicates:	8
Mean:	0.348
SD:	0.059
Tr Mean:	0.348
Trans SD:	0.059

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.043	Statistic:	Student's t
Residual St:	0.066	Test Residual SD:	0.038	Balanced Design:	Yes
S:	0.082	Ref. Residual Mean:	0.07	Transformation:	No Transformation
n:	8	Ref. Residual SD:	0.051		
b:	0.281	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.965	Calculated Value:	1.2201	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	4.4399
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.3	0.3	0.46	0.46	0.048	0.057			-0.108
2	0.43	0.43	0.53	0.53	0.083	0.013			-0.098
3	0.35	0.35	0.43	0.43	0.003	0.088			-0.088
4	0.33	0.33	0.41	0.41	0.018	0.108			-0.057
5	0.36	0.36	0.57	0.57	0.013	0.053			-0.048
6	0.42	0.42	0.49	0.49	0.073	0.028			-0.028
7	0.25	0.25	0.69	0.69	0.098	0.173			-0.018
8	0.34	0.34	0.56	0.56	0.007	0.043			-0.007
9									0.003
10									0.013
11									0.013
12									0.043
13									0.053
14									0.073
15									0.083
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164413
Alias:	NAS# 0036G
Replicates:	8
Mean:	0.403
SD:	0.075
Tr Mean:	0.403
Trans SD:	0.075

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.06	Statistic:	Student's t
Residual SD:	0.071	Test Residual SD:	0.038	Balanced Design:	Yes
SS:	0.097	Ref. Residual Mean:	0.07	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.051		
b:	0.307	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9733	Calculated Value:	0.4402	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	2.7646
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.37	0.37	0.46	0.46	0.033	0.057			-0.123
2	0.41	0.41	0.53	0.53	0.007	0.013			-0.108
3	0.49	0.49	0.43	0.43	0.088	0.088			-0.088
4	0.46	0.46	0.41	0.41	0.058	0.108			-0.063
5	0.49	0.49	0.57	0.57	0.088	0.053			-0.057
6	0.28	0.28	0.49	0.49	0.123	0.028			-0.033
7	0.38	0.38	0.69	0.69	0.023	0.173			-0.028
8	0.34	0.34	0.56	0.56	0.063	0.043			-0.023
9									0.007
10									0.013
11									0.043
12									0.053
13									0.058
14									0.088
15									0.088
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164407
Alias:	NAS# 0037G
Replicates:	8
Mean:	0.371
SD:	0.049
Tr Mean:	0.371
Trans SD:	0.049

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.039	Statistic:	Student's t
Residual SD:	0.063	Test Residual SD:	0.026	Balanced Design:	Yes
SS:	0.075	Ref. Residual Mean:	0.07	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.051		
b:	0.267	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9584	Calculated Value:	1.5279	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	4.006
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.44	0.44	0.46	0.46	0.069	0.057			-0.108
2	0.4	0.4	0.53	0.53	0.029	0.013			-0.088
3	0.33	0.33	0.43	0.43	0.041	0.088			-0.081
4	0.35	0.35	0.41	0.41	0.021	0.108			-0.057
5	0.42	0.42	0.57	0.57	0.049	0.053			-0.041
6	0.38	0.38	0.49	0.49	0.009	0.028			-0.028
7	0.29	0.29	0.69	0.69	0.081	0.173			-0.021
8	0.36	0.36	0.56	0.56	0.011	0.043			-0.011
9									0.009
10									0.013
11									0.029
12									0.043
13									0.049
14									0.053
15									0.069
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164409
Alias:	NAS# 0038G
Replicates:	8
Mean:	0.486
SD:	0.07
Tr Mean:	0.486
Trans SD:	0.07

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.07
SS:	0.092
K:	8
b:	0.295
Alpha Level:	0.05
Calculated Value:	0.9459
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.059
Test Residual SD:	0.031
Ref. Residual Mean:	0.07
Ref. Residual SD:	0.051
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.529
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	0.7704
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.46	0.46	0.46	0.46	0.026	0.057			-0.116
2	0.47	0.47	0.53	0.53	0.016	0.013			-0.108
3	0.41	0.41	0.43	0.43	0.076	0.088			-0.088
4	0.56	0.56	0.41	0.41	0.074	0.108			-0.076
5	0.54	0.54	0.57	0.57	0.054	0.053			-0.057
6	0.37	0.37	0.49	0.49	0.116	0.028			-0.028
7	0.54	0.54	0.69	0.69	0.054	0.173			-0.026
8	0.54	0.54	0.56	0.56	0.054	0.043			-0.016
9									0.013
10									0.043
11									0.053
12									0.054
13									0.054
14									0.054
15									0.074
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164410
Alias:	NAS# 0039G
Replicates:	8
Mean:	0.423
SD:	0.075
Tr Mean:	0.423
Trans SD:	0.075

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.072
SS:	0.097
K:	8
b:	0.303
Alpha Level:	0.05
Calculated Value:	0.9427
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.065
Test Residual SD:	0.029
Ref. Residual Mean:	0.07
Ref. Residual SD:	0.051
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.24
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	2.2791
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.39	0.39	0.46	0.46	0.033	0.057			-0.108
2	0.53	0.53	0.53	0.53	0.108	0.013			-0.103
3	0.47	0.47	0.43	0.43	0.048	0.088			-0.088
4	0.32	0.32	0.41	0.41	0.103	0.108			-0.083
5	0.38	0.38	0.57	0.57	0.043	0.053			-0.057
6	0.34	0.34	0.49	0.49	0.083	0.028			-0.043
7	0.47	0.47	0.69	0.69	0.048	0.173			-0.033
8	0.48	0.48	0.56	0.56	0.058	0.043			-0.028
9									0.013
10									0.043
11									0.048
12									0.048
13									0.053
14									0.058
15									0.108
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164411
Alias:	NAS# 0040G
Replicates:	8
Mean:	0.483
SD:	0.068
Tr Mean:	0.483
Trans SD:	0.068

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.047	Statistic:	Student's t
Residual SD:	0.069	Test Residual SD:	0.046	Balanced Design:	Yes
SS:	0.09	Ref. Residual Mean:	0.07	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.051		
b:	0.293	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9555	Calculated Value:	0.9509	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	0.8735
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.49	0.49	0.46	0.46	0.008	0.057			-0.113
2	0.37	0.37	0.53	0.53	0.113	0.013			-0.108
3	0.51	0.51	0.43	0.43	0.028	0.088			-0.088
4	0.47	0.47	0.41	0.41	0.013	0.108			-0.063
5	0.51	0.51	0.57	0.57	0.028	0.053			-0.057
6	0.6	0.6	0.49	0.49	0.118	0.028			-0.028
7	0.49	0.49	0.69	0.69	0.008	0.173			-0.013
8	0.42	0.42	0.56	0.56	0.063	0.043			0.008
9									0.008
10									0.013
11									0.028
12									0.028
13									0.043
14									0.053
15									0.118
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164415
Alias:	NAS# 0041G
Replicates:	8
Mean:	0.525
SD:	0.049
Tr Mean:	0.525
Trans SD:	0.049

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.063
SS:	0.074
K:	8
b:	0.262
Alpha Level:	0.05
Calculated Value:	0.9244
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.039
Test Residual SD:	0.026
Ref. Residual Mean:	0.07
Ref. Residual SD:	0.051
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.5374
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	-0.2058
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.45	0.45	0.46	0.46	0.075	0.057			-0.108
2	0.57	0.57	0.53	0.53	0.045	0.013			-0.088
3	0.52	0.52	0.43	0.43	0.005	0.088			-0.075
4	0.45	0.45	0.41	0.41	0.075	0.108			-0.075
5	0.56	0.56	0.57	0.57	0.035	0.053			-0.057
6	0.54	0.54	0.49	0.49	0.015	0.028			-0.028
7	0.55	0.55	0.69	0.69	0.025	0.173			-0.005
8	0.56	0.56	0.56	0.56	0.035	0.043			0.013
9									0.015
10									0.025
11									0.035
12									0.035
13									0.043
14									0.045
15									0.053
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164423
Alias:	NAS# 0042G
Replicates:	8
Mean:	0.323
SD:	0.053
Tr Mean:	0.323
Trans SD:	0.053

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.064
SS:	0.078
K:	8
b:	0.271
Alpha Level:	0.05
Calculated Value:	0.9431
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.043
Test Residual SD:	0.028
Ref. Residual Mean:	0.07
Ref. Residual SD:	0.051
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.327
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	5.235
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.37	0.37	0.46	0.46	0.048	0.057			-0.108
2	0.29	0.29	0.53	0.53	0.033	0.013			-0.103
3	0.35	0.35	0.43	0.43	0.028	0.088			-0.088
4	0.38	0.38	0.41	0.41	0.058	0.108			-0.057
5	0.22	0.22	0.57	0.57	0.103	0.053			-0.033
6	0.3	0.3	0.49	0.49	0.023	0.028			-0.028
7	0.36	0.36	0.69	0.69	0.038	0.173			-0.023
8	0.31	0.31	0.56	0.56	0.013	0.043			-0.013
9									0.013
10									0.028
11									0.038
12									0.043
13									0.048
14									0.053
15									0.058
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164424
Alias:	NAS# 0043G
Replicates:	8
Mean:	0.335
SD:	0.052
Tr Mean:	0.335
Trans SD:	0.052

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.063
SS:	0.077
K:	8
b:	0.266
Alpha Level:	0.05
Calculated Value:	0.9232
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.048
Test Residual SD:	0.01
Ref. Residual Mean:	0.07
Ref. Residual SD:	0.051
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.212
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	4.9361
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.38	0.38	0.46	0.46	0.045	0.057			-0.108
2	0.3	0.3	0.53	0.53	0.035	0.013			-0.088
3	0.38	0.38	0.43	0.43	0.045	0.088			-0.065
4	0.38	0.38	0.41	0.41	0.045	0.108			-0.057
5	0.27	0.27	0.57	0.57	0.065	0.053			-0.055
6	0.28	0.28	0.49	0.49	0.055	0.028			-0.035
7	0.39	0.39	0.69	0.69	0.055	0.173			-0.035
8	0.3	0.3	0.56	0.56	0.035	0.043			-0.028
9									0.013
10									0.043
11									0.045
12									0.045
13									0.045
14									0.053
15									0.055
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164427
Alias:	NAS# 0044G
Replicates:	8
Mean:	0.518
SD:	0.086
Tr Mean:	0.518
Trans SD:	0.086

Ref Samp:	x2
Ref ID:	5164478
Alias:	NAS# 9989F
Replicates:	8
Mean:	0.518
SD:	0.091
Tr Mean:	0.518
Trans SD:	0.091

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.06	Statistic:	Student's t
Residual SD:	0.076	Test Residual SD:	0.057	Balanced Design:	Yes
SS:	0.109	Ref. Residual Mean:	0.07	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.051		
b:	0.319	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9296	Calculated Value:	0.3682	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	0
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.53	0.53	0.46	0.46	0.013	0.057			-0.118
2	0.53	0.53	0.53	0.53	0.013	0.013			-0.108
3	0.5	0.5	0.43	0.43	0.018	0.088			-0.088
4	0.68	0.68	0.41	0.41	0.163	0.108			-0.088
5	0.57	0.57	0.57	0.57	0.053	0.053			-0.057
6	0.5	0.5	0.49	0.49	0.018	0.028			-0.028
7	0.4	0.4	0.69	0.69	0.118	0.173			-0.018
8	0.43	0.43	0.56	0.56	0.088	0.043			-0.018
9									0.013
10									0.013
11									0.013
12									0.043
13									0.053
14									0.053
15									0.163
16									0.173

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164472
Alias:	NAS# 9985F
Replicates:	8
Mean:	0.194
SD:	0.038
Tr Mean:	0.194
Trans SD:	0.038

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.035
SS:	0.023
K:	8
b:	0.15
Alpha Level:	0.05
Calculated Value:	0.9557
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.031
Test Residual SD:	0.018
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.02
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.5214
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	9.6462
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.15	0.15	0.45	0.45	0.044	0.059			-0.071
2	0.15	0.15	0.35	0.35	0.044	0.041			-0.044
3	0.21	0.21	0.42	0.42	0.016	0.029			-0.044
4	0.26	0.26	0.42	0.42	0.066	0.029			-0.041
5	0.18	0.18	0.32	0.32	0.014	0.071			-0.024
6	0.21	0.21	0.38	0.38	0.016	0.011			-0.021
7	0.22	0.22	0.37	0.37	0.026	0.021			-0.014
8	0.17	0.17	0.42	0.42	0.024	0.029			-0.011
9									0.016
10									0.016
11									0.026
12									0.029
13									0.029
14									0.029
15									0.059
16									0.066

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164473
Alias:	NAS# 9986F
Replicates:	8
Mean:	0.65
SD:	0.047
Tr Mean:	0.65
Trans SD:	0.047

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.039
SS:	0.029
K:	8
b:	0.167
Alpha Level:	0.05
Calculated Value:	0.9672
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.038
Test Residual SD:	0.025
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.02
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.1108
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	-11.3925
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.65	0.65	0.45	0.45	0	0.059			-0.071
2	0.67	0.67	0.35	0.35	0.02	0.041			-0.05
3	0.6	0.6	0.42	0.42	0.05	0.029			-0.05
4	0.73	0.73	0.42	0.42	0.08	0.029			-0.041
5	0.6	0.6	0.32	0.32	0.05	0.071			-0.03
6	0.62	0.62	0.38	0.38	0.03	0.011			-0.021
7	0.7	0.7	0.37	0.37	0.05	0.021			-0.02
8	0.63	0.63	0.42	0.42	0.02	0.029			-0.011
9									0
10									0.02
11									0.029
12									0.029
13									0.029
14									0.05
15									0.059
16									0.08

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164474
Alias:	NAS# 9987F
Replicates:	8
Mean:	0.335
SD:	0.042
Tr Mean:	0.335
Trans SD:	0.042

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.031	Statistic:	Student's t
Residual SD:	0.037	Test Residual SD:	0.026	Balanced Design:	Yes
SS:	0.026	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.02		
b:	0.154	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9231	Calculated Value:	0.4361	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	2.6264
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.25	0.25	0.45	0.45	0.085	0.059			-0.085
2	0.34	0.34	0.35	0.35	0.005	0.041			-0.071
3	0.3	0.3	0.42	0.42	0.035	0.029			-0.041
4	0.38	0.38	0.42	0.42	0.045	0.029			-0.035
5	0.36	0.36	0.32	0.32	0.025	0.071			-0.021
6	0.36	0.36	0.38	0.38	0.025	0.011			-0.011
7	0.36	0.36	0.37	0.37	0.025	0.021			-0.005
8	0.33	0.33	0.42	0.42	0.005	0.029			0.005
9									0.025
10									0.025
11									0.025
12									0.029
13									0.029
14									0.029
15									0.045
16									0.059

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164475
Alias:	NAS# 9988F
Replicates:	8
Mean:	0.424
SD:	0.066
Tr Mean:	0.424
Trans SD:	0.066

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.051	Statistic:	Student's t
Residual SD:	0.048	Test Residual SD:	0.037	Balanced Design:	Yes
SS:	0.044	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.02		
b:	0.208	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9812	Calculated Value:	1.002	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	-1.1585
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.42	0.42	0.45	0.45	0.004	0.059			-0.114
2	0.47	0.47	0.35	0.35	0.046	0.041			-0.071
3	0.39	0.39	0.42	0.42	0.034	0.029			-0.054
4	0.52	0.52	0.42	0.42	0.096	0.029			-0.041
5	0.47	0.47	0.32	0.32	0.046	0.071			-0.034
6	0.31	0.31	0.38	0.38	0.114	0.011			-0.021
7	0.44	0.44	0.37	0.37	0.016	0.021			-0.011
8	0.37	0.37	0.42	0.42	0.054	0.029			-0.004
9									0.016
10									0.029
11									0.029
12									0.029
13									0.046
14									0.046
15									0.059
16									0.096

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164479
Alias:	NAS# 9991F
Replicates:	8
Mean:	0.228
SD:	0.06
Tr Mean:	0.228
Trans SD:	0.06

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.045
SS:	0.039
K:	8
b:	0.187
Alpha Level:	0.05
Calculated Value:	0.9076
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.051
Test Residual SD:	0.026
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.02
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.2322
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	6.2341
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.28	0.28	0.45	0.45	0.053	0.059			-0.108
2	0.18	0.18	0.35	0.35	0.048	0.041			-0.071
3	0.24	0.24	0.42	0.42	0.013	0.029			-0.048
4	0.27	0.27	0.42	0.42	0.043	0.029			-0.048
5	0.12	0.12	0.32	0.32	0.108	0.071			-0.041
6	0.18	0.18	0.38	0.38	0.048	0.011			-0.021
7	0.27	0.27	0.37	0.37	0.043	0.021			-0.011
8	0.28	0.28	0.42	0.42	0.053	0.029			0.013
9									0.029
10									0.029
11									0.029
12									0.043
13									0.043
14									0.053
15									0.053
16									0.059

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164483
Alias:	NAS# 9992F
Replicates:	8
Mean:	0.345
SD:	0.028
Tr Mean:	0.345
Trans SD:	0.028

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.032
SS:	0.019
K:	8
b:	0.135
Alpha Level:	0.05
Calculated Value:	0.958
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.023
Test Residual SD:	0.015
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.02
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.5646
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	2.5184
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.31	0.31	0.45	0.45	0.035	0.059			-0.071
2	0.34	0.34	0.35	0.35	0.005	0.041			-0.045
3	0.37	0.37	0.42	0.42	0.025	0.029			-0.041
4	0.34	0.34	0.42	0.42	0.005	0.029			-0.035
5	0.36	0.36	0.32	0.32	0.015	0.071			-0.021
6	0.38	0.38	0.38	0.38	0.035	0.011			-0.011
7	0.3	0.3	0.37	0.37	0.045	0.021			-0.005
8	0.36	0.36	0.42	0.42	0.015	0.029			-0.005
9									0.015
10									0.015
11									0.025
12									0.029
13									0.029
14									0.029
15									0.035
16									0.059

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164485
Alias:	NAS# 9993F
Replicates:	8
Mean:	0.411
SD:	0.043
Tr Mean:	0.411
Trans SD:	0.043

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.037
SS:	0.026
K:	8
b:	0.157
Alpha Level:	0.05
Calculated Value:	0.9371
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.037
Test Residual SD:	0.018
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.02
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.0332
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	-0.9251
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.48	0.48	0.45	0.45	0.069	0.059			-0.071
2	0.38	0.38	0.35	0.35	0.031	0.041			-0.041
3	0.46	0.46	0.42	0.42	0.049	0.029			-0.041
4	0.37	0.37	0.42	0.42	0.041	0.029			-0.041
5	0.44	0.44	0.32	0.32	0.029	0.071			-0.031
6	0.39	0.39	0.38	0.38	0.021	0.011			-0.021
7	0.37	0.37	0.37	0.37	0.041	0.021			-0.021
8	0.4	0.4	0.42	0.42	0.011	0.029			-0.011
9									-0.011
10									0.029
11									0.029
12									0.029
13									0.029
14									0.049
15									0.059
16									0.069

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164487
Alias:	NAS# 9995F
Replicates:	7
Mean:	0.333
SD:	0.047
Tr Mean:	0.333
Trans SD:	0.047

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.035	Statistic:	Student's t
Residual SD:	0.037	Test Residual SD:	0.029	Balanced Design:	Yes
SS:	0.027	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	7	Ref. Residual SD:	0.02		
b:	0.161	Deg. of Freedom:	13		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9742	Calculated Value:	0.1236	Alternate:	x1 < x2
Critical Value:	<= 0.881	Critical Value:	>= 1.771		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	13
				Experimental Alpha Level:	0.05
				Calculated Value:	2.4928
Override Option:	N/A			Critical Value:	>= 1.771
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.35	0.35	0.45	0.45	0.017	0.059			-0.071
2	0.33	0.33	0.35	0.35	0.003	0.041			-0.053
3	0.35	0.35	0.42	0.42	0.017	0.029			-0.043
4	0.42	0.42	0.42	0.42	0.087	0.029			-0.041
5	0.28	0.28	0.32	0.32	0.053	0.071			-0.023
6	0.31	0.31	0.38	0.38	0.023	0.011			-0.021
7	0.29	0.29	0.37	0.37	0.043	0.021			-0.011
8			0.42	0.42		0.029			-0.003
9									0.017
10									0.017
11									0.029
12									0.029
13									0.029
14									0.059
15									0.087

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164494
Alias:	NAS# 9996F
Replicates:	8
Mean:	0.45
SD:	0.064
Tr Mean:	0.45
Trans SD:	0.064

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.047
SS:	0.042
K:	8
b:	0.2
Alpha Level:	0.05
Calculated Value:	0.9576
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.053
Test Residual SD:	0.03
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.02
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.273
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	-2.1533
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.53	0.53	0.45	0.45	0.08	0.059			-0.08
2	0.42	0.42	0.35	0.35	0.03	0.041			-0.071
3	0.45	0.45	0.42	0.42	0	0.029			-0.05
4	0.4	0.4	0.42	0.42	0.05	0.029			-0.05
5	0.4	0.4	0.32	0.32	0.05	0.071			-0.041
6	0.49	0.49	0.38	0.38	0.04	0.011			-0.03
7	0.37	0.37	0.37	0.37	0.08	0.021			-0.021
8	0.54	0.54	0.42	0.42	0.09	0.029			-0.011
9									0
10									0.029
11									0.029
12									0.029
13									0.04
14									0.059
15									0.08
16									0.09

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164507
Alias:	NAS# 9997F
Replicates:	8
Mean:	0.411
SD:	0.035
Tr Mean:	0.411
Trans SD:	0.035

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.034
SS:	0.022
K:	8
b:	0.142
Alpha Level:	0.05
Calculated Value:	0.9276
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.029
Test Residual SD:	0.016
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.02
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.8231
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	-1.0142
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.38	0.38	0.45	0.45	0.031	0.059			-0.071
2	0.4	0.4	0.35	0.35	0.011	0.041			-0.061
3	0.44	0.44	0.42	0.42	0.029	0.029			-0.041
4	0.44	0.44	0.42	0.42	0.029	0.029			-0.031
5	0.4	0.4	0.32	0.32	0.011	0.071			-0.021
6	0.45	0.45	0.38	0.38	0.039	0.011			-0.011
7	0.43	0.43	0.37	0.37	0.019	0.021			-0.011
8	0.35	0.35	0.42	0.42	0.061	0.029			-0.011
9									0.019
10									0.029
11									0.029
12									0.029
13									0.029
14									0.029
15									0.039
16									0.059

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164491
Alias:	NAS# 9999F
Replicates:	8
Mean:	0.335
SD:	0.045
Tr Mean:	0.335
Trans SD:	0.045

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.038
SS:	0.027
K:	8
b:	0.16
Alpha Level:	0.05
Calculated Value:	0.9403
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.029
Test Residual SD:	0.032
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.02
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.5567
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	2.5482
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.45	0.45	0.005	0.059			-0.071
2	0.34	0.34	0.35	0.35	0.005	0.041			-0.041
3	0.31	0.31	0.42	0.42	0.025	0.029			-0.035
4	0.31	0.31	0.42	0.42	0.025	0.029			-0.025
5	0.3	0.3	0.32	0.32	0.035	0.071			-0.025
6	0.32	0.32	0.38	0.38	0.015	0.011			-0.021
7	0.32	0.32	0.37	0.37	0.015	0.021			-0.015
8	0.44	0.44	0.42	0.42	0.105	0.029			-0.015
9									-0.011
10									0.005
11									0.005
12									0.029
13									0.029
14									0.029
15									0.059
16									0.105

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164493
Alias:	NAS# 0001G
Replicates:	8
Mean:	0.499
SD:	0.094
Tr Mean:	0.499
Trans SD:	0.094

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.063
SS:	0.075
K:	8
b:	0.266
Alpha Level:	0.05
Calculated Value:	0.9403
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.082
Test Residual SD:	0.036
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.02
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	3.1425
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	10
Experimental Alpha Level:	0.05
Calculated Value:	-2.9301
Critical Value:	>= 1.812
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.4	0.4	0.45	0.45	0.099	0.059			-0.119
2	0.59	0.59	0.35	0.35	0.091	0.041			-0.109
3	0.6	0.6	0.42	0.42	0.101	0.029			-0.099
4	0.39	0.39	0.42	0.42	0.109	0.029			-0.071
5	0.51	0.51	0.32	0.32	0.011	0.071			-0.041
6	0.55	0.55	0.38	0.38	0.051	0.011			-0.021
7	0.38	0.38	0.37	0.37	0.119	0.021			-0.011
8	0.57	0.57	0.42	0.42	0.071	0.029			0.011
9									0.029
10									0.029
11									0.029
12									0.051
13									0.059
14									0.071
15									0.091
16									0.101

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164405
Alias:	NAS# 0032G
Replicates:	8
Mean:	0.343
SD:	0.066
Tr Mean:	0.343
Trans SD:	0.066

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.044	Statistic:	Mann-Whitney
Residual SD:	0.048	Test Residual SD:	0.047	Balanced Design:	Yes
SS:	0.044	Ref. Residual Mean:	0.036	Transformation:	rank-order
K:	8	Ref. Residual SD:	0.02		
b:	0.194	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.8494	Calculated Value:	0.4535	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	47
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.37	8	0.45	16	0.028	0.059	0.19		-0.153
2	0.37	8	0.35	5	0.028	0.041	0.32		-0.071
3	0.33	3.5	0.42	14	0.013	0.029	0.33		-0.041
4	0.19	1	0.42	14	0.153	0.029	0.33		-0.021
5	0.36	6	0.32	2	0.018	0.071	0.35		-0.013
6	0.4	12	0.38	10	0.058	0.011	0.36		-0.013
7	0.39	11	0.37	8	0.048	0.021	0.37		-0.011
8	0.33	3.5	0.42	14	0.013	0.029	0.37		0.018
9							0.37		0.028
10							0.38		0.028
11							0.39		0.029
12							0.4		0.029
13							0.42		0.029
14							0.42		0.048
15							0.42		0.058
16							0.45		0.059

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164406
Alias:	NAS# 0033G
Replicates:	8
Mean:	0.451
SD:	0.046
Tr Mean:	0.451
Trans SD:	0.046

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.039
SS:	0.028
K:	8
b:	0.162
Alpha Level:	0.05
Calculated Value:	0.9364
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.039
Test Residual SD:	0.02
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.02
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.285
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	-2.6749
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.52	0.52	0.45	0.45	0.069	0.059			-0.071
2	0.4	0.4	0.35	0.35	0.051	0.041			-0.051
3	0.42	0.42	0.42	0.42	0.031	0.029			-0.041
4	0.48	0.48	0.42	0.42	0.029	0.029			-0.041
5	0.44	0.44	0.32	0.32	0.011	0.071			-0.031
6	0.51	0.51	0.38	0.38	0.059	0.011			-0.021
7	0.41	0.41	0.37	0.37	0.041	0.021			-0.021
8	0.43	0.43	0.42	0.42	0.021	0.029			-0.011
9									-0.011
10									0.029
11									0.029
12									0.029
13									0.029
14									0.059
15									0.059
16									0.069

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164408
Alias:	NAS# 0034G
Replicates:	8
Mean:	0.299
SD:	0.065
Tr Mean:	0.299
Trans SD:	0.065

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.047
SS:	0.043
K:	8
b:	0.199
Alpha Level:	0.05
Calculated Value:	0.9265
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.048
Test Residual SD:	0.039
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.02
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.791
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	3.3547
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.43	0.43	0.45	0.45	0.131	0.059			-0.071
2	0.27	0.27	0.35	0.35	0.029	0.041			-0.059
3	0.24	0.24	0.42	0.42	0.059	0.029			-0.049
4	0.25	0.25	0.42	0.42	0.049	0.029			-0.041
5	0.27	0.27	0.32	0.32	0.029	0.071			-0.029
6	0.36	0.36	0.38	0.38	0.061	0.011			-0.029
7	0.3	0.3	0.37	0.37	0.001	0.021			-0.029
8	0.27	0.27	0.42	0.42	0.029	0.029			-0.021
9									-0.011
10									0.001
11									0.029
12									0.029
13									0.029
14									0.059
15									0.061
16									0.131

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164412
Alias:	NAS# 0035G
Replicates:	8
Mean:	0.348
SD:	0.059
Tr Mean:	0.348
Trans SD:	0.059

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.045
SS:	0.038
K:	8
b:	0.192
Alpha Level:	0.05
Calculated Value:	0.981
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.043
Test Residual SD:	0.038
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.02
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.4154
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	1.6876
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.3	0.3	0.45	0.45	0.048	0.059			-0.098
2	0.43	0.43	0.35	0.35	0.083	0.041			-0.071
3	0.35	0.35	0.42	0.42	0.003	0.029			-0.048
4	0.33	0.33	0.42	0.42	0.018	0.029			-0.041
5	0.36	0.36	0.32	0.32	0.013	0.071			-0.021
6	0.42	0.42	0.38	0.38	0.073	0.011			-0.018
7	0.25	0.25	0.37	0.37	0.098	0.021			-0.011
8	0.34	0.34	0.42	0.42	0.007	0.029			-0.007
9									0.003
10									0.013
11									0.029
12									0.029
13									0.029
14									0.059
15									0.073
16									0.083

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164413
Alias:	NAS# 0036G
Replicates:	8
Mean:	0.403
SD:	0.075
Tr Mean:	0.403
Trans SD:	0.075

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.06	Statistic:	Student's t
Residual SD:	0.053	Test Residual SD:	0.038	Balanced Design:	Yes
SS:	0.052	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.02		
b:	0.225	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9694	Calculated Value:	1.5513	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	-0.3676
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.37	0.37	0.45	0.45	0.033	0.059			-0.123
2	0.41	0.41	0.35	0.35	0.007	0.041			-0.071
3	0.49	0.49	0.42	0.42	0.088	0.029			-0.063
4	0.46	0.46	0.42	0.42	0.058	0.029			-0.041
5	0.49	0.49	0.32	0.32	0.088	0.071			-0.033
6	0.28	0.28	0.38	0.38	0.123	0.011			-0.023
7	0.38	0.38	0.37	0.37	0.023	0.021			-0.021
8	0.34	0.34	0.42	0.42	0.063	0.029			-0.011
9									0.007
10									0.029
11									0.029
12									0.029
13									0.058
14									0.059
15									0.088
16									0.088

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164407
Alias:	NAS# 0037G
Replicates:	8
Mean:	0.371
SD:	0.049
Tr Mean:	0.371
Trans SD:	0.049

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.04
SS:	0.03
K:	8
b:	0.17
Alpha Level:	0.05
Calculated Value:	0.9566
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.039
Test Residual SD:	0.026
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.02
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.2139
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	0.8616
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.44	0.44	0.45	0.45	0.069	0.059			-0.081
2	0.4	0.4	0.35	0.35	0.029	0.041			-0.071
3	0.33	0.33	0.42	0.42	0.041	0.029			-0.041
4	0.35	0.35	0.42	0.42	0.021	0.029			-0.041
5	0.42	0.42	0.32	0.32	0.049	0.071			-0.021
6	0.38	0.38	0.38	0.38	0.009	0.011			-0.021
7	0.29	0.29	0.37	0.37	0.081	0.021			-0.011
8	0.36	0.36	0.42	0.42	0.011	0.029			-0.011
9									0.009
10									0.029
11									0.029
12									0.029
13									0.029
14									0.049
15									0.059
16									0.069

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164409
Alias:	NAS# 0038G
Replicates:	8
Mean:	0.486
SD:	0.07
Tr Mean:	0.486
Trans SD:	0.07

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.05
SS:	0.048
K:	8
b:	0.21
Alpha Level:	0.05
Calculated Value:	0.9291
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.059
Test Residual SD:	0.031
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.02
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.723
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	-3.2559
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.46	0.46	0.45	0.45	0.026	0.059			-0.116
2	0.47	0.47	0.35	0.35	0.016	0.041			-0.076
3	0.41	0.41	0.42	0.42	0.076	0.029			-0.071
4	0.56	0.56	0.42	0.42	0.074	0.029			-0.041
5	0.54	0.54	0.32	0.32	0.054	0.071			-0.026
6	0.37	0.37	0.38	0.38	0.116	0.011			-0.021
7	0.54	0.54	0.37	0.37	0.054	0.021			-0.016
8	0.54	0.54	0.42	0.42	0.054	0.029			-0.011
9									0.029
10									0.029
11									0.029
12									0.054
13									0.054
14									0.054
15									0.059
16									0.074

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164410
Alias:	NAS# 0039G
Replicates:	8
Mean:	0.423
SD:	0.075
Tr Mean:	0.423
Trans SD:	0.075

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.053
SS:	0.053
K:	8
b:	0.225
Alpha Level:	0.05
Calculated Value:	0.9607
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.065
Test Residual SD:	0.029
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.02
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.3302
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	11
Experimental Alpha Level:	0.05
Calculated Value:	-1.0174
Critical Value:	>= 1.796
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.39	0.39	0.45	0.45	0.033	0.059			-0.103
2	0.53	0.53	0.35	0.35	0.108	0.041			-0.083
3	0.47	0.47	0.42	0.42	0.048	0.029			-0.071
4	0.32	0.32	0.42	0.42	0.103	0.029			-0.043
5	0.38	0.38	0.32	0.32	0.043	0.071			-0.041
6	0.34	0.34	0.38	0.38	0.083	0.011			-0.033
7	0.47	0.47	0.37	0.37	0.048	0.021			-0.021
8	0.48	0.48	0.42	0.42	0.058	0.029			-0.011
9									0.029
10									0.029
11									0.029
12									0.048
13									0.048
14									0.058
15									0.059
16									0.108

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164411
Alias:	NAS# 0040G
Replicates:	8
Mean:	0.483
SD:	0.068
Tr Mean:	0.483
Trans SD:	0.068

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.047	Statistic:	Student's t
Residual SD:	0.049	Test Residual SD:	0.046	Balanced Design:	Yes
SS:	0.045	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.02		
b:	0.209	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9631	Calculated Value:	0.6037	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	-3.2035
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.49	0.49	0.45	0.45	0.008	0.059			-0.113
2	0.37	0.37	0.35	0.35	0.113	0.041			-0.071
3	0.51	0.51	0.42	0.42	0.028	0.029			-0.063
4	0.47	0.47	0.42	0.42	0.013	0.029			-0.041
5	0.51	0.51	0.32	0.32	0.028	0.071			-0.021
6	0.6	0.6	0.38	0.38	0.118	0.011			-0.013
7	0.49	0.49	0.37	0.37	0.008	0.021			-0.011
8	0.42	0.42	0.42	0.42	0.063	0.029			0.008
9									0.008
10									0.028
11									0.028
12									0.029
13									0.029
14									0.029
15									0.059
16									0.118

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164415
Alias:	NAS# 0041G
Replicates:	8
Mean:	0.525
SD:	0.049
Tr Mean:	0.525
Trans SD:	0.049

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.04
SS:	0.03
K:	8
b:	0.162
Alpha Level:	0.05
Calculated Value:	0.8795
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.039
Test Residual SD:	0.026
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.02
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.218
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	1
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.45	9	0.45	9	0.075	0.059	0.32		-0.075
2	0.57	16	0.35	2	0.045	0.041	0.35		-0.075
3	0.52	11	0.42	6	0.005	0.029	0.37		-0.071
4	0.45	9	0.42	6	0.075	0.029	0.38		-0.041
5	0.56	14.5	0.32	1	0.035	0.071	0.42		-0.021
6	0.54	12	0.38	4	0.015	0.011	0.42		-0.011
7	0.55	13	0.37	3	0.025	0.021	0.42		-0.005
8	0.56	14.5	0.42	6	0.035	0.029	0.45		0.015
9							0.45		0.025
10							0.45		0.029
11							0.52		0.029
12							0.54		0.029
13							0.55		0.035
14							0.56		0.035
15							0.56		0.045
16							0.57		0.059

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164423
Alias:	NAS# 0042G
Replicates:	8
Mean:	0.323
SD:	0.053
Tr Mean:	0.323
Trans SD:	0.053

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.043	Statistic:	Student's t
Residual SD:	0.042	Test Residual SD:	0.028	Balanced Design:	Yes
SS:	0.033	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.02		
b:	0.175	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9265	Calculated Value:	0.5142	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	2.822
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.37	0.37	0.45	0.45	0.048	0.059			-0.103
2	0.29	0.29	0.35	0.35	0.033	0.041			-0.071
3	0.35	0.35	0.42	0.42	0.028	0.029			-0.041
4	0.38	0.38	0.42	0.42	0.058	0.029			-0.033
5	0.22	0.22	0.32	0.32	0.103	0.071			-0.023
6	0.3	0.3	0.38	0.38	0.023	0.011			-0.021
7	0.36	0.36	0.37	0.37	0.038	0.021			-0.013
8	0.31	0.31	0.42	0.42	0.013	0.029			-0.011
9									0.028
10									0.029
11									0.029
12									0.029
13									0.038
14									0.048
15									0.058
16									0.059

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164424
Alias:	NAS# 0043G
Replicates:	8
Mean:	0.335
SD:	0.052
Tr Mean:	0.335
Trans SD:	0.052

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.041
SS:	0.032
K:	8
b:	0.169
Alpha Level:	0.05
Calculated Value:	0.8888
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.048
Test Residual SD:	0.01
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.02
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.418
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	2.3499
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.38	0.38	0.45	0.45	0.045	0.059			-0.071
2	0.3	0.3	0.35	0.35	0.035	0.041			-0.065
3	0.38	0.38	0.42	0.42	0.045	0.029			-0.055
4	0.38	0.38	0.42	0.42	0.045	0.029			-0.041
5	0.27	0.27	0.32	0.32	0.065	0.071			-0.035
6	0.28	0.28	0.38	0.38	0.055	0.011			-0.035
7	0.39	0.39	0.37	0.37	0.055	0.021			-0.021
8	0.3	0.3	0.42	0.42	0.035	0.029			-0.011
9									0.029
10									0.029
11									0.029
12									0.045
13									0.045
14									0.045
15									0.055
16									0.059

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164427
Alias:	NAS# 0044G
Replicates:	8
Mean:	0.518
SD:	0.086
Tr Mean:	0.518
Trans SD:	0.086

Ref Samp:	x2
Ref ID:	5164476
Alias:	NAS# 9990F
Replicates:	8
Mean:	0.391
SD:	0.044
Tr Mean:	0.391
Trans SD:	0.044

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.058
SS:	0.065
K:	8
b:	0.249
Alpha Level:	0.05
Calculated Value:	0.953
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.06
Test Residual SD:	0.057
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.02
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.1124
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	-3.7103
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.53	0.53	0.45	0.45	0.013	0.059			-0.118
2	0.53	0.53	0.35	0.35	0.013	0.041			-0.088
3	0.5	0.5	0.42	0.42	0.018	0.029			-0.071
4	0.68	0.68	0.42	0.42	0.163	0.029			-0.041
5	0.57	0.57	0.32	0.32	0.053	0.071			-0.021
6	0.5	0.5	0.38	0.38	0.018	0.011			-0.018
7	0.4	0.4	0.37	0.37	0.118	0.021			-0.018
8	0.43	0.43	0.42	0.42	0.088	0.029			-0.011
9									0.013
10									0.013
11									0.029
12									0.029
13									0.029
14									0.053
15									0.059
16									0.163

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164472
Alias:	NAS# 9985F
Replicates:	8
Mean:	0.194
SD:	0.038
Tr Mean:	0.194
Trans SD:	0.038

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.032
SS:	0.019
K:	8
b:	0.133
Alpha Level:	0.05
Calculated Value:	0.9315
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.031
Test Residual SD:	0.018
Ref. Residual Mean:	0.028
Ref. Residual SD:	0.019
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.3647
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	18.6065
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.15	0.15	0.52	0.52	0.044	0.016			-0.046
2	0.15	0.15	0.55	0.55	0.044	0.014			-0.044
3	0.21	0.21	0.49	0.49	0.016	0.046			-0.044
4	0.26	0.26	0.6	0.6	0.066	0.064			-0.026
5	0.18	0.18	0.52	0.52	0.014	0.016			-0.024
6	0.21	0.21	0.53	0.53	0.016	0.006			-0.016
7	0.22	0.22	0.51	0.51	0.026	0.026			-0.016
8	0.17	0.17	0.57	0.57	0.024	0.034			-0.014
9									-0.006
10									0.014
11									0.016
12									0.016
13									0.026
14									0.034
15									0.064
16									0.066

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164473
Alias:	NAS# 9986F
Replicates:	8
Mean:	0.65
SD:	0.047
Tr Mean:	0.65
Trans SD:	0.047

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.036
SS:	0.024
K:	8
b:	0.151
Alpha Level:	0.05
Calculated Value:	0.9352
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.038
Test Residual SD:	0.025
Ref. Residual Mean:	0.028
Ref. Residual SD:	0.019
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.8696
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	-5.4508
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.65	0.65	0.52	0.52	0	0.016			-0.05
2	0.67	0.67	0.55	0.55	0.02	0.014			-0.05
3	0.6	0.6	0.49	0.49	0.05	0.046			-0.046
4	0.73	0.73	0.6	0.6	0.08	0.064			-0.03
5	0.6	0.6	0.52	0.52	0.05	0.016			-0.026
6	0.62	0.62	0.53	0.53	0.03	0.006			-0.02
7	0.7	0.7	0.51	0.51	0.05	0.026			-0.016
8	0.63	0.63	0.57	0.57	0.02	0.034			-0.016
9									-0.006
10									0
11									0.014
12									0.02
13									0.034
14									0.05
15									0.064
16									0.08

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164474
Alias:	NAS# 9987F
Replicates:	8
Mean:	0.335
SD:	0.042
Tr Mean:	0.335
Trans SD:	0.042

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.033
SS:	0.021
K:	8
b:	0.144
Alpha Level:	0.05
Calculated Value:	0.9786
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.031
Test Residual SD:	0.026
Ref. Residual Mean:	0.028
Ref. Residual SD:	0.019
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.3034
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	10.3464
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.25	0.25	0.52	0.52	0.085	0.016			-0.085
2	0.34	0.34	0.55	0.55	0.005	0.014			-0.046
3	0.3	0.3	0.49	0.49	0.035	0.046			-0.035
4	0.38	0.38	0.6	0.6	0.045	0.064			-0.026
5	0.36	0.36	0.52	0.52	0.025	0.016			-0.016
6	0.36	0.36	0.53	0.53	0.025	0.006			-0.016
7	0.36	0.36	0.51	0.51	0.025	0.026			-0.006
8	0.33	0.33	0.57	0.57	0.005	0.034			-0.005
9									0.005
10									0.014
11									0.025
12									0.025
13									0.025
14									0.034
15									0.045
16									0.064

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164475
Alias:	NAS# 9988F
Replicates:	8
Mean:	0.424
SD:	0.066
Tr Mean:	0.424
Trans SD:	0.066

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.046
SS:	0.04
K:	8
b:	0.197
Alpha Level:	0.05
Calculated Value:	0.985
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.051
Test Residual SD:	0.037
Ref. Residual Mean:	0.028
Ref. Residual SD:	0.019
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.5767
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	4.2319
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.42	0.42	0.52	0.52	0.004	0.016			-0.114
2	0.47	0.47	0.55	0.55	0.046	0.014			-0.054
3	0.39	0.39	0.49	0.49	0.034	0.046			-0.046
4	0.52	0.52	0.6	0.6	0.096	0.064			-0.034
5	0.47	0.47	0.52	0.52	0.046	0.016			-0.026
6	0.31	0.31	0.53	0.53	0.114	0.006			-0.016
7	0.44	0.44	0.51	0.51	0.016	0.026			-0.016
8	0.37	0.37	0.57	0.57	0.054	0.034			-0.006
9									-0.004
10									0.014
11									0.016
12									0.034
13									0.046
14									0.046
15									0.064
16									0.096

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164479
Alias:	NAS# 9991F
Replicates:	8
Mean:	0.228
SD:	0.06
Tr Mean:	0.228
Trans SD:	0.06

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.051	Statistic:	Approximate t
Residual SD:	0.042	Test Residual SD:	0.026	Balanced Design:	Yes
SS:	0.034	Ref. Residual Mean:	0.028	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.019		
b:	0.179	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9388	Calculated Value:	1.9783	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	11
				Experimental Alpha Level:	0.05
				Calculated Value:	12.505
Override Option:	N/A			Critical Value:	>= 1.796
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.28	0.28	0.52	0.52	0.053	0.016			-0.108
2	0.18	0.18	0.55	0.55	0.048	0.014			-0.048
3	0.24	0.24	0.49	0.49	0.013	0.046			-0.048
4	0.27	0.27	0.6	0.6	0.043	0.064			-0.046
5	0.12	0.12	0.52	0.52	0.108	0.016			-0.026
6	0.18	0.18	0.53	0.53	0.048	0.006			-0.016
7	0.27	0.27	0.51	0.51	0.043	0.026			-0.016
8	0.28	0.28	0.57	0.57	0.053	0.034			-0.006
9									0.013
10									0.014
11									0.034
12									0.043
13									0.043
14									0.053
15									0.053
16									0.064

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164483
Alias:	NAS# 9992F
Replicates:	8
Mean:	0.345
SD:	0.028
Tr Mean:	0.345
Trans SD:	0.028

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.023	Statistic:	Student's t
Residual SD:	0.028	Test Residual SD:	0.015	Balanced Design:	Yes
SS:	0.014	Ref. Residual Mean:	0.028	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.019		
b:	0.118	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9687	Calculated Value:	0.6172	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	11.9317
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.31	0.31	0.52	0.52	0.035	0.016			-0.046
2	0.34	0.34	0.55	0.55	0.005	0.014			-0.045
3	0.37	0.37	0.49	0.49	0.025	0.046			-0.035
4	0.34	0.34	0.6	0.6	0.005	0.064			-0.026
5	0.36	0.36	0.52	0.52	0.015	0.016			-0.016
6	0.38	0.38	0.53	0.53	0.035	0.006			-0.016
7	0.3	0.3	0.51	0.51	0.045	0.026			-0.006
8	0.36	0.36	0.57	0.57	0.015	0.034			-0.005
9									-0.005
10									0.014
11									0.015
12									0.015
13									0.025
14									0.034
15									0.035
16									0.064

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164485
Alias:	NAS# 9993F
Replicates:	8
Mean:	0.411
SD:	0.043
Tr Mean:	0.411
Trans SD:	0.043

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.034
SS:	0.022
K:	8
b:	0.14
Alpha Level:	0.05
Calculated Value:	0.9062
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.037
Test Residual SD:	0.018
Ref. Residual Mean:	0.028
Ref. Residual SD:	0.019
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.9459
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	6.3537
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.48	0.48	0.52	0.52	0.069	0.016			-0.046
2	0.38	0.38	0.55	0.55	0.031	0.014			-0.041
3	0.46	0.46	0.49	0.49	0.049	0.046			-0.041
4	0.37	0.37	0.6	0.6	0.041	0.064			-0.031
5	0.44	0.44	0.52	0.52	0.029	0.016			-0.026
6	0.39	0.39	0.53	0.53	0.021	0.006			-0.021
7	0.37	0.37	0.51	0.51	0.041	0.026			-0.016
8	0.4	0.4	0.57	0.57	0.011	0.034			-0.016
9									-0.011
10									-0.006
11									0.014
12									0.029
13									0.034
14									0.049
15									0.064
16									0.069

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164487
Alias:	NAS# 9995F
Replicates:	7
Mean:	0.333
SD:	0.047
Tr Mean:	0.333
Trans SD:	0.047

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.034
SS:	0.022
K:	7
b:	0.144
Alpha Level:	0.05
Calculated Value:	0.9417
Critical Value:	<= 0.881
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.035
Test Residual SD:	0.029
Ref. Residual Mean:	0.028
Ref. Residual SD:	0.019
Deg. of Freedom:	13
Alpha Level:	0.1
Calculated Value:	0.553
Critical Value:	>= 1.771
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	13
Experimental Alpha Level:	0.05
Calculated Value:	9.5249
Critical Value:	>= 1.771
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.35	0.35	0.52	0.52	0.017	0.016			-0.053
2	0.33	0.33	0.55	0.55	0.003	0.014			-0.046
3	0.35	0.35	0.49	0.49	0.017	0.046			-0.043
4	0.42	0.42	0.6	0.6	0.087	0.064			-0.026
5	0.28	0.28	0.52	0.52	0.053	0.016			-0.023
6	0.31	0.31	0.53	0.53	0.023	0.006			-0.016
7	0.29	0.29	0.51	0.51	0.043	0.026			-0.016
8			0.57	0.57		0.034			-0.006
9									-0.003
10									0.014
11									0.017
12									0.017
13									0.034
14									0.064
15									0.087

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164494
Alias:	NAS# 9996F
Replicates:	8
Mean:	0.45
SD:	0.064
Tr Mean:	0.45
Trans SD:	0.064

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.044
SS:	0.037
K:	8
b:	0.189
Alpha Level:	0.05
Calculated Value:	0.9558
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.053
Test Residual SD:	0.03
Ref. Residual Mean:	0.028
Ref. Residual SD:	0.019
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.9529
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	11
Experimental Alpha Level:	0.05
Calculated Value:	3.347
Critical Value:	>= 1.796
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.53	0.53	0.52	0.52	0.08	0.016			-0.08
2	0.42	0.42	0.55	0.55	0.03	0.014			-0.05
3	0.45	0.45	0.49	0.49	0	0.046			-0.05
4	0.4	0.4	0.6	0.6	0.05	0.064			-0.046
5	0.4	0.4	0.52	0.52	0.05	0.016			-0.03
6	0.49	0.49	0.53	0.53	0.04	0.006			-0.026
7	0.37	0.37	0.51	0.51	0.08	0.026			-0.016
8	0.54	0.54	0.57	0.57	0.09	0.034			-0.016
9									-0.006
10									0
11									0.014
12									0.034
13									0.04
14									0.064
15									0.08
16									0.09

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164507
Alias:	NAS# 9997F
Replicates:	8
Mean:	0.411
SD:	0.035
Tr Mean:	0.411
Trans SD:	0.035

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.03
SS:	0.017
K:	8
b:	0.13
Alpha Level:	0.05
Calculated Value:	0.9757
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.029
Test Residual SD:	0.016
Ref. Residual Mean:	0.028
Ref. Residual SD:	0.019
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.1049
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	7.117
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.38	0.38	0.52	0.52	0.031	0.016			-0.061
2	0.4	0.4	0.55	0.55	0.011	0.014			-0.046
3	0.44	0.44	0.49	0.49	0.029	0.046			-0.031
4	0.44	0.44	0.6	0.6	0.029	0.064			-0.026
5	0.4	0.4	0.52	0.52	0.011	0.016			-0.016
6	0.45	0.45	0.53	0.53	0.039	0.006			-0.016
7	0.43	0.43	0.51	0.51	0.019	0.026			-0.011
8	0.35	0.35	0.57	0.57	0.061	0.034			-0.011
9									-0.006
10									0.014
11									0.019
12									0.029
13									0.029
14									0.034
15									0.039
16									0.064

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164491
Alias:	NAS# 9999F
Replicates:	8
Mean:	0.335
SD:	0.045
Tr Mean:	0.335
Trans SD:	0.045

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.035
SS:	0.023
K:	8
b:	0.139
Alpha Level:	0.05
Calculated Value:	0.8439
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.029
Test Residual SD:	0.032
Ref. Residual Mean:	0.028
Ref. Residual SD:	0.019
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.0702
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	64
Critical Value:	>= 49.0
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	6.5	0.52	11.5	0.005	0.016	0.3		-0.046
2	0.34	6.5	0.55	14	0.005	0.014	0.31		-0.035
3	0.31	2.5	0.49	9	0.025	0.046	0.31		-0.026
4	0.31	2.5	0.6	16	0.025	0.064	0.32		-0.025
5	0.3	1	0.52	11.5	0.035	0.016	0.32		-0.025
6	0.32	4.5	0.53	13	0.015	0.006	0.34		-0.016
7	0.32	4.5	0.51	10	0.015	0.026	0.34		-0.016
8	0.44	8	0.57	15	0.105	0.034	0.44		-0.015
9							0.49		-0.015
10							0.51		-0.006
11							0.52		0.005
12							0.52		0.005
13							0.53		0.014
14							0.55		0.034
15							0.57		0.064
16							0.6		0.105

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164493
Alias:	NAS# 0001G
Replicates:	8
Mean:	0.499
SD:	0.094
Tr Mean:	0.499
Trans SD:	0.094

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.061
SS:	0.071
K:	8
b:	0.26
Alpha Level:	0.05
Calculated Value:	0.9507
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.082
Test Residual SD:	0.036
Ref. Residual Mean:	0.028
Ref. Residual SD:	0.019
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	3.7562
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	9
Experimental Alpha Level:	0.05
Calculated Value:	1.0541
Critical Value:	>= 1.833
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.4	0.4	0.52	0.52	0.099	0.016			-0.119
2	0.59	0.59	0.55	0.55	0.091	0.014			-0.109
3	0.6	0.6	0.49	0.49	0.101	0.046			-0.099
4	0.39	0.39	0.6	0.6	0.109	0.064			-0.046
5	0.51	0.51	0.52	0.52	0.011	0.016			-0.026
6	0.55	0.55	0.53	0.53	0.051	0.006			-0.016
7	0.38	0.38	0.51	0.51	0.119	0.026			-0.016
8	0.57	0.57	0.57	0.57	0.071	0.034			-0.006
9									0.011
10									0.014
11									0.034
12									0.051
13									0.064
14									0.071
15									0.091
16									0.101

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164405
Alias:	NAS# 0032G
Replicates:	8
Mean:	0.343
SD:	0.066
Tr Mean:	0.343
Trans SD:	0.066

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.046
SS:	0.04
K:	8
b:	0.184
Alpha Level:	0.05
Calculated Value:	0.8546
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.044
Test Residual SD:	0.047
Ref. Residual Mean:	0.028
Ref. Residual SD:	0.019
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.9291
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	64
Critical Value:	>= 49.0
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.37	5.5	0.52	11.5	0.028	0.016	0.19		-0.153
2	0.37	5.5	0.55	14	0.028	0.014	0.33		-0.046
3	0.33	2.5	0.49	9	0.013	0.046	0.33		-0.026
4	0.19	1	0.6	16	0.153	0.064	0.36		-0.016
5	0.36	4	0.52	11.5	0.018	0.016	0.37		-0.016
6	0.4	8	0.53	13	0.058	0.006	0.37		-0.013
7	0.39	7	0.51	10	0.048	0.026	0.39		-0.013
8	0.33	2.5	0.57	15	0.013	0.034	0.4		-0.006
9							0.49		0.014
10							0.51		0.018
11							0.52		0.028
12							0.52		0.028
13							0.53		0.034
14							0.55		0.048
15							0.57		0.058
16							0.6		0.064

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164406
Alias:	NAS# 0033G
Replicates:	8
Mean:	0.451
SD:	0.046
Tr Mean:	0.451
Trans SD:	0.046

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.035
SS:	0.024
K:	8
b:	0.147
Alpha Level:	0.05
Calculated Value:	0.9108
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.039
Test Residual SD:	0.02
Ref. Residual Mean:	0.028
Ref. Residual SD:	0.019
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.1586
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	4.134
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.52	0.52	0.52	0.52	0.069	0.016			-0.051
2	0.4	0.4	0.55	0.55	0.051	0.014			-0.046
3	0.42	0.42	0.49	0.49	0.031	0.046			-0.041
4	0.48	0.48	0.6	0.6	0.029	0.064			-0.031
5	0.44	0.44	0.52	0.52	0.011	0.016			-0.026
6	0.51	0.51	0.53	0.53	0.059	0.006			-0.021
7	0.41	0.41	0.51	0.51	0.041	0.026			-0.016
8	0.43	0.43	0.57	0.57	0.021	0.034			-0.016
9									-0.011
10									-0.006
11									0.014
12									0.029
13									0.034
14									0.059
15									0.064
16									0.069

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164408
Alias:	NAS# 0034G
Replicates:	8
Mean:	0.299
SD:	0.065
Tr Mean:	0.299
Trans SD:	0.065

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.045
SS:	0.038
K:	8
b:	0.183
Alpha Level:	0.05
Calculated Value:	0.8762
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.048
Test Residual SD:	0.039
Ref. Residual Mean:	0.028
Ref. Residual SD:	0.019
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.3476
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	64
Critical Value:	>= 49.0
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.43	8	0.52	11.5	0.131	0.016	0.24		-0.059
2	0.27	4	0.55	14	0.029	0.014	0.25		-0.049
3	0.24	1	0.49	9	0.059	0.046	0.27		-0.046
4	0.25	2	0.6	16	0.049	0.064	0.27		-0.029
5	0.27	4	0.52	11.5	0.029	0.016	0.27		-0.029
6	0.36	7	0.53	13	0.061	0.006	0.3		-0.029
7	0.3	6	0.51	10	0.001	0.026	0.36		-0.026
8	0.27	4	0.57	15	0.029	0.034	0.43		-0.016
9							0.49		-0.016
10							0.51		-0.006
11							0.52		0.001
12							0.52		0.014
13							0.53		0.034
14							0.55		0.061
15							0.57		0.064
16							0.6		0.131

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164412
Alias:	NAS# 0035G
Replicates:	8
Mean:	0.348
SD:	0.059
Tr Mean:	0.348
Trans SD:	0.059

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.042
SS:	0.033
K:	8
b:	0.178
Alpha Level:	0.05
Calculated Value:	0.9604
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.043
Test Residual SD:	0.038
Ref. Residual Mean:	0.028
Ref. Residual SD:	0.019
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.9831
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	7.7593
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.3	0.3	0.52	0.52	0.048	0.016			-0.098
2	0.43	0.43	0.55	0.55	0.083	0.014			-0.048
3	0.35	0.35	0.49	0.49	0.003	0.046			-0.046
4	0.33	0.33	0.6	0.6	0.018	0.064			-0.026
5	0.36	0.36	0.52	0.52	0.013	0.016			-0.018
6	0.42	0.42	0.53	0.53	0.073	0.006			-0.016
7	0.25	0.25	0.51	0.51	0.098	0.026			-0.016
8	0.34	0.34	0.57	0.57	0.007	0.034			-0.007
9									-0.006
10									0.003
11									0.013
12									0.014
13									0.034
14									0.064
15									0.073
16									0.083

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164413
Alias:	NAS# 0036G
Replicates:	8
Mean:	0.403
SD:	0.075
Tr Mean:	0.403
Trans SD:	0.075

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.06	Statistic:	Approximate t
Residual SD:	0.05	Test Residual SD:	0.038	Balanced Design:	Yes
SS:	0.048	Ref. Residual Mean:	0.028	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.019		
b:	0.215	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.961	Calculated Value:	2.1167	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	10
				Experimental Alpha Level:	0.05
				Calculated Value:	4.5714
Override Option:	N/A			Critical Value:	>= 1.812
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.37	0.37	0.52	0.52	0.033	0.016			-0.123
2	0.41	0.41	0.55	0.55	0.007	0.014			-0.063
3	0.49	0.49	0.49	0.49	0.088	0.046			-0.046
4	0.46	0.46	0.6	0.6	0.058	0.064			-0.033
5	0.49	0.49	0.52	0.52	0.088	0.016			-0.026
6	0.28	0.28	0.53	0.53	0.123	0.006			-0.023
7	0.38	0.38	0.51	0.51	0.023	0.026			-0.016
8	0.34	0.34	0.57	0.57	0.063	0.034			-0.016
9									-0.006
10									0.007
11									0.014
12									0.034
13									0.058
14									0.064
15									0.088
16									0.088

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164407
Alias:	NAS# 0037G
Replicates:	8
Mean:	0.371
SD:	0.049
Tr Mean:	0.371
Trans SD:	0.049

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.037
SS:	0.026
K:	8
b:	0.158
Alpha Level:	0.05
Calculated Value:	0.9746
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.039
Test Residual SD:	0.026
Ref. Residual Mean:	0.028
Ref. Residual SD:	0.019
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.9467
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	7.7059
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.44	0.44	0.52	0.52	0.069	0.016			-0.081
2	0.4	0.4	0.55	0.55	0.029	0.014			-0.046
3	0.33	0.33	0.49	0.49	0.041	0.046			-0.041
4	0.35	0.35	0.6	0.6	0.021	0.064			-0.026
5	0.42	0.42	0.52	0.52	0.049	0.016			-0.021
6	0.38	0.38	0.53	0.53	0.009	0.006			-0.016
7	0.29	0.29	0.51	0.51	0.081	0.026			-0.016
8	0.36	0.36	0.57	0.57	0.011	0.034			-0.011
9									-0.006
10									0.009
11									0.014
12									0.029
13									0.034
14									0.049
15									0.064
16									0.069

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164409
Alias:	NAS# 0038G
Replicates:	8
Mean:	0.486
SD:	0.07
Tr Mean:	0.486
Trans SD:	0.07

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.048
SS:	0.043
K:	8
b:	0.201
Alpha Level:	0.05
Calculated Value:	0.9397
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.059
Test Residual SD:	0.031
Ref. Residual Mean:	0.028
Ref. Residual SD:	0.019
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.3912
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	10
Experimental Alpha Level:	0.05
Calculated Value:	1.8007
Criticel Value:	>= 1.812
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.46	0.46	0.52	0.52	0.026	0.016			-0.116
2	0.47	0.47	0.55	0.55	0.016	0.014			-0.076
3	0.41	0.41	0.49	0.49	0.076	0.046			-0.046
4	0.56	0.56	0.6	0.6	0.074	0.064			-0.026
5	0.54	0.54	0.52	0.52	0.054	0.016			-0.026
6	0.37	0.37	0.53	0.53	0.116	0.006			-0.016
7	0.54	0.54	0.51	0.51	0.054	0.026			-0.016
8	0.54	0.54	0.57	0.57	0.054	0.034			-0.016
9									-0.006
10									0.014
11									0.034
12									0.054
13									0.054
14									0.054
15									0.064
16									0.074

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164410
Alias:	NAS# 0039G
Replicates:	8
Mean:	0.423
SD:	0.075
Tr Mean:	0.423
Trans SD:	0.075

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.05
SS:	0.048
K:	8
b:	0.217
Alpha Level:	0.05
Calculated Value:	0.9785
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.065
Test Residual SD:	0.029
Ref. Residual Mean:	0.028
Ref. Residual SD:	0.019
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	3.0456
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	10
Experimental Alpha Level:	0.05
Calculated Value:	3.8717
Critical Value:	>= 1.812
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.39	0.39	0.52	0.52	0.033	0.016			-0.103
2	0.53	0.53	0.55	0.55	0.108	0.014			-0.083
3	0.47	0.47	0.49	0.49	0.048	0.046			-0.046
4	0.32	0.32	0.6	0.6	0.103	0.064			-0.043
5	0.38	0.38	0.52	0.52	0.043	0.016			-0.033
6	0.34	0.34	0.53	0.53	0.083	0.006			-0.026
7	0.47	0.47	0.51	0.51	0.048	0.026			-0.016
8	0.48	0.48	0.57	0.57	0.058	0.034			-0.016
9									-0.006
10									0.014
11									0.034
12									0.048
13									0.048
14									0.058
15									0.064
16									0.108

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164411
Alias:	NAS# 0040G
Replicates:	8
Mean:	0.483
SD:	0.068
Tr Mean:	0.483
Trans SD:	0.068

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.046
SS:	0.041
K:	8
b:	0.199
Alpha Level:	0.05
Calculated Value:	0.9694
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.047
Test Residual SD:	0.046
Ref. Residual Mean:	0.028
Ref. Residual SD:	0.019
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.0886
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	1.988
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.49	0.49	0.52	0.52	0.008	0.016			-0.113
2	0.37	0.37	0.55	0.55	0.113	0.014			-0.063
3	0.51	0.51	0.49	0.49	0.028	0.046			-0.046
4	0.47	0.47	0.6	0.6	0.013	0.064			-0.026
5	0.51	0.51	0.52	0.52	0.028	0.016			-0.016
6	0.6	0.6	0.53	0.53	0.118	0.006			-0.016
7	0.49	0.49	0.51	0.51	0.008	0.026			-0.013
8	0.42	0.42	0.57	0.57	0.063	0.034			-0.006
9									0.008
10									0.008
11									0.014
12									0.028
13									0.028
14									0.034
15									0.064
16									0.118

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164415
Alias:	NAS# 0041G
Replicates:	8
Mean:	0.525
SD:	0.049
Tr Mean:	0.525
Trans SD:	0.049

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.037
SS:	0.025
K:	8
b:	0.155
Alpha Level:	0.05
Calculated Value:	0.9463
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.039
Test Residual SD:	0.026
Ref. Residual Mean:	0.028
Ref. Residual SD:	0.019
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.9655
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	0.5284
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.45	0.45	0.52	0.52	0.075	0.016			-0.075
2	0.57	0.57	0.55	0.55	0.045	0.014			-0.075
3	0.52	0.52	0.49	0.49	0.005	0.046			-0.046
4	0.45	0.45	0.6	0.6	0.075	0.064			-0.026
5	0.56	0.56	0.52	0.52	0.035	0.016			-0.016
6	0.54	0.54	0.53	0.53	0.015	0.006			-0.016
7	0.55	0.55	0.51	0.51	0.025	0.026			-0.006
8	0.56	0.56	0.57	0.57	0.035	0.034			-0.005
9									0.014
10									0.015
11									0.025
12									0.034
13									0.035
14									0.035
15									0.045
16									0.064

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164423
Alias:	NAS# 0042G
Replicates:	8
Mean:	0.323
SD:	0.053
Tr Mean:	0.323
Trans SD:	0.053

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.039
SS:	0.029
K:	8
b:	0.165
Alpha Level:	0.05
Calculated Value:	0.9492
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.043
Test Residual SD:	0.028
Ref. Residual Mean:	0.028
Ref. Residual SD:	0.019
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.2213
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	9.4357
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.37	0.37	0.52	0.52	0.048	0.016			-0.103
2	0.29	0.29	0.55	0.55	0.033	0.014			-0.046
3	0.35	0.35	0.49	0.49	0.028	0.046			-0.033
4	0.38	0.38	0.6	0.6	0.058	0.064			-0.026
5	0.22	0.22	0.52	0.52	0.103	0.016			-0.023
6	0.3	0.3	0.53	0.53	0.023	0.006			-0.016
7	0.36	0.36	0.51	0.51	0.038	0.026			-0.016
8	0.31	0.31	0.57	0.57	0.013	0.034			-0.013
9									-0.006
10									0.014
11									0.028
12									0.034
13									0.038
14									0.048
15									0.058
16									0.064

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164424
Alias:	NAS# 0043G
Replicates:	8
Mean:	0.335
SD:	0.052
Tr Mean:	0.335
Trans SD:	0.052

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.038
SS:	0.028
K:	8
b:	0.159
Alpha Level:	0.05
Calculated Value:	0.9208
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.048
Test Residual SD:	0.01
Ref. Residual Mean:	0.028
Ref. Residual SD:	0.019
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	2.5457
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	12
Experimental Alpha Level:	0.05
Calculated Value:	9.0672
Critical Value:	>= 1.782
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.38	0.38	0.52	0.52	0.045	0.016			-0.065
2	0.3	0.3	0.55	0.55	0.035	0.014			-0.055
3	0.38	0.38	0.49	0.49	0.045	0.046			-0.046
4	0.38	0.38	0.6	0.6	0.045	0.064			-0.035
5	0.27	0.27	0.52	0.52	0.065	0.016			-0.035
6	0.28	0.28	0.53	0.53	0.055	0.006			-0.026
7	0.39	0.39	0.51	0.51	0.055	0.026			-0.016
8	0.3	0.3	0.57	0.57	0.035	0.034			-0.016
9									-0.006
10									0.014
11									0.034
12									0.045
13									0.045
14									0.045
15									0.055
16									0.064

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164427
Alias:	NAS# 0044G
Replicates:	8
Mean:	0.518
SD:	0.086
Tr Mean:	0.518
Trans SD:	0.086

Ref Samp:	x2
Ref ID:	5164486
Alias:	NAS# 9994F
Replicates:	8
Mean:	0.536
SD:	0.035
Tr Mean:	0.536
Trans SD:	0.035

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.056
SS:	0.06
K:	8
b:	0.237
Alpha Level:	0.05
Calculated Value:	0.9332
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.06
Test Residual SD:	0.057
Ref. Residual Mean:	0.028
Ref. Residual SD:	0.019
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.5129
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	0.5712
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.53	0.53	0.52	0.52	0.013	0.016			-0.118
2	0.53	0.53	0.55	0.55	0.013	0.014			-0.088
3	0.5	0.5	0.49	0.49	0.018	0.046			-0.046
4	0.68	0.68	0.6	0.6	0.163	0.064			-0.026
5	0.57	0.57	0.52	0.52	0.053	0.016			-0.018
6	0.5	0.5	0.53	0.53	0.018	0.006			-0.018
7	0.4	0.4	0.51	0.51	0.118	0.026			-0.016
8	0.43	0.43	0.57	0.57	0.088	0.034			-0.016
9									-0.006
10									0.013
11									0.013
12									0.014
13									0.034
14									0.053
15									0.064
16									0.163

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164472
Alias:	NAS# 9985F
Replicates:	8
Mean:	0.194
SD:	0.038
Tr Mean:	0.194
Trans SD:	0.038

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.045
SS:	0.038
K:	8
b:	0.186
Alpha Level:	0.05
Calculated Value:	0.8953
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.031
Test Residual SD:	0.018
Ref. Residual Mean:	0.047
Ref. Residual SD:	0.04
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.9929
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	8.584
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.15	0.15	0.46	0.46	0.044	0.041			-0.139
2	0.15	0.15	0.44	0.44	0.044	0.021			-0.044
3	0.21	0.21	0.38	0.38	0.016	0.039			-0.044
4	0.26	0.26	0.28	0.28	0.066	0.139			-0.039
5	0.18	0.18	0.41	0.41	0.014	0.009			-0.024
6	0.21	0.21	0.46	0.46	0.016	0.041			-0.014
7	0.22	0.22	0.47	0.47	0.026	0.051			-0.009
8	0.17	0.17	0.45	0.45	0.024	0.031			0.016
9									0.016
10									0.021
11									0.026
12									0.031
13									0.041
14									0.041
15									0.051
16									0.066

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164473
Alias:	NAS# 9986F
Replicates:	8
Mean:	0.65
SD:	0.047
Tr Mean:	0.65
Trans SD:	0.047

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.048
SS:	0.044
K:	8
b:	0.202
Alpha Level:	0.05
Calculated Value:	0.9322
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.038
Test Residual SD:	0.025
Ref. Residual Mean:	0.047
Ref. Residual SD:	0.04
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.5484
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	-8.2605
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.65	0.65	0.46	0.46	0	0.041			-0.139
2	0.67	0.67	0.44	0.44	0.02	0.021			-0.05
3	0.6	0.6	0.38	0.38	0.05	0.039			-0.05
4	0.73	0.73	0.28	0.28	0.08	0.139			-0.039
5	0.6	0.6	0.41	0.41	0.05	0.009			-0.03
6	0.62	0.62	0.46	0.46	0.03	0.041			-0.02
7	0.7	0.7	0.47	0.47	0.05	0.051			-0.009
8	0.63	0.63	0.45	0.45	0.02	0.031			0
9									0.02
10									0.021
11									0.031
12									0.041
13									0.041
14									0.05
15									0.051
16									0.08

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164474
Alias:	NAS# 9987F
Replicates:	8
Mean:	0.335
SD:	0.042
Tr Mean:	0.335
Trans SD:	0.042

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.031	Statistic:	Mann-Whitney
Residual SD:	0.046	Test Residual SD:	0.026	Balanced Design:	Yes
SS:	0.041	Ref. Residual Mean:	0.047	Transformation:	rank-order
K:	8	Ref. Residual SD:	0.04		
b:	0.184	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.8307	Calculated Value:	0.9195	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	56.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.25	1	0.46	14.5	0.085	0.041	0.25		-0.139
2	0.34	5	0.44	12	0.005	0.021	0.28		-0.085
3	0.3	3	0.38	9.5	0.035	0.039	0.3		-0.039
4	0.38	9.5	0.28	2	0.045	0.139	0.33		-0.035
5	0.36	7	0.41	11	0.025	0.009	0.34		-0.009
6	0.36	7	0.46	14.5	0.025	0.041	0.36		-0.005
7	0.36	7	0.47	16	0.025	0.051	0.36		0.005
8	0.33	4	0.45	13	0.005	0.031	0.36		0.021
9							0.38		0.025
10							0.38		0.025
11							0.41		0.025
12							0.44		0.031
13							0.45		0.041
14							0.46		0.041
15							0.46		0.045
16							0.47		0.051

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164475
Alias:	NAS# 9988F
Replicates:	8
Mean:	0.424
SD:	0.066
Tr Mean:	0.424
Trans SD:	0.066

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.051	Statistic:	Student's t
Residual SD:	0.056	Test Residual SD:	0.037	Balanced Design:	Yes
SS:	0.059	Ref. Residual Mean:	0.047	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.04		
b:	0.233	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9178	Calculated Value:	0.2437	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	-0.1539
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.42	0.42	0.46	0.46	0.004	0.041			-0.139
2	0.47	0.47	0.44	0.44	0.046	0.021			-0.114
3	0.39	0.39	0.38	0.38	0.034	0.039			-0.054
4	0.52	0.52	0.28	0.28	0.096	0.139			-0.039
5	0.47	0.47	0.41	0.41	0.046	0.009			-0.034
6	0.31	0.31	0.46	0.46	0.114	0.041			-0.009
7	0.44	0.44	0.47	0.47	0.016	0.051			-0.004
8	0.37	0.37	0.45	0.45	0.054	0.031			0.016
9									0.021
10									0.031
11									0.041
12									0.041
13									0.046
14									0.046
15									0.051
16									0.096

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164479
Alias:	NAS# 9991F
Replicates:	8
Mean:	0.228
SD:	0.06
Tr Mean:	0.228
Trans SD:	0.06

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.053
SS:	0.054
K:	8
b:	0.21
Alpha Level:	0.05
Calculated Value:	0.825
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.051
Test Residual SD:	0.026
Ref. Residual Mean:	0.047
Ref. Residual SD:	0.04
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.2419
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	63
Critical Value:	>= 49.0
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.28	8	0.46	14.5	0.053	0.041	0.12		-0.139
2	0.18	2.5	0.44	12	0.048	0.021	0.18		-0.108
3	0.24	4	0.38	10	0.013	0.039	0.18		-0.048
4	0.27	5.5	0.28	8	0.043	0.139	0.24		-0.048
5	0.12	1	0.41	11	0.108	0.009	0.27		-0.039
6	0.18	2.5	0.46	14.5	0.048	0.041	0.27		-0.009
7	0.27	5.5	0.47	16	0.043	0.051	0.28		0.013
8	0.28	8	0.45	13	0.053	0.031	0.28		0.021
9							0.28		0.031
10							0.38		0.041
11							0.41		0.041
12							0.44		0.043
13							0.45		0.043
14							0.46		0.051
15							0.46		0.053
16							0.47		0.053

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164483
Alias:	NAS# 9992F
Replicates:	8
Mean:	0.345
SD:	0.028
Tr Mean:	0.345
Trans SD:	0.028

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.042
SS:	0.034
K:	8
b:	0.169
Alpha Level:	0.05
Calculated Value:	0.8382
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.023
Test Residual SD:	0.015
Ref. Residual Mean:	0.047
Ref. Residual SD:	0.04
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.611
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	55.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.31	3	0.46	14.5	0.035	0.041	0.28		-0.139
2	0.34	4.5	0.44	12	0.005	0.021	0.3		-0.045
3	0.37	8	0.38	9.5	0.025	0.039	0.31		-0.039
4	0.34	4.5	0.28	1	0.005	0.139	0.34		-0.035
5	0.36	6.5	0.41	11	0.015	0.009	0.34		-0.009
6	0.38	9.5	0.46	14.5	0.035	0.041	0.36		-0.005
7	0.3	2	0.47	16	0.045	0.051	0.36		-0.005
8	0.36	6.5	0.45	13	0.015	0.031	0.37		0.015
9							0.38		0.015
10							0.38		0.021
11							0.41		0.025
12							0.44		0.031
13							0.45		0.035
14							0.46		0.041
15							0.46		0.041
16							0.47		0.051

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164485
Alias:	NAS# 9993F
Replicates:	8
Mean:	0.411
SD:	0.043
Tr Mean:	0.411
Trans SD:	0.043

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.037	Statistic:	Student's t
Residual SD:	0.047	Test Residual SD:	0.018	Balanced Design:	Yes
SS:	0.041	Ref. Residual Mean:	0.047	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.04		
b:	0.192	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.8978	Calculated Value:	0.6529	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	0.2766
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.48	0.48	0.46	0.46	0.069	0.041			-0.139
2	0.38	0.38	0.44	0.44	0.031	0.021			-0.041
3	0.46	0.46	0.38	0.38	0.049	0.039			-0.041
4	0.37	0.37	0.28	0.28	0.041	0.139			-0.039
5	0.44	0.44	0.41	0.41	0.029	0.009			-0.031
6	0.39	0.39	0.46	0.46	0.021	0.041			-0.021
7	0.37	0.37	0.47	0.47	0.041	0.051			-0.011
8	0.4	0.4	0.45	0.45	0.011	0.031			-0.009
9									0.021
10									0.029
11									0.031
12									0.041
13									0.041
14									0.049
15									0.051
16									0.069

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164487
Alias:	NAS# 9995F
Replicates:	7
Mean:	0.333
SD:	0.047
Tr Mean:	0.333
Trans SD:	0.047

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.047
SS:	0.042
K:	7
b:	0.198
Alpha Level:	0.05
Calculated Value:	0.9378
Critical Value:	<= 0.881
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.035
Test Residual SD:	0.029
Ref. Residual Mean:	0.047
Ref. Residual SD:	0.04
Deg. of Freedom:	13
Alpha Level:	0.1
Calculated Value:	0.6565
Critical Value:	>= 1.771
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	13
Experimental Alpha Level:	0.05
Calculated Value:	2.9327
Critical Value:	>= 1.771
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.35	0.35	0.46	0.46	0.017	0.041			-0.139
2	0.33	0.33	0.44	0.44	0.003	0.021			-0.053
3	0.35	0.35	0.38	0.38	0.017	0.039			-0.043
4	0.42	0.42	0.28	0.28	0.087	0.139			-0.039
5	0.28	0.28	0.41	0.41	0.053	0.009			-0.023
6	0.31	0.31	0.46	0.46	0.023	0.041			-0.009
7	0.29	0.29	0.47	0.47	0.043	0.051			-0.003
8			0.45	0.45		0.031			0.017
9									0.017
10									0.021
11									0.031
12									0.041
13									0.041
14									0.051
15									0.087

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164494
Alias:	NAS# 9996F
Replicates:	8
Mean:	0.45
SD:	0.064
Tr Mean:	0.45
Trans SD:	0.064

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.053	Statistic:	Student's t
Residual SD:	0.055	Test Residual SD:	0.03	Balanced Design:	Yes
SS:	0.057	Ref. Residual Mean:	0.047	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.04		
b:	0.233	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.957	Calculated Value:	0.3379	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	-0.9822
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.53	0.53	0.46	0.46	0.08	0.041			-0.139
2	0.42	0.42	0.44	0.44	0.03	0.021			-0.08
3	0.45	0.45	0.38	0.38	0	0.039			-0.05
4	0.4	0.4	0.28	0.28	0.05	0.139			-0.05
5	0.4	0.4	0.41	0.41	0.05	0.009			-0.039
6	0.49	0.49	0.46	0.46	0.04	0.041			-0.03
7	0.37	0.37	0.47	0.47	0.08	0.051			-0.009
8	0.54	0.54	0.45	0.45	0.09	0.031			0
9									0.021
10									0.031
11									0.04
12									0.041
13									0.041
14									0.051
15									0.08
16									0.09

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164507
Alias:	NAS# 9997F
Replicates:	8
Mean:	0.411
SD:	0.035
Tr Mean:	0.411
Trans SD:	0.035

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.044
SS:	0.037
K:	8
b:	0.176
Alpha Level:	0.05
Calculated Value:	0.842
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.029
Test Residual SD:	0.016
Ref. Residual Mean:	0.047
Ref. Residual SD:	0.04
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.1774
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	43
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.38	3.5	0.46	14.5	0.031	0.041	0.28		-0.139
2	0.4	5.5	0.44	10	0.011	0.021	0.35		-0.061
3	0.44	10	0.38	3.5	0.029	0.039	0.38		-0.039
4	0.44	10	0.28	1	0.029	0.139	0.38		-0.031
5	0.4	5.5	0.41	7	0.011	0.009	0.4		-0.011
6	0.45	12.5	0.46	14.5	0.039	0.041	0.4		-0.011
7	0.43	8	0.47	16	0.019	0.051	0.41		-0.009
8	0.35	2	0.45	12.5	0.061	0.031	0.43		0.019
9							0.44		0.021
10							0.44		0.029
11							0.44		0.029
12							0.45		0.031
13							0.45		0.039
14							0.46		0.041
15							0.46		0.041
16							0.47		0.051

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164491
Alias:	NAS# 9999F
Replicates:	8
Mean:	0.335
SD:	0.045
Tr Mean:	0.335
Trans SD:	0.045

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.029	Statistic:	Student's t
Residual SD:	0.047	Test Residual SD:	0.032	Balanced Design:	Yes
SS:	0.042	Ref. Residual Mean:	0.047	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.04		
b:	0.198	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9285	Calculated Value:	0.9845	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	3.0477
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	0.34	0.46	0.46	0.005	0.041			-0.139
2	0.34	0.34	0.44	0.44	0.005	0.021			-0.039
3	0.31	0.31	0.38	0.38	0.025	0.039			-0.035
4	0.31	0.31	0.28	0.28	0.025	0.139			-0.025
5	0.3	0.3	0.41	0.41	0.035	0.009			-0.025
6	0.32	0.32	0.46	0.46	0.015	0.041			-0.015
7	0.32	0.32	0.47	0.47	0.015	0.051			-0.015
8	0.44	0.44	0.45	0.45	0.105	0.031			-0.009
9									0.005
10									0.005
11									0.021
12									0.031
13									0.041
14									0.041
15									0.051
16									0.105

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164493
Alias:	NAS# 0001G
Replicates:	8
Mean:	0.499
SD:	0.094
Tr Mean:	0.499
Trans SD:	0.094

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.069
SS:	0.09
K:	8
b:	0.285
Alpha Level:	0.05
Calculated Value:	0.8983
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.082
Test Residual SD:	0.036
Ref. Residual Mean:	0.047
Ref. Residual SD:	0.04
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.8608
Critical Value:	>= 1.761
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	12
Experimental Alpha Level:	0.05
Calculated Value:	-1.9914
Critical Value:	>= 1.782
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.4	0.4	0.46	0.46	0.099	0.041			-0.139
2	0.59	0.59	0.44	0.44	0.091	0.021			-0.119
3	0.6	0.6	0.38	0.38	0.101	0.039			-0.109
4	0.39	0.39	0.28	0.28	0.109	0.139			-0.099
5	0.51	0.51	0.41	0.41	0.011	0.009			-0.039
6	0.55	0.55	0.46	0.46	0.051	0.041			-0.009
7	0.38	0.38	0.47	0.47	0.119	0.051			0.011
8	0.57	0.57	0.45	0.45	0.071	0.031			0.021
9									0.031
10									0.041
11									0.041
12									0.051
13									0.051
14									0.071
15									0.091
16									0.101

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164405
Alias:	NAS# 0032G
Replicates:	8
Mean:	0.343
SD:	0.066
Tr Mean:	0.343
Trans SD:	0.066

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.056
SS:	0.059
K:	8
b:	0.213
Alpha Level:	0.05
Calculated Value:	0.7685
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.044
Test Residual SD:	0.047
Ref. Residual Mean:	0.047
Ref. Residual SD:	0.04
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.1012
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	55
Critical Value:	>= 49.0
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.37	6.5	0.46	14.5	0.028	0.041	0.19		-0.153
2	0.37	6.5	0.44	12	0.028	0.021	0.28		-0.139
3	0.33	3.5	0.38	8	0.013	0.039	0.33		-0.039
4	0.19	1	0.28	2	0.153	0.139	0.33		-0.013
5	0.36	5	0.41	11	0.018	0.009	0.36		-0.013
6	0.4	10	0.46	14.5	0.058	0.041	0.37		-0.009
7	0.39	9	0.47	16	0.048	0.051	0.37		0.018
8	0.33	3.5	0.45	13	0.013	0.031	0.38		0.021
9							0.39		0.028
10							0.4		0.028
11							0.41		0.031
12							0.44		0.041
13							0.45		0.041
14							0.46		0.048
15							0.46		0.051
16							0.47		0.058

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164406
Alias:	NAS# 0033G
Replicates:	8
Mean:	0.451
SD:	0.046
Tr Mean:	0.451
Trans SD:	0.046

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.039	Statistic:	Student's t
Residual SD:	0.048	Test Residual SD:	0.02	Balanced Design:	Yes
SS:	0.043	Ref. Residual Mean:	0.047	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.04		
b:	0.199	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9141	Calculated Value:	0.4809	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	-1.1705
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.52	0.52	0.46	0.46	0.069	0.041			-0.139
2	0.4	0.4	0.44	0.44	0.051	0.021			-0.051
3	0.42	0.42	0.38	0.38	0.031	0.039			-0.041
4	0.48	0.48	0.28	0.28	0.029	0.139			-0.039
5	0.44	0.44	0.41	0.41	0.011	0.009			-0.031
6	0.51	0.51	0.46	0.46	0.059	0.041			-0.021
7	0.41	0.41	0.47	0.47	0.041	0.051			-0.011
8	0.43	0.43	0.45	0.45	0.021	0.031			-0.009
9									0.021
10									0.029
11									0.031
12									0.041
13									0.041
14									0.051
15									0.059
16									0.069

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164408
Alias:	NAS# 0034G
Replicates:	8
Mean:	0.299
SD:	0.065
Tr Mean:	0.299
Trans SD:	0.065

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.055
SS:	0.058
K:	8
b:	0.236
Alpha Level:	0.05
Calculated Value:	0.9676
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.048
Test Residual SD:	0.039
Ref. Residual Mean:	0.047
Ref. Residual SD:	0.04
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.0958
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	3.7425
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.43	0.43	0.46	0.46	0.131	0.041			-0.139
2	0.27	0.27	0.44	0.44	0.029	0.021			-0.059
3	0.24	0.24	0.38	0.38	0.059	0.039			-0.049
4	0.25	0.25	0.28	0.28	0.049	0.139			-0.039
5	0.27	0.27	0.41	0.41	0.029	0.009			-0.029
6	0.36	0.36	0.46	0.46	0.061	0.041			-0.029
7	0.3	0.3	0.47	0.47	0.001	0.051			-0.029
8	0.27	0.27	0.45	0.45	0.029	0.031			-0.009
9									0.001
10									0.021
11									0.031
12									0.041
13									0.041
14									0.051
15									0.061
16									0.131

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164412
Alias:	NAS# 0035G
Replicates:	8
Mean:	0.348
SD:	0.059
Tr Mean:	0.348
Trans SD:	0.059

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.043	Statistic:	Student's t
Residual SD:	0.053	Test Residual SD:	0.038	Balanced Design:	Yes
SS:	0.053	Ref. Residual Mean:	0.047	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.04		
b:	0.223	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9416	Calculated Value:	0.2106	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	2.324
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.3	0.3	0.46	0.46	0.048	0.041			-0.139
2	0.43	0.43	0.44	0.44	0.083	0.021			-0.098
3	0.35	0.35	0.38	0.38	0.003	0.039			-0.048
4	0.33	0.33	0.28	0.28	0.018	0.139			-0.039
5	0.36	0.36	0.41	0.41	0.013	0.009			-0.018
6	0.42	0.42	0.46	0.46	0.073	0.041			-0.009
7	0.25	0.25	0.47	0.47	0.098	0.051			-0.007
8	0.34	0.34	0.45	0.45	0.007	0.031			0.003
9									0.013
10									0.021
11									0.031
12									0.041
13									0.041
14									0.051
15									0.073
16									0.083

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164413
Alias:	NAS# 0036G
Replicates:	8
Mean:	0.403
SD:	0.075
Tr Mean:	0.403
Trans SD:	0.075

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.06
SS:	0.067
K:	8
b:	0.251
Alpha Level:	0.05
Calculated Value:	0.9335
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.06
Test Residual SD:	0.038
Ref. Residual Mean:	0.047
Ref. Residual SD:	0.04
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.6891
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	0.4683
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.37	0.37	0.46	0.46	0.033	0.041			-0.139
2	0.41	0.41	0.44	0.44	0.007	0.021			-0.123
3	0.49	0.49	0.38	0.38	0.088	0.039			-0.063
4	0.46	0.46	0.28	0.28	0.058	0.139			-0.039
5	0.49	0.49	0.41	0.41	0.088	0.009			-0.033
6	0.28	0.28	0.46	0.46	0.123	0.041			-0.023
7	0.38	0.38	0.47	0.47	0.023	0.051			-0.009
8	0.34	0.34	0.45	0.45	0.063	0.031			0.007
9									0.021
10									0.031
11									0.041
12									0.041
13									0.051
14									0.058
15									0.088
16									0.088

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164407
Alias:	NAS# 0037G
Replicates:	8
Mean:	0.371
SD:	0.049
Tr Mean:	0.371
Trans SD:	0.049

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.049
SS:	0.045
K:	8
b:	0.202
Alpha Level:	0.05
Calculated Value:	0.9076
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.039
Test Residual SD:	0.026
Ref. Residual Mean:	0.047
Ref. Residual SD:	0.04
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.4648
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	1.6724
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.44	0.44	0.46	0.46	0.069	0.041			-0.139
2	0.4	0.4	0.44	0.44	0.029	0.021			-0.081
3	0.33	0.33	0.38	0.38	0.041	0.039			-0.041
4	0.35	0.35	0.28	0.28	0.021	0.139			-0.039
5	0.42	0.42	0.41	0.41	0.049	0.009			-0.021
6	0.38	0.38	0.46	0.46	0.009	0.041			-0.011
7	0.29	0.29	0.47	0.47	0.081	0.051			-0.009
8	0.36	0.36	0.45	0.45	0.011	0.031			0.009
9									0.021
10									0.029
11									0.031
12									0.041
13									0.041
14									0.049
15									0.051
16									0.069

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164409
Alias:	NAS# 0038G
Replicates:	8
Mean:	0.486
SD:	0.07
Tr Mean:	0.486
Trans SD:	0.07

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.059	Statistic:	Mann-Whitney
Residual SD:	0.057	Test Residual SD:	0.031	Balanced Design:	Yes
SS:	0.063	Ref. Residual Mean:	0.047	Transformation:	rank-order
K:	8	Ref. Residual SD:	0.04		
b:	0.234	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.8754	Calculated Value:	0.6852	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	15
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.46	9	0.46	9	0.026	0.041	0.28		-0.139
2	0.47	11.5	0.44	6	0.016	0.021	0.37		-0.116
3	0.41	4.5	0.38	3	0.076	0.039	0.38		-0.076
4	0.56	16	0.28	1	0.074	0.139	0.41		-0.039
5	0.54	14	0.41	4.5	0.054	0.009	0.41		-0.026
6	0.37	2	0.46	9	0.116	0.041	0.44		-0.016
7	0.54	14	0.47	11.5	0.054	0.051	0.45		-0.009
8	0.54	14	0.45	7	0.054	0.031	0.46		0.021
9							0.46		0.031
10							0.46		0.041
11							0.47		0.041
12							0.47		0.051
13							0.54		0.054
14							0.54		0.054
15							0.54		0.054
16							0.56		0.074

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164410
Alias:	NAS# 0039G
Replicates:	8
Mean:	0.423
SD:	0.075
Tr Mean:	0.423
Trans SD:	0.075

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.065	Statistic:	Student's t
Residual SD:	0.06	Test Residual SD:	0.029	Balanced Design:	Yes
SS:	0.068	Ref. Residual Mean:	0.047	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.04		
b:	0.251	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9314	Calculated Value:	1.0679	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	-0.1077
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.39	0.39	0.46	0.46	0.033	0.041			-0.139
2	0.53	0.53	0.44	0.44	0.108	0.021			-0.103
3	0.47	0.47	0.38	0.38	0.048	0.039			-0.083
4	0.32	0.32	0.28	0.28	0.103	0.139			-0.043
5	0.38	0.38	0.41	0.41	0.043	0.009			-0.039
6	0.34	0.34	0.46	0.46	0.083	0.041			-0.033
7	0.47	0.47	0.47	0.47	0.048	0.051			-0.009
8	0.48	0.48	0.45	0.45	0.058	0.031			0.021
9									0.031
10									0.041
11									0.041
12									0.048
13									0.048
14									0.051
15									0.058
16									0.108

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164411
Alias:	NAS# 0040G
Replicates:	8
Mean:	0.483
SD:	0.068
Tr Mean:	0.483
Trans SD:	0.068

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.047	Statistic:	Student's t
Residual SD:	0.056	Test Residual SD:	0.046	Balanced Design:	Yes
SS:	0.06	Ref. Residual Mean:	0.047	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.04		
b:	0.237	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9257	Calculated Value:	0.0146	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	-1.9405
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.49	0.49	0.46	0.46	0.008	0.041			-0.139
2	0.37	0.37	0.44	0.44	0.113	0.021			-0.113
3	0.51	0.51	0.38	0.38	0.028	0.039			-0.063
4	0.47	0.47	0.28	0.28	0.013	0.139			-0.039
5	0.51	0.51	0.41	0.41	0.028	0.009			-0.013
6	0.6	0.6	0.46	0.46	0.118	0.041			-0.009
7	0.49	0.49	0.47	0.47	0.008	0.051			0.008
8	0.42	0.42	0.45	0.45	0.063	0.031			0.008
9									0.021
10									0.028
11									0.028
12									0.031
13									0.041
14									0.041
15									0.051
16									0.118

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164415
Alias:	NAS# 0041G
Replicates:	8
Mean:	0.525
SD:	0.049
Tr Mean:	0.525
Trans SD:	0.049

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.049
SS:	0.045
K:	8
b:	0.192
Alpha Level:	0.05
Calculated Value:	0.8191
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.039
Test Residual SD:	0.026
Ref. Residual Mean:	0.047
Ref. Residual SD:	0.04
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.4691
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	7
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.45	6	0.46	8.5	0.075	0.041	0.28		-0.139
2	0.57	16	0.44	4	0.045	0.021	0.38		-0.075
3	0.52	11	0.38	2	0.005	0.039	0.41		-0.075
4	0.45	6	0.28	1	0.075	0.139	0.44		-0.039
5	0.56	14.5	0.41	3	0.035	0.009	0.45		-0.009
6	0.54	12	0.46	8.5	0.015	0.041	0.45		-0.005
7	0.55	13	0.47	10	0.025	0.051	0.45		0.015
8	0.56	14.5	0.45	6	0.035	0.031	0.46		0.021
9							0.46		0.025
10							0.47		0.031
11							0.52		0.035
12							0.54		0.035
13							0.55		0.041
14							0.56		0.041
15							0.56		0.045
16							0.57		0.051

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164423
Alias:	NAS# 0042G
Replicates:	8
Mean:	0.323
SD:	0.053
Tr Mean:	0.323
Trans SD:	0.053

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.05
SS:	0.048
K:	8
b:	0.203
Alpha Level:	0.05
Calculated Value:	0.8509
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.043
Test Residual SD:	0.028
Ref. Residual Mean:	0.047
Ref. Residual SD:	0.04
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.2371
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	56.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.37	8	0.46	14.5	0.048	0.041	0.22		-0.139
2	0.29	3	0.44	12	0.033	0.021	0.28		-0.103
3	0.35	6	0.38	9.5	0.028	0.039	0.29		-0.039
4	0.38	9.5	0.28	2	0.058	0.139	0.3		-0.033
5	0.22	1	0.41	11	0.103	0.009	0.31		-0.023
6	0.3	4	0.46	14.5	0.023	0.041	0.35		-0.013
7	0.36	7	0.47	16	0.038	0.051	0.36		-0.009
8	0.31	5	0.45	13	0.013	0.031	0.37		0.021
9							0.38		0.028
10							0.38		0.031
11							0.41		0.038
12							0.44		0.041
13							0.45		0.041
14							0.46		0.048
15							0.46		0.051
16							0.47		0.058

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164424
Alias:	NAS# 0043G
Replicates:	8
Mean:	0.335
SD:	0.052
Tr Mean:	0.335
Trans SD:	0.052

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.05
SS:	0.047
K:	8
b:	0.2
Alpha Level:	0.05
Calculated Value:	0.85
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.048
Test Residual SD:	0.01
Ref. Residual Mean:	0.047
Ref. Residual SD:	0.04
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.0649
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	55
Critical Value:	>= 49.0
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.38	7.5	0.46	14.5	0.045	0.041	0.27		-0.139
2	0.3	4.5	0.44	12	0.035	0.021	0.28		-0.065
3	0.38	7.5	0.38	7.5	0.045	0.039	0.28		-0.055
4	0.38	7.5	0.28	2.5	0.045	0.139	0.3		-0.039
5	0.27	1	0.41	11	0.065	0.009	0.3		-0.035
6	0.28	2.5	0.46	14.5	0.055	0.041	0.38		-0.035
7	0.39	10	0.47	16	0.055	0.051	0.38		-0.009
8	0.3	4.5	0.45	13	0.035	0.031	0.38		0.021
9							0.38		0.031
10							0.39		0.041
11							0.41		0.041
12							0.44		0.045
13							0.45		0.045
14							0.46		0.045
15							0.46		0.051
16							0.47		0.055

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164427
Alias:	NAS# 0044G
Replicates:	8
Mean:	0.518
SD:	0.086
Tr Mean:	0.518
Trans SD:	0.086

Ref Samp:	x2
Ref ID:	5164489
Alias:	NAS# 9998F
Replicates:	8
Mean:	0.419
SD:	0.064
Tr Mean:	0.419
Trans SD:	0.064

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.065
SS:	0.08
K:	8
b:	0.274
Alpha Level:	0.05
Calculated Value:	0.9398
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.06
Test Residual SD:	0.057
Ref. Residual Mean:	0.047
Ref. Residual SD:	0.04
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.5478
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	-2.6153
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.53	0.53	0.46	0.46	0.013	0.041			-0.139
2	0.53	0.53	0.44	0.44	0.013	0.021			-0.118
3	0.5	0.5	0.38	0.38	0.018	0.039			-0.088
4	0.68	0.68	0.28	0.28	0.163	0.139			-0.039
5	0.57	0.57	0.41	0.41	0.053	0.009			-0.018
6	0.5	0.5	0.46	0.46	0.018	0.041			-0.018
7	0.4	0.4	0.47	0.47	0.118	0.051			-0.009
8	0.43	0.43	0.45	0.45	0.088	0.031			0.013
9									0.013
10									0.021
11									0.031
12									0.041
13									0.041
14									0.051
15									0.053
16									0.163

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164472
Alias:	NAS# 9985F
Replicates:	8
Mean:	0.194
SD:	0.038
Tr Mean:	0.194
Trans SD:	0.038

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.043
SS:	0.035
K:	8
b:	0.169
Alpha Level:	0.05
Calculated Value:	0.8195
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.031
Test Residual SD:	0.018
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.046
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.2518
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	64
Critical Value:	>= 49.0
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.15	1.5	0.42	9	0.044	0.049	0.15		-0.049
2	0.15	1.5	0.61	16	0.044	0.141	0.15		-0.044
3	0.21	5.5	0.45	11.5	0.016	0.019	0.17		-0.044
4	0.26	8	0.46	13.5	0.066	0.009	0.18		-0.039
5	0.18	4	0.46	13.5	0.014	0.009	0.21		-0.024
6	0.21	5.5	0.43	10	0.016	0.039	0.21		-0.019
7	0.22	7	0.47	15	0.026	0.001	0.22		-0.019
8	0.17	3	0.45	11.5	0.024	0.019	0.26		-0.014
9							0.42		-0.009
10							0.43		-0.009
11							0.45		0.001
12							0.45		0.016
13							0.46		0.016
14							0.46		0.026
15							0.47		0.066
16							0.61		0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164473
Alias:	NAS# 9986F
Replicates:	8
Mean:	0.65
SD:	0.047
Tr Mean:	0.65
Trans SD:	0.047

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.038	Statistic:	Mann-Whitney
Residual SD:	0.046	Test Residual SD:	0.025	Balanced Design:	Yes
SS:	0.04	Ref. Residual Mean:	0.036	Transformation:	rank-order
K:	8	Ref. Residual SD:	0.046		
b:	0.183	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.8319	Calculated Value:	0.1021	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally				Mann-Whitney N2:	8
Distributed:	No	Variances		Degrees of Freedom:	
		Homogeneous:	Yes	Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	2
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.65	13	0.42	1	0	0.049	0.42		-0.05
2	0.67	14	0.61	10	0.02	0.141	0.43		-0.05
3	0.6	8.5	0.45	3.5	0.05	0.019	0.45		-0.049
4	0.73	16	0.46	5.5	0.08	0.009	0.45		-0.039
5	0.6	8.5	0.46	5.5	0.05	0.009	0.46		-0.03
6	0.62	11	0.43	2	0.03	0.039	0.46		-0.02
7	0.7	15	0.47	7	0.05	0.001	0.47		-0.019
8	0.63	12	0.45	3.5	0.02	0.019	0.6		-0.019
9							0.6		-0.009
10							0.61		-0.009
11							0.62		0
12							0.63		0.001
13							0.65		0.02
14							0.67		0.05
15							0.7		0.08
16							0.73		0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164474
Alias:	NAS# 9987F
Replicates:	8
Mean:	0.335
SD:	0.042
Tr Mean:	0.335
Trans SD:	0.042

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.044
SS:	0.037
K:	8
b:	0.182
Alpha Level:	0.05
Calculated Value:	0.8963
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.031
Test Residual SD:	0.026
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.046
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.2368
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	5.1973
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.25	0.25	0.42	0.42	0.085	0.049			-0.085
2	0.34	0.34	0.61	0.61	0.005	0.141			-0.049
3	0.3	0.3	0.45	0.45	0.035	0.019			-0.039
4	0.38	0.38	0.46	0.46	0.045	0.009			-0.035
5	0.36	0.36	0.46	0.46	0.025	0.009			-0.019
6	0.36	0.36	0.43	0.43	0.025	0.039			-0.019
7	0.36	0.36	0.47	0.47	0.025	0.001			-0.009
8	0.33	0.33	0.45	0.45	0.005	0.019			-0.009
9									-0.005
10									0.001
11									0.005
12									0.025
13									0.025
14									0.025
15									0.045
16									0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164475
Alias:	NAS# 9988F
Replicates:	8
Mean:	0.424
SD:	0.066
Tr Mean:	0.424
Trans SD:	0.066

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.051	Statistic:	Student's t
Residual SD:	0.054	Test Residual SD:	0.037	Balanced Design:	Yes
SS:	0.055	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.046		
b:	0.229	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.944	Calculated Value:	0.7499	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	1.4297
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.42	0.42	0.42	0.42	0.004	0.049			-0.114
2	0.47	0.47	0.61	0.61	0.046	0.141			-0.054
3	0.39	0.39	0.45	0.45	0.034	0.019			-0.049
4	0.52	0.52	0.46	0.46	0.096	0.009			-0.039
5	0.47	0.47	0.46	0.46	0.046	0.009			-0.034
6	0.31	0.31	0.43	0.43	0.114	0.039			-0.019
7	0.44	0.44	0.47	0.47	0.016	0.001			-0.019
8	0.37	0.37	0.45	0.45	0.054	0.019			-0.009
9									-0.009
10									-0.004
11									0.001
12									0.016
13									0.046
14									0.046
15									0.096
16									0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164479
Alias:	NAS# 9991F
Replicates:	8
Mean:	0.228
SD:	0.06
Tr Mean:	0.228
Trans SD:	0.06

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.051	Statistic:	Student's t
Residual SD:	0.051	Test Residual SD:	0.026	Balanced Design:	Yes
SS:	0.05	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.046		
b:	0.218	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9482	Calculated Value:	0.8063	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	8.0707
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.28	0.28	0.42	0.42	0.053	0.049			-0.108
2	0.18	0.18	0.61	0.61	0.048	0.141			-0.049
3	0.24	0.24	0.45	0.45	0.013	0.019			-0.048
4	0.27	0.27	0.46	0.46	0.043	0.009			-0.048
5	0.12	0.12	0.46	0.46	0.108	0.009			-0.039
6	0.18	0.18	0.43	0.43	0.048	0.039			-0.019
7	0.27	0.27	0.47	0.47	0.043	0.001			-0.019
8	0.28	0.28	0.45	0.45	0.053	0.019			-0.009
9									-0.009
10									0.001
11									0.013
12									0.043
13									0.043
14									0.053
15									0.053
16									0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164483
Alias:	NAS# 9992F
Replicates:	8
Mean:	0.345
SD:	0.028
Tr Mean:	0.345
Trans SD:	0.028

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.023	Statistic:	Mann-Whitney
Residual SD:	0.04	Test Residual SD:	0.015	Balanced Design:	Yes
SS:	0.03	Ref. Residual Mean:	0.036	Transformation:	rank-order
K:	8	Ref. Residual SD:	0.046		
b:	0.155	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.7967	Calculated Value:	0.7744	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	64
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.31	2	0.42	9	0.035	0.049	0.3		-0.049
2	0.34	3.5	0.61	16	0.005	0.141	0.31		-0.045
3	0.37	7	0.45	11.5	0.025	0.019	0.34		-0.039
4	0.34	3.5	0.46	13.5	0.005	0.009	0.34		-0.035
5	0.36	5.5	0.46	13.5	0.015	0.009	0.36		-0.019
6	0.38	8	0.43	10	0.035	0.039	0.36		-0.019
7	0.3	1	0.47	15	0.045	0.001	0.37		-0.009
8	0.36	5.5	0.45	11.5	0.015	0.019	0.38		-0.009
9							0.42		-0.005
10							0.43		-0.005
11							0.45		0.001
12							0.45		0.015
13							0.46		0.015
14							0.46		0.025
15							0.47		0.035
16							0.61		0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164485
Alias:	NAS# 9993F
Replicates:	8
Mean:	0.411
SD:	0.043
Tr Mean:	0.411
Trans SD:	0.043

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.037	Statistic:	Mann-Whitney
Residual SD:	0.044	Test Residual SD:	0.018	Balanced Design:	Yes
SS:	0.038	Ref. Residual Mean:	0.036	Transformation:	rank-order
K:	8	Ref. Residual SD:	0.046		
b:	0.175	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.8125	Calculated Value:	0.0542	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	50
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.48	15	0.42	6	0.069	0.049	0.37		-0.049
2	0.38	3	0.61	16	0.031	0.141	0.37		-0.041
3	0.46	12	0.45	9.5	0.049	0.019	0.38		-0.041
4	0.37	1.5	0.46	12	0.041	0.009	0.39		-0.039
5	0.44	8	0.46	12	0.029	0.009	0.4		-0.031
6	0.39	4	0.43	7	0.021	0.039	0.42		-0.021
7	0.37	1.5	0.47	14	0.041	0.001	0.43		-0.019
8	0.4	5	0.45	9.5	0.011	0.019	0.44		-0.019
9							0.45		-0.011
10							0.45		-0.009
11							0.46		-0.009
12							0.46		0.001
13							0.46		0.029
14							0.47		0.049
15							0.48		0.069
16							0.61		0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164487
Alias:	NAS# 9995F
Replicates:	7
Mean:	0.333
SD:	0.047
Tr Mean:	0.333
Trans SD:	0.047

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.045
SS:	0.038
K:	7
b:	0.175
Alpha Level:	0.05
Calculated Value:	0.8094
Critical Value:	<= 0.881
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.035
Test Residual SD:	0.029
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.046
Deg. of Freedom:	13
Alpha Level:	0.1
Calculated Value:	0.0465
Critical Value:	>= 1.771
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Mann-Whitney N1:	7
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	55.5
Critical Value:	>= 43.0
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.35	5.5	0.42	7.5	0.017	0.049	0.28		-0.053
2	0.33	4	0.61	15	0.003	0.141	0.29		-0.049
3	0.35	5.5	0.45	10.5	0.017	0.019	0.31		-0.043
4	0.42	7.5	0.46	12.5	0.087	0.009	0.33		-0.039
5	0.28	1	0.46	12.5	0.053	0.009	0.35		-0.023
6	0.31	3	0.43	9	0.023	0.039	0.35		-0.019
7	0.29	2	0.47	14	-0.043	0.001	0.42		-0.019
8			0.45	10.5		0.019	0.42		-0.009
9							0.43		-0.009
10							0.45		-0.003
11							0.45		0.001
12							0.46		0.017
13							0.46		0.017
14							0.47		0.087
15							0.61		0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164494
Alias:	NAS# 9996F
Replicates:	8
Mean:	0.45
SD:	0.064
Tr Mean:	0.45
Trans SD:	0.064

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.053	Statistic:	Student's t
Residual SD:	0.053	Test Residual SD:	0.03	Balanced Design:	Yes
SS:	0.053	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.046		
b:	0.217	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.8911	Calculated Value:	0.8738	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	0.609
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.53	0.53	0.42	0.42	0.08	0.049			-0.08
2	0.42	0.42	0.61	0.61	0.03	0.141			-0.05
3	0.45	0.45	0.45	0.45	0	0.019			-0.05
4	0.4	0.4	0.46	0.46	0.05	0.009			-0.049
5	0.4	0.4	0.46	0.46	0.05	0.009			-0.039
6	0.49	0.49	0.43	0.43	0.04	0.039			-0.03
7	0.37	0.37	0.47	0.47	0.08	0.001			-0.019
8	0.54	0.54	0.45	0.45	0.09	0.019			-0.019
9									-0.009
10									-0.009
11									0
12									0.001
13									0.04
14									0.08
15									0.09
16									0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164507
Alias:	NAS# 9997F
Replicates:	8
Mean:	0.411
SD:	0.035
Tr Mean:	0.411
Trans SD:	0.035

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.042
SS:	0.033
K:	8
b:	0.167
Alpha Level:	0.05
Calculated Value:	0.8453
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.029
Test Residual SD:	0.016
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.046
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.4016
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	55.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.38	2	0.42	5	0.031	0.049	0.35		-0.061
2	0.4	3.5	0.61	16	0.011	0.141	0.38		-0.049
3	0.44	8.5	0.45	11	0.029	0.019	0.4		-0.039
4	0.44	8.5	0.46	13.5	0.029	0.009	0.4		-0.031
5	0.4	3.5	0.46	13.5	0.011	0.009	0.42		-0.019
6	0.45	11	0.43	6.5	0.039	0.039	0.43		-0.019
7	0.43	6.5	0.47	15	0.019	0.001	0.43		-0.011
8	0.35	1	0.45	11	0.061	0.019	0.44		-0.011
9							0.44		-0.009
10							0.45		-0.009
11							0.45		0.001
12							0.45		0.019
13							0.46		0.029
14							0.46		0.029
15							0.47		0.039
16							0.61		0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164491
Alias:	NAS# 9999F
Replicates:	8
Mean:	0.335
SD:	0.045
Tr Mean:	0.335
Trans SD:	0.045

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.045
SS:	0.039
K:	8
b:	0.165
Alpha Level:	0.05
Calculated Value:	0.7008
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.029
Test Residual SD:	0.032
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.046
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.3475
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	62
Critical Value:	>= 49.0
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.34	6.5	0.42	8	0.005	0.049	0.3		-0.049
2	0.34	6.5	0.61	16	0.005	0.141	0.31		-0.039
3	0.31	2.5	0.45	11.5	0.025	0.019	0.31		-0.035
4	0.31	2.5	0.46	13.5	0.025	0.009	0.32		-0.025
5	0.3	1	0.46	13.5	0.035	0.009	0.32		-0.025
6	0.32	4.5	0.43	9	0.015	0.039	0.34		-0.019
7	0.32	4.5	0.47	15	0.015	0.001	0.34		-0.019
8	0.44	10	0.45	11.5	0.105	0.019	0.42		-0.015
9							0.43		-0.015
10							0.44		-0.009
11							0.45		-0.009
12							0.45		0.001
13							0.46		0.005
14							0.46		0.005
15							0.47		0.105
16							0.61		0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164493
Alias:	NAS# 0001G
Replicates:	8
Mean:	0.499
SD:	0.094
Tr Mean:	0.499
Trans SD:	0.094

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.082	Statistic:	Approximate t
Residual SD:	0.068	Test Residual SD:	0.036	Balanced Design:	Yes
SS:	0.087	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.046		
b:	0.289	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9621	Calculated Value:	2.2471	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	No	Degrees of Freedom:	12
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	-0.7621
				Critical Value:	>= 1.782
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.4	0.4	0.42	0.42	0.099	0.049			-0.119
2	0.59	0.59	0.61	0.61	0.091	0.141			-0.109
3	0.6	0.6	0.45	0.45	0.101	0.019			-0.099
4	0.39	0.39	0.46	0.46	0.109	0.009			-0.049
5	0.51	0.51	0.46	0.46	0.011	0.009			-0.039
6	0.55	0.55	0.43	0.43	0.051	0.039			-0.019
7	0.38	0.38	0.47	0.47	0.119	0.001			-0.019
8	0.57	0.57	0.45	0.45	0.071	0.019			-0.009
9									-0.009
10									0.001
11									0.011
12									0.051
13									0.071
14									0.091
15									0.101
16									0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164405
Alias:	NAS# 0032G
Replicates:	8
Mean:	0.343
SD:	0.066
Tr Mean:	0.343
Trans SD:	0.066

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.044	Statistic:	Student's t
Residual SD:	0.054	Test Residual SD:	0.047	Balanced Design:	Yes
SS:	0.056	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.046		
b:	0.225	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9076	Calculated Value:	0.3797	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	4.0054
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.37	0.37	0.42	0.42	0.028	0.049			-0.153
2	0.37	0.37	0.61	0.61	0.028	0.141			-0.049
3	0.33	0.33	0.45	0.45	0.013	0.019			-0.039
4	0.19	0.19	0.46	0.46	0.153	0.009			-0.019
5	0.36	0.36	0.46	0.46	0.018	0.009			-0.019
6	0.4	0.4	0.43	0.43	0.058	0.039			-0.013
7	0.39	0.39	0.47	0.47	0.048	0.001			-0.013
8	0.33	0.33	0.45	0.45	0.013	0.019			-0.009
9									-0.009
10									0.001
11									0.018
12									0.028
13									0.028
14									0.048
15									0.058
16									0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164406
Alias:	NAS# 0033G
Replicates:	8
Mean:	0.451
SD:	0.046
Tr Mean:	0.451
Trans SD:	0.046

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.039	Statistic:	Mann-Whitney
Residual SD:	0.046	Test Residual SD:	0.02	Balanced Design:	Yes
SS:	0.04	Ref. Residual Mean:	0.036	Transformation:	rank-order
K:	8	Ref. Residual SD:	0.046		
b:	0.181	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.8277	Calculated Value:	0.1961	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	39
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.52	15	0.42	3.5	0.069	0.049	0.4		-0.051
2	0.4	1	0.61	16	0.051	0.141	0.41		-0.049
3	0.42	3.5	0.45	8.5	0.031	0.019	0.42		-0.041
4	0.48	13	0.46	10.5	0.029	0.009	0.42		-0.039
5	0.44	7	0.46	10.5	0.011	0.009	0.43		-0.031
6	0.51	14	0.43	5.5	0.059	0.039	0.43		-0.021
7	0.41	2	0.47	12	0.041	0.001	0.44		-0.019
8	0.43	5.5	0.45	8.5	0.021	0.019	0.45		-0.019
9							0.45		-0.011
10							0.46		-0.009
11							0.46		-0.009
12							0.47		0.001
13							0.48		0.029
14							0.51		0.059
15							0.52		0.069
16							0.61		0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164408
Alias:	NAS# 0034G
Replicates:	8
Mean:	0.299
SD:	0.065
Tr Mean:	0.299
Trans SD:	0.065

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.048	Statistic:	Mann-Whitney
Residual SD:	0.053	Test Residual SD:	0.039	Balanced Design:	Yes
SS:	0.054	Ref. Residual Mean:	0.036	Transformation:	rank-order
K:	8	Ref. Residual SD:	0.046		
b:	0.203	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.7662	Calculated Value:	0.6058	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
				Mann-Whitney N2:	8
Normally		Variances		Degrees of Freedom:	
Distributed:	No	Homogeneous:	Yes	Experimental Alpha Level:	0.05
				Calculated Value:	62.5
Override Option:	Not Invoked			Critical Value:	>= 49.0
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.43	9.5	0.42	8	0.131	0.049	0.24		-0.059
2	0.27	4	0.61	16	0.029	0.141	0.25		-0.049
3	0.24	1	0.45	11.5	0.059	0.019	0.27		-0.049
4	0.25	2	0.46	13.5	0.049	0.009	0.27		-0.039
5	0.27	4	0.46	13.5	0.029	0.009	0.27		-0.029
6	0.36	7	0.43	9.5	0.061	0.039	0.3		-0.029
7	0.3	6	0.47	15	0.001	0.001	0.36		-0.029
8	0.27	4	0.45	11.5	0.029	0.019	0.42		-0.019
9							0.43		-0.019
10							0.43		-0.009
11							0.45		-0.009
12							0.45		0.001
13							0.46		0.001
14							0.46		0.061
15							0.47		0.131
16							0.61		0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164412
Alias:	NAS# 0035G
Replicates:	8
Mean:	0.348
SD:	0.059
Tr Mean:	0.348
Trans SD:	0.059

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.043	Statistic:	Student's t
Residual SD:	0.051	Test Residual SD:	0.038	Balanced Design:	Yes
SS:	0.049	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.046		
b:	0.21	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.8973	Calculated Value:	0.3291	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	4.0974
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.3	0.3	0.42	0.42	0.048	0.049			-0.098
2	0.43	0.43	0.61	0.61	0.083	0.141			-0.049
3	0.35	0.35	0.45	0.45	0.003	0.019			-0.048
4	0.33	0.33	0.46	0.46	0.018	0.009			-0.039
5	0.36	0.36	0.46	0.46	0.013	0.009			-0.019
6	0.42	0.42	0.43	0.43	0.073	0.039			-0.019
7	0.25	0.25	0.47	0.47	0.098	0.001			-0.018
8	0.34	0.34	0.45	0.45	0.007	0.019			-0.009
9									-0.009
10									-0.007
11									0.001
12									0.003
13									0.013
14									0.073
15									0.083
16									0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164413
Alias:	NAS# 0036G
Replicates:	8
Mean:	0.403
SD:	0.075
Tr Mean:	0.403
Trans SD:	0.075

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.058
SS:	0.064
K:	8
b:	0.245
Alpha Level:	0.05
Calculated Value:	0.9378
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.06
Test Residual SD:	0.038
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.046
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.1563
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	1.9622
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.37	0.37	0.42	0.42	0.033	0.049			-0.123
2	0.41	0.41	0.61	0.61	0.007	0.141			-0.063
3	0.49	0.49	0.45	0.45	0.088	0.019			-0.049
4	0.46	0.46	0.46	0.46	0.058	0.009			-0.039
5	0.49	0.49	0.46	0.46	0.088	0.009			-0.033
6	0.28	0.28	0.43	0.43	0.123	0.039			-0.023
7	0.38	0.38	0.47	0.47	0.023	0.001			-0.019
8	0.34	0.34	0.45	0.45	0.063	0.019			-0.019
9									-0.009
10									-0.009
11									0.001
12									0.007
13									0.058
14									0.088
15									0.088
16									0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164407
Alias:	NAS# 0037G
Replicates:	8
Mean:	0.371
SD:	0.049
Tr Mean:	0.371
Trans SD:	0.049

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.047
SS:	0.042
K:	8
b:	0.194
Alpha Level:	0.05
Calculated Value:	0.9045
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.039
Test Residual SD:	0.026
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.046
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.1679
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	3.5783
Critical Value:	>= 1.761
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.44	0.44	0.42	0.42	0.069	0.049			-0.081
2	0.4	0.4	0.61	0.61	0.029	0.141			-0.049
3	0.33	0.33	0.45	0.45	0.041	0.019			-0.041
4	0.35	0.35	0.46	0.46	0.021	0.009			-0.039
5	0.42	0.42	0.46	0.46	0.049	0.009			-0.021
6	0.38	0.38	0.43	0.43	0.009	0.039			-0.019
7	0.29	0.29	0.47	0.47	0.081	0.001			-0.019
8	0.36	0.36	0.45	0.45	0.011	0.019			-0.011
9									-0.009
10									-0.009
11									0.001
12									0.009
13									0.029
14									0.049
15									0.069
16									0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164409
Alias:	NAS# 0038G
Replicates:	8
Mean:	0.486
SD:	0.07
Tr Mean:	0.486
Trans SD:	0.07

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.056
SS:	0.059
K:	8
b:	0.238
Alpha Level:	0.05
Calculated Value:	0.956
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.059
Test Residual SD:	0.031
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.046
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	1.1855
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	-0.5388
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.46	0.46	0.42	0.42	0.026	0.049			-0.116
2	0.47	0.47	0.61	0.61	0.016	0.141			-0.076
3	0.41	0.41	0.45	0.45	0.076	0.019			-0.049
4	0.56	0.56	0.46	0.46	0.074	0.009			-0.039
5	0.54	0.54	0.46	0.46	0.054	0.009			-0.026
6	0.37	0.37	0.43	0.43	0.116	0.039			-0.019
7	0.54	0.54	0.47	0.47	0.054	0.001			-0.019
8	0.54	0.54	0.45	0.45	0.054	0.019			-0.016
9									-0.009
10									-0.009
11									0.001
12									0.054
13									0.054
14									0.054
15									0.074
16									0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164410
Alias:	NAS# 0039G
Replicates:	8
Mean:	0.423
SD:	0.075
Tr Mean:	0.423
Trans SD:	0.075

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.065	Statistic:	Student's t
Residual SD:	0.058	Test Residual SD:	0.029	Balanced Design:	Yes
SS:	0.064	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.046		
b:	0.247	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.947	Calculated Value:	1.5434	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
				Calculated Value:	1.3656
Override Option:	N/A			Critical Value:	>= 1.761
				Accept Null Hypothesis:	Yes
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.39	0.39	0.42	0.42	0.033	0.049			-0.103
2	0.53	0.53	0.61	0.61	0.108	0.141			-0.083
3	0.47	0.47	0.45	0.45	0.048	0.019			-0.049
4	0.32	0.32	0.46	0.46	0.103	0.009			-0.043
5	0.38	0.38	0.46	0.46	0.043	0.009			-0.039
6	0.34	0.34	0.43	0.43	0.083	0.039			-0.033
7	0.47	0.47	0.47	0.47	0.048	0.001			-0.019
8	0.48	0.48	0.45	0.45	0.058	0.019			-0.019
9									-0.009
10									-0.009
11									0.001
12									0.048
13									0.048
14									0.058
15									0.108
16									0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164411
Alias:	NAS# 0040G
Replicates:	8
Mean:	0.483
SD:	0.068
Tr Mean:	0.483
Trans SD:	0.068

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.055
SS:	0.057
K:	8
b:	0.227
Alpha Level:	0.05
Calculated Value:	0.9053
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.047
Test Residual SD:	0.046
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.046
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.4935
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	-0.4316
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.49	0.49	0.42	0.42	0.008	0.049			-0.113
2	0.37	0.37	0.61	0.61	0.113	0.141			-0.063
3	0.51	0.51	0.45	0.45	0.028	0.019			-0.049
4	0.47	0.47	0.46	0.46	0.013	0.009			-0.039
5	0.51	0.51	0.46	0.46	0.028	0.009			-0.019
6	0.6	0.6	0.43	0.43	0.118	0.039			-0.019
7	0.49	0.49	0.47	0.47	0.008	0.001			-0.013
8	0.42	0.42	0.45	0.45	0.063	0.019			-0.009
9									-0.009
10									0.001
11									0.008
12									0.008
13									0.028
14									0.028
15									0.118
16									0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164415
Alias:	NAS# 0041G
Replicates:	8
Mean:	0.525
SD:	0.049
Tr Mean:	0.525
Trans SD:	0.049

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.047
SS:	0.041
K:	8
b:	0.195
Alpha Level:	0.05
Calculated Value:	0.9174
Critical Value:	<= 0.887
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.039
Test Residual SD:	0.026
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.046
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.1691
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	14
Experimental Alpha Level:	0.05
Calculated Value:	-2.0716
Critical Value:	>= 1.761
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.45	0.45	0.42	0.42	0.075	0.049			-0.075
2	0.57	0.57	0.61	0.61	0.045	0.141			-0.075
3	0.52	0.52	0.45	0.45	0.005	0.019			-0.049
4	0.45	0.45	0.46	0.46	0.075	0.009			-0.039
5	0.56	0.56	0.46	0.46	0.035	0.009			-0.019
6	0.54	0.54	0.43	0.43	0.015	0.039			-0.019
7	0.55	0.55	0.47	0.47	0.025	0.001			-0.009
8	0.56	0.56	0.45	0.45	0.035	0.019			-0.009
9									-0.005
10									0.001
11									0.015
12									0.025
13									0.035
14									0.035
15									0.045
16									0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164423
Alias:	NAS# 0042G
Replicates:	8
Mean:	0.323
SD:	0.053
Tr Mean:	0.323
Trans SD:	0.053

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.043	Statistic:	Student's t
Residual SD:	0.048	Test Residual SD:	0.028	Balanced Design:	Yes
SS:	0.045	Ref. Residual Mean:	0.036	Transformation:	No Transformation
K:	8	Ref. Residual SD:	0.046		
b:	0.203	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.9271	Calculated Value:	0.3635	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
Normally Distributed:	Yes	Variances Homogeneous:	Yes	Degrees of Freedom:	14
				Experimental Alpha Level:	0.05
Override Option:	N/A			Calculated Value:	5.1801
				Critical Value:	>= 1.761
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.37	0.37	0.42	0.42	0.048	0.049			-0.103
2	0.29	0.29	0.61	0.61	0.033	0.141			-0.049
3	0.35	0.35	0.45	0.45	0.028	0.019			-0.039
4	0.38	0.38	0.46	0.46	0.058	0.009			-0.033
5	0.22	0.22	0.46	0.46	0.103	0.009			-0.023
6	0.3	0.3	0.43	0.43	0.023	0.039			-0.019
7	0.36	0.36	0.47	0.47	0.038	0.001			-0.019
8	0.31	0.31	0.45	0.45	0.013	0.019			-0.013
9									-0.009
10									-0.009
11									0.001
12									0.028
13									0.038
14									0.048
15									0.058
16									0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164424
Alias:	NAS# 0043G
Replicates:	8
Mean:	0.335
SD:	0.052
Tr Mean:	0.335
Trans SD:	0.052

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:		Levene's Results:		Test Results:	
Residual Mean:	0	Test Residual Mean:	0.048	Statistic:	Mann-Whitney
Residual SD:	0.048	Test Residual SD:	0.01	Balanced Design:	Yes
SS:	0.043	Ref. Residual Mean:	0.036	Transformation:	rank-order
K:	8	Ref. Residual SD:	0.046		
b:	0.196	Deg. of Freedom:	14		
				Experimental Hypothesis	
Alpha Level:	0.05	Alpha Level:	0.1	Null:	x1 >= x2
Calculated Value:	0.8866	Calculated Value:	0.7188	Alternate:	x1 < x2
Critical Value:	<= 0.887	Critical Value:	>= 1.761		
				Mann-Whitney N1:	8
Normally		Variances		Mann-Whitney N2:	8
Distributed:	No	Homogeneous:	Yes	Degrees of Freedom:	
				Experimental Alpha Level:	0.05
Override Option:	Not Invoked			Calculated Value:	64
				Critical Value:	>= 49.0
				Accept Null Hypothesis:	No
				Power:	
				Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.38	6	0.42	9	0.045	0.049	0.27		-0.065
2	0.3	3.5	0.61	16	0.035	0.141	0.28		-0.055
3	0.38	6	0.45	11.5	0.045	0.019	0.3		-0.049
4	0.38	6	0.46	13.5	0.045	0.009	0.3		-0.039
5	0.27	1	0.46	13.5	0.065	0.009	0.38		-0.035
6	0.28	2	0.43	10	0.055	0.039	0.38		-0.035
7	0.39	8	0.47	15	0.055	0.001	0.38		-0.019
8	0.3	3.5	0.45	11.5	0.035	0.019	0.39		-0.019
9							0.42		-0.009
10							0.43		-0.009
11							0.45		0.001
12							0.45		0.045
13							0.46		0.045
14							0.46		0.045
15							0.47		0.055
16							0.61		0.141

Project Name: P727-2 Hyalella 28-day Individual weight

Sample:	x1
Samp ID:	5164427
Alias:	NAS# 0044G
Replicates:	8
Mean:	0.518
SD:	0.086
Tr Mean:	0.518
Trans SD:	0.086

Ref Samp:	x2
Ref ID:	5164496
Alias:	NAS# 0002G
Replicates:	8
Mean:	0.469
SD:	0.059
Tr Mean:	0.469
Trans SD:	0.059

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.063
SS:	0.076
K:	8
b:	0.26
Alpha Level:	0.05
Calculated Value:	0.8834
Critical Value:	<= 0.887
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	0.06
Test Residual SD:	0.057
Ref. Residual Mean:	0.036
Ref. Residual SD:	0.046
Deg. of Freedom:	14
Alpha Level:	0.1
Calculated Value:	0.9447
Critical Value:	>= 1.761
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Mann-Whitney N1:	8
Mann-Whitney N2:	8
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	19.5
Critical Value:	>= 49.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.53	12.5	0.42	2	0.013	0.049	0.4		-0.118
2	0.53	12.5	0.61	15	0.013	0.141	0.42		-0.088
3	0.5	10.5	0.45	5.5	0.018	0.019	0.43		-0.049
4	0.68	16	0.46	7.5	0.163	0.009	0.43		-0.039
5	0.57	14	0.46	7.5	0.053	0.009	0.45		-0.019
6	0.5	10.5	0.43	3.5	0.018	0.039	0.45		-0.019
7	0.4	1	0.47	9	0.118	0.001	0.46		-0.018
8	0.43	3.5	0.45	5.5	0.088	0.019	0.46		-0.018
9							0.47		-0.009
10							0.5		-0.009
11							0.5		0.001
12							0.53		0.013
13							0.53		0.013
14							0.57		0.053
15							0.61		0.141
16							0.68		0.163

Water Quality Data

	NAS	CLIENT			Overlying water						
BKR	SMPL	DESCRIP	REPL	DAY	TEMP	DO	COND	pH	NH3	HARD	ALK
3	0033G	05164406	8	0	23.5	8.2	275	7.5	0.1	77	60
12	0002G	05164496	8	0	23.3	6.6	330	7.2	0.5	103	90
21	0043G	05164424	8	0	23.3	6.6	270	6.8	0.3	86	70
29	9988F	05164475	8	0	23.4	6.7	325	7.2	0.3	120	110
31	9997F	05164507	8	0	23.4	6.8	300	7.0	0.6	103	80
37	0038G	05164409	8	0	23.3	7.9	270	7.5	0.1	77	70
40	0042F	05164423	8	0	23.5	8.0	285	7.5	0.2	86	70
41	0032G	05164405	8	0	23.4	8.0	285	7.5	0.2	86	80
43	9996F	05164494	8	0	23.4	7.3	290	7.2	0.2	86	80
51	9993F	05164485	8	0	23.5	6.8	285	7.1	0.3	86	70
52	9952F	Control	8	0	23.5	7.0	350	7.1	0.2	68	60
60	0039G	05164410	8	0	23.9	7.1	280	6.7	0.4	86	80
76	9987F	05164474	8	0	23.4	7.0	335	6.9	0.9	120	110
78	9986F	05164473	8	0	23.4	6.9	345	7.2	0.5	111	120
80	0041G	05164415	8	0	23.5	7.2	300	7.3	0.1	103	90
94	9994F	05164486	8	0	23.5	6.6	300	6.9	0.6	94	90
100	9995F	05164487	8	0	23.8	6.8	290	6.9	0.7	94	70
121	0034G	05164408	8	0	23.5	7.0	255	6.7	0.4	68	60
137	9983F	05164470	8	0	23.4	7.0	340	7.3	0.6	128	150
143	9999F	05164491	8	0	23.4	7.2	290	7.3	0.2	86	70
145	9998F	05164489	8	0	23.8	7.0	275	7.0	0.4	86	80
159	0035G	05164412	8	0	23.5	7.0	275	6.8	0.3	86	80
170	9985F	05164472	8	0	23.7	7.8	275	7.4	0.2	77	70
179	0037G	05164407	8	0	23.4	7.9	290	7.5	0.2	103	80
204	0036G	05164413	8	0	23.5	6.4	305	7.1	0.3	111	90
216	9991F	05164479	8	0	23.5	6.8	285	7.4	0.3	86	80
217	0040G	05164411	8	0	23.5	7.8	300	7.4	0.3	94	80
221	9989F	05164478	8	0	23.5	7.8	345	7.5	0.4	94	80
227	9992F	05164483	8	0	23.5	7.8	290	7.2	0.3	128	120
229	9990F	05164476	8	0	23.5	7.0	345	7.3	0.3	137	140
250	0001G	05164493	8	0	23.8	7.2	305	7.1	0.3	103	90
255	0044G	05164427	8	0	23.9	7.1	305	7.3	0.1	103	90
3	0033G	05164406	8	1	23.4	7.7		7.1			
12	0002G	05164496	8	1	23.1	5.8		7.1			
21	0043G	05164424	8	1	23.2	6.7		6.9			
29	9988F	05164475	8	1	23.2	6.9		7.0			
31	9997F	05164507	8	1	23.2	7.0		7.0			
37	0038G	05164409	8	1	23.0	7.4		7.2			
40	0042F	05164423	8	1	23.4	7.4		7.2			
41	0032G	05164405	8	1	23.2	7.3		7.2			
43	9996F	05164494	8	1	23.1	7.2		7.1			
51	9993F	05164485	8	1	23.3	7.1		7.1			
52	9952F	Control	8	1	23.3	6.9		7.0			
60	0039G	05164410	8	1	23.6	6.9		6.9			
76	9987F	05164474	8	1	23.3	7.0		6.9			
78	9986F	05164473	8	1	23.2	7.0		7.1			
80	0041G	05164415	8	1	23.6	7.1		7.1			
94	9994F	05164486	8	1	23.4	6.6		6.9			
100	9995F	05164487	8	1	23.6	7.0		7.0			
121	0034G	05164408	8	1	23.4	7.1		6.9			
137	9983F	05164470	8	1	23.3	6.8		7.3			
143	9999F	05164491	8	1	23.3	7.1		7.1			
145	9998F	05164489	8	1	23.6	6.8		6.9			
159	0035G	05164412	8	1	23.3	6.9		6.9			

170	9985F	05164472	8	1	23.5	7.4		7.1			
179	0037G	05164407	8	1	23.3	7.5		7.3			
204	0036G	05164413	8	1	23.4	7.3		7.1			
216	9991F	05164479	8	1	23.5	7.5		7.2			
217	0040G	05164411	8	1	23.4	7.4		7.2			
221	9989F	05164478	8	1	23.5	6.8		7.2			
227	9992F	05164483	8	1	23.4	6.9		7.1			
229	9990F	05164476	8	1	23.4	6.8		7.2			
250	0001G	05164493	8	1	23.8	7.3		7.1			
255	0044G	05164427	8	1	23.9	7.4		7.2			
3	0033G	05164406	8	2	23.2						
12	0002G	05164496	8	2	22.9						
21	0043G	05164424	8	2	22.9						
29	9988F	05164475	8	2	22.9						
31	9997F	05164507	8	2	22.9						
37	0038G	05164409	8	2	22.9						
40	0042F	05164423	8	2	23.0						
41	0032G	05164405	8	2	22.9						
43	9996F	05164494	8	2	23.0						
51	9993F	05164485	8	2	23.1						
52	9952F	Control	8	2	23.1						
60	0039G	05164410	8	2	23.3						
76	9987F	05164474	8	2	23.0						
78	9986F	05164473	8	2	23.0						
80	0041G	05164415	8	2	23.3						
94	9994F	05164486	8	2	23.2						
100	9995F	05164487	8	2	23.3						
121	0034G	05164408	8	2	23.0						
137	9983F	05164470	8	2	22.9						
143	9999F	05164491	8	2	22.9						
145	9998F	05164489	8	2	23.2						
159	0035G	05164412	8	2	23.0						
170	9985F	05164472	8	2	23.2						
179	0037G	05164407	8	2	23.0						
204	0036G	05164413	8	2	23.0						
216	9991F	05164479	8	2	23.1						
217	0040G	05164411	8	2	23.1						
221	9989F	05164478	8	2	23.0						
227	9992F	05164483	8	2	23.0						
229	9990F	05164476	8	2	23.0						
250	0001G	05164493	8	2	23.2						
255	0044G	05164427	8	2	23.4						
3	0033G	05164406	8	3	23.2						
12	0002G	05164496	8	3	22.9						
21	0043G	05164424	8	3	22.9						
29	9988F	05164475	8	3	22.9						
31	9997F	05164507	8	3	22.9						
37	0038G	05164409	8	3	23.0						
40	0042F	05164423	8	3	23.0						
41	0032G	05164405	8	3	22.9						
43	9996F	05164494	8	3	22.9						
51	9993F	05164485	8	3	23.0						
52	9952F	Control	8	3	22.9						
60	0039G	05164410	8	3	23.2						
76	9987F	05164474	8	3	23.0						
78	9986F	05164473	8	3	22.9						
80	0041G	05164415	8	3	23.2						
94	9994F	05164486	8	3	23.0						
100	9995F	05164487	8	3	23.2						

121	0034G	05164408	8	3	22.9						
137	9983F	05164470	8	3	22.9						
143	9999F	05164491	8	3	22.9						
145	9998F	05164489	8	3	23.1						
159	0035G	05164412	8	3	22.9						
170	9985F	05164472	8	3	23.1						
179	0037G	05164407	8	3	22.9						
204	0036G	05164413	8	3	22.9						
216	9991F	05164479	8	3	23.0						
217	0040G	05164411	8	3	22.9						
221	9989F	05164478	8	3	22.9						
227	9992F	05164483	8	3	22.9						
229	9990F	05164476	8	3	23.0						
250	0001G	05164493	8	3	23.3						
255	0044G	05164427	8	3	23.4						
3	0033G	05164406	8	4	22.9	6.7		7.2			
12	0002G	05164496	8	4	22.7	6.9		7.3			
21	0043G	05164424	8	4	22.7	7.1		7.2			
29	9988F	05164475	8	4	22.7	7.1		7.1			
31	9997F	05164507	8	4	22.7	7.3		7.2			
37	0038G	05164409	8	4	22.6	7.6		7.3			
40	0042F	05164423	8	4	22.8	7.5		7.2			
41	0032G	05164405	8	4	22.7	7.6		7.1			
43	9996F	05164494	8	4	22.6	7.5		7.2			
51	9993F	05164485	8	4	22.9	7.3		7.2			
52	9952F	Control	8	4	22.8	7.2		7.1			
60	0039G	05164410	8	4	23.0	7.2		7.0			
76	9987F	05164474	8	4	22.8	7.1		7.0			
78	9986F	05164473	8	4	22.7	7.1		7.1			
80	0041G	05164415	8	4	23.0	7.0		7.1			
94	9994F	05164486	8	4	22.8	6.7		7.0			
100	9995F	05164487	8	4	23.1	7.1		7.0			
121	0034G	05164408	8	4	22.8	7.3		7.0			
137	9983F	05164470	8	4	22.7	6.8		7.2			
143	9999F	05164491	8	4	22.7	7.0		7.2			
145	9998F	05164489	8	4	23.0	7.1		7.1			
159	0035G	05164412	8	4	22.7	7.0		7.0			
170	9985F	05164472	8	4	22.9	7.3		7.1			
179	0037G	05164407	8	4	22.8	7.3		7.2			
204	0036G	05164413	8	4	22.8	7.2		7.1			
216	9991F	05164479	8	4	22.8	7.4		7.1			
217	0040G	05164411	8	4	22.8	7.2		7.1			
221	9989F	05164478	8	4	22.8	6.7		7.1			
227	9992F	05164483	8	4	22.7	6.9		7.1			
229	9990F	05164476	8	4	22.8	6.8		7.2			
250	0001G	05164493	8	4	23.2	7.1		7.1			
255	0044G	05164427	8	4	23.2	7.1		7.2			
3	0033G	05164406	8	5	22.9						
12	0002G	05164496	8	5	22.7						
21	0043G	05164424	8	5	22.7						
29	9988F	05164475	8	5	22.7						
31	9997F	05164507	8	5	22.7						
37	0038G	05164409	8	5	22.6						
40	0042F	05164423	8	5	22.8						
41	0032G	05164405	8	5	22.7						
43	9996F	05164494	8	5	22.7						
51	9993F	05164485	8	5	22.8						
52	9952F	Control	8	5	22.8						
60	0039G	05164410	8	5	23.0						

76	9987F	05164474	8	5	22.9				
78	9986F	05164473	8	5	22.8				
80	0041G	05164415	8	5	23.0				
94	9994F	05164486	8	5	22.8				
100	9995F	05164487	8	5	23.1				
121	0034G	05164408	8	5	22.9				
137	9983F	05164470	8	5	22.8				
143	9999F	05164491	8	5	22.8				
145	9998F	05164489	8	5	23.0				
159	0035G	05164412	8	5	22.9				
170	9985F	05164472	8	5	23.0				
179	0037G	05164407	8	5	22.8				
204	0036G	05164413	8	5	22.9				
216	9991F	05164479	8	5	22.9				
217	0040G	05164411	8	5	22.7				
221	9989F	05164478	8	5	22.9				
227	9992F	05164483	8	5	22.8				
229	9990F	05164476	8	5	22.9				
250	0001G	05164493	8	5	23.2				
255	0044G	05164427	8	5	23.3				
3	0033G	05164406	8	6	22.9	6.2	285	7.1	
12	0002G	05164496	8	6	22.7	5.3	300	7.1	
21	0043G	05164424	8	6	22.7	6.3	285	7.1	
29	9988F	05164475	8	6	22.7	6.4	290	7.1	
31	9997F	05164507	8	6	22.7	6.5	290	7.1	
37	0038G	05164409	8	6	22.6	6.6	290	7.1	
40	0042F	05164423	8	6	22.8	6.7	290	7.2	
41	0032G	05164405	8	6	22.7	6.8	285	7.2	
43	9996F	05164494	8	6	22.7	6.8	285	7.1	
51	9993F	05164485	8	6	22.8	6.8	285	7.1	
52	9952F	Control	8	6	22.9	6.6	285	7.1	
60	0039G	05164410	8	6	22.8	6.2	285	7.0	
76	9987F	05164474	8	6	22.9	6.2	295	7.0	
78	9986F	05164473	8	6	22.8	6.3	285	7.1	
80	0041G	05164415	8	6	23.2	6.1	290	7.1	
94	9994F	05164486	8	6	22.9	6.2	285	7.1	
100	9995F	05164487	8	6	23.2	6.3	285	7.0	
121	0034G	05164408	8	6	22.9	6.4	280	7.0	
137	9983F	05164470	8	6	22.8	6.4	295	7.3	
143	9999F	05164491	8	6	22.8	6.4	285	7.2	
145	9998F	05164489	8	6	23.1	6.5	285	7.1	
159	0035G	05164412	8	6	22.8	6.6	280	7.1	
170	9985F	05164472	8	6	22.9	6.7	285	7.1	
179	0037G	05164407	8	6	22.8	6.6	290	7.2	
204	0036G	05164413	8	6	22.9	6.7	285	7.1	
216	9991F	05164479	8	6	22.9	6.9	285	7.2	
217	0040G	05164411	8	6	22.8	6.7	285	7.2	
221	9989F	05164478	8	6	22.9	6.1	300	7.4	
227	9992F	05164483	8	6	22.8	6.6	280	7.2	
229	9990F	05164476	8	6	22.9	6.3	295	7.2	
250	0001G	05164493	8	6	23.3	6.4	290	7.1	
255	0044G	05164427	8	6	23.4	6.3	295	7.2	
3	0033G	05164406	8	7	22.9				
12	0002G	05164496	8	7	22.8				
21	0043G	05164424	8	7	22.8				
29	9988F	05164475	8	7	22.8				
31	9997F	05164507	8	7	22.8				
37	0038G	05164409	8	7	22.7				
40	0042F	05164423	8	7	22.9				

41	0032G	05164405	8	7	22.8						
43	9996F	05164494	8	7	22.7						
51	9993F	05164485	8	7	23.0						
52	9952F	Control	8	7	23.0						
60	0039G	05164410	8	7	23.2						
76	9987F	05164474	8	7	22.9						
78	9986F	05164473	8	7	22.8						
80	0041G	05164415	8	7	23.2						
94	9994F	05164486	8	7	23.0						
100	9995F	05164487	8	7	23.2						
121	0034G	05164408	8	7	23.0						
137	9983F	05164470	8	7	22.9						
143	9999F	05164491	8	7	22.9						
145	9998F	05164489	8	7	23.1						
159	0035G	05164412	8	7	22.9						
170	9985F	05164472	8	7	23.0						
179	0037G	05164407	8	7	22.9						
204	0036G	05164413	8	7	23.0						
216	9991F	05164479	8	7	23.0						
217	0040G	05164411	8	7	23.0						
221	9989F	05164478	8	7	23.0						
227	9992F	05164483	8	7	22.9						
229	9990F	05164476	8	7	23.0						
250	0001G	05164493	8	7	23.3						
255	0044G	05164427	8	7	23.4						
3	0033G	05164406	8	8	22.9	7.8		7.1			
12	0002G	05164496	8	8	22.7	6.8		7.1			
21	0043G	05164424	8	8	22.8	7.1		7.0			
29	9988F	05164475	8	8	22.8	7.2		7.0			
31	9997F	05164507	8	8	22.8	7.3		7.0			
37	0038G	05164409	8	8	22.7	7.4		7.0			
40	0042F	05164423	8	8	22.9	7.6		7.1			
41	0032G	05164405	8	8	22.8	7.6		7.1			
43	9996F	05164494	8	8	22.7	7.5		7.1			
51	9993F	05164485	8	8	22.9	7.2		7.0			
52	9952F	Control	8	8	22.8	7.1		7.0			
60	0039G	05164410	8	8	23.0	6.8		7.0			
76	9987F	05164474	8	8	22.9	6.5		6.9			
78	9986F	05164473	8	8	22.8	6.8		6.9			
80	0041G	05164415	8	8	23.0	7.0		7.0			
94	9994F	05164486	8	8	22.9	6.6		6.9			
100	9995F	05164487	8	8	23.0	6.8		6.9			
121	0034G	05164408	8	8	22.9	7.0		6.9			
137	9983F	05164470	8	8	22.8	6.7		7.4			
143	9999F	05164491	8	8	22.7	7.0		7.1			
145	9998F	05164489	8	8	22.9	6.9		7.0			
159	0035G	05164412	8	8	22.8	6.9		6.9			
170	9985F	05164472	8	8	23.0	7.2		7.0			
179	0037G	05164407	8	8	22.8	7.3		7.1			
204	0036G	05164413	8	8	22.9	7.1		7.0			
216	9991F	05164479	8	8	22.9	7.0		7.0			
217	0040G	05164411	8	8	22.9	6.9		7.0			
221	9989F	05164478	8	8	22.9	6.6		7.4			
227	9992F	05164483	8	8	22.8	7.1		6.9			
229	9990F	05164476	8	8	22.9	6.7		7.1			
250	0001G	05164493	8	8	23.2	6.8		7.0			
255	0044G	05164427	8	8	23.3	6.8		7.0			
3	0033G	05164406	8	9	23.1						
12	0002G	05164496	8	9	22.8						

21	0043G	05164424	8	9	22.9							
29	9988F	05164475	8	9	22.9							
31	9997F	05164507	8	9	22.9							
37	0038G	05164409	8	9	22.8							
40	0042F	05164423	8	9	23.0							
41	0032G	05164405	8	9	22.9							
43	9996F	05164494	8	9	22.9							
51	9993F	05164485	8	9	22.9							
52	9952F	Control	8	9	22.9							
60	0039G	05164410	8	9	23.2							
76	9987F	05164474	8	9	22.9							
78	9986F	05164473	8	9	22.9							
80	0041G	05164415	8	9	23.2							
94	9994F	05164486	8	9	22.9							
100	9995F	05164487	8	9	23.2							
121	0034G	05164408	8	9	22.9							
137	9983F	05164470	8	9	22.9							
143	9999F	05164491	8	9	22.9							
145	9998F	05164489	8	9	23.1							
159	0035G	05164412	8	9	22.9							
170	9985F	05164472	8	9	23.0							
179	0037G	05164407	8	9	22.9							
204	0036G	05164413	8	9	23.0							
216	9991F	05164479	8	9	23.0							
217	0040G	05164411	8	9	23.0							
221	9989F	05164478	8	9	22.9							
227	9992F	05164483	8	9	22.9							
229	9990F	05164476	8	9	23.0							
250	0001G	05164493	8	9	23.3							
255	0044G	05164427	8	9	23.4							
3	0033G	05164406	8	10	23.4							
12	0002G	05164496	8	10	23.4							
21	0043G	05164424	8	10	23.2							
29	9988F	05164475	8	10	23.2							
31	9997F	05164507	8	10	23.2							
37	0038G	05164409	8	10	23.2							
40	0042F	05164423	8	10	23.3							
41	0032G	05164405	8	10	23.2							
43	9996F	05164494	8	10	23.2							
51	9993F	05164485	8	10	23.2							
52	9952F	Control	8	10	23.2							
60	0039G	05164410	8	10	23.3							
76	9987F	05164474	8	10	23.2							
78	9986F	05164473	8	10	23.2							
80	0041G	05164415	8	10	23.3							
94	9994F	05164486	8	10	23.2							
100	9995F	05164487	8	10	23.4							
121	0034G	05164408	8	10	23.2							
137	9983F	05164470	8	10	23.2							
143	9999F	05164491	8	10	23.2							
145	9998F	05164489	8	10	23.2							
159	0035G	05164412	8	10	23.2							
170	9985F	05164472	8	10	23.3							
179	0037G	05164407	8	10	23.2							
204	0036G	05164413	8	10	23.2							
216	9991F	05164479	8	10	23.3							
217	0040G	05164411	8	10	23.3							
221	9989F	05164478	8	10	23.3							
227	9992F	05164483	8	10	23.2							

229	9990F	05164476	8	10	23.3						
250	0001G	05164493	8	10	23.4						
255	0044G	05164427	8	10	23.5						
3	0033G	05164406	8	11	23.1	7.2		7.0			
12	0002G	05164496	8	11	23.0	6.5		7.0			
21	0043G	05164424	8	11	23.0	6.5		7.0			
29	9988F	05164475	8	11	23.0	6.7		6.9			
31	9997F	05164507	8	11	23.0	6.8		6.9			
37	0038G	05164409	8	11	23.0	7.1		6.9			
40	0042F	05164423	8	11	23.0	7.1		7.0			
41	0032G	05164405	8	11	23.0	7.0		7.0			
43	9996F	05164494	8	11	23.0	7.0		6.9			
51	9993F	05164485	8	11	23.1	7.2		7.0			
52	9952F	Control	8	11	23.1	6.7		6.9			
60	0039G	05164410	8	11	23.2	6.5		7.0			
76	9987F	05164474	8	11	23.1	6.4		6.9			
78	9986F	05164473	8	11	23.0	6.3		7.1			
80	0041G	05164415	8	11	23.2	6.6		7.0			
94	9994F	05164486	8	11	23.1	6.4		6.9			
100	9995F	05164487	8	11	23.2	6.6		6.9			
121	0034G	05164408	8	11	23.1	6.8		6.8			
137	9983F	05164470	8	11	23.0	5.7		7.6			
143	9999F	05164491	8	11	23.0	6.5		7.0			
145	9998F	05164489	8	11	23.2	6.4		7.1			
159	0035G	05164412	8	11	23.0	6.7		6.9			
170	9985F	05164472	8	11	23.2	6.8		7.0			
179	0037G	05164407	8	11	23.1	6.8		7.0			
204	0036G	05164413	8	11	23.1	6.8		6.9			
216	9991F	05164479	8	11	23.1	7.0		6.9			
217	0040G	05164411	8	11	23.1	7.0		6.9			
221	9989F	05164478	8	11	23.2	6.0		7.4			
227	9992F	05164483	8	11	23.1	6.7		7.0			
229	9990F	05164476	8	11	23.1	6.1		7.2			
250	0001G	05164493	8	11	23.4	6.6		6.9			
255	0044G	05164427	8	11	23.4	6.6		7.0			
3	0033G	05164406	8	12	23.0						
12	0002G	05164496	8	12	22.8						
21	0043G	05164424	8	12	22.8						
29	9988F	05164475	8	12	22.8						
31	9997F	05164507	8	12	22.8						
37	0038G	05164409	8	12	22.7						
40	0042F	05164423	8	12	22.9						
41	0032G	05164405	8	12	22.9						
43	9996F	05164494	8	12	22.7						
51	9993F	05164485	8	12	22.9						
52	9952F	Control	8	12	22.9						
60	0039G	05164410	8	12	23.1						
76	9987F	05164474	8	12	22.9						
78	9986F	05164473	8	12	22.8						
80	0041G	05164415	8	12	23.1						
94	9994F	05164486	8	12	22.9						
100	9995F	05164487	8	12	23.1						
121	0034G	05164408	8	12	22.9						
137	9983F	05164470	8	12	22.9						
143	9999F	05164491	8	12	22.8						
145	9998F	05164489	8	12	23.0						
159	0035G	05164412	8	12	22.8						
170	9985F	05164472	8	12	23.0						
179	0037G	05164407	8	12	22.8						

204	0036G	05164413	8	12	22.9						
216	9991F	05164479	8	12	23.0						
217	0040G	05164411	8	12	23.0						
221	9989F	05164478	8	12	22.9						
227	9992F	05164483	8	12	22.9						
229	9990F	05164476	8	12	22.9						
250	0001G	05164493	8	12	23.1						
255	0044G	05164427	8	12	23.2						
3	0033G	05164406	8	13	22.9	7.5	285	7.2			
12	0002G	05164496	8	13	22.7	6.6	300	7.1			
21	0043G	05164424	8	13	22.8	7.0	290	7.2			
29	9988F	05164475	8	13	22.7	7.0	290	7.0			
31	9997F	05164507	8	13	22.8	7.1	290	7.0			
37	0038G	05164409	8	13	22.7	7.2	290	7.0			
40	0042F	05164423	8	13	22.9	7.3	290	7.1			
41	0032G	05164405	8	13	22.8	7.3	290	7.1			
43	9996F	05164494	8	13	22.7	7.3	285	7.1			
51	9993F	05164485	8	13	22.9	7.2	295	7.0			
52	9952F	Control	8	13	22.8	7.0	295	7.1			
60	0039G	05164410	8	13	23.1	6.7	295	7.1			
76	9987F	05164474	8	13	22.8	6.8	295	6.9			
78	9986F	05164473	8	13	22.7	6.8	295	7.1			
80	0041G	05164415	8	13	23.1	6.9	295	7.0			
94	9994F	05164486	8	13	22.8	7.0	295	7.0			
100	9995F	05164487	8	13	23.1	6.9	290	7.0			
121	0034G	05164408	8	13	22.8	7.2	285	6.8			
137	9983F	05164470	8	13	22.7	6.4	320	7.5			
143	9999F	05164491	8	13	22.7	6.8	295	7.0			
145	9998F	05164489	8	13	23.0	6.8	295	7.1			
159	0035G	05164412	8	13	22.7	7.0	285	6.9			
170	9985F	05164472	8	13	22.9	7.1	290	6.9			
179	0037G	05164407	8	13	22.7	7.2	290	7.0			
204	0036G	05164413	8	13	22.8	7.2	295	6.9			
216	9991F	05164479	8	13	22.9	7.3	295	6.9			
217	0040G	05164411	8	13	22.9	7.1	290	6.9			
221	9989F	05164478	8	13	22.9	6.4	315	7.8			
227	9992F	05164483	8	13	22.8	7.1	285	7.0			
229	9990F	05164476	8	13	22.8	6.5	300	7.6			
250	0001G	05164493	8	13	23.1	6.8	300	7.0			
255	0044G	05164427	8	13	23.2	6.9	300	7.1			
3	0033G	05164406	8	14	23.0						
12	0002G	05164496	8	14	22.9						
21	0043G	05164424	8	14	22.9						
29	9988F	05164475	8	14	22.9						
31	9997F	05164507	8	14	22.9						
37	0038G	05164409	8	14	23.0						
40	0042F	05164423	8	14	22.9						
41	0032G	05164405	8	14	22.8						
43	9996F	05164494	8	14	22.8						
51	9993F	05164485	8	14	22.9						
52	9952F	Control	8	14	22.9						
60	0039G	05164410	8	14	23.1						
76	9987F	05164474	8	14	22.9						
78	9986F	05164473	8	14	22.9						
80	0041G	05164415	8	14	23.1						
94	9994F	05164486	8	14	23.0						
100	9995F	05164487	8	14	23.1						
121	0034G	05164408	8	14	23.0						
137	9983F	05164470	8	14	22.9						

143	9999F	05164491	8	14	22.9						
145	9998F	05164489	8	14	23.1						
159	0035G	05164412	8	14	23.0						
170	9985F	05164472	8	14	23.0						
179	0037G	05164407	8	14	22.9						
204	0036G	05164413	8	14	22.9						
216	9991F	05164479	8	14	23.0						
217	0040G	05164411	8	14	22.9						
221	9989F	05164478	8	14	23.0						
227	9992F	05164483	8	14	22.9						
229	9990F	05164476	8	14	22.9						
250	0001G	05164493	8	14	23.2						
255	0044G	05164427	8	14	23.3						
3	0033G	05164406	8	15	23.1	7.6		7.1			
12	0002G	05164496	8	15	23.0	6.6		7.1			
21	0043G	05164424	8	15	23.0	6.8		7.1			
29	9988F	05164475	8	15	22.9	6.9		7.0			
31	9997F	05164507	8	15	23.0	7.0		7.0			
37	0038G	05164409	8	15	22.9	7.4		7.0			
40	0042F	05164423	8	15	23.0	7.4		7.0			
41	0032G	05164405	8	15	23.0	7.4		7.1			
43	9996F	05164494	8	15	22.9	7.4		7.0			
51	9993F	05164485	8	15	22.9	7.5		7.0			
52	9952F	Control	8	15	23.0	7.1		7.0			
60	0039G	05164410	8	15	23.2	6.6		7.0			
76	9987F	05164474	8	15	23.0	6.6		7.0			
78	9986F	05164473	8	15	23.0	6.7		7.1			
80	0041G	05164415	8	15	23.2	7.0		7.0			
94	9994F	05164486	8	15	23.1	7.0		6.9			
100	9995F	05164487	8	15	23.2	7.0		7.0			
121	0034G	05164408	8	15	23.0	7.4		7.0			
137	9983F	05164470	8	15	23.0	6.6		7.5			
143	9999F	05164491	8	15	22.9	6.8		7.1			
145	9998F	05164489	8	15	23.1	6.9		7.2			
159	0035G	05164412	8	15	23.0	7.1		7.0			
170	9985F	05164472	8	15	23.2	7.2		7.1			
179	0037G	05164407	8	15	23.0	7.4		7.1			
204	0036G	05164413	8	15	23.0	7.4		7.0			
216	9991F	05164479	8	15	23.0	7.4		7.1			
217	0040G	05164411	8	15	23.1	7.4		7.1			
221	9989F	05164478	8	15	23.1	6.3		7.8			
227	9992F	05164483	8	15	23.0	7.1		7.0			
229	9990F	05164476	8	15	23.0	6.6		7.8			
250	0001G	05164493	8	15	23.3	7.0		7.1			
255	0044G	05164427	8	15	23.4	7.1		7.2			
3	0033G	05164406	8	16	22.9						
12	0002G	05164496	8	16	22.9						
21	0043G	05164424	8	16	22.8						
29	9988F	05164475	8	16	22.6						
31	9997F	05164507	8	16	22.6						
37	0038G	05164409	8	16	22.6						
40	0042F	05164423	8	16	22.5						
41	0032G	05164405	8	16	22.6						
43	9996F	05164494	8	16	22.6						
51	9993F	05164485	8	16	22.5						
52	9952F	Control	8	16	22.5						
60	0039G	05164410	8	16	22.7						
76	9987F	05164474	8	16	22.5						
78	9986F	05164473	8	16	22.5						

80	0041G	05164415	8	16	22.5						
94	9994F	05164486	8	16	22.7						
100	9995F	05164487	8	16	22.6						
121	0034G	05164408	8	16	22.6						
137	9983F	05164470	8	16	22.5						
143	9999F	05164491	8	16	22.4						
145	9998F	05164489	8	16	22.4						
159	0035G	05164412	8	16	22.5						
170	9985F	05164472	8	16	22.5						
179	0037G	05164407	8	16	22.4						
204	0036G	05164413	8	16	22.5						
216	9991F	05164479	8	16	22.5						
217	0040G	05164411	8	16	22.5						
221	9989F	05164478	8	16	22.6						
227	9992F	05164483	8	16	22.5						
229	9990F	05164476	8	16	22.7						
250	0001G	05164493	8	16	22.9						
255	0044G	05164427	8	16	22.8						
3	0033G	05164406	8	17	22.8						
12	0002G	05164496	8	17	22.9						
21	0043G	05164424	8	17	22.7						
29	9988F	05164475	8	17	22.7						
31	9997F	05164507	8	17	22.7						
37	0038G	05164409	8	17	22.8						
40	0042F	05164423	8	17	22.9						
41	0032G	05164405	8	17	22.8						
43	9996F	05164494	8	17	22.7						
51	9993F	05164485	8	17	22.8						
52	9952F	Control	8	17	22.9						
60	0039G	05164410	8	17	22.9						
76	9987F	05164474	8	17	22.9						
78	9986F	05164473	8	17	22.8						
80	0041G	05164415	8	17	23.1						
94	9994F	05164486	8	17	23.0						
100	9995F	05164487	8	17	23.1						
121	0034G	05164408	8	17	22.9						
137	9983F	05164470	8	17	22.9						
143	9999F	05164491	8	17	22.8						
145	9998F	05164489	8	17	23.0						
159	0035G	05164412	8	17	22.8						
170	9985F	05164472	8	17	23.0						
179	0037G	05164407	8	17	22.9						
204	0036G	05164413	8	17	22.9						
216	9991F	05164479	8	17	22.9						
217	0040G	05164411	8	17	22.9						
221	9989F	05164478	8	17	22.9						
227	9992F	05164483	8	17	22.9						
229	9990F	05164476	8	17	22.9						
250	0001G	05164493	8	17	23.2						
255	0044G	05164427	8	17	23.4						
3	0033G	05164406	8	18	23.1	7.6		7.0			
12	0002G	05164496	8	18	22.9	6.6		7.0			
21	0043G	05164424	8	18	22.9	7.0		7.0			
29	9988F	05164475	8	18	22.9	7.1		6.9			
31	9997F	05164507	8	18	22.9	7.2		6.9			
37	0038G	05164409	8	18	22.9	7.3		6.9			
40	0042F	05164423	8	18	23.1	7.4		6.9			
41	0032G	05164405	8	18	23.0	7.5		6.9			
43	9996F	05164494	8	18	22.9	7.6		6.9			

51	9993F	05164485	8	18	23.1	7.5		6.9			
52	9952F	Control	8	18	23.0	7.4		6.9			
60	0039G	05164410	8	18	23.3	6.7		6.8			
76	9987F	05164474	8	18	23.0	6.6		6.8			
78	9986F	05164473	8	18	23.0	6.9		6.9			
80	0041G	05164415	8	18	23.3	7.4		6.9			
94	9994F	05164486	8	18	23.1	7.0		6.8			
100	9995F	05164487	8	18	23.2	7.2		6.8			
121	0034G	05164408	8	18	23.1	7.6		6.8			
137	9983F	05164470	8	18	23.0	7.2		7.4			
143	9999F	05164491	8	18	23.0	7.3		7.0			
145	9998F	05164489	8	18	23.2	7.3		7.0			
159	0035G	05164412	8	18	23.0	7.4		6.9			
170	9985F	05164472	8	18	23.2	7.6		6.9			
179	0037G	05164407	8	18	23.0	7.7		7.0			
204	0036G	05164413	8	18	23.0	7.8		7.0			
216	9991F	05164479	8	18	23.1	7.8		6.9			
217	0040G	05164411	8	18	23.0	7.8		7.0			
221	9989F	05164478	8	18	23.0	6.8		6.9			
227	9992F	05164483	8	18	22.9	7.5		6.9			
229	9990F	05164476	8	18	23.0	7.2		7.5			
250	0001G	05164493	8	18	23.3	7.4		7.0			
255	0044G	05164427	8	18	23.4	7.5		7.1			
3	0033G	05164406	8	19	22.9						
12	0002G	05164496	8	19	22.8						
21	0043G	05164424	8	19	22.9						
29	9988F	05164475	8	19	22.8						
31	9997F	05164507	8	19	22.9						
37	0038G	05164409	8	19	22.8						
40	0042F	05164423	8	19	22.8						
41	0032G	05164405	8	19	22.8						
43	9996F	05164494	8	19	22.8						
51	9993F	05164485	8	19	22.9						
52	9952F	Control	8	19	22.8						
60	0039G	05164410	8	19	23.0						
76	9987F	05164474	8	19	22.8						
78	9986F	05164473	8	19	22.8						
80	0041G	05164415	8	19	23.0						
94	9994F	05164486	8	19	22.8						
100	9995F	05164487	8	19	22.9						
121	0034G	05164408	8	19	22.9						
137	9983F	05164470	8	19	22.7						
143	9999F	05164491	8	19	22.7						
145	9998F	05164489	8	19	23.0						
159	0035G	05164412	8	19	22.8						
170	9985F	05164472	8	19	22.9						
179	0037G	05164407	8	19	22.9						
204	0036G	05164413	8	19	22.8						
216	9991F	05164479	8	19	22.9						
217	0040G	05164411	8	19	22.8						
221	9989F	05164478	8	19	22.9						
227	9992F	05164483	8	19	22.8						
229	9990F	05164476	8	19	22.8						
250	0001G	05164493	8	19	23.0						
255	0044G	05164427	8	19	23.2						
3	0033G	05164406	8	20	23.0	6.1	285	6.9			
12	0002G	05164496	8	20	22.9	4.5	300	6.8			
21	0043G	05164424	8	20	22.9	5.4	285	6.8			
29	9988F	05164475	8	20	22.9	5.3	285	6.8			

31	9997F	05164507	8	20	22.9	5.6	285	6.8			
37	0038G	05164409	8	20	22.8	6.0	310	6.9			
40	0042F	05164423	8	20	23.0	6.0	290	6.9			
41	0032G	05164405	8	20	22.9	5.8	285	6.9			
43	9996F	05164494	8	20	22.9	5.9	280	6.8			
51	9993F	05164485	8	20	23.1	6.0	285	6.8			
52	9952F	Control	8	20	23.0	5.4	285	6.8			
60	0039G	05164410	8	20	23.0	5.0	285	6.8			
76	9987F	05164474	8	20	23.1	4.8	290	6.8			
78	9986F	05164473	8	20	22.9	5.5	280	6.8			
80	0041G	05164415	8	20	23.1	6.2	280	6.9			
94	9994F	05164486	8	20	22.9	5.1	280	6.7			
100	9995F	05164487	8	20	23.2	5.7	280	6.8			
121	0034G	05164408	8	20	22.9	6.5	280	6.8			
137	9983F	05164470	8	20	22.9	5.8	295	7.2			
143	9999F	05164491	8	20	22.8	5.3	285	6.8			
145	9998F	05164489	8	20	23.1	5.8	280	6.9			
159	0035G	05164412	8	20	22.9	5.7	280	6.9			
170	9985F	05164472	8	20	23.0	6.2	280	6.9			
179	0037G	05164407	8	20	22.9	6.4	280	7.0			
204	0036G	05164413	8	20	23.0	6.6	280	7.0			
216	9991F	05164479	8	20	23.0	6.6	280	6.9			
217	0040G	05164411	8	20	23.0	6.3	280	7.0			
221	9989F	05164478	8	20	23.0	5.2	300	7.4			
227	9992F	05164483	8	20	22.9	6.1	280	7.0			
229	9990F	05164476	8	20	23.0	5.5	295	7.2			
250	0001G	05164493	8	20	23.2	6.0	285	7.0			
255	0044G	05164427	8	20	23.4	6.5	290	7.1			
3	0033G	05164406	8	21	23.4						
12	0002G	05164496	8	21	23.3						
21	0043G	05164424	8	21	23.2						
29	9988F	05164475	8	21	23.3						
31	9997F	05164507	8	21	23.3						
37	0038G	05164409	8	21	23.4						
40	0042F	05164423	8	21	23.4						
41	0032G	05164405	8	21	23.3						
43	9996F	05164494	8	21	23.3						
51	9993F	05164485	8	21	23.3						
52	9952F	Control	8	21	23.3						
60	0039G	05164410	8	21	23.4						
76	9987F	05164474	8	21	23.2						
78	9986F	05164473	8	21	23.2						
80	0041G	05164415	8	21	23.4						
94	9994F	05164486	8	21	23.3						
100	9995F	05164487	8	21	23.4						
121	0034G	05164408	8	21	23.3						
137	9983F	05164470	8	21	23.2						
143	9999F	05164491	8	21	23.2						
145	9998F	05164489	8	21	23.2						
159	0035G	05164412	8	21	23.3						
170	9985F	05164472	8	21	23.2						
179	0037G	05164407	8	21	23.3						
204	0036G	05164413	8	21	23.2						
216	9991F	05164479	8	21	23.2						
217	0040G	05164411	8	21	23.2						
221	9989F	05164478	8	21	23.2						
227	9992F	05164483	8	21	23.2						
229	9990F	05164476	8	21	23.2						
250	0001G	05164493	8	21	23.4						

255	0044G	05164427	8	21	23.5						
3	0033G	05164406	8	22	23.1	6.2		6.9			
12	0002G	05164496	8	22	22.9	4.5		6.9			
21	0043G	05164424	8	22	22.9	5.3		6.9			
29	9988F	05164475	8	22	22.9	5.4		7.0			
31	9997F	05164507	8	22	22.9	5.2		7.0			
37	0038G	05164409	8	22	22.8	5.7		7.0			
40	0042F	05164423	8	22	23.0	5.6		7.1			
41	0032G	05164405	8	22	22.9	5.6		7.1			
43	9996F	05164494	8	22	22.8	5.5		7.0			
51	9993F	05164485	8	22	22.9	6.0		7.2			
52	9952F	Control	8	22	22.9	5.2		7.1			
60	0039G	05164410	8	22	23.1	5.2		7.1			
76	9987F	05164474	8	22	22.9	5.4		7.1			
78	9986F	05164473	8	22	22.8	5.1		7.1			
80	0041G	05164415	8	22	23.0	5.7		7.2			
94	9994F	05164486	8	22	22.9	4.6		7.0			
100	9995F	05164487	8	22	23.0	5.6		7.2			
121	0034G	05164408	8	22	22.9	6.2		7.2			
137	9983F	05164470	8	22	22.7	5.3		7.4			
143	9999F	05164491	8	22	22.7	5.0		7.2			
145	9998F	05164489	8	22	23.0	5.3		7.1			
159	0035G	05164412	8	22	22.8	5.6		7.2			
170	9985F	05164472	8	22	22.9	5.9		7.2			
179	0037G	05164407	8	22	22.8	6.0		7.2			
204	0036G	05164413	8	22	22.8	5.6		7.2			
216	9991F	05164479	8	22	22.9	6.0		7.2			
217	0040G	05164411	8	22	22.9	6.0		7.2			
221	9989F	05164478	8	22	22.9	4.8		7.5			
227	9992F	05164483	8	22	22.8	5.8		7.2			
229	9990F	05164476	8	22	22.8	5.3		7.3			
250	0001G	05164493	8	22	23.0	6.8		7.2			
255	0044G	05164427	8	22	23.2	6.3		7.4			
3	0033G	05164406	8	23	23.3						
12	0002G	05164496	8	23	23.2						
21	0043G	05164424	8	23	23.2						
29	9988F	05164475	8	23	23.0						
31	9997F	05164507	8	23	23.0						
37	0038G	05164409	8	23	23.0						
40	0042F	05164423	8	23	23.1						
41	0032G	05164405	8	23	23.1						
43	9996F	05164494	8	23	23.0						
51	9993F	05164485	8	23	23.1						
52	9952F	Control	8	23	23.1						
60	0039G	05164410	8	23	23.1						
76	9987F	05164474	8	23	23.2						
78	9986F	05164473	8	23	23.0						
80	0041G	05164415	8	23	23.2						
94	9994F	05164486	8	23	23.1						
100	9995F	05164487	8	23	23.2						
121	0034G	05164408	8	23	23.1						
137	9983F	05164470	8	23	23.0						
143	9999F	05164491	8	23	23.0						
145	9998F	05164489	8	23	23.1						
159	0035G	05164412	8	23	23.0						
170	9985F	05164472	8	23	23.1						
179	0037G	05164407	8	23	23.0						
204	0036G	05164413	8	23	23.1						
216	9991F	05164479	8	23	23.1						

217	0040G	05164411	8	23	23.1						
221	9989F	05164478	8	23	23.1						
227	9992F	05164483	8	23	23.0						
229	9990F	05164476	8	23	23.0						
250	0001G	05164493	8	23	23.3						
255	0044G	05164427	8	23	23.4						
3	0033G	05164406	8	24	23.0						
12	0002G	05164496	8	24	22.9						
21	0043G	05164424	8	24	22.8						
29	9988F	05164475	8	24	22.8						
31	9997F	05164507	8	24	22.8						
37	0038G	05164409	8	24	22.7						
40	0042F	05164423	8	24	22.8						
41	0032G	05164405	8	24	22.8						
43	9996F	05164494	8	24	22.7						
51	9993F	05164485	8	24	22.8						
52	9952F	Control	8	24	22.8						
60	0039G	05164410	8	24	23.0						
76	9987F	05164474	8	24	22.8						
78	9986F	05164473	8	24	22.7						
80	0041G	05164415	8	24	23.0						
94	9994F	05164486	8	24	22.8						
100	9995F	05164487	8	24	23.0						
121	0034G	05164408	8	24	22.9						
137	9983F	05164470	8	24	22.8						
143	9999F	05164491	8	24	22.7						
145	9998F	05164489	8	24	22.9						
159	0035G	05164412	8	24	22.7						
170	9985F	05164472	8	24	22.9						
179	0037G	05164407	8	24	22.7						
204	0036G	05164413	8	24	22.8						
216	9991F	05164479	8	24	22.8						
217	0040G	05164411	8	24	22.8						
221	9989F	05164478	8	24	22.8						
227	9992F	05164483	8	24	22.8						
229	9990F	05164476	8	24	22.8						
250	0001G	05164493	8	24	23.1						
255	0044G	05164427	8	24	23.2						
3	0033G	05164406	8	25	23.4	5.6		6.9			
12	0002G	05164496	8	25	23.0	4.2		7.0			
21	0043G	05164424	8	25	22.9	5.3		6.9			
29	9988F	05164475	8	25	22.9	5.2		6.9			
31	9997F	05164507	8	25	22.9	5.6		7.0			
37	0038G	05164409	8	25	22.8	6.0		7.0			
40	0042F	05164423	8	25	23.0	5.8		7.0			
41	0032G	05164405	8	25	22.9	5.8		7.1			
43	9996F	05164494	8	25	22.9	5.4		6.9			
51	9993F	05164485	8	25	23.0	6.6		7.1			
52	9952F	Control	8	25	22.9	5.5		7.0			
60	0039G	05164410	8	25	23.2	4.7		6.9			
76	9987F	05164474	8	25	23.0	3.8		6.8			
78	9986F	05164473	8	25	22.9	5.0		7.0			
80	0041G	05164415	8	25	23.2	5.8		7.1			
94	9994F	05164486	8	25	23.0	4.5		6.8			
100	9995F	05164487	8	25	23.1	5.6		7.0			
121	0034G	05164408	8	25	22.9	7.1		7.1			
137	9983F	05164470	8	25	22.8	5.6		7.3			
143	9999F	05164491	8	25	22.8	5.1		7.0			

145	9998F	05164489	8	25	22.8	5.8		7.1			
159	0035G	05164412	8	25	22.8	5.9		7.1			
170	9985F	05164472	8	25	22.9	6.2		7.0			
179	0037G	05164407	8	25	22.8	6.4		7.2			
204	0036G	05164413	8	25	22.9	6.9		7.1			
216	9991F	05164479	8	25	22.9	5.7		7.0			
217	0040G	05164411	8	25	22.9	6.4		7.1			
221	9989F	05164478	8	25	22.9	5.2		7.4			
227	9992F	05164483	8	25	22.9	6.1		7.1			
229	9990F	05164476	8	25	22.9	5.5		7.1			
250	0001G	05164493	8	25	23.2	6.1		7.2			
255	0044G	05164427	8	25	23.3	6.9		7.4			
3	0033G	05164406	8	26	23.0						
12	0002G	05164496	8	26	22.9						
21	0043G	05164424	8	26	22.9						
29	9988F	05164475	8	26	22.8						
31	9997F	05164507	8	26	22.9						
37	0038G	05164409	8	26	22.8						
40	0042F	05164423	8	26	23.0						
41	0032G	05164405	8	26	22.9						
43	9996F	05164494	8	26	22.9						
51	9993F	05164485	8	26	23.0						
52	9952F	Control	8	26	22.9						
60	0039G	05164410	8	26	23.1						
76	9987F	05164474	8	26	22.9						
78	9986F	05164473	8	26	22.8						
80	0041G	05164415	8	26	23.0						
94	9994F	05164486	8	26	22.9						
100	9995F	05164487	8	26	23.1						
121	0034G	05164408	8	26	22.9						
137	9983F	05164470	8	26	22.8						
143	9999F	05164491	8	26	22.8						
145	9998F	05164489	8	26	23.0						
159	0035G	05164412	8	26	22.9						
170	9985F	05164472	8	26	22.9						
179	0037G	05164407	8	26	22.8						
204	0036G	05164413	8	26	22.9						
216	9991F	05164479	8	26	22.9						
217	0040G	05164411	8	26	22.9						
221	9989F	05164478	8	26	22.9						
227	9992F	05164483	8	26	22.8						
229	9990F	05164476	8	26	22.9						
250	0001G	05164493	8	26	23.1						
255	0044G	05164427	8	26	23.2						
3	0033G	05164406	8	27	23.2	6.7	275	6.9			
12	0002G	05164496	8	27	22.9	4.2	290	6.8			
21	0043G	05164424	8	27	22.9	5.6	275	6.8			
29	9988F	05164475	8	27	22.8	5.2	275	6.7			
31	9997F	05164507	8	27	22.8	5.4	280	6.8			
37	0038G	05164409	8	27	22.6	5.9	275	6.8			
40	0042F	05164423	8	27	22.9	5.8	275	6.9			
41	0032G	05164405	8	27	22.8	5.7	275	6.9			
43	9996F	05164494	8	27	22.7	5.5	275	6.9			
51	9993F	05164485	8	27	22.9	7.1	275	7.0			
52	9952F	Control	8	27	22.8	5.6	275	6.9			
60	0039G	05164410	8	27	23.0	4.8	275	6.8			
76	9987F	05164474	8	27	22.8	3.9	280	6.8			
78	9986F	05164473	8	27	22.7	5.0	275	6.8			
80	0041G	05164415	8	27	23.0	6.2	280	7.0			

94	9994F	05164486	8	27	22.8	4.6	275	6.7				
100	9995F	05164487	8	27	23.0	5.8	275	6.9				
121	0034G	05164408	8	27	22.8	7.2	270	7.1				
137	9983F	05164470	8	27	22.7	5.4	300	7.3				
143	9999F	05164491	8	27	22.6	5.0	280	6.9				
145	9998F	05164489	8	27	23.0	5.7	275	6.9				
159	0035G	05164412	8	27	22.7	5.9	275	7.2				
170	9985F	05164472	8	27	22.9	5.9	275	7.0				
179	0037G	05164407	8	27	22.7	6.3	275	7.1				
204	0036G	05164413	8	27	22.8	7.0	275	7.2				
216	9991F	05164479	8	27	22.9	5.8	275	7.0				
217	0040G	05164411	8	27	22.8	6.4	275	7.1				
221	9989F	05164478	8	27	22.8	5.2	290	7.3				
227	9992F	05164483	8	27	22.7	6.2	275	7.0				
229	9990F	05164476	8	27	22.8	5.6	285	7.1				
250	0001G	05164493	8	27	23.1	6.4	280	7.2				
255	0044G	05164427	8	27	23.2	6.3	280	7.4				
3	0033G	05164406	8	28	23.2	6.8	280	7.0	<0.1	86	70	
12	0002G	05164496	8	28	22.9	3.5	315	6.7	<0.1	103	90	
21	0043G	05164424	8	28	22.8	4.8	280	6.6	<0.1	86	70	
29	9988F	05164475	8	28	22.7	5.0	285	6.6	<0.1	94	70	
31	9997F	05164507	8	28	22.7	5.6	290	6.5	<0.1	103	60	
37	0038G	05164409	8	28	22.8	6.2	280	6.6	<0.1	86	60	
40	0042F	05164423	8	28	22.7	5.8	280	6.7	<0.1	94	60	
41	0032G	05164405	8	28	22.8	5.8	285	6.7	<0.1	86	70	
43	9996F	05164494	8	28	22.8	5.5	280	6.6	<0.1	86	60	
51	9993F	05164485	8	28	22.9	6.4	280	6.7	<0.1	77	60	
52	9952F	Control	8	28	22.8	5.2	280	6.8	<0.1	77	70	
60	0039G	05164410	8	28	22.8	5.2	280	6.6	<0.1	86	70	
76	9987F	05164474	8	28	22.9	3.0	300	6.5	0.8	94	80	
78	9986F	05164473	8	28	22.7	4.8	285	6.6	0.1	77	60	
80	0041G	05164415	8	28	22.9	6.0	285	6.7	<0.1	77	60	
94	9994F	05164486	8	28	22.7	5.2	275	6.5	<0.1	77	70	
100	9995F	05164487	8	28	22.9	6.0	280	6.7	<0.1	77	60	
121	0034G	05164408	8	28	22.7	6.1	275	6.7	<0.1	86	70	
137	9983F	05164470	8	28	22.6	5.4	320	7.1	<0.1	120	90	
143	9999F	05164491	8	28	22.6	5.5	290	6.8	<0.1	86	60	
145	9998F	05164489	8	28	22.8	6.1	280	6.7	<0.1	77	60	
159	0035G	05164412	8	28	22.6	5.0	280	6.9	<0.1	77	60	
170	9985F	05164472	8	28	22.7	5.7	280	6.9	<0.1	77	60	
179	0037G	05164407	8	28	22.6	6.0	285	6.9	<0.1	86	70	
204	0036G	05164413	8	28	22.6	6.6	280	6.9	<0.1	77	70	
216	9991F	05164479	8	28	22.7	6.2	285	6.9	<0.1	86	70	
217	0040G	05164411	8	28	22.7	6.5	285	7.0	<0.1	86	70	
221	9989F	05164478	8	28	22.7	6.6	325	7.0	<0.1	111	90	
227	9992F	05164483	8	28	22.6	6.0	280	6.8	<0.1	77	60	
229	9990F	05164476	8	28	22.7	5.8	305	6.9	<0.1	94	80	
250	0001G	05164493	8	28	22.9	5.4	295	6.9	<0.1	94	70	
255	0044G	05164427	8	28	22.9	5.9	295	7.0	<0.1	94	80	
				Mean	23.0	6.5	289	7.0	0.3	92	78	
				SD	0.2	0.8	15	0.2	0.2	15	19	
				n	928	448	192	448	64	64	64	
				Min	22.4	3.0	255	6.5	<0.1	68	60	
				Max	23.9	8.2	350	7.8	0.9	137	150	

CHAIN-OF-CUSTODY RECORDS

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No:

L

Date Shipped:	4/21/2005
Carrier Name:	FedEx
Airbill:	850842532346
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

Sampler Signature: Jeff Franklin

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/21/05 / 12:00	[signature]	4-22-05 1320
2				
3				
4				

For Lab Use Only
Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164433	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05164433 (Ice Only) (1)	RM704A1(X1)	S: 4/20/2005	8:50	NAS # 9953F
05164434	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05164434 (Ice Only) (1)	RM698A1(X1)	S: 4/20/2005	10:10	NAS # 9954F
05164435	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164435 (Ice Only) (1)	RM744A1(X1)	S: 4/20/2005	10:45	NAS # 9955F
05164436	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164436 (Ice Only) (1)	RM744A2(X3)	S: 4/20/2005	11:45	NAS # 9956F
05164437	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05164437 (Ice Only) (1)	RM692A1(X1)	S: 4/20/2005	11:15	NAS # 9957F

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Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.0°C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? Y	Shipment Iced? Y

BIO-28 = Bioassay 28-day

TR Number: 10-555125664-042105-0006

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax

LABORATORY COPY

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/21/2005
Carrier Name:	FedEx
Airbill:	850842532335
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/21/05 12:00	[signature]	4-22-05 1320
2				
3				
4				

Sampler Signature: Jeff Franklin

For Lab Use Only
Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164440	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05164440 (Ice Only) (1)	RM687A1	S: 4/20/2005	14:00	NAS# 9958F
05164441	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05164441 (Ice Only) (1)	RM689A1(X3)	S: 4/20/2005	12:55	NAS# 9959F
05164442	Sediment/ Josh Butler	L/G	BIO-28 (90)	05164442 (Ice Only) (1)	RM706A1(X1)	S: 4/20/2005	13:30	NAS# 9960F
05164443	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164443 (Ice Only) (1)	RM743A2(X3)	S: 4/20/2005	13:15	NAS# 9961F
05164449	Sediment/ Josh Butler	L/G	BIO-28 (90)	05164449 (Ice Only) (1)	RM706A2(X7)	S: 4/20/2005	16:25	NAS# 9962F

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.0 °C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? Y	Shipment Iced? Y

BIO-28 = Bioassay 28-day

TR Number: 10-555125664-042105-0005

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
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LABORATORY COPY

EPA USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No:
L

Date Shipped: 4/22/2005
Carrier Name: UPS
Airbill: 1Z E72 494 44 9812 7675
Shipped to: Northwestern Aquatic Sciences
3814 Yaquina Bay Rd.
Newport OR 97365
(541) 265-7225

Chain of Custody Record

Sampler Signature: Jeff Franklin

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/22/05/11:00	Gerald Irissarri	4-23-05 0935
2				
3				
4				

For Lab Use Only
Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164439	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05164439 (Ice Only) (1)	RM686A1(X3)	S: 4/21/2005	9:30	NAS# 9966F
05164450	Sediment/ Greg Warren	L/G	BIO-28 (90)	05164450 (Ice Only) (1)	RM708A1(X3)	S: 4/21/2005	9:43	NAS# 9967F
05164451	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05164451 (Ice Only) (1)	RM680A1(X1)	S: 4/21/2005	~~10:25~~ 10:40 NG	NAS# 9968F
05164452	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164452 (Ice Only) (1)	RM742A1(X1)	S: 4/21/2005	11:00	NAS# 9969F

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Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.5°C	Chain of Custody Seal Number:
Analysis Key: BIO-28 = Bioassay 28-day	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? Y	Shipment Iced? Y

TR Number: 10-555125664-042105-0017

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
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LAB COPY

F2V5.1.047 Page 1 of 1

USEPA Contract Laboratory Program
Generic Chain of Custody

EPA

Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/22/2005
Carrier Name:	UPS
Airbill:	1Z E72 494 44 9947 4691
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

	Relinquished By (Date / Time)	Received By (Date / Time)
1	4/22/05 11:00	4-23-05 0935
2		
3		
4		

Sampler Signature:

For Lab Use Only
Lab Contract No:
Unit Price:
Tranafer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164453	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164453 (Ice Only) (1)	RM743A1(X1)	S: 4/21/2005	10:15	NAS# 9970F
05184454	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05164454 (Ice Only) (1)	RM678A1(X1)	S: 4/21/2005	12:35	NAS# 9971F
05164455	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164455 (Ice Only) (1)	RM742A2(X5)	S: 4/21/2005	12:20	NAS# 9972F
05164456	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05164456 (Ice Only) (1)	RM677A1(X3)	S: 4/21/2005	13:20	NAS# 9973F

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Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.0°C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? Y	Shipment Iced? Y

BIO-28 = Bioassay 28-day

TR Number: 10-555125664-042105-0018

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EPA USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No:
L

Date Shipped:	4/22/2005
Carrier Name:	UPS
Airbill:	1Z E72 494 44 9753 8063
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/22/05 11:00	[signature]	4-23-05 0935
2				
3				
4				

Sampler Signature: Jeff Franklin

For Lab Use Only
Lab Contract No:
Unit Price:
Tranafer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164457	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05164457 (Ice Only) (1)	RM878A1(X3)	S: 4/21/2005	14:05	NAS # 9974F
05164459	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164459 (Ice Only) (1)	RM741A1(X3)	S: 4/21/2005	13:30	NAS# 9975F
05164460	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164460 (Ice Only) (1)	RM740A1(X1)	S: 4/21/2005	14:30	NAS# 9976F
05164461	Sediment/ Greg Warren	L/G	BIO-28 (90)	05164461 (Ice Only) (1)	RM724A1(X1)	S: 4/21/2005	13:20	NAS# 9977F

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number:
			0.0°C	

Analysis Key: Concentration: L = Low, M = Low/Medium, H = High Type/Designate: Composite = C, Grab = G

Custody Seal Intact? Y Shipment Iced? Y

BIO-28 = Bioassay 28-day

TR Number: 10-555125664-042105-0019

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USEPA Contract Laboratory Program
Generic Chain of Custody

EPA

Reference Case 34063
Client No:
SDG No:

L

Date Shipped:	4/25/2005
Carrier Name:	FedEx
Airbill:	8508 4253 2357
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

Relinquished By	(Date / Time)	Received By	(Date / Time)
1	4/25/05 13:00	Gwald Luisarri	4-26-05 1310
2			
3			
4			

Sampler Signature: Jeff Franklin

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164468	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164468 (Ice Only) (1)	RM738A1(X3)	S: 4/22/2005	11:00	NAS # 9981F
05164469	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164469 (Ice Only) (1)	RM739A1(X3)	S: 4/22/2005	10:00	NAS # 9982F
05164470	Sediment/ John Culley	L/G	BIO-28 (90)	~~05164470 (Ice Only),~~ NG 05164470 (Ice Only) (2)	RM732R1	S: 4/22/2005	11:35	NAS # 9983F
05164471	Sediment/ Josh Butler	L/G	BIO-28 (90)	05164471 (Ice Only) (1)	RM724A2(X3)	S: 4/22/2005	11:27	NAS # 9984F
05164472	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164472 (Ice Only) (1)	RM737A1(X3)	S: 4/22/2005	12:15	NAS # 9985F

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Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.0 °C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? Y	Shipment Iced? Y
BIO-28 = Bioassay 28-day				

TR Number: 10-555125664-042305-0001

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USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/25/2005
Carrier Name:	FedEx
Airbill:	8508 4253 2368
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

Relinquished By	(Date / Time)	Received By	(Date / Time)
1	4/25/05 13:00		4-26-05 13:10
2			
3			
4			

Sampler Signature:

For Lab Use Only

Lab Contract No:
Unit Price:
Tranafer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164473	Sediment/ Josh Butler	L/G	BIO-28 (90)	05164473 (Ice Only) (1)	RM723A1(X1)	S: 4/22/2005	12:55	NAS # 9986F
05164474	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164474 (Ice Only) (1)	RM736A1(X1)	S: 4/22/2005	13:45	NAS # 9987F
05164475	Sediment/ Josh Butler	L/G	BIO-28 (90)	05164475 (Ice Only) (1)	RM723A2(X3)	S: 4/22/2005	15:16	NAS # 9988F
05164478	Sediment/ John Culley	L/G	BIO-28 (90)	~~05164478 (Ice Only)~~ NG 05164478 (Ice Only) (2)	RM726R1	S: 4/22/2005	13:20	NAS # 9989F

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Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.0°C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? Y	Shipment Iced? Y

BIO-28 = Bioassay 28-day

TR Number: 10-555125664-042305-0002

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
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USEPA Contract Laboratory Program
Generic Chain of Custody

EPA

Reference Case 34063
Client No:
SDG No:
L

Date Shipped:	4/25/2005
Carrier Name:	FedEx
Airbill:	8508 4253 2770
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/25/05 13:00	[signature]	4-26-05 1310
2				
3				
4				

Sampler Signature: [signature]

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
~~05164476~~	~~Sediment/~~ John Culley	L/G	BIO-28 (90)	~~05164476 (Ice Only)~~ NG 05164476 (Ice Only) (2)	RM721R1	S: 4/22/2005	14:30	NAS # 9990 F
05164479	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164479 (Ice Only) (1)	RM734A1(X3)	S: 4/22/2005	15:00	NAS # 9991 F
05164483	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05164483 (Ice Only) (1)	RM661A1(X1)	S: 4/22/2005	10:15	NAS # 9992 F
05164485	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05164485 (Ice Only) (1)	RM658A1(X3)	S: 4/22/2005	11:30	NAS # 9993 F

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Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.0 °C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? Y	Shipment Iced? Y
BIO-28 = Bioassay 28-day				

TR Number: 10-555125664-042305-0003

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USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No:

L

Date Shipped: 4/25/2005
Carrier Name: FedEx
Airbill: 8508 4253 3397
Shipped to: Northwestern Aquatic Sciences
3814 Yaquina Bay Rd.
Newport OR 97365
(541) 265-7225

Chain of Custody Record | Sampler Signature: [signature]

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/25/05/13:00	[signature]	4-26-05 1310
2				
3				
4				

For Lab Use Only
Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164486	Sediment/ John Culley	L/G	BIO-28 (90)	~~051644 (Ice Only);~~ JG 05164486 (Ice Only) (2)	RM705R1	S: 4/23/2005	9:25	NAS # 9994F
05164487	Sediment/ Greg Warren	L/G	BIO-28 (90)	05164487 (Ice Only) (1)	RM713A1(X3)	S: 4/23/2005	9:30	NAS # 9995F
05164494	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164494 (Ice Only) (1)	RM729A1(X1)	S: 4/23/2005	12:30	NAS # 9996F
05164507	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164507 (Ice Only) (1)	RM727A1(X1)	S: 4/23/2005	14:15	NAS # 9997F

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Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.0°C	Chain of Custody Seal Number:

Analysis Key: Concentration: L = Low, M = Low/Medium, H = High Type/Designate: Composite = C, Grab = G Custody Seal Intact? Y Shipment Iced? Y

BIO-28 = Bioassay 28-day

TR Number: 10-555125664-042505-0003

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
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USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/25/2005
Carrier Name:	FedEx
Airbill:	8508 4253 3375
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

Sampler Signature: John Culley

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	John Culley	4/25/05 13:00	Gualt Livsani	4-26-05 1310
2				
3				
4				

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05164489	Sediment/ John Culley	L/G	BIO-28 (90)	~~051644 (Ice Only),~~ NG 05164489 (Ice Only) (2)	RM686R1	S: 4/23/2005	11:20	NAS # 9998 F
05164491	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164491 (Ice Only) (1)	RM730A1(X1)	S: 4/23/2005	11:15	NAS # 9999 F
05164493	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05164493 (Ice Only) (1)	RM733A1(X1)	S: 4/23/2005	9:45	NAS # 00016
05164496	Sediment/ John Culley	L/G	BIO-28 (90)	~~051644 (Ice Only),~~ NG 05164496 (Ice Only) (2)	RM685R1	S: 4/23/2005	13:50	NAS # 00026

PAGE 390 OF 393

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.5 °C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? Y	Shipment Iced? Y
BIO-28 = Bioassay 28-day				

TR Number: 10-555125664-042505-0004

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/27/2005
Carrier Name:	FedEx
Airbill:	8508 4253 3147
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1		4/27/05 12:00		4-28-05 1420
2				
3				
4				

Sampler Signature:

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05174405	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05174405 (Ice Only) (1)	RM644A1(X3)	S: 4/26/2005	10:15	NAS# 00326
05174406	Sediment/ Josh Butler	L/G	BIO-28 (90)	05174406 (Ice Only) (1)	RM637A1(X1)	S: 4/26/2005	11:26	NAS# 00336
05174408	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05174408 (Ice Only) (1)	RM642A1(X1)	S: 4/26/2005	11:50	NAS# 00346
05174412	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05174412 (Ice Only) (1)	RM641A1(X1)	S: 4/26/2005	13:54	NAS# 00356
05174413	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05174413 (Ice Only) (1)	RM640A1(X3)	S: 4/26/2005	15:20	NAS# 00366

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number:
			0.0°C	

Analysis Key: Concentration: L = Low, M = Low/Medium, H = High Type/Designate: Composite = C, Grab = G

Custody Seal Intact? Y Shipment Iced? Y

BIO-28 = Bioassay 28-day

TR Number: 10-555125664-042605-0012

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/27/2005
Carrier Name:	FedEx
Airbill:	8508 4253 3386
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	4/27/05 12:00	[signature]	4-28-05 1420
2				
3				
4				

Sampler Signature: [signature]

For Lab Use Only
Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
05174407	Sediment/ Josh Butler	L/G	BIO-28 (90)	05174407 (Ice Only) (1)	RM634A1(X1)	S: 4/26/2005	14:02	NAS# 00376
05174409	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05174409 (Ice Only) (1)	RM605A1(X1)	S: 4/26/2005	14:17	NAS# 00386
05174410	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05174410 (Ice Only) (1)	RM606A1(X3)	S: 4/26/2005	13:01	NAS# 00396
05174411	Sediment/ Jeff Franklin	L/G	BIO-28 (90)	05174411 (Ice Only) (1)	RM616A1(X3)	S: 4/26/2005	10:16	NAS # 00406
05174415	Sediment/ Josh Butler	L/G	BIO-28 (90)	05174415 (Ice Only) (1)	RM628A1(X1)	S: 4/26/2005	15:42	NAS # 00416

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Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.0°C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? Y	Shipment Iced? Y

BIO-28 = Bioassay 28-day

TR Number: 10-555125664-042605-0011

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 34063
Client No:
SDG No: **L**

Date Shipped:	4/29/2005
Carrier Name:	UPS
Airbill:	1Z E72 494 44 9779 2832
Shipped to:	Northwestern Aquatic Sciences 3814 Yaquina Bay Rd. Newport OR 97365 (541) 265-7225

Chain of Custody Record

Relinquished By	(Date / Time)	Received By	(Date / Time)
1	4/29/05 12:00		4-30-05 0905
2			
3			
4			

Sampler Signature:

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt	
05174423	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05174423 (Ice Only) (1)	RM603A1(X1)	S: 4/28/2005	10:45	NAS #	00426
05174424	Sediment/ Jeff Schut	L/G	BIO-28 (90)	05174424 (Ice Only) (1)	RM605A2(X8)	S: 4/28/2005	9:47	NAS#	00436
05174427	Sediment/ Greg Warren	L/G	BIO-28 (90)	05174427 (Ice Only) (1)	RM622A1(X3)	S: 4/28/2005	9:58	NAS#	00446

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Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 0.5 °C	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? Y	Shipment Iced? Y

BIO-28 = Bioassay 28-day

TR Number: 10-555125664-042805-0006

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

APPENDIX III

RAW DATA – REFERENCE TOXICANT TEST

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS- _____

ACUTE TOXICITY TEST (ALL SPECIES)

REVIEWED PAGES 1-7 -GJI

Test No. 999-1958 Client: QC Test Investigator _____

Test Type (rangefinding/definitive) _____ Test Length (hr) 96

Species *Hyalella azteca*

STUDY MANAGEMENT

Client: QC test

Client's Study Monitor: QC test

Testing Laboratory: Northwestern Aquatic Sciences

Test Location: Newport Laboratory

Laboratory's Study Personnel:

Proj. Man./Study Dir. G.J. Irissarri GJI

QA Officer L. K. Nemeth

1. FAB Miller WB 2. Susan Gage SG

3. B.B. Pridgeon BBP 4. M.S. Redmond MSR

Test Beginning: 5-5-05 1150 Test Ending: 5-9-05 1330

5. Bill Montgomery WM

TEST MATERIAL Lot No.: MALLINCKRODT TNZ

Description: Cadmium as $CdCl_2$-2.5H_2O (1.0 mg/ml) Prepared: 7-13-04

NAS Sample No.				
Date of Collection:				
Date of Receipt:				
Temperature (deg C):				
Dissolved oxygen (mg/L):				
pH:				
Conductivity (umhos/cm):				
Hardness (mg/L):				
Alkalinity (mg/L):				
Salinity (ppt):				
Total chlorine (mg/L):				
Total ammonia-N (mg/L):				
_____:				

DILUTION WATER

Description: Moderately hard synthetic water

Date of Preparation/Collection: 4-22-05

Water Quality: Cond. (umhos/cm): 280 Salinity (ppt) – pH 7.6

Hardness (mg/L as $CaCO_3$): 86 Alkalinity (mg/L as $CaCO_3$): 70

Treatments: Aerated ≥ 24 hrs

TEST LOCATION

Test conducted in (circle one): (room 1) room 2 trailer water bath other: _____

Randomization chart:

REP B	7.5	15	60	ϕ	3.75	30				
REP A	3.75	30	ϕ	7.5	60	15				

Error codes: 1) Correction of handwriting error
2) Written in wrong location; entry deleted
3) Wrong date deleted; replaced with correct date
4) Error found in measurement; measurement repeated

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-_____

ACUTE TOXICITY TEST (ALL SPECIES)

Test No. 999-1958 Client QC Test Investigator _____

TEST ORGANISMS

Species: *Hyalella azteca* Age: 7-8 DAYS Size: _____

Source: Chesapeake Cultures, Hayes, VA Date received: 5-3-05

Acclimation Data:

Date	Temp. (deg.C)	DO (mg/L)	pH	Cond. umhos/cm	Hardness (mg/L)	Alkalinity (mg/L)	Feeding* Amount	Feeding description	Water changes
5-3-05	19.9	11.4	7.1	370	162	190	20 ML	YTC	YES - RECENING
5-4-05	22.6	8.4	8.1	420	171	210	10 ML	YTC	YES
5-5-05	22.8	8.0	7.6	350	119	110	10 ML	YTC	—
Mean	21.8	9.3	7.6	380	151	170			
S.D.	1.6	1.9	0.5	36	28	53			
(N)	3	3	3	3	3	3			

Photoperiod during acclimation: 16:8, L:D

* PER PMN

TEST PROCEDURES AND CONDITIONS

Test concentrations (50% series recommended): 60, 30, 15, 7.5, 3.75, 0 ug/L

Test chamber: 250 ml glass beakers Test volume: 100 ml

Replicates/treatment: 10 Organisms/treatment: 20 (10/rep)

Test water changes: None Aeration during test: None

Feeding: 0.5 ml YTC suspension per beaker on days 0 and 2

Duration: 24-hr, 48-hr, (96-hr) Test temperature (deg.C): (23 ± 1) or 20 ± 1

Beaker placement: Stratified randomization Photoperiod: 16:8, L:D

MISCELLANEOUS NOTES

Test solution preparation:

1st working stock made by 1:99 (1ml ↑ 100 ml) dilution of concentrated 1.0 mg/ml Cd stock.
Final conc.: 10 ug/L.

2nd working stock made by 10:90 (10ml ↑ 100 ml) dilution of concentrated 1st working stock.
Final conc.: 1ug/L.

Test concentration (ug/L)	ml of 2nd working stock per **200** ml	Dilution water
60	12	Brought up to final volume of 200 ml with dilution water and distributed evenly between two replicates
30	6	
15	3	
7.5	1.5	
3.75	0.75	
0	0	

GJJ 5-5-05

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-_____

ACUTE TOXICITY TEST (ALL SPECIES)

Test No. 999-1958 Client _____ QC Test

DAILY RECORD SHEET

Day 0 (5 / 5 /05) GJI

Conc. (ug/L)	Temp. (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L)	Survivors A	Survivors B
1. 60	23.1	8.5	255	7.5	68	60	10	10
2. 30	23.2	8.5	265	7.5			10	10
3. 15	23.2	8.4	265	7.5			10	10
4. 7.5	23.2	8.5	270	7.5			10	10
5. 3.75	23.2	8.5	265	7.5			10	10
6. 0	23.2	8.5	260	7.5	77	70	10	10
All animals fed 0.5 ml YTC suspension. Initials: GJI								

Day 1 (5 / 6 /05) BBP/GJI/MB

Conc. (ug/L)	Temp. (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L)	Survivors A	Survivors B
1. 60	23.8	7.9	270	7.4			10	10
2. 30	23.8	7.8	275	7.3			10	10
3. 15	23.9	7.8	280	7.2			10	10
4. 7.5	23.9	7.8	280	7.2			10	10
5. 3.75	23.8	7.9	280	7.2			10	10
6. 0	23.8	8.1	280	7.2			10	10

Day 2 (5/ 7 /05) MB

Conc. (ug/L)	Temp. (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L)	Survivors A	Survivors B
1. 60	23.4	7.9	275	7.5			0(10D)	0(10D)
2. 30	23.4	7.9	280	7.5			0(10D)	0(10D)
3. 15	23.4	7.8	280	7.5			7(3D)	8(2D)
4. 7.5	23.4	7.9	275	7.5			10	10
5. 3.75	23.4	7.7	280	7.5			10	10
6. 0	23.4	7.9	275	7.4			10	10
All animals fed 0.5 ml YTC suspension. Initials: MB								

Day 3 (5 / 8 /05) GJI

Conc. (ug/L)	Temp. (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L)	Survivors A	Survivors B
1. 60	—	—	—	—			∅	∅
2. 30	—	—	—	—			∅	∅
3. 15	23.4	7.8	295	7.2			2(5D)	∅ (8D)
4. 7.5	23.4	7.8	295	7.3			5(5D)	7(3D)
5. 3.75	23.4	7.8	300	7.2			10	8(2D)
6. 0	23.4	7.7	300	7.2			10	10

Day 4 (5 / 9 /05) mm/GJI

Conc. (ug/L)	Temp. (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L)	Survivors A	Survivors B
1. 60	—	—	—	—	—	—	∅	∅
2. 30	—	—	—	—			∅	∅
3. 15	23.3	8.1	305	7.3			∅ (2D)	∅
4. 7.5	23.3	8.0	305	7.3			∅ (5D)	∅ (7D)
5. 3.75	23.3	7.9	300	7.3			8(2D)	5(3D)
6. 0	23.3	7.9	300	7.2	94	80	10	10
Mean	23.4	8.0	281	7.4	80	70		
SD	0.2	0.3	15	0.1	13	10		
n	26	26	26	26	3	3		

Chesapeake Cultures

P.O. Box 507 Hayes, VA 23072 (804) 693-4046 (804)694-4704 fax
www.c-cultures.com
e-mail growfish@c-cultures.com

NAS

Shipment Information

Species Hydrella azteca Date 5/2/05

Age ~4-5 days 1.5 mm P.O. No. verbal

Quanitity 3,400+ Invoice No. 5021

Temperature 24°C Salinity — pH 7.94

Notes

RECEIVED 5-3-05
GSI

Biologist

Please inspect shipment and report any problem immediately

Acute 96-hr Toxicity Test-96 Hr Survival

Start Date:	5/5/2005 11:50	Test ID:	999-1958	Sample ID:	REF-Ref Toxicant
End Date:	5/9/2005 13:30	Lab ID:	ORNAS-Northwestern Aquati	Sample Type:	CDCL-Cadmium chloride
Sample Date:		Protocol:	EPAF 91-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:					

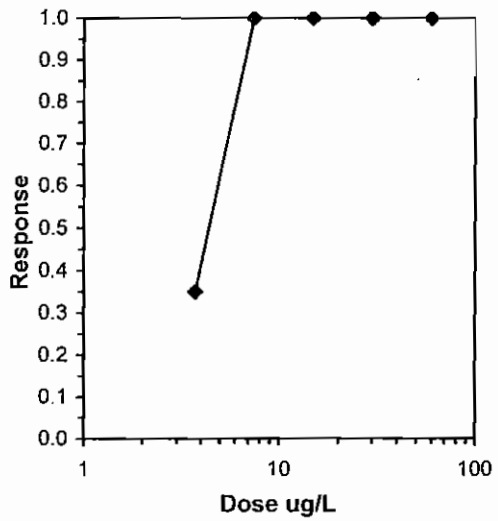
Conc-ug/L	1	2
D-Control	1.0000	1.0000
3.75	0.8000	0.5000
7.5	0.0000	0.0000
15	0.0000	0.0000
30	0.0000	0.0000
60	0.0000	0.0000

			Transform: Arcsin Square Root					Number	Total
Conc-ug/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Resp	Number
D-Control	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	2	0	20
3.75	0.6500	0.6500	0.9463	0.7854	1.1071	24.043	2	7	20
7.5	0.0000	0.0000	0.1588	0.1588	0.1588	0.000	2	20	20
15	0.0000	0.0000	0.1588	0.1588	0.1588	0.000	2	20	20
30	0.0000	0.0000	0.1588	0.1588	0.1588	0.000	2	20	20
60	0.0000	0.0000	0.1588	0.1588	0.1588	0.000	2	20	20

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Normality of the data set cannot be confirmed				
Equality of variance cannot be confirmed				

Trimmed Spearman-Karber

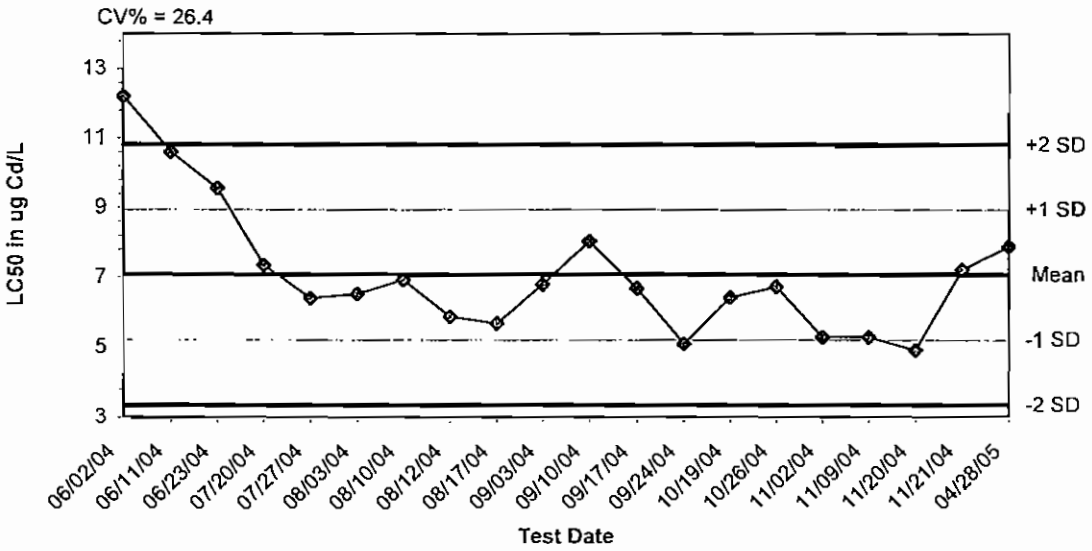
Trim Level	EC50	95% CL	
0.0%			
5.0%			
10.0%			
20.0%			
Auto-35.0%	4.4005	3.6941	5.2419



Test: AT-Acute 96-hr Toxicity Test							Test ID: 999-1958		
Species: HA-Hyalella azteca							Protocol: EPAF 91-EPA Freshwater		
Sample ID: REF-Ref Toxicant							Sample Type: CDCL-Cadmium chloride		
Start Date: 5/5/2005 11:50			End Date: 5/9/2005 13:30				Lab ID: ORNAS-Northwestern Aquatic Sciences		
Pos	ID	Rep	Group	Start	24 Hr	48 Hr	72 Hr	96 Hr	Notes
	1	1	D-Control	10	10	10	10	10	
	2	2	D-Control	10	10	10	10	10	
	3	1	3.750	10	10	10	10	8	
	4	2	3.750	10	10	10	8	5	
	5	1	7.500	10	10	10	5	0	
	6	2	7.500	10	10	10	7	0	
	7	1	15.000	10	10	7	2	0	
	8	2	15.000	10	10	8	0	0	
	9	1	30.000	10	10	0	0	0	
	10	2	30.000	10	10	0	0	0	
	11	1	60.000	10	10	0	0	0	
	12	2	60.000	10	10	0	0	0	

Comments:

Hyalella azteca 96-hr reference toxicant test - last 20 points



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
06/02/04	12.2000	7.0780	5.2109	3.3438	8.9451	10.8122
06/11/04	10.6000	7.0780	5.2109	3.3438	8.9451	10.8122
06/23/04	9.5600	7.0780	5.2109	3.3438	8.9451	10.8122
07/20/04	7.3500	7.0780	5.2109	3.3438	8.9451	10.8122
07/27/04	6.4100	7.0780	5.2109	3.3438	8.9451	10.8122
08/03/04	6.5300	7.0780	5.2109	3.3438	8.9451	10.8122
08/10/04	6.9300	7.0780	5.2109	3.3438	8.9451	10.8122
08/12/04	5.8800	7.0780	5.2109	3.3438	8.9451	10.8122
08/17/04	5.6800	7.0780	5.2109	3.3438	8.9451	10.8122
09/03/04	6.8000	7.0780	5.2109	3.3438	8.9451	10.8122
09/10/04	8.0300	7.0780	5.2109	3.3438	8.9451	10.8122
09/17/04	6.6900	7.0780	5.2109	3.3438	8.9451	10.8122
09/24/04	5.1000	7.0780	5.2109	3.3438	8.9451	10.8122
10/19/04	6.4300	7.0780	5.2109	3.3438	8.9451	10.8122
10/26/04	6.7300	7.0780	5.2109	3.3438	8.9451	10.8122
11/02/04	5.3000	7.0780	5.2109	3.3438	8.9451	10.8122
11/09/04	5.3000	7.0780	5.2109	3.3438	8.9451	10.8122
11/20/04	4.9300	7.0780	5.2109	3.3438	8.9451	10.8122
11/21/04	7.2200	7.0780	5.2109	3.3438	8.9451	10.8122
04/28/05	7.8900	7.0780	5.2109	3.3438	8.9451	10.8122

MJR
5-4-05

ADDENDUM

November 8, 2005

(ADDITIONAL STATISTICAL COMPARISONS AT P=0.01)

Freshwater Sediment Average ind. biomass

Start Date: 5/5/05 10:45 Test ID: 727-2 Sample ID:
End Date: 6/2/05 11:30 Lab ID: ORNAS-Northwestern Aquati Sample Type: SED-Sediment
Sample Date: Protocol: NASXXXHA4C-Hyalella 28-d Test Species: HA-Hyalella azteca
Comments:

Conc-	1	2	3	4	5	6	7	8
D-Control	0.3796	0.3302	0.3439	0.3631	0.4163	0.4020	0.4459	0.3690
Ref05164470	0.5743	0.4324	0.5050	0.4664	0.5373	0.5038	0.4467	0.5069
5164472	0.1466	0.1529	0.2098	0.2594	0.1827	0.2051	0.2246	0.1726
5164474	0.2531	0.3401	0.3040	0.3825	0.3590	0.3644	0.3560	0.3292
5164475	0.4217	0.4661	0.3861	0.5213	0.4732	0.3056	0.4408	0.3684
5164479	0.2778	0.1776	0.2417	0.2656	0.1244	0.1760	0.2714	0.2793
5164483	0.3128	0.3400	0.3655	0.3433	0.3619	0.3817	0.2992	0.3571
5164485	0.4795	0.3802	0.4628	0.3740	0.4356	0.3949	0.3689	0.4036
5164487	0.3474	0.3323	0.3528	0.4196	0.2776	0.3133	0.2931	
5164494	0.5281	0.4157	0.4516	0.3972	0.4048	0.4854	0.3656	0.5403
5164507	0.3807	0.3983	0.4403	0.4428	0.4024	0.4451	0.4305	0.3529
5164491	0.3357	0.3449	0.3054	0.3106	0.3039	0.3184	0.3243	0.4426
5174405	0.3653	0.3654	0.3251	0.1942	0.3552	0.4017	0.3895	0.3303
5174406	0.5207	0.3988	0.4200	0.4814	0.4371	0.5065	0.4137	0.4303
5174408	0.4318	0.2727	0.2441	0.2501	0.2738	0.3639	0.2964	0.2726
5174412	0.3002	0.4346	0.3499	0.3285	0.3582	0.4225	0.2495	0.3407
5174413	0.3668	0.4075	0.4885	0.4601	0.4882	0.2803	0.3802	0.3365
5174407	0.4374	0.4042	0.3282	0.3496	0.4168	0.3815	0.2892	0.3645
5174410	0.3887	0.5274	0.4676	0.3194	0.3794	0.3404	0.4685	0.4805
5164411	0.4933	0.3682	0.5132	0.4686	0.5116	0.6045	0.4914	0.4237
5164423	0.3749	0.2897	0.3527	0.3782	0.2211	0.3040	0.3645	0.3087
5164424	0.3765	0.2971	0.3800	0.3829	0.2654	0.2821	0.3933	0.2952

mlh 11-9-05 ①

			Transform: Untransformed					1-Tailed		
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.3813	0.7677	0.3813	0.3302	0.4459	10.072	8			
Ref05164470	0.4966	1.0000	0.4966	0.4324	0.5743	9.462	8			
*5164472	0.1942	0.3911	0.1942	0.1466	0.2594	19.575	8	14.151	2.624	0.0561
*5164474	0.3360	0.6767	0.3360	0.2531	0.3825	12.246	8	7.271	2.624	0.0580
5164475	0.4229	0.8516	0.4229	0.3056	0.5213	16.111	8	2.519	2.624	0.0768
*5164479	0.2267	0.4565	0.2267	0.1244	0.2793	26.121	8	10.097	2.624	0.0701
*5164483	0.3452	0.6951	0.3452	0.2992	0.3817	8.017	8	7.853	2.624	0.0506
*5164485	0.4124	0.8305	0.4124	0.3689	0.4795	10.191	8	3.776	2.624	0.0585
*5164487	0.3337	0.6720	0.3337	0.2776	0.4196	14.024	7	6.709	2.650	0.0643
5164494	0.4486	0.9033	0.4486	0.3656	0.5403	14.257	8			
*5164507	0.4116	0.8289	0.4116	0.3529	0.4451	8.181	8	4.158	2.624	0.0536
*5164491	0.3357	0.6760	0.3357	0.3039	0.4426	13.560	8	6.955	2.624	0.0607
*5174405	0.3408	0.6864	0.3408	0.1942	0.4017	18.996	8	5.507	2.624	0.0742
5174406	0.4511	0.9083	0.4511	0.3988	0.5207	10.109	8	1.967	2.624	0.0608
*5174408	0.3007	0.6055	0.3007	0.2441	0.4318	21.501	8	6.933	2.624	0.0742
*5174412	0.3480	0.7008	0.3480	0.2495	0.4346	17.364	8	5.490	2.624	0.0710
*5174413	0.4010	0.8075	0.4010	0.2803	0.4885	18.644	8	3.062	2.624	0.0819
*5174407	0.3714	0.7479	0.3714	0.2892	0.4374	13.166	8	5.221	2.624	0.0629
5174410	0.4215	0.8488	0.4215	0.3194	0.5274	17.678	8	2.411	2.624	0.0817
5164411	0.4843	0.9753	0.4843	0.3682	0.6045	14.297	8			
*5164423	0.3242	0.6529	0.3242	0.2211	0.3782	16.647	8	6.813	2.624	0.0664
*5164424	0.3341	0.6727	0.3341	0.2654	0.3933	16.037	8	6.451	2.624	0.0661

mlh 11-9-05 ①

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.48544	1.035	-0.1195	-0.0377
Bartlett's Test indicates equal variances (p = 0.51)	17.241	34.8052		
The control means are significantly different (p = 9.77E-05)	5.37603	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.06612	0.13315	0.04226	0.00289	2.3E-23	18, 132

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

Pos	ID	Rep	Group	Day 0	Day 10	psurv Day 10	Day 20	psurv Day 20	Day 28	psurv day 28	Dry Wt (mg)	Tare Wt (mg)	Wt. count	TWT	WT	Ashed dry wt	TAFDW	AFDW
	1	1	D-Control	10					10	1	33.303	29.507	10	3.796	0.3796			
	2	2	D-Control	10					9	0.9	31.978	29.006	9	2.972	0.330222			
	3	3	D-Control	10					10	1	32.368	28.929	10	3.439	0.3439			
	4	4	D-Control	10					10	1	31.555	27.924	10	3.631	0.3631			
	5	5	D-Control	10					9	0.9	30.507	26.76	9	3.747	0.416333			
	6	6	D-Control	10					10	1	31.762	27.742	10	4.02	0.402			
	7	7	D-Control	10					10	1	32.183	27.724	10	4.459	0.4459			
	8	8	D-Control	10					10	1	31.578	27.888	10	3.69	0.369			
	9	1	Ref05164470	10					9	0.9	34.155	28.986	9	5.169	0.574333			
	10	2	Ref05164470	10					10	1	34.508	30.184	10	4.324	0.4324			
	11	3	Ref05164470	10					10	1	32.499	27.449	10	5.05	0.505			
	12	4	Ref05164470	10					10	1	32.878	28.214	10	4.664	0.4664			
	13	5	Ref05164470	10					10	1	34.181	28.808	10	5.373	0.5373			
	14	6	Ref05164470	10					9	0.9	32.703	28.169	9	4.534	0.503778			
	15	7	Ref05164470	10					9	0.9	32.748	28.728	9	4.02	0.446667			
	16	8	Ref05164470	10					9	0.9	30.461	25.899	9	4.562	0.506889			
	17	1	5164472	10					9	0.9	29.872	28.553	9	1.319	0.146556			
	18	2	5164472	10					9	0.9	31.124	29.748	9	1.376	0.152889			
	19	3	5164472	10					6	0.6	27.904	26.645	6	1.259	0.209833			
	20	4	5164472	10					9	0.9	30.117	27.782	9	2.335	0.259444			
	21	5	5164472	10					10	1	30.816	28.989	10	1.827	0.1827			
	22	6	5164472	10					10	1	30.53	28.479	10	2.051	0.2051			
	23	7	5164472	10					9	0.9	30.524	28.503	9	2.021	0.224556			
	24	8	5164472	10					10	1	28.853	27.127	10	1.726	0.1726			
	25	1	5164474	10					9	0.9	33.565	31.287	9	2.278	0.253111			
	26	2	5164474	10					7	0.7	31.279	28.898	7	2.381	0.340143			
	27	3	5164474	10					8	0.8	31.038	28.606	8	2.432	0.304			
	28	4	5164474	10					10	1	33.902	30.077	10	3.825	0.3825			
	29	5	5164474	10					9	0.9	33.625	30.394	9	3.231	0.359			
	30	6	5164474	10					8	0.8	31.273	28.358	8	2.915	0.364375			
	31	7	5164474	10					10	1	33.28	29.72	10	3.56	0.356			
	32	8	5164474	10					10	1	31.883	28.591	10	3.292	0.3292			
	33	1	5164475	10					10	1	32.398	28.181	10	4.217	0.4217			
	34	2	5164475	10					9	0.9	33.521	29.326	9	4.195	0.466111			
	35	3	5164475	10					8	0.8	32.711	29.622	8	3.089	0.386125			
	36	4	5164475	10					10	1	35.087	29.874	10	5.213	0.5213			
	37	5	5164475	10					10	1	34.818	30.086	10	4.732	0.4732			
	38	6	5164475	10					9	0.9	31.272	28.522	9	2.75	0.305556			
	39	7	5164475	10					10	1	32.338	27.93	10	4.408	0.4408			

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	40	8	5164475	10					10	1	32.502	28.818	10	3.684	0.3684			
	41	1	5164479	10					8	0.8	30.986	28.764	8	2.222	0.27775			
	42	2	5164479	10					7	0.7	31.607	30.364	7	1.243	0.177571			
	43	3	5164479	10					9	0.9	30.588	28.413	9	2.175	0.241667			
	44	4	5164479	10					8	0.8	30.838	28.713	8	2.125	0.265625			
	45	5	5164479	10					9	0.9	30.412	29.292	9	1.12	0.124444			
	46	6	5164479	10					8	0.8	30.025	28.617	8	1.408	0.176			
	47	7	5164479	10					10	1	30.715	28.001	10	2.714	0.2714			
	48	8	5164479	10					10	1	31.126	28.333	10	2.793	0.2793			
	49	1	5164483	10					10	1	32.708	29.58	10	3.128	0.3128			
	50	2	5164483	10					9	0.9	31.911	28.851	9	3.06	0.34			
	51	3	5164483	10					10	1	31.953	28.298	10	3.655	0.3655			
	52	4	5164483	10					9	0.9	34.745	31.655	9	3.09	0.343333			
	53	5	5164483	10					10	1	32.414	28.795	10	3.619	0.3619			
	54	6	5164483	10					10	1	32.44	28.623	10	3.817	0.3817			
	55	7	5164483	10					10	1	33.702	30.71	10	2.992	0.2992			
	56	8	5164483	10					10	1	34.048	30.477	10	3.571	0.3571			
	57	1	5164485	10					10	1	32.167	27.372	10	4.795	0.4795			
	58	2	5164485	10					9	0.9	32.849	29.427	9	3.422	0.380222			
	59	3	5164485	10					10	1	33.804	29.176	10	4.628	0.4628			
	60	4	5164485	10					10	1	33.798	30.058	10	3.74	0.374			
	61	5	5164485	10					10	1	34.635	30.279	10	4.356	0.4356			
	62	6	5164485	10					10	1	33.923	29.974	10	3.949	0.3949			
	63	7	5164485	10					10	1	31.329	27.64	10	3.689	0.3689			
	64	8	5164485	10					10	1	32.864	28.828	10	4.036	0.4036			
	65	1	5164487	10					10	1	31.71	28.236	10	3.474	0.3474			
	66	2	5164487	10					10	1	31.993	28.67	10	3.323	0.3323			
	67	3	5164487	10					10	1	33.07	29.542	10	3.528	0.3528			
	68	4	5164487	10					10	1	34.381	30.185	10	4.196	0.4196			
	69	5	5164487	10					10	1	29.142	26.366	10	2.776	0.2776			
	70	6	5164487	10					10	1	34.103	31.283	9	2.82	0.313333			
	71	7	5164487	10					10	1	30.494	27.563	10	2.931	0.2931			
	72	1	5164494	10					9	0.9	32.597	27.844	9	4.753	0.528111			
	73	2	5164494	10					10	1	34.318	30.161	10	4.157	0.4157			
	74	3	5164494	10					10	1	32.834	28.318	10	4.516	0.4516			
	75	4	5164494	10					10	1	32.17	28.198	10	3.972	0.3972			
	76	5	5164494	10					9	0.9	31.541	27.898	9	3.643	0.404778			
	77	6	5164494	10					9	0.9	32.541	28.172	9	4.369	0.485444			
	78	7	5164494	10					8	0.8	31.064	28.139	8	2.925	0.365625			
	79	8	5164494	10					9	0.9	32.438	27.575	9	4.863	0.540333			
	80	1	5164507	10					10	1	33.763	29.956	10	3.807	0.3807			

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	81	2	5164507	10					10	1	32.746	28.763	10	3.983	0.3983			
	82	3	5164507	10					10	1	33.64	29.237	10	4.403	0.4403			
	83	4	5164507	10					9	0.9	34.971	30.986	9	3.985	0.442778			
	84	5	5164507	10					10	1	33.529	29.505	10	4.024	0.4024			
	85	6	5164507	10					9	0.9	33.624	29.618	9	4.006	0.445111			
	86	7	5164507	10					10	1	33.621	29.316	10	4.305	0.4305			
	87	8	5164507	10					10	1	31.546	28.017	10	3.529	0.3529			
	88	1	5164491	10					10	1	31.616	28.259	10	3.357	0.3357			
	89	2	5164491	10					8	0.8	30.43	27.671	8	2.759	0.344875			
	90	3	5164491	10					9	0.9	32.483	29.734	9	2.749	0.305444			
	91	4	5164491	10					7	0.7	30.904	28.73	7	2.174	0.310571			
	92	5	5164491	10					9	0.9	32.789	30.054	9	2.735	0.303889			
	93	6	5164491	10					10	1	33.145	29.961	10	3.184	0.3184			
	94	7	5164491	10					8	0.8	31.543	28.949	8	2.594	0.32425			
	95	8	5164491	10					8	0.8	32.276	28.735	8	3.541	0.442625			
	96	1	5174405	10					9	0.9	32.488	29.2	9	3.288	0.365333			
	97	2	5174405	10					10	1	32.941	29.287	10	3.654	0.3654			
	98	3	5174405	10					10	1	33.148	29.897	10	3.251	0.3251			
	99	4	5174405	10					5	0.5	29.545	28.574	5	0.971	0.1942			
	100	5	5174405	10					10	1	31.754	28.557	9	3.197	0.355222			
	101	6	5174405	10					10	1	33.503	29.486	10	4.017	0.4017			
	102	7	5174405	10					10	1	33.137	29.242	10	3.895	0.3895			
	103	8	5174405	10					10	1	33.291	29.988	10	3.303	0.3303			
	104	1	5174406	10					9	0.9	34.114	29.428	9	4.686	0.520667			
	105	2	5174406	10					10	1	33.226	29.238	10	3.988	0.3988			
	106	3	5174406	10					9	0.9	32.493	28.713	9	3.78	0.42			
	107	4	5174406	10					10	1	33.569	28.755	10	4.814	0.4814			
	108	5	5174406	10					10	1	33.018	28.647	10	4.371	0.4371			
	109	6	5174406	10					10	1	33.495	28.43	10	5.065	0.5065			
	110	7	5174406	10					10	1	33.467	29.33	10	4.137	0.4137			
	111	8	5174406	10					9	0.9	33.035	29.162	9	3.873	0.430333			
	112	1	5174408	10					10	1	35.471	31.153	10	4.318	0.4318			
	113	2	5174408	10					10	1	29.793	27.066	10	2.727	0.2727			
	114	3	5174408	10					8	0.8	31.152	29.199	8	1.953	0.244125			
	115	4	5174408	10					10	1	30.678	28.177	10	2.501	0.2501			
	116	5	5174408	10					10	1	31.054	28.316	10	2.738	0.2738			
	117	6	5174408	10					10	1	32.319	28.68	10	3.639	0.3639			
	118	7	5174408	10					9	0.9	30.82	28.152	9	2.668	0.296444			
	119	8	5174408	10					10	1	32.704	29.978	10	2.726	0.2726			
	120	1	5174412	10					10	1	31.711	28.709	10	3.002	0.3002			
	121	2	5174412	10					9	0.9	31.09	27.179	9	3.911	0.434556			

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	122	3	5174412	10					10	1	32.204	28.705	10	3.499	0.3499						
	123	4	5174412	10					8	0.8	30.444	27.816	8	2.628	0.3285						
	124	5	5174412	10					9	0.9	31.068	27.844	9	3.224	0.358222						
	125	6	5174412	10					10	1	34.472	30.247	10	4.225	0.4225						
	126	7	5174412	11					11	1	29.633	26.888	11	2.745	0.249545						
	127	8	5174412	10					10	1	32.509	29.102	10	3.407	0.3407						
	128	1	5174413	10					10	1	31.112	27.444	10	3.668	0.3668						
	129	2	5174413	10					10	1	34.282	30.207	10	4.075	0.4075						
	130	3	5174413	10					8	0.8	33.981	30.073	8	3.908	0.4885						
	131	4	5174413	10					9	0.9	33.318	29.177	9	4.141	0.460111						
	132	5	5174413	10					10	1	32.592	27.71	10	4.882	0.4882						
	133	6	5174413	10					10	1	31.78	28.977	10	2.803	0.2803						
	134	7	5174413	10					10	1	33.301	29.499	10	3.802	0.3802						
	135	8	5174413	10					10	1	31.847	28.482	10	3.365	0.3365						
	136	1	5174407	10					10	1	32.581	28.207	10	4.374	0.4374						
	137	2	5174407	10					9	0.9	31.34	27.702	9	3.638	0.404222						
	138	3	5174407	10					9	0.9	30.987	28.033	9	2.954	0.328222						
	139	4	5174407	10					9	0.9	32.125	28.979	9	3.146	0.349556						
	140	5	5174407	10					8	0.8	32.24	28.906	8	3.334	0.41675						
	141	6	5174407	10					8	0.8	30.826	27.774	8	3.052	0.3815						
	142	7	5174407	10					10	1	31.86	28.968	10	2.892	0.2892						
	143	8	5174407	10					10	1	33.477	29.832	10	3.645	0.3645						
	144	1	5174410	10					10	1	33.011	29.124	10	3.887	0.3887						
	145	2	5174410	10					10	1	35.613	30.339	10	5.274	0.5274						
	146	3	5174410	10					9	0.9	33.787	29.579	9	4.208	0.467556						
	147	4	5174410	10					9	0.9	33.065	30.19	9	2.875	0.319444						
	148	5	5174410	10					9	0.9	32.123	28.708	9	3.415	0.379444						
	149	6	5174410	10					10	1	32.809	29.405	10	3.404	0.3404						
	150	7	5174410	10					10	1	33.143	28.458	10	4.685	0.4685						
	151	8	5174410	10					8	0.8	31.927	28.083	8	3.844	0.4805						
	152	1	5164411	10					10	1	33.521	28.588	10	4.933	0.4933						
	153	2	5164411	10					10	1	31.872	28.19	10	3.682	0.3682						
	154	3	5164411	10					10	1	33.76	28.628	10	5.132	0.5132						
	155	4	5164411	10					9	0.9	33.05	28.833	9	4.217	0.468556						
	156	5	5164411	10					10	1	33.817	28.701	10	5.116	0.5116						
	157	6	5164411	10					8	0.8	33.794	28.958	8	4.836	0.6045						
	158	7	5164411	10					10	1	33.147	28.233	10	4.914	0.4914						
	159	8	5164411	10					10	1	33.265	29.028	10	4.237	0.4237						
	160	1	5164423	10					10	1	33.089	29.34	10	3.749	0.3749						
	161	2	5164423	10					10	1	32.375	29.478	10	2.897	0.2897						
	162	3	5164423	10					10	1	30.968	27.441	10	3.527	0.3527						

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Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	163	4	5164423	10					9	0.9	32.03	28.626	9	3.404	0.378222				
	164	5	5164423	10					10	1	30.45	28.239	10	2.211	0.2211				
	165	6	5164423	10					10	1	33.802	30.762	10	3.04	0.304				
	166	7	5164423	10					8	0.8	32.537	29.621	8	2.916	0.3645				
	167	8	5164423	10					10	1	30.865	27.778	10	3.087	0.3087				
	168	1	5164424	10					10	1	34.194	30.429	10	3.765	0.3765				
	169	2	5164424	10					8	0.8	32.972	30.595	8	2.377	0.297125				
	170	3	5164424	10					9	0.9	33.409	29.989	9	3.42	0.38				
	171	4	5164424	10					9	0.9	31.268	27.822	9	3.446	0.382889				
	172	5	5164424	10					10	1	30.574	28.185	9	2.389	0.265444				
	173	6	5164424	10					10	1	31.609	28.788	10	2.821	0.2821				
	174	7	5164424	10					9	0.9	31.611	28.071	9	3.54	0.393333				
	175	8	5164424	10					10	1	32.07	29.118	10	2.952	0.2952				

Comments: Data entry verified against EXCEL spreadsheet - MHE 11-9-05

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Freshwater Sediment-Average ind. biomass

Start Date:	5/5/05 10:45	Test ID: 727-2	Sample ID:
End Date:	6/2/05 11:30	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

727-2
Ref 78

Conc-	1	2	3	4	5	6	7	8
D-Control	0.3796	0.3302	0.3439	0.3631	0.4163	0.4020	0.4459	0.3690
Ref05164478	0.4640	0.5319	0.4263	0.4149	0.5749	0.4937	0.6923	0.5633
5164472	0.1466	0.1529	0.2098	0.2594	0.1827	0.2051	0.2246	0.1726
5164474	0.2531	0.3401	0.3040	0.3825	0.3590	0.3644	0.3560	0.3292
5164475	0.4217	0.4661	0.3861	0.5213	0.4732	0.3056	0.4408	0.3684
5164479	0.2778	0.1776	0.2417	0.2656	0.1244	0.1760	0.2714	0.2793
5164483	0.3128	0.3400	0.3655	0.3433	0.3619	0.3817	0.2992	0.3571
5164485	0.4795	0.3802	0.4628	0.3740	0.4356	0.3949	0.3689	0.4036
5164487	0.3474	0.3323	0.3528	0.4196	0.2776	0.3133	0.2931	
5164494	0.5281	0.4157	0.4516	0.3972	0.4048	0.4854	0.3656	0.5403
5164507	0.3807	0.3983	0.4403	0.4428	0.4024	0.4451	0.4305	0.3529
5164491	0.3357	0.3449	0.3054	0.3106	0.3039	0.3184	0.3243	0.4426
5174405	0.3653	0.3654	0.3251	0.1942	0.3552	0.4017	0.3895	0.3303
5174406	0.5207	0.3988	0.4200	0.4814	0.4371	0.5065	0.4137	0.4303
5174408	0.4318	0.2727	0.2441	0.2501	0.2738	0.3639	0.2964	0.2726
5174412	0.3002	0.4346	0.3499	0.3285	0.3582	0.4225	0.2495	0.3407
5174413	0.3668	0.4075	0.4885	0.4601	0.4882	0.2803	0.3802	0.3365
5174407	0.4374	0.4042	0.3282	0.3496	0.4168	0.3815	0.2892	0.3645
5174410	0.3887	0.5274	0.4676	0.3194	0.3794	0.3404	0.4685	0.4805
5164411	0.4933	0.3682	0.5132	0.4686	0.5116	0.6045	0.4914	0.4237
5164423	0.3749	0.2897	0.3527	0.3782	0.2211	0.3040	0.3645	0.3087
5164424	0.3765	0.2971	0.3800	0.3829	0.2654	0.2821	0.3933	0.2952

mrk 11-9-05 ①

			Transform: Untransformed						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.3813	0.7330	0.3813	0.3302	0.4459	10.072	8			
Ref05164478	0.5202	1.0000	0.5202	0.4149	0.6923	17.557	8			
*5164472	0.1942	0.3734	0.1942	0.1466	0.2594	19.575	8	9.320	2.624	0.0918
*5164474	0.3360	0.6460	0.3360	0.2531	0.3825	12.246	8	5.199	2.624	0.0929
5164475	0.4229	0.8130	0.4229	0.3056	0.5213	16.111	8	2.414	2.624	0.1057
*5164479	0.2267	0.4359	0.2267	0.1244	0.2793	26.121	8	7.625	2.624	0.1010
5164483	0.3452	0.6636	0.3452	0.2992	0.3817	8.017	8			
*5164485	0.4124	0.7929	0.4124	0.3689	0.4795	10.191	8	3.031	2.624	0.0933
*5164487	0.3337	0.6416	0.3337	0.2776	0.4196	14.024	7	4.856	2.650	0.1017
5164494	0.4486	0.8624	0.4486	0.3656	0.5403	14.257	8			
*5164507	0.4116	0.7913	0.4116	0.3529	0.4451	8.181	8	3.154	2.624	0.0903
*5164491	0.3357	0.6454	0.3357	0.3039	0.4426	13.560	8	5.112	2.624	0.0947
*5174405	0.3408	0.6553	0.3408	0.1942	0.4017	18.996	8	4.531	2.624	0.1039
5174406	0.4511	0.8672	0.4511	0.3988	0.5207	10.109	8	1.915	2.624	0.0947
*5174408	0.3007	0.5781	0.3007	0.2441	0.4318	21.501	8	5.548	2.624	0.1038
*5174412	0.3480	0.6690	0.3480	0.2495	0.4346	17.364	8	4.446	2.624	0.1016
*5174413	0.4010	0.7709	0.4010	0.2803	0.4885	18.644	8	2.855	2.624	0.1095
*5174407	0.3714	0.7140	0.3714	0.2892	0.4374	13.166	8	4.061	2.624	0.0961
5174410	0.4215	0.8103	0.4215	0.3194	0.5274	17.678	8	2.368	2.624	0.1094
5164411	0.4843	0.9311	0.4843	0.3682	0.6045	14.297	8			
*5164423	0.3242	0.6233	0.3242	0.2211	0.3782	16.647	8	5.224	2.624	0.0984
*5164424	0.3341	0.6422	0.3341	0.2654	0.3933	16.037	8	4.971	2.624	0.0982

mrk 11-9-05 ①

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.5801	1.035	0.03712	0.18181
Bartlett's Test indicates equal variances (p = 0.24)	20.5966	33.4087		
The control means are significantly different (p = 1.41E-03)	3.96572	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.09825	0.18888	0.04795	0.00335	7.9E-22	17, 125

Freshwater Sediment-Average ind. biomass

Start Date:	5/5/05 10:45	Test ID: 727-2	Sample ID:
End Date:	6/2/05 11:30	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.3796	0.3302	0.3439	0.3631	0.4163	0.4020	0.4459	0.3690
Ref05164478	0.4640	0.5319	0.4263	0.4149	0.5749	0.4937	0.6923	0.5633
5164472	0.1466	0.1529	0.2098	0.2594	0.1827	0.2051	0.2246	0.1726
5164474	0.2531	0.3401	0.3040	0.3825	0.3590	0.3644	0.3560	0.3292
5164475	0.4217	0.4661	0.3861	0.5213	0.4732	0.3056	0.4408	0.3684
5164479	0.2778	0.1776	0.2417	0.2656	0.1244	0.1760	0.2714	0.2793
5164483	0.3128	0.3400	0.3655	0.3433	0.3619	0.3817	0.2992	0.3571
5164485	0.4795	0.3802	0.4628	0.3740	0.4356	0.3949	0.3689	0.4036
5164487	0.3474	0.3323	0.3528	0.4196	0.2776	0.3133	0.2931	
5164494	0.5281	0.4157	0.4516	0.3972	0.4048	0.4854	0.3656	0.5403
5164507	0.3807	0.3983	0.4403	0.4428	0.4024	0.4451	0.4305	0.3529
5164491	0.3357	0.3449	0.3054	0.3106	0.3039	0.3184	0.3243	0.4426
5174405	0.3653	0.3654	0.3251	0.1942	0.3552	0.4017	0.3895	0.3303
5174406	0.5207	0.3988	0.4200	0.4814	0.4371	0.5065	0.4137	0.4303
5174408	0.4318	0.2727	0.2441	0.2501	0.2738	0.3639	0.2964	0.2726
5174412	0.3002	0.4346	0.3499	0.3285	0.3582	0.4225	0.2495	0.3407
5174413	0.3668	0.4075	0.4885	0.4601	0.4882	0.2803	0.3802	0.3365
5174407	0.4374	0.4042	0.3282	0.3496	0.4168	0.3815	0.2892	0.3645
5174410	0.3887	0.5274	0.4676	0.3194	0.3794	0.3404	0.4685	0.4805
5164411	0.4933	0.3682	0.5132	0.4686	0.5116	0.6045	0.4914	0.4237
5164423	0.3749	0.2897	0.3527	0.3782	0.2211	0.3040	0.3645	0.3087
5164424	0.3765	0.2971	0.3800	0.3829	0.2654	0.2821	0.3933	0.2952

MLR 11-9-05 ①

			Transform: Untransformed						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.3813	0.7330	0.3813	0.3302	0.4459	10.072	8			
Ref05164478	0.5202	1.0000	0.5202	0.4149	0.6923	17.557	8			
5164472	0.1942	0.3734	0.1942	0.1466	0.2594	19.575	8			
5164474	0.3360	0.6460	0.3360	0.2531	0.3825	12.246	8			
5164475	0.4229	0.8130	0.4229	0.3056	0.5213	16.111	8			
5164479	0.2267	0.4359	0.2267	0.1244	0.2793	26.121	8			
*5164483	0.3452	0.6636	0.3452	0.2992	0.3817	8.017	8	5.186	2.896	0.0977
5164485	0.4124	0.7929	0.4124	0.3689	0.4795	10.191	8			
5164487	0.3337	0.6416	0.3337	0.2776	0.4196	14.024	7			
5164494	0.4486	0.8624	0.4486	0.3656	0.5403	14.257	8			
5164507	0.4116	0.7913	0.4116	0.3529	0.4451	8.181	8			
5164491	0.3357	0.6454	0.3357	0.3039	0.4426	13.560	8			
5174405	0.3408	0.6553	0.3408	0.1942	0.4017	18.996	8			
5174406	0.4511	0.8672	0.4511	0.3988	0.5207	10.109	8			
5174408	0.3007	0.5781	0.3007	0.2441	0.4318	21.501	8			
5174412	0.3480	0.6690	0.3480	0.2495	0.4346	17.364	8			
5174413	0.4010	0.7709	0.4010	0.2803	0.4885	18.644	8			
5174407	0.3714	0.7140	0.3714	0.2892	0.4374	13.166	8			
5174410	0.4215	0.8103	0.4215	0.3194	0.5274	17.678	8			
5164411	0.4843	0.9311	0.4843	0.3682	0.6045	14.297	8			
5164423	0.3242	0.6233	0.3242	0.2211	0.3782	16.647	8			
5164424	0.3341	0.6422	0.3341	0.2654	0.3933	16.037	8			

MLR 9-05 ①

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.92968	0.844	0.85026	2.41272
F-Test indicates unequal variances (p = 5.43E-03)	10.8904	8.88531		
The control means are significantly different (p = 1.41E-03)	3.96572	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Heteroscedastic t Test indicates significant differences	0.09772	0.18787	0.12246	0.00455	1.4E-04	1, 14

Freshwater Sediment-28-day survival

Start Date: 5/5/05 10:45 Test ID: 727-2 Sample ID:
End Date: 6/2/05 11:30 Lab ID: ORNAS-Northwestern Aquati Sample Type: SED-Sediment
Sample Date: Protocol: NASXXXHA4C-Hyalella 28-d Test Species: HA-Hyalella azteca
Comments:

Conc-	1	2	3	4	5	6	7	8
D-Control	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
Ref05164478	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000
5164472	0.9000	0.9000	0.6000	0.9000	1.0000	1.0000	0.9000	1.0000
5164474	0.9000	0.7000	0.8000	1.0000	0.9000	0.8000	1.0000	1.0000
5164475	1.0000	0.9000	0.8000	1.0000	1.0000	0.9000	1.0000	1.0000
5164479	0.8000	0.7000	0.9000	0.8000	0.9000	0.8000	1.0000	1.0000
5164483	1.0000	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000
5164485	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5164487	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
5164494	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000	0.8000	0.9000
5164507	1.0000	1.0000	1.0000	0.9000	1.0000	0.9000	1.0000	1.0000
5164491	1.0000	0.8000	0.9000	0.7000	0.9000	1.0000	0.8000	0.8000
5174405	0.9000	1.0000	1.0000	0.5000	1.0000	1.0000	1.0000	1.0000
5174406	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000	0.9000
5174408	1.0000	1.0000	0.8000	1.0000	1.0000	1.0000	0.9000	1.0000
5174412	1.0000	0.9000	1.0000	0.8000	0.9000	1.0000	1.0000	1.0000
5174413	1.0000	1.0000	0.8000	0.9000	1.0000	1.0000	1.0000	1.0000
5174407	1.0000	0.9000	0.9000	0.9000	0.8000	0.8000	1.0000	1.0000
5174410	1.0000	1.0000	0.9000	0.9000	0.9000	1.0000	1.0000	0.8000
5164411	1.0000	1.0000	1.0000	0.9000	1.0000	0.8000	1.0000	1.0000
5164423	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000	0.8000	1.0000
5164424	1.0000	0.8000	0.9000	0.9000	1.0000	1.0000	0.9000	1.0000

MLK 11-9-05 ①

			Transform: Arcsin Square Root						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.9750	1.0000	1.3713	1.2490	1.4120	5.501	8			
Ref05164478	0.9750	1.0000	1.3713	1.2490	1.4120	5.501	8			
5164472	0.9000	0.9231	1.2648	0.8861	1.4120	13.676	8			
5164474	0.8875	0.9103	1.2424	0.9912	1.4120	13.124	8	2.028	2.624	0.1667
5164475	0.9500	0.9744	1.3332	1.1071	1.4120	8.799	8			
*5164479	0.8625	0.8846	1.2043	0.9912	1.4120	12.711	8	2.767	2.624	0.1584
5164483	0.9750	1.0000	1.3713	1.2490	1.4120	5.501	8			
5164485	0.9875	1.0128	1.3916	1.2490	1.4120	4.140	8			
5164487	1.0000	1.0256	1.4120	1.4120	1.4120	0.000	7			
5164494	0.9250	0.9487	1.2924	1.1071	1.4120	8.514	8			
5164507	0.9750	1.0000	1.3713	1.2490	1.4120	5.501	8			
*5164491	0.8625	0.8846	1.2043	0.9912	1.4120	12.711	8	2.767	2.624	0.1584
5174405	0.9250	0.9487	1.3133	0.7854	1.4120	16.813	8			
5174406	0.9625	0.9872	1.3509	1.2490	1.4120	6.244	8			
5174408	0.9625	0.9872	1.3535	1.1071	1.4120	8.476	8			
5174412	0.9500	0.9744	1.3341	1.1071	1.4195	8.848	8			
5174413	0.9625	0.9872	1.3535	1.1071	1.4120	8.476	8			
5174407	0.9125	0.9359	1.2747	1.1071	1.4120	10.042	8			
5174410	0.9375	0.9615	1.3128	1.1071	1.4120	8.821	8			
5164411	0.9625	0.9872	1.3535	1.1071	1.4120	8.476	8			
5164423	0.9625	0.9872	1.3535	1.1071	1.4120	8.476	8			
5164424	0.9375	0.9615	1.3128	1.1071	1.4120	8.821	8			

MLK 11-9-05 ①

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.91985	0.904	0.02675	-0.8959
Bartlett's Test indicates equal variances (p = 0.18)	4.86189	11.3449		
The control means are not significantly different (p = 1.00)	5.9E-15	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.08342	0.08683	0.05016	0.01979	0.07706	3, 28

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

Pos	ID	Rep	Group	Day 0	Day 10	psurv Day 10	Day 20	psurv Day 20	Day 28	psurv day 28	Dry Wt (mg)	Tare Wt (mg)	Wt. count	TWT	WT	Ashed dry wt	TAFDW	AFDW
	1	1	D-Control	10					10	1	33.303	29.507	10	3.796	0.3796			
	2	2	D-Control	10					9	0.9	31.978	29.006	9	2.972	0.330222			
	3	3	D-Control	10					10	1	32.368	28.929	10	3.439	0.3439			
	4	4	D-Control	10					10	1	31.555	27.924	10	3.631	0.3631			
	5	5	D-Control	10					9	0.9	30.507	26.76	9	3.747	0.416333			
	6	6	D-Control	10					10	1	31.762	27.742	10	4.02	0.402			
	7	7	D-Control	10					10	1	32.183	27.724	10	4.459	0.4459			
	8	8	D-Control	10					10	1	31.578	27.888	10	3.69	0.369			
	9	1	Ref05164478	10					10	1	32.419	27.779	10	4.64	0.464			
	10	2	Ref05164478	10					10	1	32.639	27.32	10	5.319	0.5319			
	11	3	Ref05164478	10					10	1	33.687	29.424	10	4.263	0.4263			
	12	4	Ref05164478	10					9	0.9	31.544	27.81	9	3.734	0.414889			
	13	5	Ref05164478	10					10	1	34.34	28.591	10	5.749	0.5749			
	14	6	Ref05164478	10					10	1	38.062	33.125	10	4.937	0.4937			
	15	7	Ref05164478	10					9	0.9	35.009	28.778	9	6.231	0.692333			
	16	8	Ref05164478	10					10	1	32.017	26.384	10	5.633	0.5633			
	17	1	5164472	10					9	0.9	29.872	28.553	9	1.319	0.146556			
	18	2	5164472	10					9	0.9	31.124	29.748	9	1.376	0.152889			
	19	3	5164472	10					6	0.6	27.904	26.645	6	1.259	0.209833			
	20	4	5164472	10					9	0.9	30.117	27.782	9	2.335	0.259444			
	21	5	5164472	10					10	1	30.816	28.989	10	1.827	0.1827			
	22	6	5164472	10					10	1	30.53	28.479	10	2.051	0.2051			
	23	7	5164472	10					9	0.9	30.524	28.503	9	2.021	0.224556			
	24	8	5164472	10					10	1	28.853	27.127	10	1.726	0.1726			
	25	1	5164474	10					9	0.9	33.565	31.287	9	2.278	0.253111			
	26	2	5164474	10					7	0.7	31.279	28.898	7	2.381	0.340143			
	27	3	5164474	10					8	0.8	31.038	28.606	8	2.432	0.304			
	28	4	5164474	10					10	1	33.902	30.077	10	3.825	0.3825			
	29	5	5164474	10					9	0.9	33.625	30.394	9	3.231	0.359			
	30	6	5164474	10					8	0.8	31.273	28.358	8	2.915	0.364375			
	31	7	5164474	10					10	1	33.28	29.72	10	3.56	0.356			
	32	8	5164474	10					10	1	31.883	28.591	10	3.292	0.3292			
	33	1	5164475	10					10	1	32.398	28.181	10	4.217	0.4217			
	34	2	5164475	10					9	0.9	33.521	29.326	9	4.195	0.466111			
	35	3	5164475	10					8	0.8	32.711	29.622	8	3.089	0.386125			
	36	4	5164475	10					10	1	35.087	29.874	10	5.213	0.5213			
	37	5	5164475	10					10	1	34.818	30.086	10	4.732	0.4732			
	38	6	5164475	10					9	0.9	31.272	28.522	9	2.75	0.305556			
	39	7	5164475	10					10	1	32.338	27.93	10	4.408	0.4408			

see input data entry against EXCEL spreadsheet [illegible] 11-9-05

ToxCalc 5.0.23N

Test: FW-Freshwater Sediment
Test ID: 727-2
Species: HA-Hyalella azteca
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample ID:
Sample Type: SED-Sediment
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30
Lab ID: ORNAS-Northwestern Aquatic Sciences

	40	8	5164475	10					10	1	32.502	28.818	10	3.684	0.3684				
	41	1	5164479	10					8	0.8	30.986	28.764	8	2.222	0.27775				
	42	2	5164479	10					7	0.7	31.607	30.364	7	1.243	0.177571				
	43	3	5164479	10					9	0.9	30.588	28.413	9	2.175	0.241667				
	44	4	5164479	10					8	0.8	30.838	28.713	8	2.125	0.265625				
	45	5	5164479	10					9	0.9	30.412	29.292	9	1.12	0.124444				
	46	6	5164479	10					8	0.8	30.025	28.617	8	1.408	0.176				
	47	7	5164479	10					10	1	30.715	28.001	10	2.714	0.2714				
	48	8	5164479	10					10	1	31.126	28.333	10	2.793	0.2793				
	49	1	5164483	10					10	1	32.708	29.58	10	3.128	0.3128				
	50	2	5164483	10					9	0.9	31.911	28.851	9	3.06	0.34				
	51	3	5164483	10					10	1	31.953	28.298	10	3.655	0.3655				
	52	4	5164483	10					9	0.9	34.745	31.655	9	3.09	0.343333				
	53	5	5164483	10					10	1	32.414	28.795	10	3.619	0.3619				
	54	6	5164483	10					10	1	32.44	28.623	10	3.817	0.3817				
	55	7	5164483	10					10	1	33.702	30.71	10	2.992	0.2992				
	56	8	5164483	10					10	1	34.048	30.477	10	3.571	0.3571				
	57	1	5164485	10					10	1	32.167	27.372	10	4.795	0.4795				
	58	2	5164485	10					9	0.9	32.849	29.427	9	3.422	0.380222				
	59	3	5164485	10					10	1	33.804	29.176	10	4.628	0.4628				
	60	4	5164485	10					10	1	33.798	30.058	10	3.74	0.374				
	61	5	5164485	10					10	1	34.635	30.279	10	4.356	0.4356				
	62	6	5164485	10					10	1	33.923	29.974	10	3.949	0.3949				
	63	7	5164485	10					10	1	31.329	27.64	10	3.689	0.3689				
	64	8	5164485	10					10	1	32.864	28.828	10	4.036	0.4036				
	65	1	5164487	10					10	1	31.71	28.236	10	3.474	0.3474				
	66	2	5164487	10					10	1	31.993	28.67	10	3.323	0.3323				
	67	3	5164487	10					10	1	33.07	29.542	10	3.528	0.3528				
	68	4	5164487	10					10	1	34.381	30.185	10	4.196	0.4196				
	69	5	5164487	10					10	1	29.142	26.366	10	2.776	0.2776				
	70	6	5164487	10					10	1	34.103	31.283	9	2.82	0.313333				
	71	7	5164487	10					10	1	30.494	27.563	10	2.931	0.2931				
	72	1	5164494	10					9	0.9	32.597	27.844	9	4.753	0.528111				
	73	2	5164494	10					10	1	34.318	30.161	10	4.157	0.4157				
	74	3	5164494	10					10	1	32.834	28.318	10	4.516	0.4516				
	75	4	5164494	10					10	1	32.17	28.198	10	3.972	0.3972				
	76	5	5164494	10					9	0.9	31.541	27.898	9	3.643	0.404778				
	77	6	5164494	10					9	0.9	32.541	28.172	9	4.369	0.485444				
	78	7	5164494	10					8	0.8	31.064	28.139	8	2.925	0.365625				
	79	8	5164494	10					9	0.9	32.438	27.575	9	4.863	0.540333				
	80	1	5164507	10					10	1	33.763	29.956	10	3.807	0.3807				

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	81	2	5164507	10					10	1	32.746	28.763	10	3.983	0.3983				
	82	3	5164507	10					10	1	33.64	29.237	10	4.403	0.4403				
	83	4	5164507	10					9	0.9	34.971	30.986	9	3.985	0.442778				
	84	5	5164507	10					10	1	33.529	29.505	10	4.024	0.4024				
	85	6	5164507	10					9	0.9	33.624	29.618	9	4.006	0.445111				
	86	7	5164507	10					10	1	33.621	29.316	10	4.305	0.4305				
	87	8	5164507	10					10	1	31.546	28.017	10	3.529	0.3529				
	88	1	5164491	10					10	1	31.616	28.259	10	3.357	0.3357				
	89	2	5164491	10					8	0.8	30.43	27.671	8	2.759	0.344875				
	90	3	5164491	10					9	0.9	32.483	29.734	9	2.749	0.305444				
	91	4	5164491	10					7	0.7	30.904	28.73	7	2.174	0.310571				
	92	5	5164491	10					9	0.9	32.789	30.054	9	2.735	0.303889				
	93	6	5164491	10					10	1	33.145	29.961	10	3.184	0.3184				
	94	7	5164491	10					8	0.8	31.543	28.949	8	2.594	0.32425				
	95	8	5164491	10					8	0.8	32.276	28.735	8	3.541	0.442625				
	96	1	5174405	10					9	0.9	32.488	29.2	9	3.288	0.365333				
	97	2	5174405	10					10	1	32.941	29.287	10	3.654	0.3654				
	98	3	5174405	10					10	1	33.148	29.897	10	3.251	0.3251				
	99	4	5174405	10					5	0.5	29.545	28.574	5	0.971	0.1942				
	100	5	5174405	10					10	1	31.754	28.557	9	3.197	0.355222				
	101	6	5174405	10					10	1	33.503	29.486	10	4.017	0.4017				
	102	7	5174405	10					10	1	33.137	29.242	10	3.895	0.3895				
	103	8	5174405	10					10	1	33.291	29.988	10	3.303	0.3303				
	104	1	5174406	10					9	0.9	34.114	29.428	9	4.686	0.520667				
	105	2	5174406	10					10	1	33.226	29.238	10	3.988	0.3988				
	106	3	5174406	10					9	0.9	32.493	28.713	9	3.78	0.42				
	107	4	5174406	10					10	1	33.569	28.755	10	4.814	0.4814				
	108	5	5174406	10					10	1	33.018	28.647	10	4.371	0.4371				
	109	6	5174406	10					10	1	33.495	28.43	10	5.065	0.5065				
	110	7	5174406	10					10	1	33.467	29.33	10	4.137	0.4137				
	111	8	5174406	10					9	0.9	33.035	29.162	9	3.873	0.430333				
	112	1	5174408	10					10	1	35.471	31.153	10	4.318	0.4318				
	113	2	5174408	10					10	1	29.793	27.066	10	2.727	0.2727				
	114	3	5174408	10					8	0.8	31.152	29.199	8	1.953	0.244125				
	115	4	5174408	10					10	1	30.678	28.177	10	2.501	0.2501				
	116	5	5174408	10					10	1	31.054	28.316	10	2.738	0.2738				
	117	6	5174408	10					10	1	32.319	28.68	10	3.639	0.3639				
	118	7	5174408	10					9	0.9	30.82	28.152	9	2.668	0.296444				
	119	8	5174408	10					10	1	32.704	29.978	10	2.726	0.2726				
	120	1	5174412	10					10	1	31.711	28.709	10	3.002	0.3002				
	121	2	5174412	10					9	0.9	31.09	27.179	9	3.911	0.434556				

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	122	3	5174412	10					10	1	32.204	28.705	10	3.499	0.3499				
	123	4	5174412	10					8	0.8	30.444	27.816	8	2.628	0.3285				
	124	5	5174412	10					9	0.9	31.068	27.844	9	3.224	0.358222				
	125	6	5174412	10					10	1	34.472	30.247	10	4.225	0.4225				
	126	7	5174412	11					11	1	29.633	26.888	11	2.745	0.249545				
	127	8	5174412	10					10	1	32.509	29.102	10	3.407	0.3407				
	128	1	5174413	10					10	1	31.112	27.444	10	3.668	0.3668				
	129	2	5174413	10					10	1	34.282	30.207	10	4.075	0.4075				
	130	3	5174413	10					8	0.8	33.981	30.073	8	3.908	0.4885				
	131	4	5174413	10					9	0.9	33.318	29.177	9	4.141	0.460111				
	132	5	5174413	10					10	1	32.592	27.71	10	4.882	0.4882				
	133	6	5174413	10					10	1	31.78	28.977	10	2.803	0.2803				
	134	7	5174413	10					10	1	33.301	29.499	10	3.802	0.3802				
	135	8	5174413	10					10	1	31.847	28.482	10	3.365	0.3365				
	136	1	5174407	10					10	1	32.581	28.207	10	4.374	0.4374				
	137	2	5174407	10					9	0.9	31.34	27.702	9	3.638	0.404222				
	138	3	5174407	10					9	0.9	30.987	28.033	9	2.954	0.328222				
	139	4	5174407	10					9	0.9	32.125	28.979	9	3.146	0.349556				
	140	5	5174407	10					8	0.8	32.24	28.906	8	3.334	0.41675				
	141	6	5174407	10					8	0.8	30.826	27.774	8	3.052	0.3815				
	142	7	5174407	10					10	1	31.86	28.968	10	2.892	0.2892				
	143	8	5174407	10					10	1	33.477	29.832	10	3.645	0.3645				
	144	1	5174410	10					10	1	33.011	29.124	10	3.887	0.3887				
	145	2	5174410	10					10	1	35.613	30.339	10	5.274	0.5274				
	146	3	5174410	10					9	0.9	33.787	29.579	9	4.208	0.467556				
	147	4	5174410	10					9	0.9	33.065	30.19	9	2.875	0.319444				
	148	5	5174410	10					9	0.9	32.123	28.708	9	3.415	0.379444				
	149	6	5174410	10					10	1	32.809	29.405	10	3.404	0.3404				
	150	7	5174410	10					10	1	33.143	28.458	10	4.685	0.4685				
	151	8	5174410	10					8	0.8	31.927	28.083	8	3.844	0.4805				
	152	1	5164411	10					10	1	33.521	28.588	10	4.933	0.4933				
	153	2	5164411	10					10	1	31.872	28.19	10	3.682	0.3682				
	154	3	5164411	10					10	1	33.76	28.628	10	5.132	0.5132				
	155	4	5164411	10					9	0.9	33.05	28.833	9	4.217	0.468556				
	156	5	5164411	10					10	1	33.817	28.701	10	5.116	0.5116				
	157	6	5164411	10					8	0.8	33.794	28.958	8	4.836	0.6045				
	158	7	5164411	10					10	1	33.147	28.233	10	4.914	0.4914				
	159	8	5164411	10					10	1	33.265	29.028	10	4.237	0.4237				
	160	1	5164423	10					10	1	33.089	29.34	10	3.749	0.3749				
	161	2	5164423	10					10	1	32.375	29.478	10	2.897	0.2897				
	162	3	5164423	10					10	1	30.968	27.441	10	3.527	0.3527				

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Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	163	4	5164423	10					9	0.9	32.03	28.626	9	3.404	0.378222				
	164	5	5164423	10					10	1	30.45	28.239	10	2.211	0.2211				
	165	6	5164423	10					10	1	33.802	30.762	10	3.04	0.304				
	166	7	5164423	10					8	0.8	32.537	29.621	8	2.916	0.3645				
	167	8	5164423	10					10	1	30.865	27.778	10	3.087	0.3087				
	168	1	5164424	10					10	1	34.194	30.429	10	3.765	0.3765				
	169	2	5164424	10					8	0.8	32.972	30.595	8	2.377	0.297125				
	170	3	5164424	10					9	0.9	33.409	29.989	9	3.42	0.38				
	171	4	5164424	10					9	0.9	31.268	27.822	9	3.446	0.382889				
	172	5	5164424	10					10	1	30.574	28.185	9	2.389	0.265444				
	173	6	5164424	10					10	1	31.609	28.788	10	2.821	0.2821				
	174	7	5164424	10					9	0.9	31.611	28.071	9	3.54	0.393333				
	175	8	5164424	10					10	1	32.07	29.118	10	2.952	0.2952				

Comments:

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Freshwater Sediment-Average ind. biomass

Start Date:	5/5/05 10:45	Test ID:	727-2	Sample ID:	
End Date:	6/2/05 11:30	Lab ID:	ORNAS-Northwestern Aquati	Sample Type:	SED-Sediment
Sample Date:		Protocol:	NASXXXHA4C-Hyalella 28-d	Test Species:	HA-Hyalella azteca
Comments:					

727-2

Ref 7b

Conc-	1	2	3	4	5	6	7	8
D-Control	0.3796	0.3302	0.3439	0.3631	0.4163	0.4020	0.4459	0.3690
Ref05164476	0.4464	0.3511	0.4163	0.4182	0.3245	0.3761	0.3710	0.4218
5164472	0.1466	0.1529	0.2098	0.2594	0.1827	0.2051	0.2246	0.1726
5164474	0.2531	0.3401	0.3040	0.3825	0.3590	0.3644	0.3560	0.3292
5164475	0.4217	0.4661	0.3861	0.5213	0.4732	0.3056	0.4408	0.3684
5164479	0.2778	0.1776	0.2417	0.2656	0.1244	0.1760	0.2714	0.2793
5164483	0.3128	0.3400	0.3655	0.3433	0.3619	0.3817	0.2992	0.3571
5164485	0.4795	0.3802	0.4628	0.3740	0.4356	0.3949	0.3689	0.4036
5164487	0.3474	0.3323	0.3528	0.4196	0.2776	0.3133	0.2931	
5164494	0.5281	0.4157	0.4516	0.3972	0.4048	0.4854	0.3656	0.5403
5164507	0.3807	0.3983	0.4403	0.4428	0.4024	0.4451	0.4305	0.3529
5164491	0.3357	0.3449	0.3054	0.3106	0.3039	0.3184	0.3243	0.4426
5174405	0.3653	0.3654	0.3251	0.1942	0.3552	0.4017	0.3895	0.3303
5174406	0.5207	0.3988	0.4200	0.4814	0.4371	0.5065	0.4137	0.4303
5174408	0.4318	0.2727	0.2441	0.2501	0.2738	0.3639	0.2964	0.2726
5174412	0.3002	0.4346	0.3499	0.3285	0.3582	0.4225	0.2495	0.3407
5174413	0.3668	0.4075	0.4885	0.4601	0.4882	0.2803	0.3802	0.3365
5174407	0.4374	0.4042	0.3282	0.3496	0.4168	0.3815	0.2892	0.3645
5174410	0.3887	0.5274	0.4676	0.3194	0.3794	0.3404	0.4685	0.4805
5164411	0.4933	0.3682	0.5132	0.4686	0.5116	0.6045	0.4914	0.4237
5164423	0.3749	0.2897	0.3527	0.3782	0.2211	0.3040	0.3645	0.3087
5164424	0.3765	0.2971	0.3800	0.3829	0.2654	0.2821	0.3933	0.2952

MSL 11-9-05 ①

			Transform: Untransformed					1-Tailed		
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.3813	0.9759	0.3813	0.3302	0.4459	10.072	8			
Ref05164476	0.3907	1.0000	0.3907	0.3245	0.4464	10.613	8			
*5164472	0.1942	0.4971	0.1942	0.1466	0.2594	19.575	8	9.879	2.624	0.0522
*5164474	0.3360	0.8602	0.3360	0.2531	0.3825	12.246	8	2.645	2.624	0.0542
5164475	0.4229	1.0825	0.4229	0.3056	0.5213	16.111	8			
*5164479	0.2267	0.5803	0.2267	0.1244	0.2793	26.121	8	6.415	2.624	0.0671
5164483	0.3452	0.8836	0.3452	0.2992	0.3817	8.017	8	2.581	2.624	0.0463
5164485	0.4124	1.0557	0.4124	0.3689	0.4795	10.191	8			
5164487	0.3337	0.8542	0.3337	0.2776	0.4196	14.024	7	2.500	2.650	0.0604
5164494	0.4486	1.1483	0.4486	0.3656	0.5403	14.257	8			
5164507	0.4116	1.0536	0.4116	0.3529	0.4451	8.181	8			
5164491	0.3357	0.8593	0.3357	0.3039	0.4426	13.560	8	2.524	2.624	0.0571
5174405	0.3408	0.8724	0.3408	0.1942	0.4017	18.996	8			
5174406	0.4511	1.1546	0.4511	0.3988	0.5207	10.109	8			
*5174408	0.3007	0.7696	0.3007	0.2441	0.4318	21.501	8	3.314	2.624	0.0713
5174412	0.3480	0.8908	0.3480	0.2495	0.4346	17.364	8			
5174413	0.4010	1.0265	0.4010	0.2803	0.4885	18.644	8			
5174407	0.3714	0.9507	0.3714	0.2892	0.4374	13.166	8			
5174410	0.4215	1.0789	0.4215	0.3194	0.5274	17.678	8			
5164411	0.4843	1.2397	0.4843	0.3682	0.6045	14.297	8			
*5164423	0.3242	0.8299	0.3242	0.2211	0.3782	16.647	8	2.761	2.624	0.0632
5164424	0.3341	0.8551	0.3341	0.2654	0.3933	16.037	8	2.363	2.624	0.0629

MSL 11-9-05 ①

Auxiliary Tests	Statistic	Critical		Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.53646	1.035		0.19504	0.07945
Bartlett's Test indicates equal variances (p = 0.37)	9.71266	21.666			
The control means are not significantly different (p = 0.64)	0.47144	2.14479			
Hypothesis Test (1-tail, 0.01)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates significant differences	0.06286	0.1609	0.02734	0.00234	6.2E-11	9, 69

Freshwater Sediment 28-day survival

Start Date:	5/5/05 10:45	Test ID: 727-2	Sample ID:
End Date:	6/2/05 11:30	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
Ref05164476	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000	0.9000
5164472	0.9000	0.9000	0.6000	0.9000	1.0000	1.0000	0.9000	1.0000
5164474	0.9000	0.7000	0.8000	1.0000	0.9000	0.8000	1.0000	1.0000
5164475	1.0000	0.9000	0.8000	1.0000	1.0000	0.9000	1.0000	1.0000
5164479	0.8000	0.7000	0.9000	0.8000	0.9000	0.8000	1.0000	1.0000
5164483	1.0000	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000
5164485	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5164487	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
5164494	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000	0.8000	0.9000
5164507	1.0000	1.0000	1.0000	0.9000	1.0000	0.9000	1.0000	1.0000
5164491	1.0000	0.8000	0.9000	0.7000	0.9000	1.0000	0.8000	0.8000
5174405	0.9000	1.0000	1.0000	0.5000	1.0000	1.0000	1.0000	1.0000
5174406	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000	0.9000
5174408	1.0000	1.0000	0.8000	1.0000	1.0000	1.0000	0.9000	1.0000
5174412	1.0000	0.9000	1.0000	0.8000	0.9000	1.0000	1.0000	1.0000
5174413	1.0000	1.0000	0.8000	0.9000	1.0000	1.0000	1.0000	1.0000
5174407	1.0000	0.9000	0.9000	0.9000	0.8000	0.8000	1.0000	1.0000
5174410	1.0000	1.0000	0.9000	0.9000	0.9000	1.0000	1.0000	0.8000
5164411	1.0000	1.0000	1.0000	0.9000	1.0000	0.8000	1.0000	1.0000
5164423	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000	0.8000	1.0000
5164424	1.0000	0.8000	0.9000	0.9000	1.0000	1.0000	0.9000	1.0000

MLK 11-9-05 ①

			Transform: Arcsin Square Root						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.9750	1.0000	1.3713	1.2490	1.4120	5.501	8			
Ref05164476	0.9750	1.0000	1.3713	1.2490	1.4120	5.501	8			
5164472	0.9000	0.9231	1.2648	0.8861	1.4120	13.676	8			
5164474	0.8875	0.9103	1.2424	0.9912	1.4120	13.124	8	2.028	2.624	0.1667
5164475	0.9500	0.9744	1.3332	1.1071	1.4120	8.799	8			
*5164479	0.8625	0.8846	1.2043	0.9912	1.4120	12.711	8	2.767	2.624	0.1584
5164483	0.9750	1.0000	1.3713	1.2490	1.4120	5.501	8			
5164485	0.9875	1.0128	1.3916	1.2490	1.4120	4.140	8			
5164487	1.0000	1.0256	1.4120	1.4120	1.4120	0.000	7			
5164494	0.9250	0.9487	1.2924	1.1071	1.4120	8.514	8			
5164507	0.9750	1.0000	1.3713	1.2490	1.4120	5.501	8			
*5164491	0.8625	0.8846	1.2043	0.9912	1.4120	12.711	8	2.767	2.624	0.1584
5174405	0.9250	0.9487	1.3133	0.7854	1.4120	16.813	8			
5174406	0.9625	0.9872	1.3509	1.2490	1.4120	6.244	8			
5174408	0.9625	0.9872	1.3535	1.1071	1.4120	8.476	8			
5174412	0.9500	0.9744	1.3341	1.1071	1.4195	8.848	8			
5174413	0.9625	0.9872	1.3535	1.1071	1.4120	8.476	8			
5174407	0.9125	0.9359	1.2747	1.1071	1.4120	10.042	8			
5174410	0.9375	0.9615	1.3128	1.1071	1.4120	8.821	8			
5164411	0.9625	0.9872	1.3535	1.1071	1.4120	8.476	8			
5164423	0.9625	0.9872	1.3535	1.1071	1.4120	8.476	8			
5164424	0.9375	0.9615	1.3128	1.1071	1.4120	8.821	8			

MLK 11-9-05 ①

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.91985	0.904	0.02675	-0.8959
Bartlett's Test indicates equal variances (p = 0.18)	4.86189	11.3449		
The control means are not significantly different (p = 1.00)	0	2.14479		

Hypothesis Test (1-tail 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.08342	0.08683	0.05016	0.01979	0.07706	3, 28

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

Pos	ID	Rep	Group	Day 0	Day 10	psurv Day 10	Day 20	psurv Day 20	Day 28	psurv day 28	Dry Wt (mg)	Tare Wt (mg)	Wt. count	TWT	WT	Ashed dry wt	TAFDW	AFDW
	1	1	D-Control	10					10	1	33.303	29.507	10	3.796	0.3796			
	2	2	D-Control	10					9	0.9	31.978	29.006	9	2.972	0.330222			
	3	3	D-Control	10					10	1	32.368	28.929	10	3.439	0.3439			
	4	4	D-Control	10					10	1	31.555	27.924	10	3.631	0.3631			
	5	5	D-Control	10					9	0.9	30.507	26.76	9	3.747	0.416333			
	6	6	D-Control	10					10	1	31.762	27.742	10	4.02	0.402			
	7	7	D-Control	10					10	1	32.183	27.724	10	4.459	0.4459			
	8	8	D-Control	10					10	1	31.578	27.888	10	3.69	0.369			
	9	1	Ref05164476	10					10	1	33.713	29.249	10	4.464	0.4464			
	10	2	Ref05164476	10					10	1	31.047	27.536	10	3.511	0.3511			
	11	3	Ref05164476	10					9	0.9	33.01	29.263	9	3.747	0.416333			
	12	4	Ref05164476	10					10	1	34.512	30.33	10	4.182	0.4182			
	13	5	Ref05164476	10					10	1	31.536	28.291	10	3.245	0.3245			
	14	6	Ref05164476	10					10	1	32.217	28.456	10	3.761	0.3761			
	15	7	Ref05164476	10					10	1	32.708	28.998	10	3.71	0.371			
	16	8	Ref05164476	10					9	0.9	32.762	28.966	9	3.796	0.421778			
	17	1	5164472	10					9	0.9	29.872	28.553	9	1.319	0.146556			
	18	2	5164472	10					9	0.9	31.124	29.748	9	1.376	0.152889			
	19	3	5164472	10					6	0.6	27.904	26.645	6	1.259	0.209833			
	20	4	5164472	10					9	0.9	30.117	27.782	9	2.335	0.259444			
	21	5	5164472	10					10	1	30.816	28.989	10	1.827	0.1827			
	22	6	5164472	10					10	1	30.53	28.479	10	2.051	0.2051			
	23	7	5164472	10					9	0.9	30.524	28.503	9	2.021	0.224556			
	24	8	5164472	10					10	1	28.853	27.127	10	1.726	0.1726			
	25	1	5164474	10					9	0.9	33.565	31.287	9	2.278	0.253111			
	26	2	5164474	10					7	0.7	31.279	28.898	7	2.381	0.340143			
	27	3	5164474	10					8	0.8	31.038	28.606	8	2.432	0.304			
	28	4	5164474	10					10	1	33.902	30.077	10	3.825	0.3825			
	29	5	5164474	10					9	0.9	33.625	30.394	9	3.231	0.359			
	30	6	5164474	10					8	0.8	31.273	28.358	8	2.915	0.364375			
	31	7	5164474	10					10	1	33.28	29.72	10	3.56	0.356			
	32	8	5164474	10					10	1	31.883	28.591	10	3.292	0.3292			
	33	1	5164475	10					10	1	32.398	28.181	10	4.217	0.4217			
	34	2	5164475	10					9	0.9	33.521	29.326	9	4.195	0.466111			
	35	3	5164475	10					8	0.8	32.711	29.622	8	3.089	0.386125			
	36	4	5164475	10					10	1	35.087	29.874	10	5.213	0.5213			
	37	5	5164475	10					10	1	34.818	30.086	10	4.732	0.4732			
	38	6	5164475	10					9	0.9	31.272	28.522	9	2.75	0.305556			
	39	7	5164475	10					10	1	32.338	27.93	10	4.408	0.4408			

verified data entry against EXCEL spreadsheet MJK 11-9-05

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Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	40	8	5164475	10					10	1	32.502	28.818	10	3.684	0.3684				
	41	1	5164479	10					8	0.8	30.986	28.764	8	2.222	0.27775				
	42	2	5164479	10					7	0.7	31.607	30.364	7	1.243	0.177571				
	43	3	5164479	10					9	0.9	30.588	28.413	9	2.175	0.241667				
	44	4	5164479	10					8	0.8	30.838	28.713	8	2.125	0.265625				
	45	5	5164479	10					9	0.9	30.412	29.292	9	1.12	0.124444				
	46	6	5164479	10					8	0.8	30.025	28.617	8	1.408	0.176				
	47	7	5164479	10					10	1	30.715	28.001	10	2.714	0.2714				
	48	8	5164479	10					10	1	31.126	28.333	10	2.793	0.2793				
	49	1	5164483	10					10	1	32.708	29.58	10	3.128	0.3128				
	50	2	5164483	10					9	0.9	31.911	28.851	9	3.06	0.34				
	51	3	5164483	10					10	1	31.953	28.298	10	3.655	0.3655				
	52	4	5164483	10					9	0.9	34.745	31.655	9	3.09	0.343333				
	53	5	5164483	10					10	1	32.414	28.795	10	3.619	0.3619				
	54	6	5164483	10					10	1	32.44	28.623	10	3.817	0.3817				
	55	7	5164483	10					10	1	33.702	30.71	10	2.992	0.2992				
	56	8	5164483	10					10	1	34.048	30.477	10	3.571	0.3571				
	57	1	5164485	10					10	1	32.167	27.372	10	4.795	0.4795				
	58	2	5164485	10					9	0.9	32.849	29.427	9	3.422	0.380222				
	59	3	5164485	10					10	1	33.804	29.176	10	4.628	0.4628				
	60	4	5164485	10					10	1	33.798	30.058	10	3.74	0.374				
	61	5	5164485	10					10	1	34.635	30.279	10	4.356	0.4356				
	62	6	5164485	10					10	1	33.923	29.974	10	3.949	0.3949				
	63	7	5164485	10					10	1	31.329	27.64	10	3.689	0.3689				
	64	8	5164485	10					10	1	32.864	28.828	10	4.036	0.4036				
	65	1	5164487	10					10	1	31.71	28.236	10	3.474	0.3474				
	66	2	5164487	10					10	1	31.993	28.67	10	3.323	0.3323				
	67	3	5164487	10					10	1	33.07	29.542	10	3.528	0.3528				
	68	4	5164487	10					10	1	34.381	30.185	10	4.196	0.4196				
	69	5	5164487	10					10	1	29.142	26.366	10	2.776	0.2776				
	70	6	5164487	10					10	1	34.103	31.283	9	2.82	0.313333				
	71	7	5164487	10					10	1	30.494	27.563	10	2.931	0.2931				
	72	1	5164494	10					9	0.9	32.597	27.844	9	4.753	0.528111				
	73	2	5164494	10					10	1	34.318	30.161	10	4.157	0.4157				
	74	3	5164494	10					10	1	32.834	28.318	10	4.516	0.4516				
	75	4	5164494	10					10	1	32.17	28.198	10	3.972	0.3972				
	76	5	5164494	10					9	0.9	31.541	27.898	9	3.643	0.404778				
	77	6	5164494	10					9	0.9	32.541	28.172	9	4.369	0.485444				
	78	7	5164494	10					8	0.8	31.064	28.139	8	2.925	0.365625				
	79	8	5164494	10					9	0.9	32.438	27.575	9	4.863	0.540333				
	80	1	5164507	10					10	1	33.763	29.956	10	3.807	0.3807				

Test: FW-Freshwater Sediment
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Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	81	2	5164507	10					10	1	32.746	28.763	10	3.983	0.3983			
	82	3	5164507	10					10	1	33.64	29.237	10	4.403	0.4403			
	83	4	5164507	10					9	0.9	34.971	30.986	9	3.985	0.442778			
	84	5	5164507	10					10	1	33.529	29.505	10	4.024	0.4024			
	85	6	5164507	10					9	0.9	33.624	29.618	9	4.006	0.445111			
	86	7	5164507	10					10	1	33.621	29.316	10	4.305	0.4305			
	87	8	5164507	10					10	1	31.546	28.017	10	3.529	0.3529			
	88	1	5164491	10					10	1	31.616	28.259	10	3.357	0.3357			
	89	2	5164491	10					8	0.8	30.43	27.671	8	2.759	0.344875			
	90	3	5164491	10					9	0.9	32.483	29.734	9	2.749	0.305444			
	91	4	5164491	10					7	0.7	30.904	28.73	7	2.174	0.310571			
	92	5	5164491	10					9	0.9	32.789	30.054	9	2.735	0.303889			
	93	6	5164491	10					10	1	33.145	29.961	10	3.184	0.3184			
	94	7	5164491	10					8	0.8	31.543	28.949	8	2.594	0.32425			
	95	8	5164491	10					8	0.8	32.276	28.735	8	3.541	0.442625			
	96	1	5174405	10					9	0.9	32.488	29.2	9	3.288	0.365333			
	97	2	5174405	10					10	1	32.941	29.287	10	3.654	0.3654			
	98	3	5174405	10					10	1	33.148	29.897	10	3.251	0.3251			
	99	4	5174405	10					5	0.5	29.545	28.574	5	0.971	0.1942			
	100	5	5174405	10					10	1	31.754	28.557	9	3.197	0.355222			
	101	6	5174405	10					10	1	33.503	29.486	10	4.017	0.4017			
	102	7	5174405	10					10	1	33.137	29.242	10	3.895	0.3895			
	103	8	5174405	10					10	1	33.291	29.988	10	3.303	0.3303			
	104	1	5174406	10					9	0.9	34.114	29.428	9	4.686	0.520667			
	105	2	5174406	10					10	1	33.226	29.238	10	3.988	0.3988			
	106	3	5174406	10					9	0.9	32.493	28.713	9	3.78	0.42			
	107	4	5174406	10					10	1	33.569	28.755	10	4.814	0.4814			
	108	5	5174406	10					10	1	33.018	28.647	10	4.371	0.4371			
	109	6	5174406	10					10	1	33.495	28.43	10	5.065	0.5065			
	110	7	5174406	10					10	1	33.467	29.33	10	4.137	0.4137			
	111	8	5174406	10					9	0.9	33.035	29.162	9	3.873	0.430333			
	112	1	5174408	10					10	1	35.471	31.153	10	4.318	0.4318			
	113	2	5174408	10					10	1	29.793	27.066	10	2.727	0.2727			
	114	3	5174408	10					8	0.8	31.152	29.199	8	1.953	0.244125			
	115	4	5174408	10					10	1	30.678	28.177	10	2.501	0.2501			
	116	5	5174408	10					10	1	31.054	28.316	10	2.738	0.2738			
	117	6	5174408	10					10	1	32.319	28.68	10	3.639	0.3639			
	118	7	5174408	10					9	0.9	30.82	28.152	9	2.668	0.296444			
	119	8	5174408	10					10	1	32.704	29.978	10	2.726	0.2726			
	120	1	5174412	10					10	1	31.711	28.709	10	3.002	0.3002			
	121	2	5174412	10					9	0.9	31.09	27.179	9	3.911	0.434556			

Test: FW-Freshwater Sediment
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Lab ID: ORNAS-Northwestern Aquatic Sciences

	122	3	5174412	10					10	1	32.204	28.705	10	3.499	0.3499				
	123	4	5174412	10					8	0.8	30.444	27.816	8	2.628	0.3285				
	124	5	5174412	10					9	0.9	31.068	27.844	9	3.224	0.358222				
	125	6	5174412	10					10	1	34.472	30.247	10	4.225	0.4225				
	126	7	5174412	11					11	1	29.633	26.888	11	2.745	0.249545				
	127	8	5174412	10					10	1	32.509	29.102	10	3.407	0.3407				
	128	1	5174413	10					10	1	31.112	27.444	10	3.668	0.3668				
	129	2	5174413	10					10	1	34.282	30.207	10	4.075	0.4075				
	130	3	5174413	10					8	0.8	33.981	30.073	8	3.908	0.4885				
	131	4	5174413	10					9	0.9	33.318	29.177	9	4.141	0.460111				
	132	5	5174413	10					10	1	32.592	27.71	10	4.882	0.4882				
	133	6	5174413	10					10	1	31.78	28.977	10	2.803	0.2803				
	134	7	5174413	10					10	1	33.301	29.499	10	3.802	0.3802				
	135	8	5174413	10					10	1	31.847	28.482	10	3.365	0.3365				
	136	1	5174407	10					10	1	32.581	28.207	10	4.374	0.4374				
	137	2	5174407	10					9	0.9	31.34	27.702	9	3.638	0.404222				
	138	3	5174407	10					9	0.9	30.987	28.033	9	2.954	0.328222				
	139	4	5174407	10					9	0.9	32.125	28.979	9	3.146	0.349556				
	140	5	5174407	10					8	0.8	32.24	28.906	8	3.334	0.41675				
	141	6	5174407	10					8	0.8	30.826	27.774	8	3.052	0.3815				
	142	7	5174407	10					10	1	31.86	28.968	10	2.892	0.2892				
	143	8	5174407	10					10	1	33.477	29.832	10	3.645	0.3645				
	144	1	5174410	10					10	1	33.011	29.124	10	3.887	0.3887				
	145	2	5174410	10					10	1	35.613	30.339	10	5.274	0.5274				
	146	3	5174410	10					9	0.9	33.787	29.579	9	4.208	0.467556				
	147	4	5174410	10					9	0.9	33.065	30.19	9	2.875	0.319444				
	148	5	5174410	10					9	0.9	32.123	28.708	9	3.415	0.379444				
	149	6	5174410	10					10	1	32.809	29.405	10	3.404	0.3404				
	150	7	5174410	10					10	1	33.143	28.458	10	4.685	0.4685				
	151	8	5174410	10					8	0.8	31.927	28.083	8	3.844	0.4805				
	152	1	5164411	10					10	1	33.521	28.588	10	4.933	0.4933				
	153	2	5164411	10					10	1	31.872	28.19	10	3.682	0.3682				
	154	3	5164411	10					10	1	33.76	28.628	10	5.132	0.5132				
	155	4	5164411	10					9	0.9	33.05	28.833	9	4.217	0.468556				
	156	5	5164411	10					10	1	33.817	28.701	10	5.116	0.5116				
	157	6	5164411	10					8	0.8	33.794	28.958	8	4.836	0.6045				
	158	7	5164411	10					10	1	33.147	28.233	10	4.914	0.4914				
	159	8	5164411	10					10	1	33.265	29.028	10	4.237	0.4237				
	160	1	5164423	10					10	1	33.089	29.34	10	3.749	0.3749				
	161	2	5164423	10					10	1	32.375	29.478	10	2.897	0.2897				
	162	3	5164423	10					10	1	30.968	27.441	10	3.527	0.3527				

mrk 11-9-05

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	163	4	5164423	10					9	0.9	32.03	28.626	9	3.404	0.378222			
	164	5	5164423	10					10	1	30.45	28.239	10	2.211	0.2211			
	165	6	5164423	10					10	1	33.802	30.762	10	3.04	0.304			
	166	7	5164423	10					8	0.8	32.537	29.621	8	2.916	0.3645			
	167	8	5164423	10					10	1	30.865	27.778	10	3.087	0.3087			
	168	1	5164424	10					10	1	34.194	30.429	10	3.765	0.3765			
	169	2	5164424	10					8	0.8	32.972	30.595	8	2.377	0.297125			
	170	3	5164424	10					9	0.9	33.409	29.989	9	3.42	0.38			
	171	4	5164424	10					9	0.9	31.268	27.822	9	3.446	0.382889			
	172	5	5164424	10					10	1	30.574	28.185	9	2.389	0.265444			
	173	6	5164424	10					10	1	31.609	28.788	10	2.821	0.2821			
	174	7	5164424	10					9	0.9	31.611	28.071	9	3.54	0.393333			
	175	8	5164424	10					10	1	32.07	29.118	10	2.952	0.2952			

Comments: mk 11-9-05 ① 7

ToxCalc 5.0.23N

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Freshwater Sediment-Average ind. biomass

Start Date:	5/5/05 10:45	Test ID: 727-2	Sample ID:
End Date:	6/2/05 11:30	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

727-2
Ref 86

Conc-	1	2	3	4	5	6	7	8
D-Control	0.3796	0.3302	0.3439	0.3631	0.4163	0.4020	0.4459	0.3690
Ref05164486	0.5202	0.5521	0.4863	0.5951	0.5176	0.5268	0.5055	0.5720
5164472	0.1466	0.1529	0.2098	0.2594	0.1827	0.2051	0.2246	0.1726
5164474	0.2531	0.3401	0.3040	0.3825	0.3590	0.3644	0.3560	0.3292
5164475	0.4217	0.4661	0.3861	0.5213	0.4732	0.3056	0.4408	0.3684
5164479	0.2778	0.1776	0.2417	0.2656	0.1244	0.1760	0.2714	0.2793
5164483	0.3128	0.3400	0.3655	0.3433	0.3619	0.3817	0.2992	0.3571
5164485	0.4795	0.3802	0.4628	0.3740	0.4356	0.3949	0.3689	0.4036
5164487	0.3474	0.3323	0.3528	0.4196	0.2776	0.3133	0.2931	
5164494	0.5281	0.4157	0.4516	0.3972	0.4048	0.4854	0.3656	0.5403
5164507	0.3807	0.3983	0.4403	0.4428	0.4024	0.4451	0.4305	0.3529
5164491	0.3357	0.3449	0.3054	0.3106	0.3039	0.3184	0.3243	0.4426
5174405	0.3653	0.3654	0.3251	0.1942	0.3552	0.4017	0.3895	0.3303
5174406	0.5207	0.3988	0.4200	0.4814	0.4371	0.5065	0.4137	0.4303
5174408	0.4318	0.2727	0.2441	0.2501	0.2738	0.3639	0.2964	0.2726
5174412	0.3002	0.4346	0.3499	0.3285	0.3582	0.4225	0.2495	0.3407
5174413	0.3668	0.4075	0.4885	0.4601	0.4882	0.2803	0.3802	0.3365
5174407	0.4374	0.4042	0.3282	0.3496	0.4168	0.3815	0.2892	0.3645
5174410	0.3887	0.5274	0.4676	0.3194	0.3794	0.3404	0.4685	0.4805
5174411	0.4933	0.3682	0.5132	0.4686	0.5116	0.6045	0.4914	0.4237
5174423	0.3749	0.2897	0.3527	0.3782	0.2211	0.3040	0.3645	0.3087
5174424	0.3765	0.2971	0.3800	0.3829	0.2654	0.2821	0.3933	0.2952

			Transform: Untransformed						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.3813	0.7134	0.3813	0.3302	0.4459	10.072	8			
Ref05164486	0.5345	1.0000	0.5345	0.4863	0.5951	6.746	8			
*5164472	0.1942	0.3634	0.1942	0.1466	0.2594	19.575	8	18.367	2.624	0.0486
*5164474	0.3360	0.6288	0.3360	0.2531	0.3825	12.246	8	10.257	2.624	0.0508
*5164475	0.4229	0.7913	0.4229	0.3056	0.5213	16.111	8	4.093	2.624	0.0715
*5164479	0.2267	0.4242	0.2267	0.1244	0.2793	26.121	8	12.554	2.624	0.0643
*5164483	0.3452	0.6459	0.3452	0.2992	0.3817	8.017	8	11.778	2.624	0.0422
*5164485	0.4124	0.7717	0.4124	0.3689	0.4795	10.191	8	6.232	2.624	0.0514
*5164487	0.3337	0.6244	0.3337	0.2776	0.4196	14.024	7	9.376	2.650	0.0567
*5164494	0.4486	0.8394	0.4486	0.3656	0.5403	14.257	8	3.307	2.624	0.0681
*5164507	0.4116	0.7702	0.4116	0.3529	0.4451	8.181	8	7.042	2.624	0.0458
*5164491	0.3357	0.6282	0.3357	0.3039	0.4426	13.560	8	9.680	2.624	0.0539
*5174405	0.3408	0.6377	0.3408	0.1942	0.4017	18.996	8	7.389	2.624	0.0688
*5174406	0.4511	0.8440	0.4511	0.3988	0.5207	10.109	8	4.057	2.624	0.0539
*5174408	0.3007	0.5626	0.3007	0.2441	0.4318	21.501	8	8.932	2.624	0.0687
*5174412	0.3480	0.6512	0.3480	0.2495	0.4346	17.364	8	7.494	2.624	0.0653
*5174413	0.4010	0.7503	0.4010	0.2803	0.4885	18.644	8	4.547	2.624	0.0770
*5174407	0.3714	0.6950	0.3714	0.2892	0.4374	13.166	8	7.590	2.624	0.0564
*5174410	0.4215	0.7886	0.4215	0.3194	0.5274	17.678	8	3.860	2.624	0.0768
5174411	0.4843	0.9062	0.4843	0.3682	0.6045	14.297	8	1.817	2.624	0.0724
*5174423	0.3242	0.6067	0.3242	0.2211	0.3782	16.647	8	9.160	2.624	0.0602
*5174424	0.3341	0.6251	0.3341	0.2654	0.3933	16.037	8	8.776	2.624	0.0599

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.52664	1.035	-0.0797	-0.037
Bartlett's Test indicates equal variances (p = 0.54)	18.7898	37.5663		
The control means are significantly different (p = 9.88E-07)	8.22615	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.05992	0.11212	0.05114	0.003	7.7E-29	20, 146

Freshwater Sediment 28-day survival

Start Date:	5/5/05 10:45	Test ID:	727-2	Sample ID:	
End Date:	6/2/05 11:30	Lab ID:	ORNAS-Northwestern Aquati	Sample Type:	SED-Sediment
Sample Date:		Protocol:	NASXXXHA4C-Hyalella 28-d	Test Species:	HA-Hyalella azteca
Comments:					

Conc-	1	2	3	4	5	6	7	8
D-Control	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
Ref05164486	1.0000	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000	0.9000
5164472	0.9000	0.9000	0.6000	0.9000	1.0000	1.0000	0.9000	1.0000
5164474	0.9000	0.7000	0.8000	1.0000	0.9000	0.8000	1.0000	1.0000
5164475	1.0000	0.9000	0.8000	1.0000	1.0000	0.9000	1.0000	1.0000
5164479	0.8000	0.7000	0.9000	0.8000	0.9000	0.8000	1.0000	1.0000
5164483	1.0000	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000
5164485	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5164487	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
5164494	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000	0.8000	0.9000
5164507	1.0000	1.0000	1.0000	0.9000	1.0000	0.9000	1.0000	1.0000
5164491	1.0000	0.8000	0.9000	0.7000	0.9000	1.0000	0.8000	0.8000
5174405	0.9000	1.0000	1.0000	0.5000	1.0000	1.0000	1.0000	1.0000
5174406	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000	0.9000
5174408	1.0000	1.0000	0.8000	1.0000	1.0000	1.0000	0.9000	1.0000
5174412	1.0000	0.9000	1.0000	0.8000	0.9000	1.0000	1.0000	1.0000
5174413	1.0000	1.0000	0.8000	0.9000	1.0000	1.0000	1.0000	1.0000
5174407	1.0000	0.9000	0.9000	0.9000	0.8000	0.8000	1.0000	1.0000
5174410	1.0000	1.0000	0.9000	0.9000	0.9000	1.0000	1.0000	0.8000
5174411	1.0000	1.0000	1.0000	0.9000	1.0000	0.8000	1.0000	1.0000
5174423	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000	0.8000	1.0000
5174424	1.0000	0.8000	0.9000	0.9000	1.0000	1.0000	0.9000	1.0000

			Transform: Arcsin Square Root						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.9750	1.0000	1.3713	1.2490	1.4120	5.501	8			
Ref05164486	0.9750	1.0000	1.3722	1.2490	1.4195	5.543	8			
5164472	0.9000	0.9231	1.2648	0.8861	1.4120	13.676	8			
5164474	0.8875	0.9103	1.2424	0.9912	1.4120	13.124	8	2.040	2.624	0.1669
5164475	0.9500	0.9744	1.3332	1.1071	1.4120	8.799	8			
*5164479	0.8625	0.8846	1.2043	0.9912	1.4120	12.711	8	2.778	2.624	0.1586
5164483	0.9750	1.0000	1.3713	1.2490	1.4120	5.501	8			
5164485	0.9875	1.0128	1.3916	1.2490	1.4120	4.140	8			
5164487	1.0000	1.0256	1.4120	1.4120	1.4120	0.000	7			
5164494	0.9250	0.9487	1.2924	1.1071	1.4120	8.514	8			
5164507	0.9750	1.0000	1.3713	1.2490	1.4120	5.501	8			
*5164491	0.8625	0.8846	1.2043	0.9912	1.4120	12.711	8	2.778	2.624	0.1586
5174405	0.9250	0.9487	1.3133	0.7854	1.4120	16.813	8			
5174406	0.9625	0.9872	1.3509	1.2490	1.4120	6.244	8			
5174408	0.9625	0.9872	1.3535	1.1071	1.4120	8.476	8			
5174412	0.9500	0.9744	1.3341	1.1071	1.4195	8.848	8			
5174413	0.9625	0.9872	1.3535	1.1071	1.4120	8.476	8			
5174407	0.9125	0.9359	1.2747	1.1071	1.4120	10.042	8			
5174410	0.9375	0.9615	1.3128	1.1071	1.4120	8.821	8			
5174411	0.9625	0.9872	1.3535	1.1071	1.4120	8.476	8			
5174423	0.9625	0.9872	1.3535	1.1071	1.4120	8.476	8			
5174424	0.9375	0.9615	1.3128	1.1071	1.4120	8.821	8			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.92073	0.904	0.02571	-0.8998
Bartlett's Test indicates equal variances (p = 0.19)	4.78664	11.3449		
The control means are not significantly different (p = 0.98)	0.02458	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.08334	0.08671	0.05073	0.01981	0.07496	3, 28

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

Pos	ID	Rep	Group	Day 0	Day 10	psurv Day 10	Day 20	psurv Day 20	Day 28	psurv day 28	Dry Wt (mg)	Tare Wt (mg)	Wt. count	TWT	WT	Ashed dry wt	TAFDW	AFDW
	1	1	D-Control	10					10	1	33.303	29.507	10	3.796	0.3796			
	2	2	D-Control	10					9	0.9	31.978	29.006	9	2.972	0.330222			
	3	3	D-Control	10					10	1	32.368	28.929	10	3.439	0.3439			
	4	4	D-Control	10					10	1	31.555	27.924	10	3.631	0.3631			
	5	5	D-Control	10					9	0.9	30.507	26.76	9	3.747	0.416333			
	6	6	D-Control	10					10	1	31.762	27.742	10	4.02	0.402			
	7	7	D-Control	10					10	1	32.183	27.724	10	4.459	0.4459			
	8	8	D-Control	10					10	1	31.578	27.888	10	3.69	0.369			
	9	1	Ref05164486	10					10	1	35.387	30.185	10	5.202	0.5202			
	10	2	Ref05164486	10					10	1	34.453	28.932	10	5.521	0.5521			
	11	3	Ref05164486	10					10	1	32.994	28.131	10	4.863	0.4863			
	12	4	Ref05164486	10					10	1	34.802	28.851	10	5.951	0.5951			
	13	5	Ref05164486	10					10	1	32.385	27.209	10	5.176	0.5176			
	14	6	Ref05164486	10					9	0.9	32.697	27.956	9	4.741	0.526778			
	15	7	Ref05164486	11					11	1	33.261	27.7	11	5.561	0.505545			
	16	8	Ref05164486	10					9	0.9	33.544	28.396	9	5.148	0.572			
	17	1	5164472	10					9	0.9	29.872	28.553	9	1.319	0.146556			
	18	2	5164472	10					9	0.9	31.124	29.748	9	1.376	0.152889			
	19	3	5164472	10					6	0.6	27.904	26.645	6	1.259	0.209833			
	20	4	5164472	10					9	0.9	30.117	27.782	9	2.335	0.259444			
	21	5	5164472	10					10	1	30.816	28.989	10	1.827	0.1827			
	22	6	5164472	10					10	1	30.53	28.479	10	2.051	0.2051			
	23	7	5164472	10					9	0.9	30.524	28.503	9	2.021	0.224556			
	24	8	5164472	10					10	1	28.853	27.127	10	1.726	0.1726			
	25	1	5164474	10					9	0.9	33.565	31.287	9	2.278	0.253111			
	26	2	5164474	10					7	0.7	31.279	28.898	7	2.381	0.340143			
	27	3	5164474	10					8	0.8	31.038	28.606	8	2.432	0.304			
	28	4	5164474	10					10	1	33.902	30.077	10	3.825	0.3825			
	29	5	5164474	10					9	0.9	33.625	30.394	9	3.231	0.359			
	30	6	5164474	10					8	0.8	31.273	28.358	8	2.915	0.364375			
	31	7	5164474	10					10	1	33.28	29.72	10	3.56	0.356			
	32	8	5164474	10					10	1	31.883	28.591	10	3.292	0.3292			
	33	1	5164475	10					10	1	32.398	28.181	10	4.217	0.4217			
	34	2	5164475	10					9	0.9	33.521	29.326	9	4.195	0.466111			
	35	3	5164475	10					8	0.8	32.711	29.622	8	3.089	0.386125			
	36	4	5164475	10					10	1	35.087	29.874	10	5.213	0.5213			
	37	5	5164475	10					10	1	34.818	30.086	10	4.732	0.4732			
	38	6	5164475	10					9	0.9	31.272	28.522	9	2.75	0.305556			
	39	7	5164475	10					10	1	32.338	27.93	10	4.408	0.4408			

data entry verified against EXCEL spreadsheet MSR 11-9-05

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	40	8	5164475	10					10	1	32.502	28.818	10	3.684	0.3684				
	41	1	5164479	10					8	0.8	30.986	28.764	8	2.222	0.27775				
	42	2	5164479	10					7	0.7	31.607	30.364	7	1.243	0.177571				
	43	3	5164479	10					9	0.9	30.588	28.413	9	2.175	0.241667				
	44	4	5164479	10					8	0.8	30.838	28.713	8	2.125	0.265625				
	45	5	5164479	10					9	0.9	30.412	29.292	9	1.12	0.124444				
	46	6	5164479	10					8	0.8	30.025	28.617	8	1.408	0.176				
	47	7	5164479	10					10	1	30.715	28.001	10	2.714	0.2714				
	48	8	5164479	10					10	1	31.126	28.333	10	2.793	0.2793				
	49	1	5164483	10					10	1	32.708	29.58	10	3.128	0.3128				
	50	2	5164483	10					9	0.9	31.911	28.851	9	3.06	0.34				
	51	3	5164483	10					10	1	31.953	28.298	10	3.655	0.3655				
	52	4	5164483	10					9	0.9	34.745	31.655	9	3.09	0.343333				
	53	5	5164483	10					10	1	32.414	28.795	10	3.619	0.3619				
	54	6	5164483	10					10	1	32.44	28.623	10	3.817	0.3817				
	55	7	5164483	10					10	1	33.702	30.71	10	2.992	0.2992				
	56	8	5164483	10					10	1	34.048	30.477	10	3.571	0.3571				
	57	1	5164485	10					10	1	32.167	27.372	10	4.795	0.4795				
	58	2	5164485	10					9	0.9	32.849	29.427	9	3.422	0.380222				
	59	3	5164485	10					10	1	33.804	29.176	10	4.628	0.4628				
	60	4	5164485	10					10	1	33.798	30.058	10	3.74	0.374				
	61	5	5164485	10					10	1	34.635	30.279	10	4.356	0.4356				
	62	6	5164485	10					10	1	33.923	29.974	10	3.949	0.3949				
	63	7	5164485	10					10	1	31.329	27.64	10	3.689	0.3689				
	64	8	5164485	10					10	1	32.864	28.828	10	4.036	0.4036				
	65	1	5164487	10					10	1	31.71	28.236	10	3.474	0.3474				
	66	2	5164487	10					10	1	31.993	28.67	10	3.323	0.3323				
	67	3	5164487	10					10	1	33.07	29.542	10	3.528	0.3528				
	68	4	5164487	10					10	1	34.381	30.185	10	4.196	0.4196				
	69	5	5164487	10					10	1	29.142	26.366	10	2.776	0.2776				
	70	6	5164487	10					10	1	34.103	31.283	9	2.82	0.313333				
	71	7	5164487	10					10	1	30.494	27.563	10	2.931	0.2931				
	72	1	5164494	10					9	0.9	32.597	27.844	9	4.753	0.528111				
	73	2	5164494	10					10	1	34.318	30.161	10	4.157	0.4157				
	74	3	5164494	10					10	1	32.834	28.318	10	4.516	0.4516				
	75	4	5164494	10					10	1	32.17	28.198	10	3.972	0.3972				
	76	5	5164494	10					9	0.9	31.541	27.898	9	3.643	0.404778				
	77	6	5164494	10					9	0.9	32.541	28.172	9	4.369	0.485444				
	78	7	5164494	10					8	0.8	31.064	28.139	8	2.925	0.365625				
	79	8	5164494	10					9	0.9	32.438	27.575	9	4.863	0.540333				
	80	1	5164507	10					10	1	33.763	29.956	10	3.807	0.3807				

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	81	2	5164507	10					10	1	32.746	28.763	10	3.983	0.3983				
	82	3	5164507	10					10	1	33.64	29.237	10	4.403	0.4403				
	83	4	5164507	10					9	0.9	34.971	30.986	9	3.985	0.442778				
	84	5	5164507	10					10	1	33.529	29.505	10	4.024	0.4024				
	85	6	5164507	10					9	0.9	33.624	29.618	9	4.006	0.445111				
	86	7	5164507	10					10	1	33.621	29.316	10	4.305	0.4305				
	87	8	5164507	10					10	1	31.546	28.017	10	3.529	0.3529				
	88	1	5164491	10					10	1	31.616	28.259	10	3.357	0.3357				
	89	2	5164491	10					8	0.8	30.43	27.671	8	2.759	0.344875				
	90	3	5164491	10					9	0.9	32.483	29.734	9	2.749	0.305444				
	91	4	5164491	10					7	0.7	30.904	28.73	7	2.174	0.310571				
	92	5	5164491	10					9	0.9	32.789	30.054	9	2.735	0.303889				
	93	6	5164491	10					10	1	33.145	29.961	10	3.184	0.3184				
	94	7	5164491	10					8	0.8	31.543	28.949	8	2.594	0.32425				
	95	8	5164491	10					8	0.8	32.276	28.735	8	3.541	0.442625				
	96	1	5174405	10					9	0.9	32.488	29.2	9	3.288	0.365333				
	97	2	5174405	10					10	1	32.941	29.287	10	3.654	0.3654				
	98	3	5174405	10					10	1	33.148	29.897	10	3.251	0.3251				
	99	4	5174405	10					5	0.5	29.545	28.574	5	0.971	0.1942				
	100	5	5174405	10					10	1	31.754	28.557	9	3.197	0.355222				
	101	6	5174405	10					10	1	33.503	29.486	10	4.017	0.4017				
	102	7	5174405	10					10	1	33.137	29.242	10	3.895	0.3895				
	103	8	5174405	10					10	1	33.291	29.988	10	3.303	0.3303				
	104	1	5174406	10					9	0.9	34.114	29.428	9	4.686	0.520667				
	105	2	5174406	10					10	1	33.226	29.238	10	3.988	0.3988				
	106	3	5174406	10					9	0.9	32.493	28.713	9	3.78	0.42				
	107	4	5174406	10					10	1	33.569	28.755	10	4.814	0.4814				
	108	5	5174406	10					10	1	33.018	28.647	10	4.371	0.4371				
	109	6	5174406	10					10	1	33.495	28.43	10	5.065	0.5065				
	110	7	5174406	10					10	1	33.467	29.33	10	4.137	0.4137				
	111	8	5174406	10					9	0.9	33.035	29.162	9	3.873	0.430333				
	112	1	5174408	10					10	1	35.471	31.153	10	4.318	0.4318				
	113	2	5174408	10					10	1	29.793	27.066	10	2.727	0.2727				
	114	3	5174408	10					8	0.8	31.152	29.199	8	1.953	0.244125				
	115	4	5174408	10					10	1	30.678	28.177	10	2.501	0.2501				
	116	5	5174408	10					10	1	31.054	28.316	10	2.738	0.2738				
	117	6	5174408	10					10	1	32.319	28.68	10	3.639	0.3639				
	118	7	5174408	10					9	0.9	30.82	28.152	9	2.668	0.296444				
	119	8	5174408	10					10	1	32.704	29.978	10	2.726	0.2726				
	120	1	5174412	10					10	1	31.711	28.709	10	3.002	0.3002				
	121	2	5174412	10					9	0.9	31.09	27.179	9	3.911	0.434556				

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	122	3	5174412	10					10	1	32.204	28.705	10	3.499	0.3499				
	123	4	5174412	10					8	0.8	30.444	27.816	8	2.628	0.3285				
	124	5	5174412	10					9	0.9	31.068	27.844	9	3.224	0.358222				
	125	6	5174412	10					10	1	34.472	30.247	10	4.225	0.4225				
	126	7	5174412	11					11	1	29.633	26.888	11	2.745	0.249545				
	127	8	5174412	10					10	1	32.509	29.102	10	3.407	0.3407				
	128	1	5174413	10					10	1	31.112	27.444	10	3.668	0.3668				
	129	2	5174413	10					10	1	34.282	30.207	10	4.075	0.4075				
	130	3	5174413	10					8	0.8	33.981	30.073	8	3.908	0.4885				
	131	4	5174413	10					9	0.9	33.318	29.177	9	4.141	0.460111				
	132	5	5174413	10					10	1	32.592	27.71	10	4.882	0.4882				
	133	6	5174413	10					10	1	31.78	28.977	10	2.803	0.2803				
	134	7	5174413	10					10	1	33.301	29.499	10	3.802	0.3802				
	135	8	5174413	10					10	1	31.847	28.482	10	3.365	0.3365				
	136	1	5174407	10					10	1	32.581	28.207	10	4.374	0.4374				
	137	2	5174407	10					9	0.9	31.34	27.702	9	3.638	0.404222				
	138	3	5174407	10					9	0.9	30.987	28.033	9	2.954	0.328222				
	139	4	5174407	10					9	0.9	32.125	28.979	9	3.146	0.349556				
	140	5	5174407	10					8	0.8	32.24	28.906	8	3.334	0.41675				
	141	6	5174407	10					8	0.8	30.826	27.774	8	3.052	0.3815				
	142	7	5174407	10					10	1	31.86	28.968	10	2.892	0.2892				
	143	8	5174407	10					10	1	33.477	29.832	10	3.645	0.3645				
	144	1	5174410	10					10	1	33.011	29.124	10	3.887	0.3887				
	145	2	5174410	10					10	1	35.613	30.339	10	5.274	0.5274				
	146	3	5174410	10					9	0.9	33.787	29.579	9	4.208	0.467556				
	147	4	5174410	10					9	0.9	33.065	30.19	9	2.875	0.319444				
	148	5	5174410	10					9	0.9	32.123	28.708	9	3.415	0.379444				
	149	6	5174410	10					10	1	32.809	29.405	10	3.404	0.3404				
	150	7	5174410	10					10	1	33.143	28.458	10	4.685	0.4685				
	151	8	5174410	10					8	0.8	31.927	28.083	8	3.844	0.4805				
	152	1	5174411	10					10	1	33.521	28.588	10	4.933	0.4933				
	153	2	5174411	10					10	1	31.872	28.19	10	3.682	0.3682				
	154	3	5174411	10					10	1	33.76	28.628	10	5.132	0.5132				
	155	4	5174411	10					9	0.9	33.05	28.833	9	4.217	0.468556				
	156	5	5174411	10					10	1	33.817	28.701	10	5.116	0.5116				
	157	6	5174411	10					8	0.8	33.794	28.958	8	4.836	0.6045				
	158	7	5174411	10					10	1	33.147	28.233	10	4.914	0.4914				
	159	8	5174411	10					10	1	33.265	29.028	10	4.237	0.4237				
	160	1	5174423	10					10	1	33.089	29.34	10	3.749	0.3749				
	161	2	5174423	10					10	1	32.375	29.478	10	2.897	0.2897				
	162	3	5174423	10					10	1	30.968	27.441	10	3.527	0.3527				

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	163	4	5174423	10					9	0.9	32.03	28.626	9	3.404	0.378222			
	164	5	5174423	10					10	1	30.45	28.239	10	2.211	0.2211			
	165	6	5174423	10					10	1	33.802	30.762	10	3.04	0.304			
	166	7	5174423	10					8	0.8	32.537	29.621	8	2.916	0.3645			
	167	8	5174423	10					10	1	30.865	27.778	10	3.087	0.3087			
	168	1	5174424	10					10	1	34.194	30.429	10	3.765	0.3765			
	169	2	5174424	10					8	0.8	32.972	30.595	8	2.377	0.297125			
	170	3	5174424	10					9	0.9	33.409	29.989	9	3.42	0.38			
	171	4	5174424	10					9	0.9	31.268	27.822	9	3.446	0.382889			
	172	5	5174424	10					10	1	30.574	28.185	9	2.389	0.265444			
	173	6	5174424	10					10	1	31.609	28.788	10	2.821	0.2821			
	174	7	5174424	10					9	0.9	31.611	28.071	9	3.54	0.393333			
	175	8	5174424	10					10	1	32.07	29.118	10	2.952	0.2952			

Comments:

Freshwater Sediment-Average ind. biomass

Start Date:	5/5/05 10:45	Test ID: 727-2	Sample ID:
End Date:	6/2/05 11:30	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.3796	0.3302	0.3439	0.3631	0.4163	0.4020	0.4459	0.3690
Ref05164489	0.4634	0.4380	0.3815	0.2815	0.4058	0.4568	0.4749	0.4549
5164472	0.1466	0.1529	0.2098	0.2594	0.1827	0.2051	0.2246	0.1726
5164474	0.2531	0.3401	0.3040	0.3825	0.3590	0.3644	0.3560	0.3292
5164475	0.4217	0.4661	0.3861	0.5213	0.4732	0.3056	0.4408	0.3684
5164479	0.2778	0.1776	0.2417	0.2656	0.1244	0.1760	0.2714	0.2793
5164483	0.3128	0.3400	0.3655	0.3433	0.3619	0.3817	0.2992	0.3571
5164485	0.4795	0.3802	0.4628	0.3740	0.4356	0.3949	0.3689	0.4036
5164487	0.3474	0.3323	0.3528	0.4196	0.2776	0.3133	0.2931	
5164494	0.5281	0.4157	0.4516	0.3972	0.4048	0.4854	0.3656	0.5403
5164507	0.3807	0.3983	0.4403	0.4428	0.4024	0.4451	0.4305	0.3529
5164491	0.3357	0.3449	0.3054	0.3106	0.3039	0.3184	0.3243	0.4426
5174405	0.3653	0.3654	0.3251	0.1942	0.3552	0.4017	0.3895	0.3303
5174406	0.5207	0.3988	0.4200	0.4814	0.4371	0.5065	0.4137	0.4303
5174408	0.4318	0.2727	0.2441	0.2501	0.2738	0.3639	0.2964	0.2726
5174412	0.3002	0.4346	0.3499	0.3285	0.3582	0.4225	0.2495	0.3407
5174413	0.3668	0.4075	0.4885	0.4601	0.4882	0.2803	0.3802	0.3365
5174407	0.4374	0.4042	0.3282	0.3496	0.4168	0.3815	0.2892	0.3645
5174410	0.3887	0.5274	0.4676	0.3194	0.3794	0.3404	0.4685	0.4805
5174411	0.4933	0.3682	0.5132	0.4686	0.5116	0.6045	0.4914	0.4237
5174423	0.3749	0.2897	0.3527	0.3782	0.2211	0.3040	0.3645	0.3087
5174424	0.3765	0.2971	0.3800	0.3829	0.2654	0.2821	0.3933	0.2952

			Transform: Untransformed						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.3813	0.9086	0.3813	0.3302	0.4459	10.072	8			
Ref05164489	0.4196	1.0000	0.4196	0.2815	0.4749	15.249	8			
*5164472	0.1942	0.4628	0.1942	0.1466	0.2594	19.575	8	8.565	2.624	0.0691
*5164474	0.3360	0.8009	0.3360	0.2531	0.3825	12.246	8	3.107	2.624	0.0706
5164475	0.4229	1.0079	0.4229	0.3056	0.5213	16.111	8			
5164479	0.2267	0.5403	0.2267	0.1244	0.2793	26.121	8			
*5164483	0.3452	0.8227	0.3452	0.2992	0.3817	8.017	8	3.019	2.624	0.0647
5164485	0.4124	0.9829	0.4124	0.3689	0.4795	10.191	8			
*5164487	0.3337	0.7954	0.3337	0.2776	0.4196	14.024	7	2.926	2.650	0.0778
5164494	0.4486	1.0691	0.4486	0.3656	0.5403	14.257	8			
5164507	0.4116	0.9810	0.4116	0.3529	0.4451	8.181	8			
*5164491	0.3357	0.8001	0.3357	0.3039	0.4426	13.560	8	3.021	2.624	0.0729
5174405	0.3408	0.8123	0.3408	0.1942	0.4017	18.996	8			
5174406	0.4511	1.0750	0.4511	0.3988	0.5207	10.109	8			
*5174408	0.3007	0.7166	0.3007	0.2441	0.4318	21.501	8	3.698	2.624	0.0844
5174412	0.3480	0.8294	0.3480	0.2495	0.4346	17.364	8	2.301	2.624	0.0817
5174413	0.4010	0.9557	0.4010	0.2803	0.4885	18.644	8			
5174407	0.3714	0.8852	0.3714	0.2892	0.4374	13.166	8			
5174410	0.4215	1.0045	0.4215	0.3194	0.5274	17.678	8			
5174411	0.4843	1.1542	0.4843	0.3682	0.6045	14.297	8			
*5174423	0.3242	0.7727	0.3242	0.2211	0.3782	16.647	8	3.222	2.624	0.0777
*5174424	0.3341	0.7962	0.3341	0.2654	0.3933	16.037	8	2.899	2.624	0.0774

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.49845	1.035	0.00707	0.51319
Bartlett's Test indicates equal variances (p = 0.31)	10.4803	21.666		
The control means are not significantly different (p = 0.17)	1.4533	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.07744	0.18455	0.02483	0.00259	2.6E-09	9, 69

Freshwater Sediment-Average ind. biomass

Start Date:	5/5/05 10:45	Test ID: 727-2	Sample ID:
End Date:	6/2/05 11:30	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.3796	0.3302	0.3439	0.3631	0.4163	0.4020	0.4459	0.3690
Ref05164489	0.4634	0.4380	0.3815	0.2815	0.4058	0.4568	0.4749	0.4549
5164472	0.1466	0.1529	0.2098	0.2594	0.1827	0.2051	0.2246	0.1726
5164474	0.2531	0.3401	0.3040	0.3825	0.3590	0.3644	0.3560	0.3292
5164475	0.4217	0.4661	0.3861	0.5213	0.4732	0.3056	0.4408	0.3684
5164479	0.2778	0.1776	0.2417	0.2656	0.1244	0.1760	0.2714	0.2793
5164483	0.3128	0.3400	0.3655	0.3433	0.3619	0.3817	0.2992	0.3571
5164485	0.4795	0.3802	0.4628	0.3740	0.4356	0.3949	0.3689	0.4036
5164487	0.3474	0.3323	0.3528	0.4196	0.2776	0.3133	0.2931	
5164494	0.5281	0.4157	0.4516	0.3972	0.4048	0.4854	0.3656	0.5403
5164507	0.3807	0.3983	0.4403	0.4428	0.4024	0.4451	0.4305	0.3529
5164491	0.3357	0.3449	0.3054	0.3106	0.3039	0.3184	0.3243	0.4426
5174405	0.3653	0.3654	0.3251	0.1942	0.3552	0.4017	0.3895	0.3303
5174406	0.5207	0.3988	0.4200	0.4814	0.4371	0.5065	0.4137	0.4303
5174408	0.4318	0.2727	0.2441	0.2501	0.2738	0.3639	0.2964	0.2726
5174412	0.3002	0.4346	0.3499	0.3285	0.3582	0.4225	0.2495	0.3407
5174413	0.3668	0.4075	0.4885	0.4601	0.4882	0.2803	0.3802	0.3365
5174407	0.4374	0.4042	0.3282	0.3496	0.4168	0.3815	0.2892	0.3645
5174410	0.3887	0.5274	0.4676	0.3194	0.3794	0.3404	0.4685	0.4805
5174411	0.4933	0.3682	0.5132	0.4686	0.5116	0.6045	0.4914	0.4237
5174423	0.3749	0.2897	0.3527	0.3782	0.2211	0.3040	0.3645	0.3087
5174424	0.3765	0.2971	0.3800	0.3829	0.2654	0.2821	0.3933	0.2952

			Transform: Untransformed					Rank	1-Tailed
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	0.3813	0.9086	0.3813	0.3302	0.4459	10.072	8		
Ref05164489	0.4196	1.0000	0.4196	0.2815	0.4749	15.249	8		
5164472	0.1942	0.4628	0.1942	0.1466	0.2594	19.575	8		
5164474	0.3360	0.8009	0.3360	0.2531	0.3825	12.246	8		
5164475	0.4229	1.0079	0.4229	0.3056	0.5213	16.111	8		
*5164479	0.2267	0.5403	0.2267	0.1244	0.2793	26.121	8	36.00	45.00
5164483	0.3452	0.8227	0.3452	0.2992	0.3817	8.017	8		
5164485	0.4124	0.9829	0.4124	0.3689	0.4795	10.191	8		
5164487	0.3337	0.7954	0.3337	0.2776	0.4196	14.024	7		
5164494	0.4486	1.0691	0.4486	0.3656	0.5403	14.257	8		
5164507	0.4116	0.9810	0.4116	0.3529	0.4451	8.181	8		
5164491	0.3357	0.8001	0.3357	0.3039	0.4426	13.560	8		
*5174405	0.3408	0.8123	0.3408	0.1942	0.4017	18.996	8	45.00	45.00
5174406	0.4511	1.0750	0.4511	0.3988	0.5207	10.109	8		
5174408	0.3007	0.7166	0.3007	0.2441	0.4318	21.501	8		
5174412	0.3480	0.8294	0.3480	0.2495	0.4346	17.364	8		
5174413	0.4010	0.9557	0.4010	0.2803	0.4885	18.644	8		
5174407	0.3714	0.8852	0.3714	0.2892	0.4374	13.166	8		
5174410	0.4215	1.0045	0.4215	0.3194	0.5274	17.678	8		
5174411	0.4843	1.1542	0.4843	0.3682	0.6045	14.297	8		
5174423	0.3242	0.7727	0.3242	0.2211	0.3782	16.647	8		
5174424	0.3341	0.7962	0.3341	0.2654	0.3933	16.037	8		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.83486	0.884	-1.326	0.98174
Bartlett's Test indicates equal variances (p = 0.33)	2.20785	9.21035		
The control means are not significantly different (p = 0.17)	1.4533	2.14479		

Hypothesis Test (1-tail, 0.01)

Wilcoxon Two-Sample Test indicates significant differences

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

Pos	ID	Rep	Group	Day 0	Day 10	psurv Day 10	Day 20	psurv Day 20	Day 28	psurv day 28	Dry Wt (mg)	Tare Wt (mg)	Wt. count	TWT	WT	Ashed dry wt	TAFDW	AFDW
	1	1	D-Control	10					10	1	33.303	29.507	10	3.796	0.3796			
	2	2	D-Control	10					9	0.9	31.978	29.006	9	2.972	0.330222			
	3	3	D-Control	10					10	1	32.368	28.929	10	3.439	0.3439			
	4	4	D-Control	10					10	1	31.555	27.924	10	3.631	0.3631			
	5	5	D-Control	10					9	0.9	30.507	26.76	9	3.747	0.416333			
	6	6	D-Control	10					10	1	31.762	27.742	10	4.02	0.402			
	7	7	D-Control	10					10	1	32.183	27.724	10	4.459	0.4459			
	8	8	D-Control	10					10	1	31.578	27.888	10	3.69	0.369			
	9	1	Ref05164489	10					10	1	32.842	28.208	10	4.634	0.4634			
	10	2	Ref05164489	10					9	0.9	32.931	28.989	9	3.942	0.438			
	11	3	Ref05164489	10					10	1	32.773	28.958	10	3.815	0.3815			
	12	4	Ref05164489	10					6	0.6	30.786	29.097	6	1.689	0.2815			
	13	5	Ref05164489	10					10	1	33.567	29.509	10	4.058	0.4058			
	14	6	Ref05164489	10					10	1	32.808	28.240	10	4.568	0.4568			
	15	7	Ref05164489	10					10	1	34.536	29.787	10	4.749	0.4749			
	16	8	Ref05164489	10					10	1	32.831	28.282	10	4.549	0.4549			
	17	1	5164472	10					9	0.9	29.872	28.553	9	1.319	0.146556			
	18	2	5164472	10					9	0.9	31.124	29.748	9	1.376	0.152889			
	19	3	5164472	10					6	0.6	27.904	26.645	6	1.259	0.209833			
	20	4	5164472	10					9	0.9	30.117	27.782	9	2.335	0.259444			
	21	5	5164472	10					10	1	30.816	28.989	10	1.827	0.1827			
	22	6	5164472	10					10	1	30.53	28.479	10	2.051	0.2051			
	23	7	5164472	10					9	0.9	30.524	28.503	9	2.021	0.224556			
	24	8	5164472	10					10	1	28.853	27.127	10	1.726	0.1726			
	25	1	5164474	10					9	0.9	33.565	31.287	9	2.278	0.253111			
	26	2	5164474	10					7	0.7	31.279	28.898	7	2.381	0.340143			
	27	3	5164474	10					8	0.8	31.038	28.606	8	2.432	0.304			
	28	4	5164474	10					10	1	33.902	30.077	10	3.825	0.3825			
	29	5	5164474	10					9	0.9	33.625	30.394	9	3.231	0.359			
	30	6	5164474	10					8	0.8	31.273	28.358	8	2.915	0.364375			
	31	7	5164474	10					10	1	33.28	29.72	10	3.56	0.356			
	32	8	5164474	10					10	1	31.883	28.591	10	3.292	0.3292			
	33	1	5164475	10					10	1	32.398	28.181	10	4.217	0.4217			
	34	2	5164475	10					9	0.9	33.521	29.326	9	4.195	0.466111			
	35	3	5164475	10					8	0.8	32.711	29.622	8	3.089	0.386125			
	36	4	5164475	10					10	1	35.087	29.874	10	5.213	0.5213			
	37	5	5164475	10					10	1	34.818	30.086	10	4.732	0.4732			
	38	6	5164475	10					9	0.9	31.272	28.522	9	2.75	0.305556			
	39	7	5164475	10					10	1	32.338	27.93	10	4.408	0.4408			

data entry verified against EXCEL spreadsheet MLR 11-4-05

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Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	40	8	5164475	10					10	1	32.502	28.818	10	3.684	0.3684					
	41	1	5164479	10					8	0.8	30.986	28.764	8	2.222	0.27775					
	42	2	5164479	10					7	0.7	31.607	30.364	7	1.243	0.177571					
	43	3	5164479	10					9	0.9	30.588	28.413	9	2.175	0.241667					
	44	4	5164479	10					8	0.8	30.838	28.713	8	2.125	0.265625					
	45	5	5164479	10					9	0.9	30.412	29.292	9	1.12	0.124444					
	46	6	5164479	10					8	0.8	30.025	28.617	8	1.408	0.176					
	47	7	5164479	10					10	1	30.715	28.001	10	2.714	0.2714					
	48	8	5164479	10					10	1	31.126	28.333	10	2.793	0.2793					
	49	1	5164483	10					10	1	32.708	29.58	10	3.128	0.3128					
	50	2	5164483	10					9	0.9	31.911	28.851	9	3.06	0.34					
	51	3	5164483	10					10	1	31.953	28.298	10	3.655	0.3655					
	52	4	5164483	10					9	0.9	34.745	31.655	9	3.09	0.343333					
	53	5	5164483	10					10	1	32.414	28.795	10	3.619	0.3619					
	54	6	5164483	10					10	1	32.44	28.623	10	3.817	0.3817					
	55	7	5164483	10					10	1	33.702	30.71	10	2.992	0.2992					
	56	8	5164483	10					10	1	34.048	30.477	10	3.571	0.3571					
	57	1	5164485	10					10	1	32.167	27.372	10	4.795	0.4795					
	58	2	5164485	10					9	0.9	32.849	29.427	9	3.422	0.380222					
	59	3	5164485	10					10	1	33.804	29.176	10	4.628	0.4628					
	60	4	5164485	10					10	1	33.798	30.058	10	3.74	0.374					
	61	5	5164485	10					10	1	34.635	30.279	10	4.356	0.4356					
	62	6	5164485	10					10	1	33.923	29.974	10	3.949	0.3949					
	63	7	5164485	10					10	1	31.329	27.64	10	3.689	0.3689					
	64	8	5164485	10					10	1	32.864	28.828	10	4.036	0.4036					
	65	1	5164487	10					10	1	31.71	28.236	10	3.474	0.3474					
	66	2	5164487	10					10	1	31.993	28.67	10	3.323	0.3323					
	67	3	5164487	10					10	1	33.07	29.542	10	3.528	0.3528					
	68	4	5164487	10					10	1	34.381	30.185	10	4.196	0.4196					
	69	5	5164487	10					10	1	29.142	26.366	10	2.776	0.2776					
	70	6	5164487	10					10	1	34.103	31.283	9	2.82	0.313333					
	71	7	5164487	10					10	1	30.494	27.563	10	2.931	0.2931					
	72	1	5164494	10					9	0.9	32.597	27.844	9	4.753	0.528111					
	73	2	5164494	10					10	1	34.318	30.161	10	4.157	0.4157					
	74	3	5164494	10					10	1	32.834	28.318	10	4.516	0.4516					
	75	4	5164494	10					10	1	32.17	28.198	10	3.972	0.3972					
	76	5	5164494	10					9	0.9	31.541	27.898	9	3.643	0.404778					
	77	6	5164494	10					9	0.9	32.541	28.172	9	4.369	0.485444					
	78	7	5164494	10					8	0.8	31.064	28.139	8	2.925	0.365625					
	79	8	5164494	10					9	0.9	32.438	27.575	9	4.863	0.540333					
	80	1	5164507	10					10	1	33.763	29.956	10	3.807	0.3807					

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Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	81	2	5164507	10					10	1	32.746	28.763	10	3.983	0.3983			
	82	3	5164507	10					10	1	33.64	29.237	10	4.403	0.4403			
	83	4	5164507	10					9	0.9	34.971	30.986	9	3.985	0.442778			
	84	5	5164507	10					10	1	33.529	29.505	10	4.024	0.4024			
	85	6	5164507	10					9	0.9	33.624	29.618	9	4.006	0.445111			
	86	7	5164507	10					10	1	33.621	29.316	10	4.305	0.4305			
	87	8	5164507	10					10	1	31.546	28.017	10	3.529	0.3529			
	88	1	5164491	10					10	1	31.616	28.259	10	3.357	0.3357			
	89	2	5164491	10					8	0.8	30.43	27.671	8	2.759	0.344875			
	90	3	5164491	10					9	0.9	32.483	29.734	9	2.749	0.305444			
	91	4	5164491	10					7	0.7	30.904	28.73	7	2.174	0.310571			
	92	5	5164491	10					9	0.9	32.789	30.054	9	2.735	0.303889			
	93	6	5164491	10					10	1	33.145	29.961	10	3.184	0.3184			
	94	7	5164491	10					8	0.8	31.543	28.949	8	2.594	0.32425			
	95	8	5164491	10					8	0.8	32.276	28.735	8	3.541	0.442625			
	96	1	5174405	10					9	0.9	32.488	29.2	9	3.288	0.365333			
	97	2	5174405	10					10	1	32.941	29.287	10	3.654	0.3654			
	98	3	5174405	10					10	1	33.148	29.897	10	3.251	0.3251			
	99	4	5174405	10					5	0.5	29.545	28.574	5	0.971	0.1942			
	100	5	5174405	10					10	1	31.754	28.557	9	3.197	0.355222			
	101	6	5174405	10					10	1	33.503	29.486	10	4.017	0.4017			
	102	7	5174405	10					10	1	33.137	29.242	10	3.895	0.3895			
	103	8	5174405	10					10	1	33.291	29.988	10	3.303	0.3303			
	104	1	5174406	10					9	0.9	34.114	29.428	9	4.686	0.520667			
	105	2	5174406	10					10	1	33.226	29.238	10	3.988	0.3988			
	106	3	5174406	10					9	0.9	32.493	28.713	9	3.78	0.42			
	107	4	5174406	10					10	1	33.569	28.755	10	4.814	0.4814			
	108	5	5174406	10					10	1	33.018	28.647	10	4.371	0.4371			
	109	6	5174406	10					10	1	33.495	28.43	10	5.065	0.5065			
	110	7	5174406	10					10	1	33.467	29.33	10	4.137	0.4137			
	111	8	5174406	10					9	0.9	33.035	29.162	9	3.873	0.430333			
	112	1	5174408	10					10	1	35.471	31.153	10	4.318	0.4318			
	113	2	5174408	10					10	1	29.793	27.066	10	2.727	0.2727			
	114	3	5174408	10					8	0.8	31.152	29.199	8	1.953	0.244125			
	115	4	5174408	10					10	1	30.678	28.177	10	2.501	0.2501			
	116	5	5174408	10					10	1	31.054	28.316	10	2.738	0.2738			
	117	6	5174408	10					10	1	32.319	28.68	10	3.639	0.3639			
	118	7	5174408	10					9	0.9	30.82	28.152	9	2.668	0.296444			
	119	8	5174408	10					10	1	32.704	29.978	10	2.726	0.2726			
	120	1	5174412	10					10	1	31.711	28.709	10	3.002	0.3002			
	121	2	5174412	10					9	0.9	31.09	27.179	9	3.911	0.434556			

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	122	3	5174412	10					10	1	32.204	28.705	10	3.499	0.3499				
	123	4	5174412	10					8	0.8	30.444	27.816	8	2.628	0.3285				
	124	5	5174412	10					9	0.9	31.068	27.844	9	3.224	0.358222				
	125	6	5174412	10					10	1	34.472	30.247	10	4.225	0.4225				
	126	7	5174412	11					11	1	29.633	26.888	11	2.745	0.249545				
	127	8	5174412	10					10	1	32.509	29.102	10	3.407	0.3407				
	128	1	5174413	10					10	1	31.112	27.444	10	3.668	0.3668				
	129	2	5174413	10					10	1	34.282	30.207	10	4.075	0.4075				
	130	3	5174413	10					8	0.8	33.981	30.073	8	3.908	0.4885				
	131	4	5174413	10					9	0.9	33.318	29.177	9	4.141	0.460111				
	132	5	5174413	10					10	1	32.592	27.71	10	4.882	0.4882				
	133	6	5174413	10					10	1	31.78	28.977	10	2.803	0.2803				
	134	7	5174413	10					10	1	33.301	29.499	10	3.802	0.3802				
	135	8	5174413	10					10	1	31.847	28.482	10	3.365	0.3365				
	136	1	5174407	10					10	1	32.581	28.207	10	4.374	0.4374				
	137	2	5174407	10					9	0.9	31.34	27.702	9	3.638	0.404222				
	138	3	5174407	10					9	0.9	30.987	28.033	9	2.954	0.328222				
	139	4	5174407	10					9	0.9	32.125	28.979	9	3.146	0.349556				
	140	5	5174407	10					8	0.8	32.24	28.906	8	3.334	0.41675				
	141	6	5174407	10					8	0.8	30.826	27.774	8	3.052	0.3815				
	142	7	5174407	10					10	1	31.86	28.968	10	2.892	0.2892				
	143	8	5174407	10					10	1	33.477	29.832	10	3.645	0.3645				
	144	1	5174410	10					10	1	33.011	29.124	10	3.887	0.3887				
	145	2	5174410	10					10	1	35.613	30.339	10	5.274	0.5274				
	146	3	5174410	10					9	0.9	33.787	29.579	9	4.208	0.467556				
	147	4	5174410	10					9	0.9	33.065	30.19	9	2.875	0.319444				
	148	5	5174410	10					9	0.9	32.123	28.708	9	3.415	0.379444				
	149	6	5174410	10					10	1	32.809	29.405	10	3.404	0.3404				
	150	7	5174410	10					10	1	33.143	28.458	10	4.685	0.4685				
	151	8	5174410	10					8	0.8	31.927	28.083	8	3.844	0.4805				
	152	1	5174411	10					10	1	33.521	28.588	10	4.933	0.4933				
	153	2	5174411	10					10	1	31.872	28.19	10	3.682	0.3682				
	154	3	5174411	10					10	1	33.76	28.628	10	5.132	0.5132				
	155	4	5174411	10					9	0.9	33.05	28.833	9	4.217	0.468556				
	156	5	5174411	10					10	1	33.817	28.701	10	5.116	0.5116				
	157	6	5174411	10					8	0.8	33.794	28.958	8	4.836	0.6045				
	158	7	5174411	10					10	1	33.147	28.233	10	4.914	0.4914				
	159	8	5174411	10					10	1	33.265	29.028	10	4.237	0.4237				
	160	1	5174423	10					10	1	33.089	29.34	10	3.749	0.3749				
	161	2	5174423	10					10	1	32.375	29.478	10	2.897	0.2897				
	162	3	5174423	10					10	1	30.968	27.441	10	3.527	0.3527				

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Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	163	4	5174423	10					9	0.9	32.03	28.626	9	3.404	0.378222			
	164	5	5174423	10					10	1	30.45	28.239	10	2.211	0.2211			
	165	6	5174423	10					10	1	33.802	30.762	10	3.04	0.304			
	166	7	5174423	10					8	0.8	32.537	29.621	8	2.916	0.3645			
	167	8	5174423	10					10	1	30.865	27.778	10	3.087	0.3087			
	168	1	5174424	10					10	1	34.194	30.429	10	3.765	0.3765			
	169	2	5174424	10					8	0.8	32.972	30.595	8	2.377	0.297125			
	170	3	5174424	10					9	0.9	33.409	29.989	9	3.42	0.38			
	171	4	5174424	10					9	0.9	31.268	27.822	9	3.446	0.382889			
	172	5	5174424	10					10	1	30.574	28.185	9	2.389	0.265444			
	173	6	5174424	10					10	1	31.609	28.788	10	2.821	0.2821			
	174	7	5174424	10					9	0.9	31.611	28.071	9	3.54	0.393333			
	175	8	5174424	10					10	1	32.07	29.118	10	2.952	0.2952			

Comments:

Freshwater Sediment Average ind. biomass

Start Date:	5/5/05 10:45	Test ID: 727-2	Sample ID:
End Date:	6/2/05 11:30	Lab ID: ORNAS-Northwestern Aquati	Sample Type: SED-Sediment
Sample Date:		Protocol: NASXXXHA4C-Hyalella 28-d	Test Species: HA-Hyalella azteca
Comments:			

Conc-	1	2	3	4	5	6	7	8
D-Control	0.3796	0.3302	0.3439	0.3631	0.4163	0.4020	0.4459	0.3690
Ref05164496	0.4226	0.6080	0.4525	0.4552	0.4581	0.4318	0.4669	0.4508
5164472	0.1466	0.1529	0.2098	0.2594	0.1827	0.2051	0.2246	0.1726
5164474	0.2531	0.3401	0.3040	0.3825	0.3590	0.3644	0.3560	0.3292
5164475	0.4217	0.4661	0.3861	0.5213	0.4732	0.3056	0.4408	0.3684
5164479	0.2778	0.1776	0.2417	0.2656	0.1244	0.1760	0.2714	0.2793
5164483	0.3128	0.3400	0.3655	0.3433	0.3619	0.3817	0.2992	0.3571
5164485	0.4795	0.3802	0.4628	0.3740	0.4356	0.3949	0.3689	0.4036
5164487	0.3474	0.3323	0.3528	0.4196	0.2776	0.3133	0.2931	
5164494	0.5281	0.4157	0.4516	0.3972	0.4048	0.4854	0.3656	0.5403
5164507	0.3807	0.3983	0.4403	0.4428	0.4024	0.4451	0.4305	0.3529
5164491	0.3357	0.3449	0.3054	0.3106	0.3039	0.3184	0.3243	0.4426
5174405	0.3653	0.3654	0.3251	0.1942	0.3552	0.4017	0.3895	0.3303
5174406	0.5207	0.3988	0.4200	0.4814	0.4371	0.5065	0.4137	0.4303
5174408	0.4318	0.2727	0.2441	0.2501	0.2738	0.3639	0.2964	0.2726
5174412	0.3002	0.4346	0.3499	0.3285	0.3582	0.4225	0.2495	0.3407
5174413	0.3668	0.4075	0.4885	0.4601	0.4882	0.2803	0.3802	0.3365
5174407	0.4374	0.4042	0.3282	0.3496	0.4168	0.3815	0.2892	0.3645
5174410	0.3887	0.5274	0.4676	0.3194	0.3794	0.3404	0.4685	0.4805
5174411	0.4933	0.3682	0.5132	0.4686	0.5116	0.6045	0.4914	0.4237
5174423	0.3749	0.2897	0.3527	0.3782	0.2211	0.3040	0.3645	0.3087
5174424	0.3765	0.2971	0.3800	0.3829	0.2654	0.2821	0.3933	0.2952

			Transform: Untransformed						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.3813	0.8142	0.3813	0.3302	0.4459	10.072	8			
Ref05164496	0.4682	1.0000	0.4682	0.4226	0.6080	12.445	8			
5164472	0.1942	0.4148	0.1942	0.1466	0.2594	19.575	8			
*5164474	0.3360	0.7177	0.3360	0.2531	0.3825	12.246	8	5.242	2.624	0.0662
5164475	0.4229	0.9032	0.4229	0.3056	0.5213	16.111	8			
*5164479	0.2267	0.4842	0.2267	0.1244	0.2793	26.121	8	8.222	2.624	0.0771
5164483	0.3452	0.7372	0.3452	0.2992	0.3817	8.017	8			
5164485	0.4124	0.8808	0.4124	0.3689	0.4795	10.191	8			
5164487	0.3337	0.7127	0.3337	0.2776	0.4196	14.024	7			
5164494	0.4486	0.9580	0.4486	0.3656	0.5403	14.257	8			
5164507	0.4116	0.8791	0.4116	0.3529	0.4451	8.181	8			
5164491	0.3357	0.7170	0.3357	0.3039	0.4426	13.560	8			
*5174405	0.3408	0.7279	0.3408	0.1942	0.4017	18.996	8	4.137	2.624	0.0808
5174406	0.4511	0.9633	0.4511	0.3988	0.5207	10.109	8			
5174408	0.3007	0.6422	0.3007	0.2441	0.4318	21.501	8			
*5174412	0.3480	0.7432	0.3480	0.2495	0.4346	17.364	8	4.051	2.624	0.0779
5174413	0.4010	0.8564	0.4010	0.2803	0.4885	18.644	8	2.006	2.624	0.0880
*5174407	0.3714	0.7932	0.3714	0.2892	0.4374	13.166	8	3.600	2.624	0.0706
5174410	0.4215	0.9002	0.4215	0.3194	0.5274	17.678	8			
5174411	0.4843	1.0343	0.4843	0.3682	0.6045	14.297	8			
*5174423	0.3242	0.6924	0.3242	0.2211	0.3782	16.647	8	5.128	2.624	0.0737
*5174424	0.3341	0.7135	0.3341	0.2654	0.3933	16.037	8	4.794	2.624	0.0734

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.57983	1.035	-0.2842	0.11722
Bartlett's Test indicates equal variances (p = 0.42)	8.18345	20.0902		
The control means are significantly different (p = 3.36E-03)	3.52547	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.07345	0.15686	0.03344	0.00336	7.6E-09	8, 63

Freshwater Sediment Average ind. biomass

Start Date:	5/5/05 10:45	Test ID:	727-2	Sample ID:	
End Date:	6/2/05 11:30	Lab ID:	ORNAS-Northwestern Aquati	Sample Type:	SED-Sediment
Sample Date:		Protocol:	NASXXXHA4C-Hyalella 28-d	Test Species:	HA-Hyalella azteca
Comments:					

Conc-	1	2	3	4	5	6	7	8
D-Control	0.3796	0.3302	0.3439	0.3631	0.4163	0.4020	0.4459	0.3690
Ref05164496	0.4226	0.6080	0.4525	0.4552	0.4581	0.4318	0.4669	0.4508
5164472	0.1466	0.1529	0.2098	0.2594	0.1827	0.2051	0.2246	0.1726
5164474	0.2531	0.3401	0.3040	0.3825	0.3590	0.3644	0.3560	0.3292
5164475	0.4217	0.4661	0.3861	0.5213	0.4732	0.3056	0.4408	0.3684
5164479	0.2778	0.1776	0.2417	0.2656	0.1244	0.1760	0.2714	0.2793
5164483	0.3128	0.3400	0.3655	0.3433	0.3619	0.3817	0.2992	0.3571
5164485	0.4795	0.3802	0.4628	0.3740	0.4356	0.3949	0.3689	0.4036
5164487	0.3474	0.3323	0.3528	0.4196	0.2776	0.3133	0.2931	
5164494	0.5281	0.4157	0.4516	0.3972	0.4048	0.4854	0.3656	0.5403
5164507	0.3807	0.3983	0.4403	0.4428	0.4024	0.4451	0.4305	0.3529
5164491	0.3357	0.3449	0.3054	0.3106	0.3039	0.3184	0.3243	0.4426
5174405	0.3653	0.3654	0.3251	0.1942	0.3552	0.4017	0.3895	0.3303
5174406	0.5207	0.3988	0.4200	0.4814	0.4371	0.5065	0.4137	0.4303
5174408	0.4318	0.2727	0.2441	0.2501	0.2738	0.3639	0.2964	0.2726
5174412	0.3002	0.4346	0.3499	0.3285	0.3582	0.4225	0.2495	0.3407
5174413	0.3668	0.4075	0.4885	0.4601	0.4882	0.2803	0.3802	0.3365
5174407	0.4374	0.4042	0.3282	0.3496	0.4168	0.3815	0.2892	0.3645
5174410	0.3887	0.5274	0.4676	0.3194	0.3794	0.3404	0.4685	0.4805
5174411	0.4933	0.3682	0.5132	0.4686	0.5116	0.6045	0.4914	0.4237
5174423	0.3749	0.2897	0.3527	0.3782	0.2211	0.3040	0.3645	0.3087
5174424	0.3765	0.2971	0.3800	0.3829	0.2654	0.2821	0.3933	0.2952

			Transform: Untransformed					Rank	1-Tailed
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	0.3813	0.8142	0.3813	0.3302	0.4459	10.072	8		
Ref05164496	0.4682	1.0000	0.4682	0.4226	0.6080	12.445	8		
*5164472	0.1942	0.4148	0.1942	0.1466	0.2594	19.575	8	36.00	45.00
5164474	0.3360	0.7177	0.3360	0.2531	0.3825	12.246	8		
5164475	0.4229	0.9032	0.4229	0.3056	0.5213	16.111	8		
5164479	0.2267	0.4842	0.2267	0.1244	0.2793	26.121	8		
*5164483	0.3452	0.7372	0.3452	0.2992	0.3817	8.017	8	36.00	45.00
5164485	0.4124	0.8808	0.4124	0.3689	0.4795	10.191	8	51.00	45.00
*5164487	0.3337	0.7127	0.3337	0.2776	0.4196	14.024	7	28.00	35.00
5164494	0.4486	0.9580	0.4486	0.3656	0.5403	14.257	8		
*5164507	0.4116	0.8791	0.4116	0.3529	0.4451	8.181	8	43.00	45.00
*5164491	0.3357	0.7170	0.3357	0.3039	0.4426	13.560	8	38.00	45.00
5174405	0.3408	0.7279	0.3408	0.1942	0.4017	18.996	8		
5174406	0.4511	0.9633	0.4511	0.3988	0.5207	10.109	8		
*5174408	0.3007	0.6422	0.3007	0.2441	0.4318	21.501	8	37.00	45.00
5174412	0.3480	0.7432	0.3480	0.2495	0.4346	17.364	8		
5174413	0.4010	0.8564	0.4010	0.2803	0.4885	18.644	8		
5174407	0.3714	0.7932	0.3714	0.2892	0.4374	13.166	8		
5174410	0.4215	0.9002	0.4215	0.3194	0.5274	17.678	8		
5174411	0.4843	1.0343	0.4843	0.3682	0.6045	14.297	8		
5174423	0.3242	0.6924	0.3242	0.2211	0.3782	16.647	8		
5174424	0.3341	0.7135	0.3341	0.2654	0.3933	16.037	8		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.01)	1.08543	1.035	1.31256	1.89983
Bartlett's Test indicates equal variances (p = 0.40)	7.26503	18.4753		
The control means are significantly different (p = 3.36E-03)	3.52547	2.14479		

Hypothesis Test (1-tail, 0.01)

Wilcoxon Two-Sample Test indicates significant differences

Freshwater Sediment-28-day survival

Start Date: 5/5/05 10:45 Test ID: 727-2 Sample ID:
End Date: 6/2/05 11:30 Lab ID: ORNAS-Northwestern Aquati Sample Type: SED-Sediment
Sample Date: Protocol: NASXXXHA4C-Hyalella 28-d Test Species: HA-Hyalella azteca
Comments:

Conc-	1	2	3	4	5	6	7	8
D-Control	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
Ref05164496	1.0000	1.0000	1.0000	0.9000	0.8000	1.0000	0.9000	1.0000
5164472	0.9000	0.9000	0.6000	0.9000	1.0000	1.0000	0.9000	1.0000
5164474	0.9000	0.7000	0.8000	1.0000	0.9000	0.8000	1.0000	1.0000
5164475	1.0000	0.9000	0.8000	1.0000	1.0000	0.9000	1.0000	1.0000
5164479	0.8000	0.7000	0.9000	0.8000	0.9000	0.8000	1.0000	1.0000
5164483	1.0000	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000
5164485	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5164487	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
5164494	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000	0.8000	0.9000
5164507	1.0000	1.0000	1.0000	0.9000	1.0000	0.9000	1.0000	1.0000
5164491	1.0000	0.8000	0.9000	0.7000	0.9000	1.0000	0.8000	0.8000
5174405	0.9000	1.0000	1.0000	0.5000	1.0000	1.0000	1.0000	1.0000
5174406	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000	0.9000
5174408	1.0000	1.0000	0.8000	1.0000	1.0000	1.0000	0.9000	1.0000
5174412	1.0000	0.9000	1.0000	0.8000	0.9000	1.0000	1.0000	1.0000
5174413	1.0000	1.0000	0.8000	0.9000	1.0000	1.0000	1.0000	1.0000
5174407	1.0000	0.9000	0.9000	0.9000	0.8000	0.8000	1.0000	1.0000
5174410	1.0000	1.0000	0.9000	0.9000	0.9000	1.0000	1.0000	0.8000
5174411	1.0000	1.0000	1.0000	0.9000	1.0000	0.8000	1.0000	1.0000
5174423	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000	0.8000	1.0000
5174424	1.0000	0.8000	0.9000	0.9000	1.0000	1.0000	0.9000	1.0000

			Transform: Arcsin Square Root						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.9750	1.0263	1.3713	1.2490	1.4120	5.501	8			
Ref05164496	0.9500	1.0000	1.3332	1.1071	1.4120	8.799	8			
5164472	0.9000	0.9474	1.2648	0.8861	1.4120	13.676	8			
5164474	0.8875	0.9342	1.2424	0.9912	1.4120	13.124	8			
5164475	0.9500	1.0000	1.3332	1.1071	1.4120	8.799	8			
5164479	0.8625	0.9079	1.2043	0.9912	1.4120	12.711	8	1.889	2.624	0.1790
5164483	0.9750	1.0263	1.3713	1.2490	1.4120	5.501	8			
5164485	0.9875	1.0395	1.3916	1.2490	1.4120	4.140	8			
5164487	1.0000	1.0526	1.4120	1.4120	1.4120	0.000	7			
5164494	0.9250	0.9737	1.2924	1.1071	1.4120	8.514	8			
5164507	0.9750	1.0263	1.3713	1.2490	1.4120	5.501	8			
5164491	0.8625	0.9079	1.2043	0.9912	1.4120	12.711	8	1.889	2.624	0.1790
5174405	0.9250	0.9737	1.3133	0.7854	1.4120	16.813	8			
5174406	0.9625	1.0132	1.3509	1.2490	1.4120	6.244	8			
5174408	0.9625	1.0132	1.3535	1.1071	1.4120	8.476	8			
5174412	0.9500	1.0000	1.3341	1.1071	1.4195	8.848	8			
5174413	0.9625	1.0132	1.3535	1.1071	1.4120	8.476	8			
5174407	0.9125	0.9605	1.2747	1.1071	1.4120	10.042	8			
5174410	0.9375	0.9868	1.3128	1.1071	1.4120	8.821	8			
5174411	0.9625	1.0132	1.3535	1.1071	1.4120	8.476	8			
5174423	0.9625	1.0132	1.3535	1.1071	1.4120	8.476	8			
5174424	0.9375	0.9868	1.3128	1.1071	1.4120	8.821	8			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.90734	0.884	0.01918	-0.9433
Bartlett's Test indicates equal variances (p = 0.59)	1.05539	9.21035		
The control means are not significantly different (p = 0.45)	0.77284	2.14479		

Hypothesis Test (1-tail, 0.01)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences	0.10832	0.11467	0.04426	0.02021	0.13684	2, 21

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

Pos	ID	Rep	Group	Day 0	Day 10	psurv Day 10	Day 20	psurv Day 20	Day 28	psurv day 28	Dry Wt (mg)	Tare Wt (mg)	Wt. count	TWT	WT	Ashed dry wt	TAFDW	AFDW
	1	1	D-Control	10					10	1	33.303	29.507	10	3.796	0.3796			
	2	2	D-Control	10					9	0.9	31.978	29.006	9	2.972	0.330222			
	3	3	D-Control	10					10	1	32.368	28.929	10	3.439	0.3439			
	4	4	D-Control	10					10	1	31.555	27.924	10	3.631	0.3631			
	5	5	D-Control	10					9	0.9	30.507	26.76	9	3.747	0.416333			
	6	6	D-Control	10					10	1	31.762	27.742	10	4.02	0.402			
	7	7	D-Control	10					10	1	32.183	27.724	10	4.459	0.4459			
	8	8	D-Control	10					10	1	31.578	27.888	10	3.69	0.369			
	9	1	Ref05164496	10					10	1	33.66	29.434	10	4.226	0.4226			
	10	2	Ref05164496	10					10	0.9	34.906	28.826	10	6.08	0.608			
	11	3	Ref05164496	10					10	1	34.542	30.017	10	4.525	0.4525	data entry verified against EXCEL spreadsheet TKH 11-9-05		
	12	4	Ref05164496	10					9	0.6	31.849	27.752	9	4.097	0.455222			
	13	5	Ref05164496	10					8	1	31.848	28.183	8	3.665	0.458125			
	14	6	Ref05164496	10					10	1	31.472	27.154	10	4.318	0.4318			
	15	7	Ref05164496	10					9	1	32.316	28.114	9	4.202	0.466889			
	16	8	Ref05164496	10					10	1	31.039	26.531	10	4.508	0.4508			
	17	1	5164472	10					9	0.9	29.872	28.553	9	1.319	0.146556			
	18	2	5164472	10					9	0.9	31.124	29.748	9	1.376	0.152889			
	19	3	5164472	10					6	0.6	27.904	26.645	6	1.259	0.209833			
	20	4	5164472	10					9	0.9	30.117	27.782	9	2.335	0.259444			
	21	5	5164472	10					10	1	30.816	28.989	10	1.827	0.1827			
	22	6	5164472	10					10	1	30.53	28.479	10	2.051	0.2051			
	23	7	5164472	10					9	0.9	30.524	28.503	9	2.021	0.224556			
	24	8	5164472	10					10	1	28.853	27.127	10	1.726	0.1726			
	25	1	5164474	10					9	0.9	33.565	31.287	9	2.278	0.253111			
	26	2	5164474	10					7	0.7	31.279	28.898	7	2.381	0.340143			
	27	3	5164474	10					8	0.8	31.038	28.606	8	2.432	0.304			
	28	4	5164474	10					10	1	33.902	30.077	10	3.825	0.3825			
	29	5	5164474	10					9	0.9	33.625	30.394	9	3.231	0.359			
	30	6	5164474	10					8	0.8	31.273	28.358	8	2.915	0.364375			
	31	7	5164474	10					10	1	33.28	29.72	10	3.56	0.356			
	32	8	5164474	10					10	1	31.883	28.591	10	3.292	0.3292			
	33	1	5164475	10					10	1	32.398	28.181	10	4.217	0.4217			
	34	2	5164475	10					9	0.9	33.521	29.326	9	4.195	0.466111			
	35	3	5164475	10					8	0.8	32.711	29.622	8	3.089	0.386125			
	36	4	5164475	10					10	1	35.087	29.874	10	5.213	0.5213			
	37	5	5164475	10					10	1	34.818	30.086	10	4.732	0.4732			
	38	6	5164475	10					9	0.9	31.272	28.522	9	2.75	0.305556			
	39	7	5164475	10					10	1	32.338	27.93	10	4.408	0.4408			

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	40	8	5164475	10					10	1	32.502	28.818	10	3.684	0.3684					
	41	1	5164479	10					8	0.8	30.986	28.764	8	2.222	0.27775					
	42	2	5164479	10					7	0.7	31.607	30.364	7	1.243	0.177571					
	43	3	5164479	10					9	0.9	30.588	28.413	9	2.175	0.241667					
	44	4	5164479	10					8	0.8	30.838	28.713	8	2.125	0.265625					
	45	5	5164479	10					9	0.9	30.412	29.292	9	1.12	0.124444					
	46	6	5164479	10					8	0.8	30.025	28.617	8	1.408	0.176					
	47	7	5164479	10					10	1	30.715	28.001	10	2.714	0.2714					
	48	8	5164479	10					10	1	31.126	28.333	10	2.793	0.2793					
	49	1	5164483	10					10	1	32.708	29.58	10	3.128	0.3128					
	50	2	5164483	10					9	0.9	31.911	28.851	9	3.06	0.34					
	51	3	5164483	10					10	1	31.953	28.298	10	3.655	0.3655					
	52	4	5164483	10					9	0.9	34.745	31.655	9	3.09	0.343333					
	53	5	5164483	10					10	1	32.414	28.795	10	3.619	0.3619					
	54	6	5164483	10					10	1	32.44	28.623	10	3.817	0.3817					
	55	7	5164483	10					10	1	33.702	30.71	10	2.992	0.2992					
	56	8	5164483	10					10	1	34.048	30.477	10	3.571	0.3571					
	57	1	5164485	10					10	1	32.167	27.372	10	4.795	0.4795					
	58	2	5164485	10					9	0.9	32.849	29.427	9	3.422	0.380222					
	59	3	5164485	10					10	1	33.804	29.176	10	4.628	0.4628					
	60	4	5164485	10					10	1	33.798	30.058	10	3.74	0.374					
	61	5	5164485	10					10	1	34.635	30.279	10	4.356	0.4356					
	62	6	5164485	10					10	1	33.923	29.974	10	3.949	0.3949					
	63	7	5164485	10					10	1	31.329	27.64	10	3.689	0.3689					
	64	8	5164485	10					10	1	32.864	28.828	10	4.036	0.4036					
	65	1	5164487	10					10	1	31.71	28.236	10	3.474	0.3474					
	66	2	5164487	10					10	1	31.993	28.67	10	3.323	0.3323					
	67	3	5164487	10					10	1	33.07	29.542	10	3.528	0.3528					
	68	4	5164487	10					10	1	34.381	30.185	10	4.196	0.4196					
	69	5	5164487	10					10	1	29.142	26.366	10	2.776	0.2776					
	70	6	5164487	10					10	1	34.103	31.283	9	2.82	0.313333					
	71	7	5164487	10					10	1	30.494	27.563	10	2.931	0.2931					
	72	1	5164494	10					9	0.9	32.597	27.844	9	4.753	0.528111					
	73	2	5164494	10					10	1	34.318	30.161	10	4.157	0.4157					
	74	3	5164494	10					10	1	32.834	28.318	10	4.516	0.4516					
	75	4	5164494	10					10	1	32.17	28.198	10	3.972	0.3972					
	76	5	5164494	10					9	0.9	31.541	27.898	9	3.643	0.404778					
	77	6	5164494	10					9	0.9	32.541	28.172	9	4.369	0.485444					
	78	7	5164494	10					8	0.8	31.064	28.139	8	2.925	0.365625					
	79	8	5164494	10					9	0.9	32.438	27.575	9	4.863	0.540333					
	80	1	5164507	10					10	1	33.763	29.956	10	3.807	0.3807					

Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	81	2	5164507	10					10	1	32.746	28.763	10	3.983	0.3983				
	82	3	5164507	10					10	1	33.64	29.237	10	4.403	0.4403				
	83	4	5164507	10					9	0.9	34.971	30.986	9	3.985	0.442778				
	84	5	5164507	10					10	1	33.529	29.505	10	4.024	0.4024				
	85	6	5164507	10					9	0.9	33.624	29.618	9	4.006	0.445111				
	86	7	5164507	10					10	1	33.621	29.316	10	4.305	0.4305				
	87	8	5164507	10					10	1	31.546	28.017	10	3.529	0.3529				
	88	1	5164491	10					10	1	31.616	28.259	10	3.357	0.3357				
	89	2	5164491	10					8	0.8	30.43	27.671	8	2.759	0.344875				
	90	3	5164491	10					9	0.9	32.483	29.734	9	2.749	0.305444				
	91	4	5164491	10					7	0.7	30.904	28.73	7	2.174	0.310571				
	92	5	5164491	10					9	0.9	32.789	30.054	9	2.735	0.303889				
	93	6	5164491	10					10	1	33.145	29.961	10	3.184	0.3184				
	94	7	5164491	10					8	0.8	31.543	28.949	8	2.594	0.32425				
	95	8	5164491	10					8	0.8	32.276	28.735	8	3.541	0.442625				
	96	1	5174405	10					9	0.9	32.488	29.2	9	3.288	0.365333				
	97	2	5174405	10					10	1	32.941	29.287	10	3.654	0.3654				
	98	3	5174405	10					10	1	33.148	29.897	10	3.251	0.3251				
	99	4	5174405	10					5	0.5	29.545	28.574	5	0.971	0.1942				
	100	5	5174405	10					10	1	31.754	28.557	9	3.197	0.355222				
	101	6	5174405	10					10	1	33.503	29.486	10	4.017	0.4017				
	102	7	5174405	10					10	1	33.137	29.242	10	3.895	0.3895				
	103	8	5174405	10					10	1	33.291	29.988	10	3.303	0.3303				
	104	1	5174406	10					9	0.9	34.114	29.428	9	4.686	0.520667				
	105	2	5174406	10					10	1	33.226	29.238	10	3.988	0.3988				
	106	3	5174406	10					9	0.9	32.493	28.713	9	3.78	0.42				
	107	4	5174406	10					10	1	33.569	28.755	10	4.814	0.4814				
	108	5	5174406	10					10	1	33.018	28.647	10	4.371	0.4371				
	109	6	5174406	10					10	1	33.495	28.43	10	5.065	0.5065				
	110	7	5174406	10					10	1	33.467	29.33	10	4.137	0.4137				
	111	8	5174406	10					9	0.9	33.035	29.162	9	3.873	0.430333				
	112	1	5174408	10					10	1	35.471	31.153	10	4.318	0.4318				
	113	2	5174408	10					10	1	29.793	27.066	10	2.727	0.2727				
	114	3	5174408	10					8	0.8	31.152	29.199	8	1.953	0.244125				
	115	4	5174408	10					10	1	30.678	28.177	10	2.501	0.2501				
	116	5	5174408	10					10	1	31.054	28.316	10	2.738	0.2738				
	117	6	5174408	10					10	1	32.319	28.68	10	3.639	0.3639				
	118	7	5174408	10					9	0.9	30.82	28.152	9	2.668	0.296444				
	119	8	5174408	10					10	1	32.704	29.978	10	2.726	0.2726				
	120	1	5174412	10					10	1	31.711	28.709	10	3.002	0.3002				
	121	2	5174412	10					9	0.9	31.09	27.179	9	3.911	0.434556				

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Test: FW-Freshwater Sediment
Species: HA-Hyalella azteca
Sample ID:
Start Date: 5/5/05 10:45 End Date: 6/2/05 11:30

Test ID: 727-2
Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample Type: SED-Sediment
Lab ID: ORNAS-Northwestern Aquatic Sciences

	122	3	5174412	10					10	1	32.204	28.705	10	3.499	0.3499					
	123	4	5174412	10					8	0.8	30.444	27.816	8	2.628	0.3285					
	124	5	5174412	10					9	0.9	31.068	27.844	9	3.224	0.358222					
	125	6	5174412	10					10	1	34.472	30.247	10	4.225	0.4225					
	126	7	5174412	11					11	1	29.633	26.888	11	2.745	0.249545					
	127	8	5174412	10					10	1	32.509	29.102	10	3.407	0.3407					
	128	1	5174413	10					10	1	31.112	27.444	10	3.668	0.3668					
	129	2	5174413	10					10	1	34.282	30.207	10	4.075	0.4075					
	130	3	5174413	10					8	0.8	33.981	30.073	8	3.908	0.4885					
	131	4	5174413	10					9	0.9	33.318	29.177	9	4.141	0.460111					
	132	5	5174413	10					10	1	32.592	27.71	10	4.882	0.4882					
	133	6	5174413	10					10	1	31.78	28.977	10	2.803	0.2803					
	134	7	5174413	10					10	1	33.301	29.499	10	3.802	0.3802					
	135	8	5174413	10					10	1	31.847	28.482	10	3.365	0.3365					
	136	1	5174407	10					10	1	32.581	28.207	10	4.374	0.4374					
	137	2	5174407	10					9	0.9	31.34	27.702	9	3.638	0.404222					
	138	3	5174407	10					9	0.9	30.987	28.033	9	2.954	0.328222					
	139	4	5174407	10					9	0.9	32.125	28.979	9	3.146	0.349556					
	140	5	5174407	10					8	0.8	32.24	28.906	8	3.334	0.41675					
	141	6	5174407	10					8	0.8	30.826	27.774	8	3.052	0.3815					
	142	7	5174407	10					10	1	31.86	28.968	10	2.892	0.2892					
	143	8	5174407	10					10	1	33.477	29.832	10	3.645	0.3645					
	144	1	5174410	10					10	1	33.011	29.124	10	3.887	0.3887					
	145	2	5174410	10					10	1	35.613	30.339	10	5.274	0.5274					
	146	3	5174410	10					9	0.9	33.787	29.579	9	4.208	0.467556					
	147	4	5174410	10					9	0.9	33.065	30.19	9	2.875	0.319444					
	148	5	5174410	10					9	0.9	32.123	28.708	9	3.415	0.379444					
	149	6	5174410	10					10	1	32.809	29.405	10	3.404	0.3404					
	150	7	5174410	10					10	1	33.143	28.458	10	4.685	0.4685					
	151	8	5174410	10					8	0.8	31.927	28.083	8	3.844	0.4805					
	152	1	5174411	10					10	1	33.521	28.588	10	4.933	0.4933					
	153	2	5174411	10					10	1	31.872	28.19	10	3.682	0.3682					
	154	3	5174411	10					10	1	33.76	28.628	10	5.132	0.5132					
	155	4	5174411	10					9	0.9	33.05	28.833	9	4.217	0.468556					
	156	5	5174411	10					10	1	33.817	28.701	10	5.116	0.5116					
	157	6	5174411	10					8	0.8	33.794	28.958	8	4.836	0.6045					
	158	7	5174411	10					10	1	33.147	28.233	10	4.914	0.4914					
	159	8	5174411	10					10	1	33.265	29.028	10	4.237	0.4237					
	160	1	5174423	10					10	1	33.089	29.34	10	3.749	0.3749					
	161	2	5174423	10					10	1	32.375	29.478	10	2.897	0.2897					
	162	3	5174423	10					10	1	30.968	27.441	10	3.527	0.3527					

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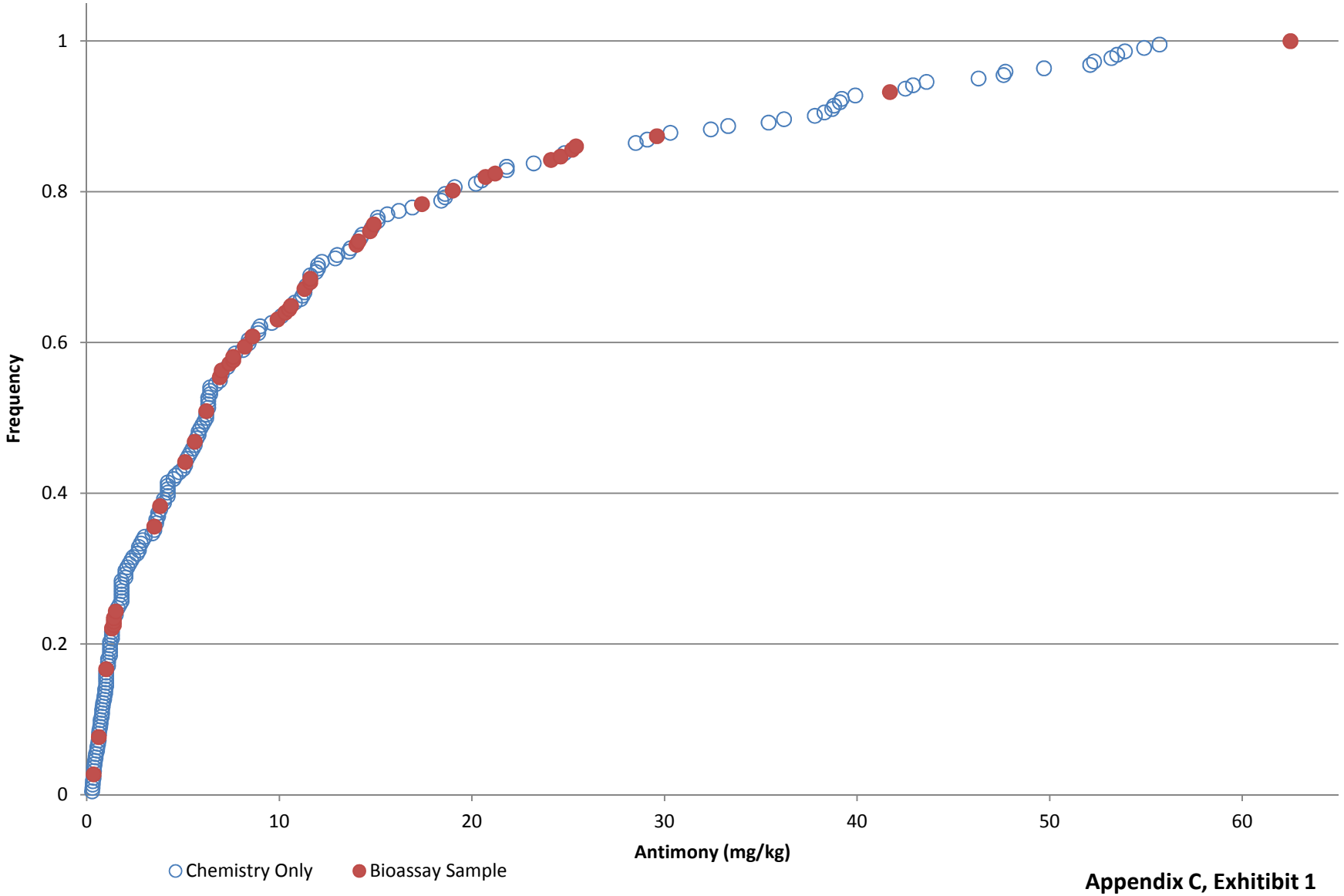
Test: FW-Freshwater Sediment | Test ID: 727-2
Species: HA-Hyalella azteca | Protocol: NASXXXHA4C-Hyalella 28-day sediment
Sample ID: | Sample Type: SED-Sediment
Start Date: 5/5/05 10:45 | End Date: 6/2/05 11:30 | Lab ID: ORNAS-Northwestern Aquatic Sciences

	163	4	5174423	10					9	0.9	32.03	28.626	9	3.404	0.378222			
	164	5	5174423	10					10	1	30.45	28.239	10	2.211	0.2211			
	165	6	5174423	10					10	1	33.802	30.762	10	3.04	0.304			
	166	7	5174423	10					8	0.8	32.537	29.621	8	2.916	0.3645			
	167	8	5174423	10					10	1	30.865	27.778	10	3.087	0.3087			
	168	1	5174424	10					10	1	34.194	30.429	10	3.765	0.3765			
	169	2	5174424	10					8	0.8	32.972	30.595	8	2.377	0.297125			
	170	3	5174424	10					9	0.9	33.409	29.989	9	3.42	0.38			
	171	4	5174424	10					9	0.9	31.268	27.822	9	3.446	0.382889			
	172	5	5174424	10					10	1	30.574	28.185	9	2.389	0.265444			
	173	6	5174424	10					10	1	31.609	28.788	10	2.821	0.2821			
	174	7	5174424	10					9	0.9	31.611	28.071	9	3.54	0.393333			
	175	8	5174424	10					10	1	32.07	29.118	10	2.952	0.2952			

Comments:

Appendix C

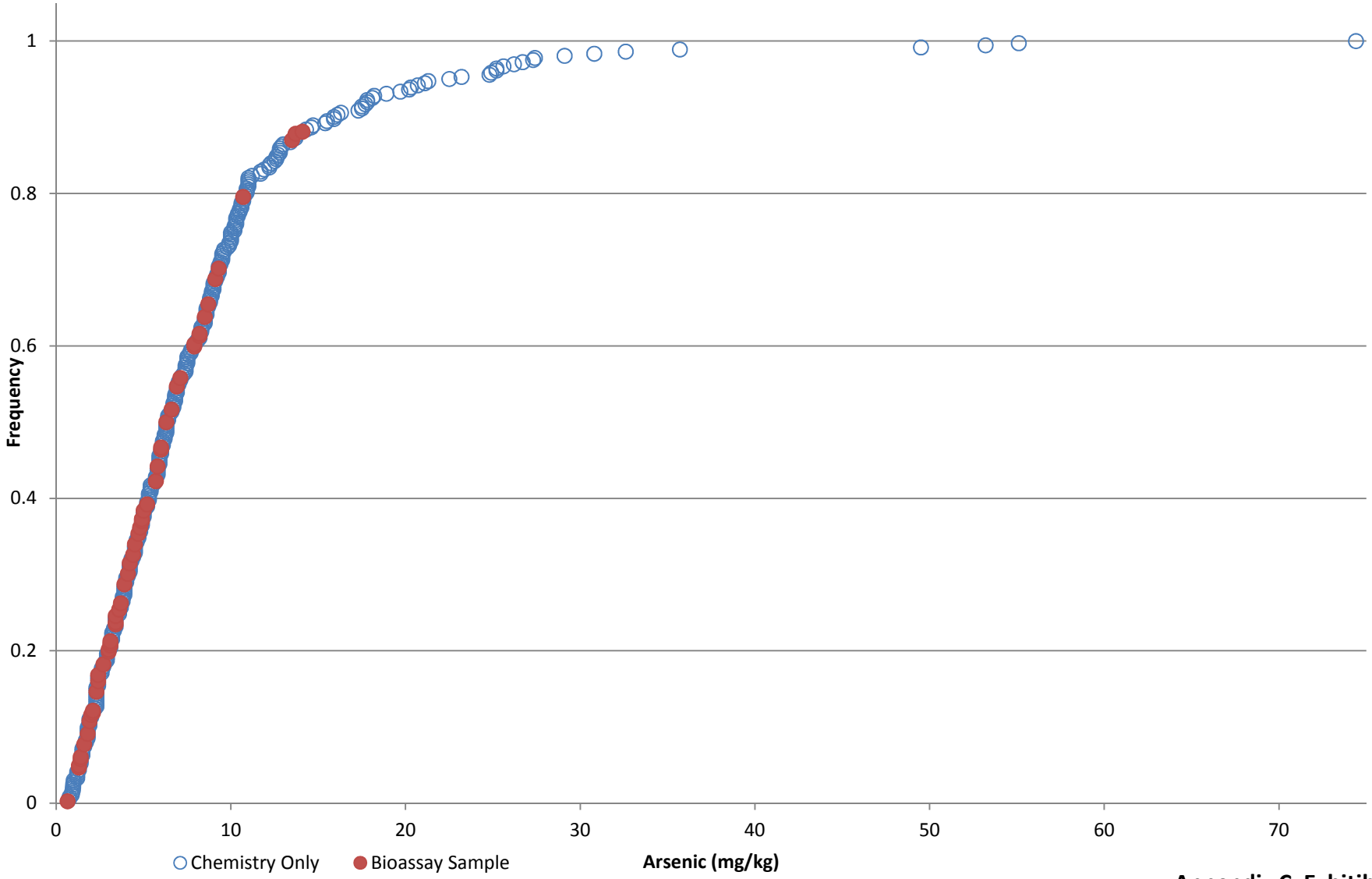
Sediment Metal Frequency Distributions



Appendix C, Exhitibit 1

Frequency Distribution of Antimony in 2005 Phase I Sediment Samples

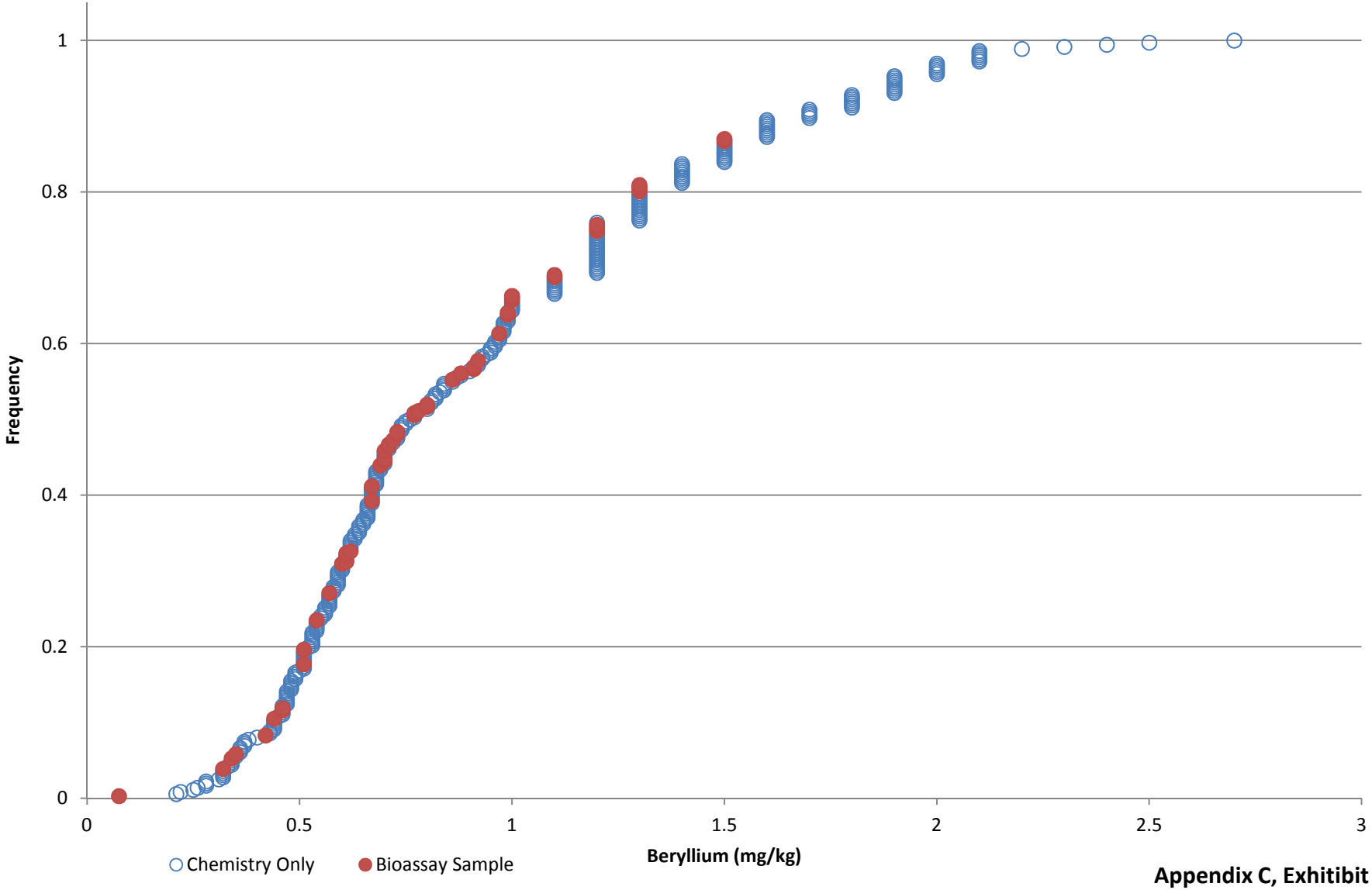
Upper Columbia River RI/FS



Appendix C, Exhibit 2

Frequency Distribution of Arsenic in 2005 Phase I Sediment Samples

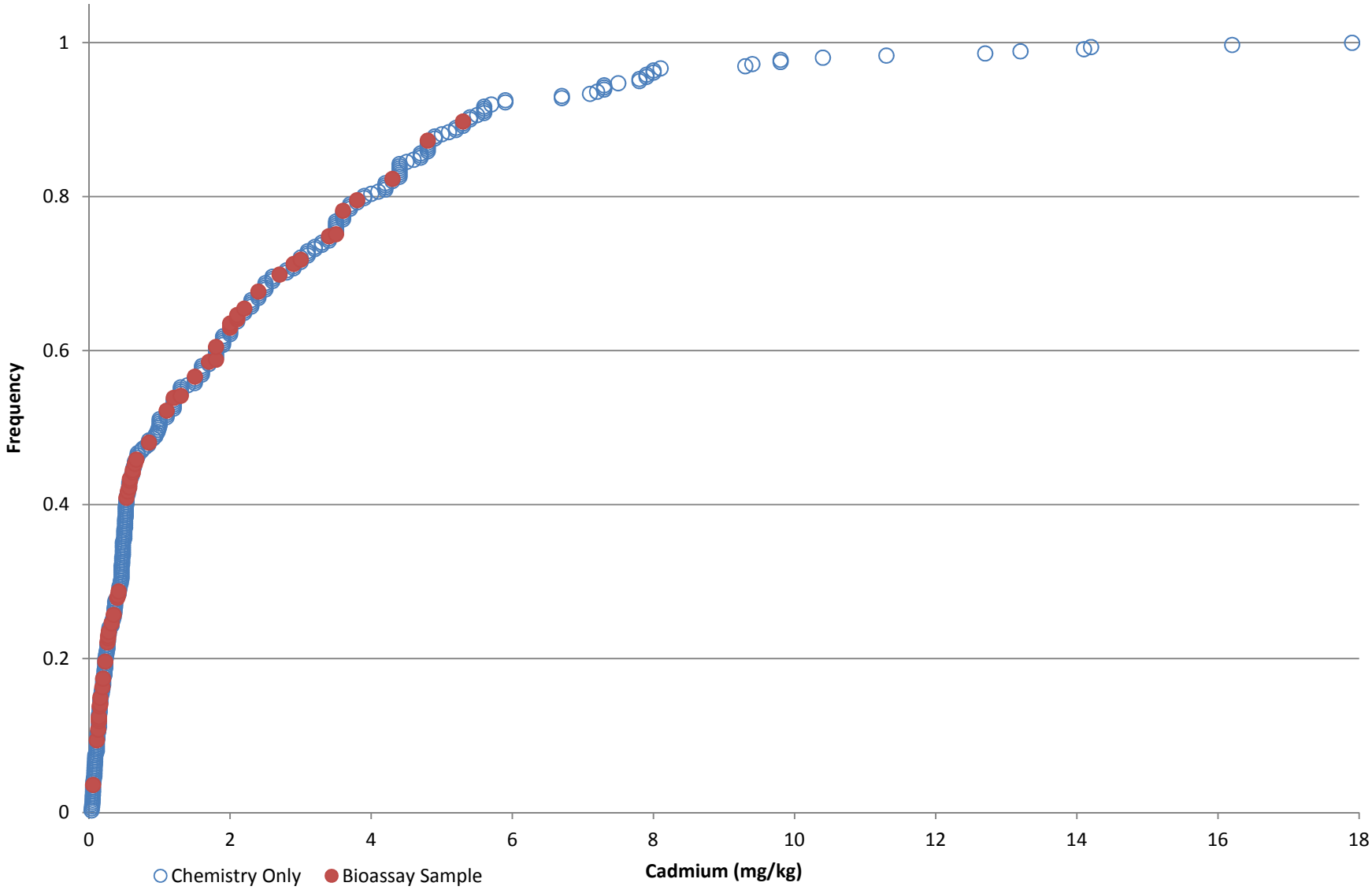
Upper Columbia River RI/FS



Appendix C, Exhitibit 3

Frequency Distribution of Beryllium in 2005 Phase I Sediment Samples

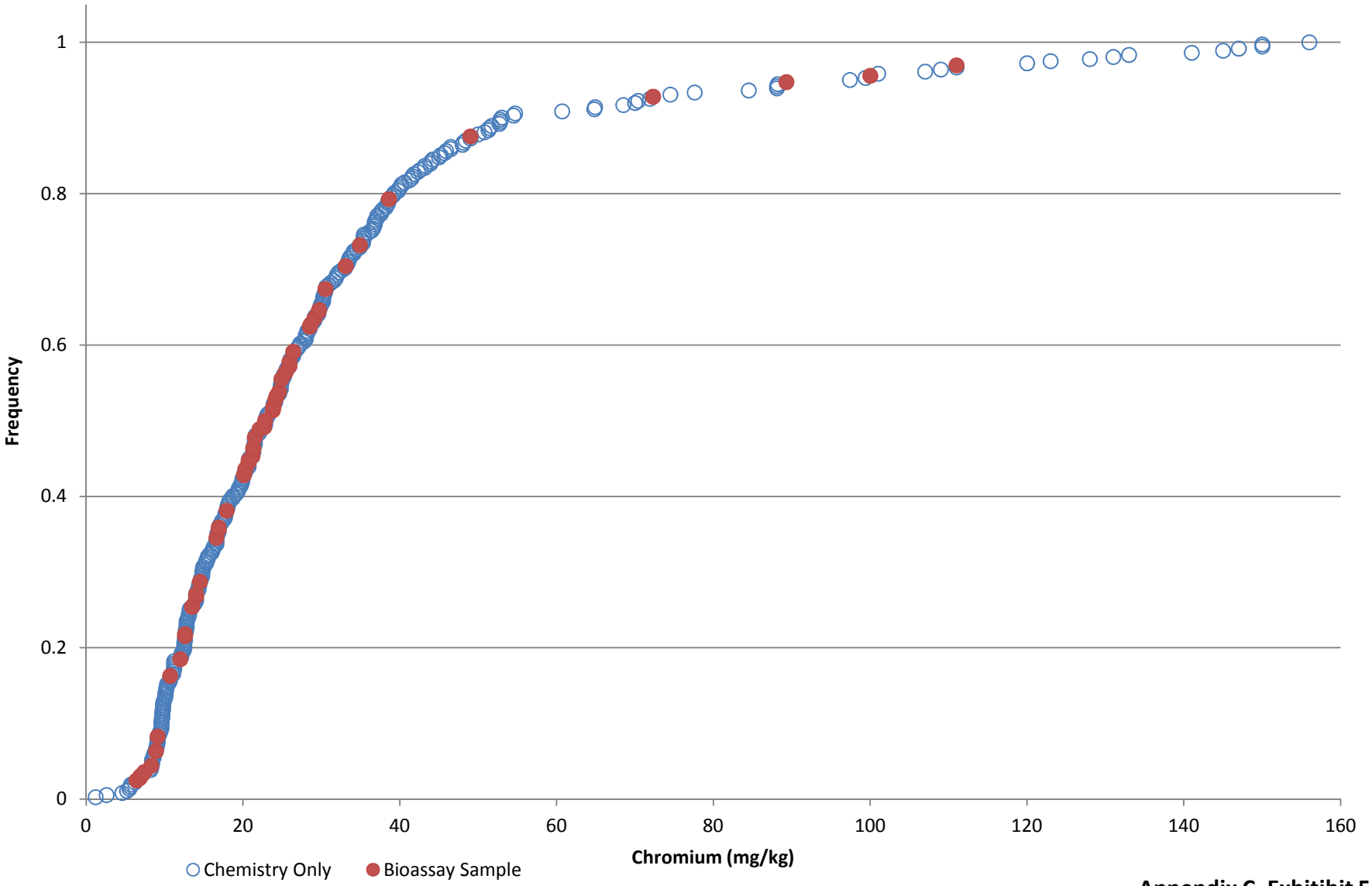
Upper Columbia River RI/FS



Appendix C, Exhitibit 4

Frequency Distribution of Cadmium in 2005 Phase I Sediment Samples

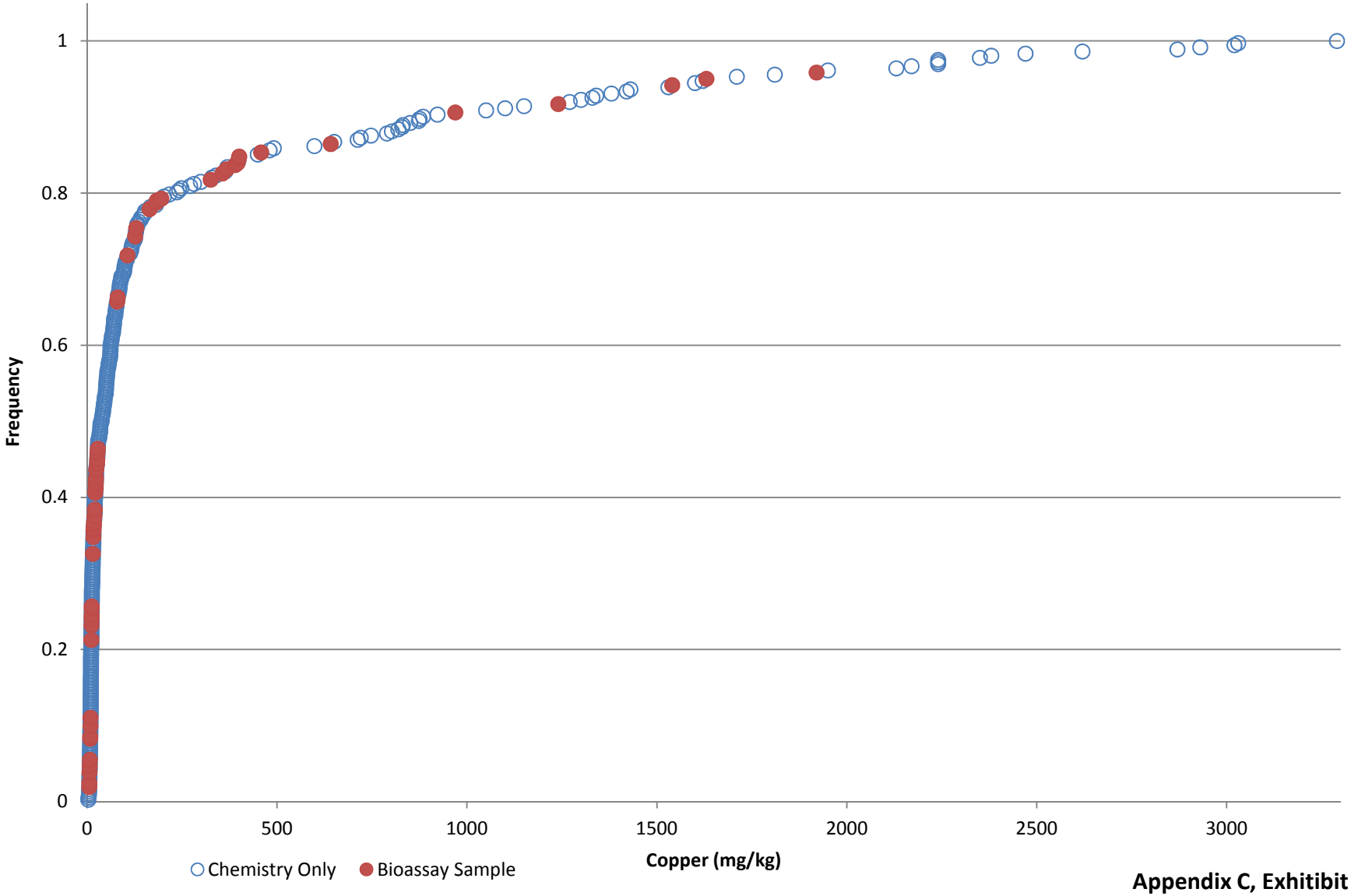
Upper Columbia River RI/FS



Appendix C, Exhitibit 5

Frequency Distribution of Chromium in 2005 Phase I Sediment Samples

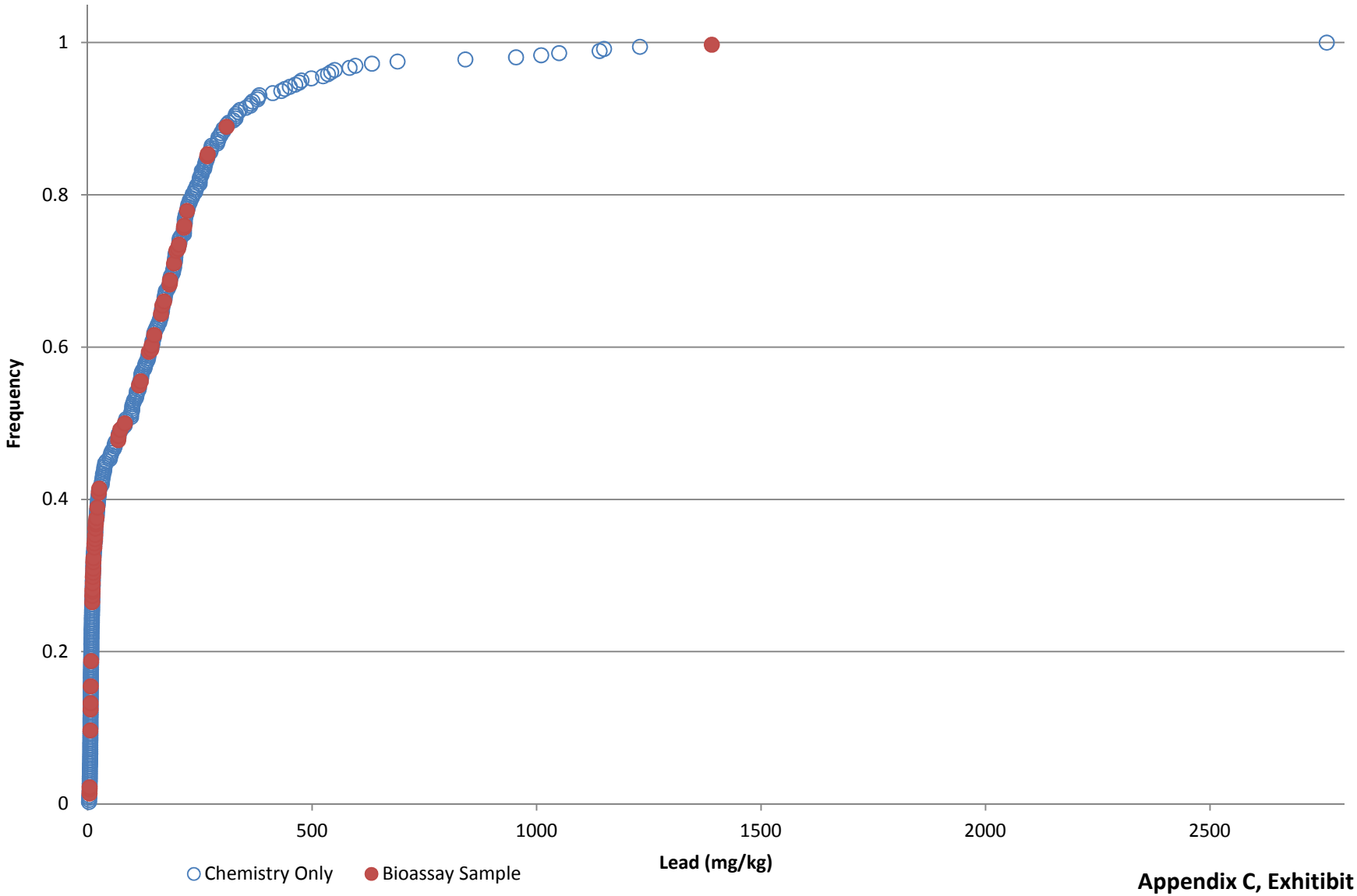
Upper Columbia River RI/FS



Appendix C, Exhibit 6

Frequency Distribution of Copper in 2005 Phase I Sediment Samples

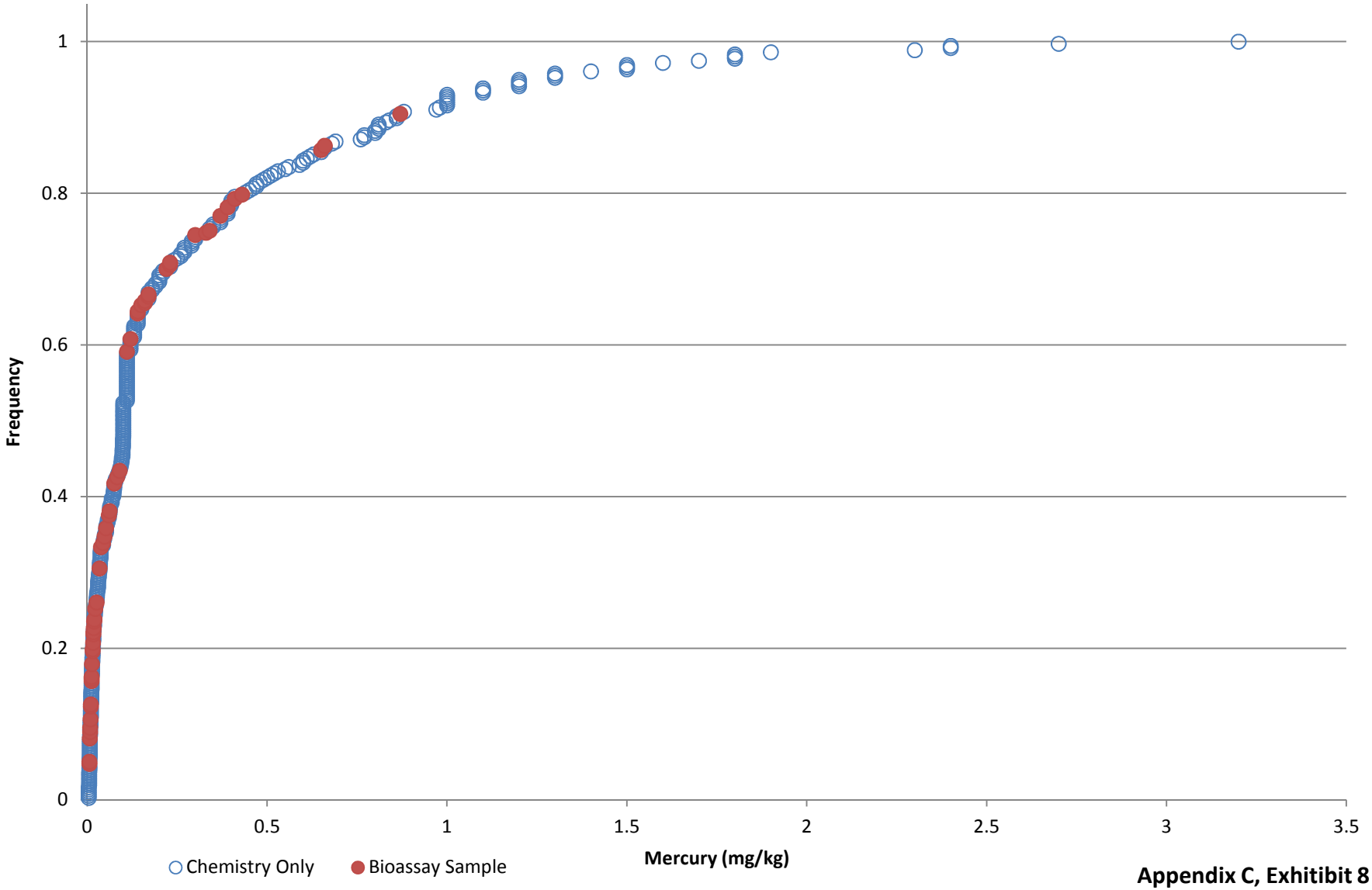
Upper Columbia River RI/FS



Appendix C, Exhibit 7

Frequency Distribution of Lead in 2005 Phase I Sediment Samples

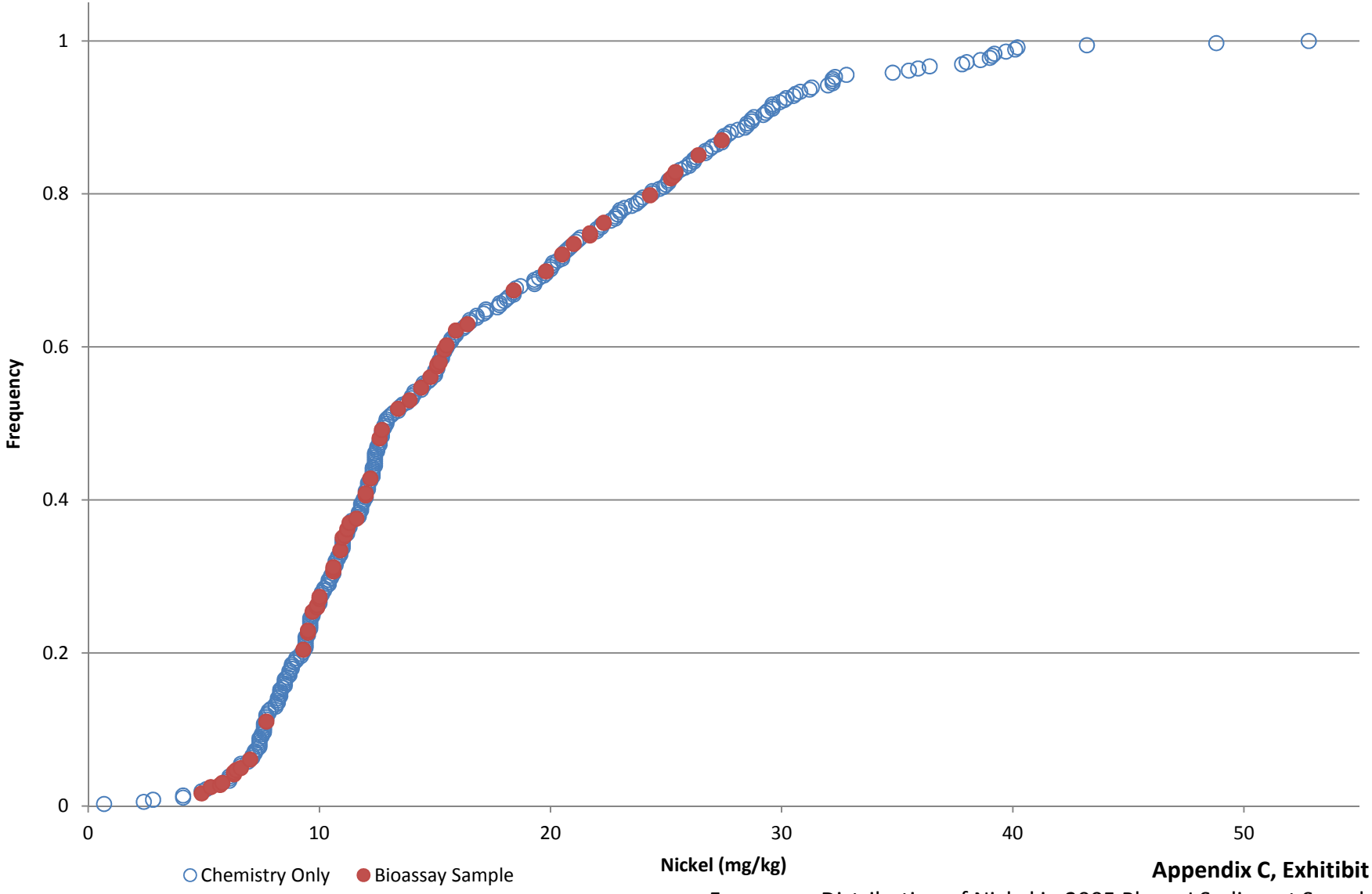
Upper Columbia River RI/FS



Appendix C, Exhitibit 8

Frequency Distribution of Mercury in 2005 Phase I Sediment Samples

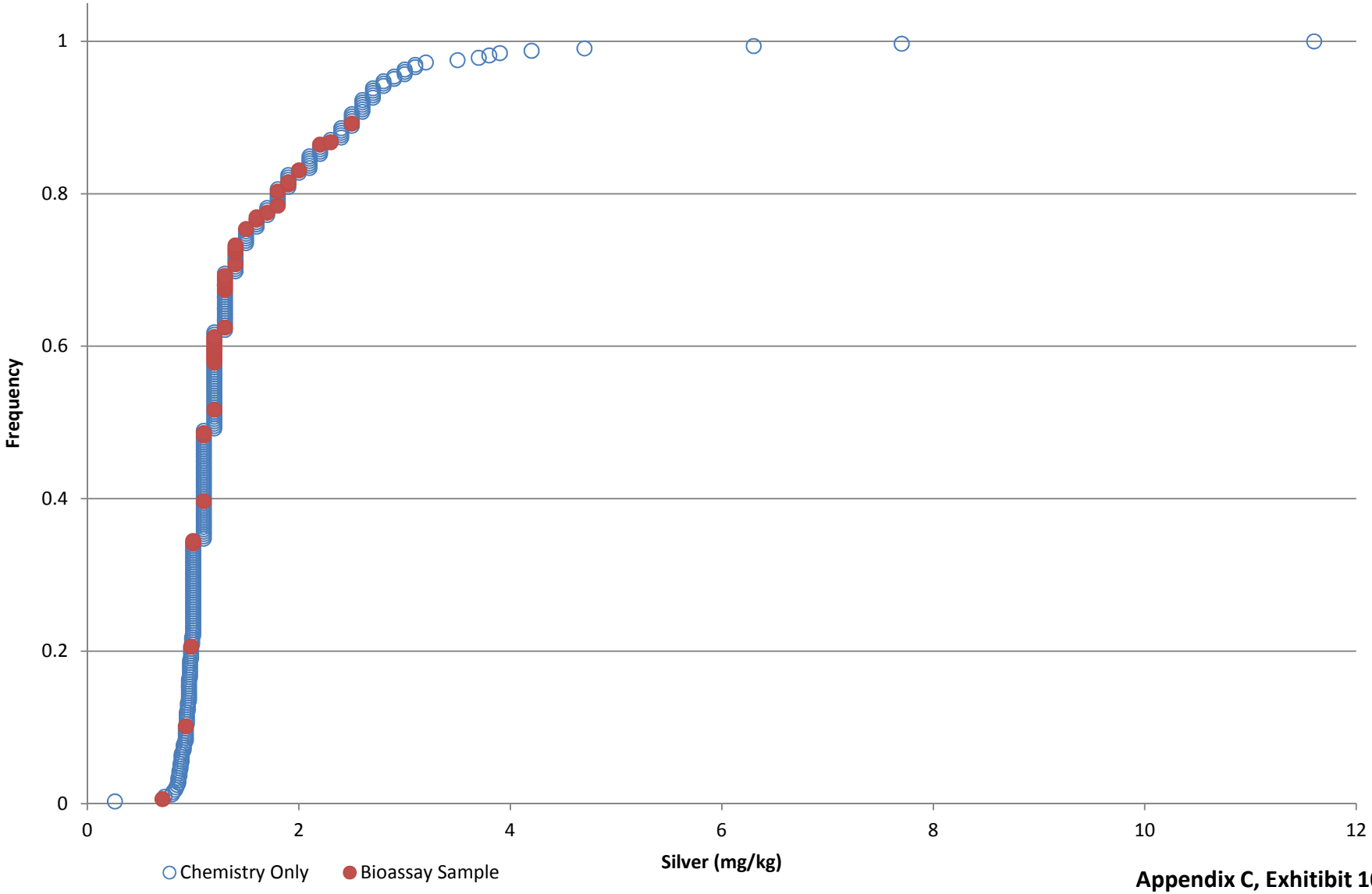
Upper Columbia River RI/FS



Appendix C, Exhitibit 9

Frequency Distribution of Nickel in 2005 Phase I Sediment Samples

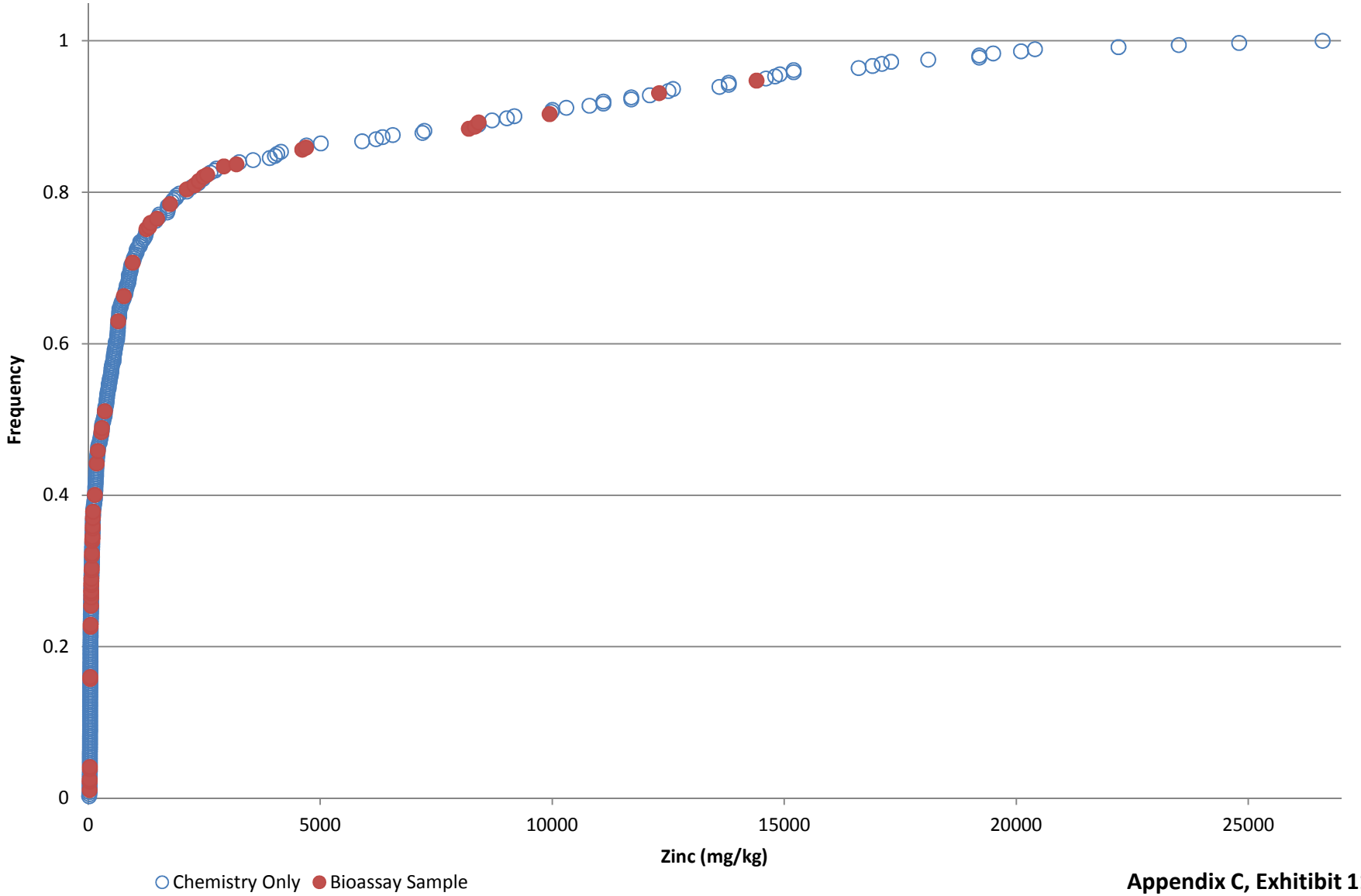
Upper Columbia River RI/FS



Appendix C, Exhitibit 10

Frequency Distribution of Silver in 2005 Phase I Sediment Samples

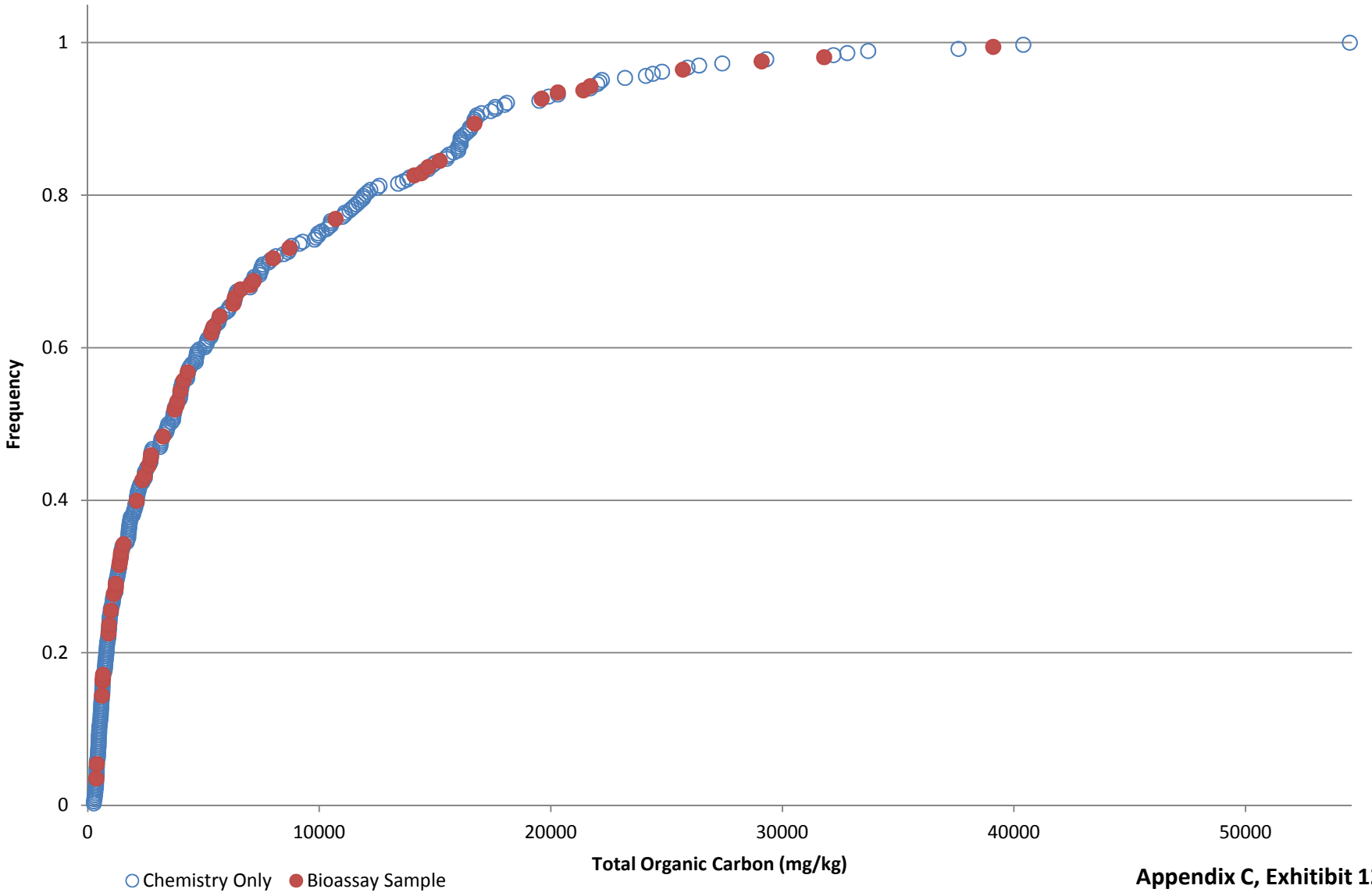
Upper Columbia River RI/FS



Appendix C, Exhitibit 11

Frequency Distribution of Zinc in 2005 Phase I Sediment Samples

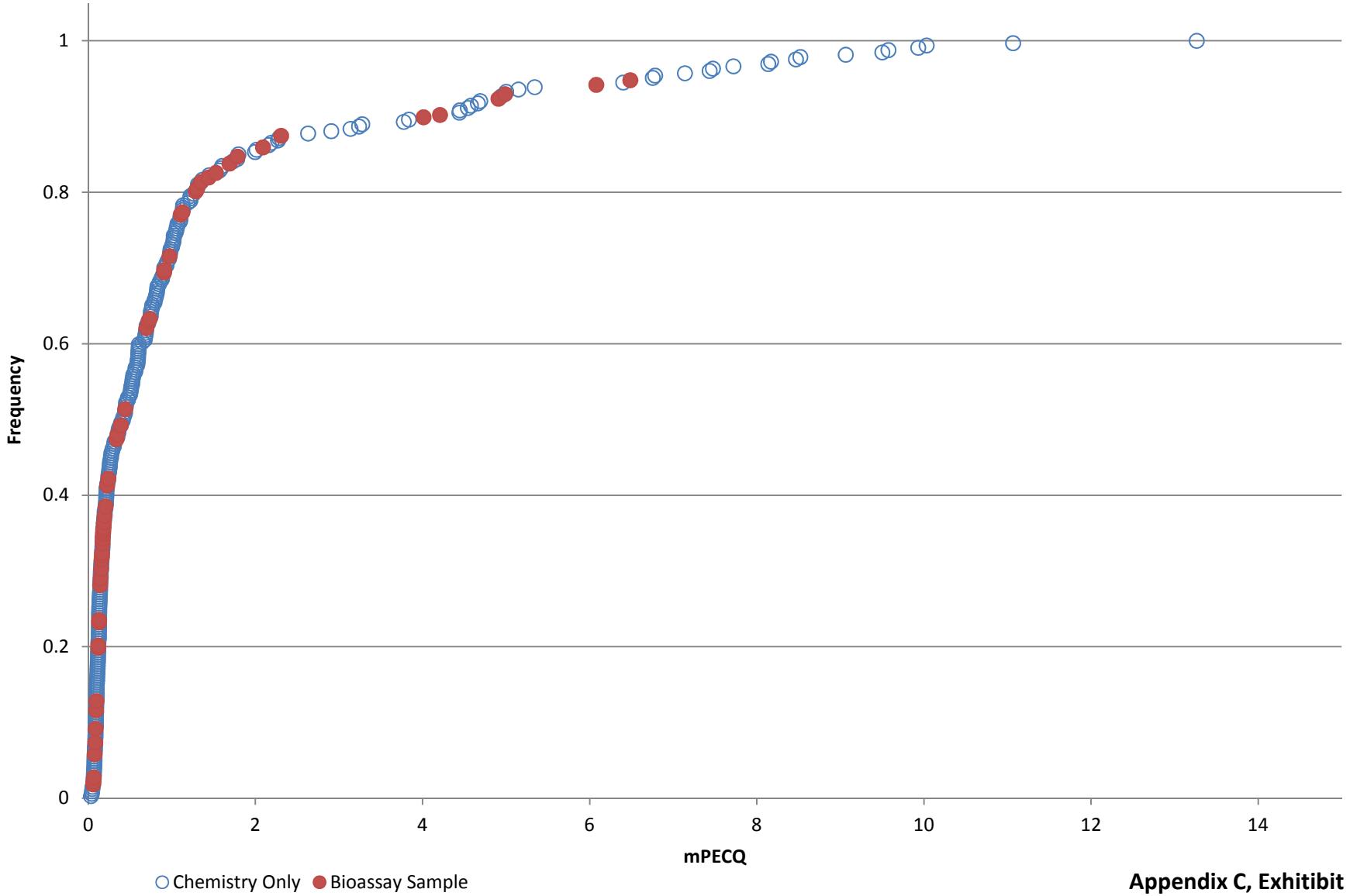
Upper Columbia River RI/FS



Appendix C, Exhitibit 12

Frequency Distribution of Total Organic Carbon in 2005 Phase I Sediment Samples

Upper Columbia River RI/FS



Appendix C, Exhibit 13

Frequency Distribution of the mean PECQ in 2005 Phase I Sediment Samples

Upper Columbia River RI/FS

Appendix D

Detailed Statistical Analyses

Hyalella azteca Survival Regression Analyses

Arcsin *Hyalella* survival % vs. log PEC-Q Arsenic

Regression Summary
HASurvArc vs. logAs

Count	62
Num. Missing	0
R	.320
R Squared	.102
Adjusted R Squared	.087
RMS Residual	.094

ANOVA Table
HASurvArc vs. logAs

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.060	.060	6.829	.0113
Residual	60	.530	.009		
Total	61	.590			

Regression Coefficients
HASurvArc vs. logAs

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.225	.041	1.225	29.780	<.0001
logAs	-.110	.042	-.320	-2.613	.0113

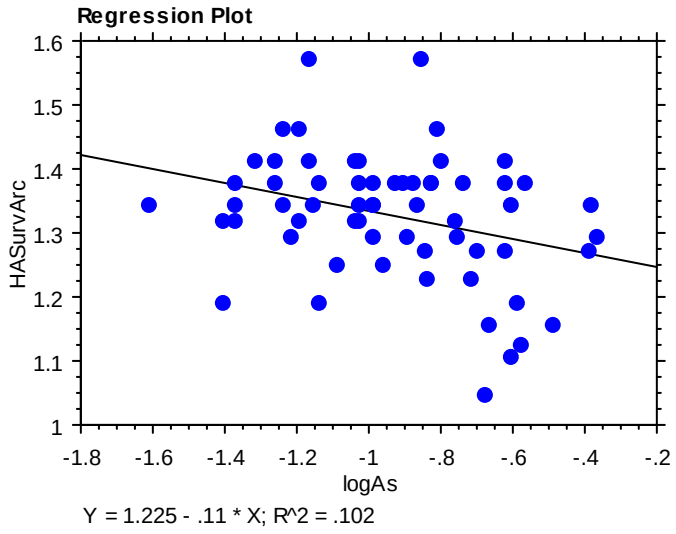


Exhibit D.1.1: ***Hyalella azteca*** **Survial vs. log PEC-Q Arsenic**

Regression Summary
HASurvArc vs. LogCd

Count	62
Num. Missing	0
R	.098
R Squared	.010
Adjusted R Squared	•
RMS Residual	.099

ANOVA Table
HASurvArc vs. LogCd

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.006	.006	.579	.4495
Residual	60	.584	.010		
Total	61	.590			

Regression Coefficients
HASurvArc vs. LogCd

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.312	.025	1.312	53.246	<.0001
LogCd	-.019	.025	-.098	-.761	.4495

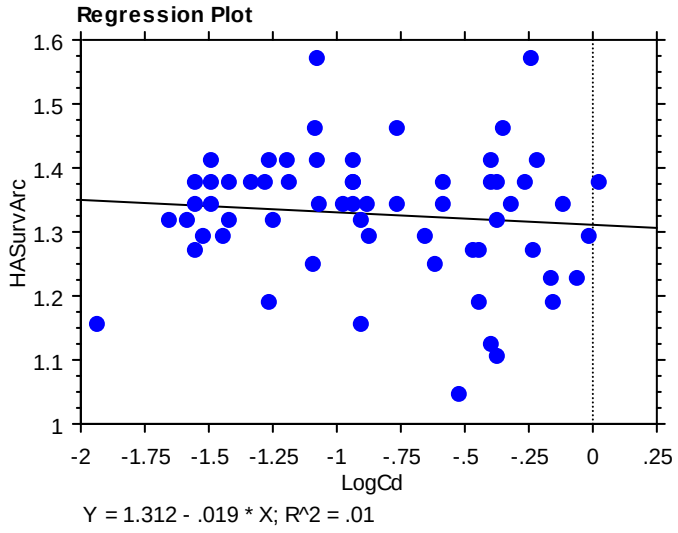


Exhibit D.1.2: *Hyalella azteca* Survival vs. log PEC-Q Cadmium

Regression Summary
HASurvArc vs. LogCr

Count	62
Num. Missing	0
R	.243
R Squared	.059
Adjusted R Squared	.043
RMS Residual	.096

ANOVA Table
HASurvArc vs. LogCr

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.035	.035	3.756	.0573
Residual	60	.555	.009		
Total	61	.590			

Regression Coefficients
HASurvArc vs. LogCr

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.264	.036	1.264	35.547	<.0001
LogCr	-.087	.045	-.243	-1.938	.0573

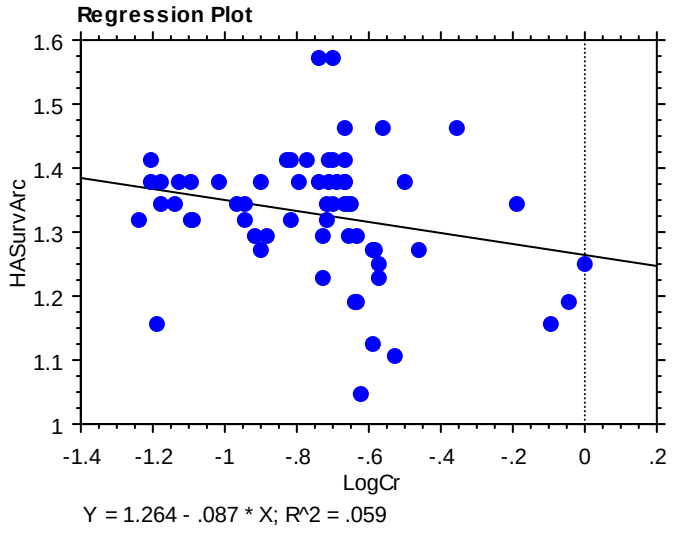


Exhibit D.1.3: *Hyalella azteca* Survival vs. vs. log PEC-Q Chromium

Regression Summary
HASurvArc vs. LogCu

Count	62
Num. Missing	0
R	.457
R Squared	.209
Adjusted R Squared	.196
RMS Residual	.088

ANOVA Table
HASurvArc vs. LogCu

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.123	.123	15.830	.0002
Residual	60	.467	.008		
Total	61	.590			

Regression Coefficients
HASurvArc vs. LogCu

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.297	.014	1.297	94.425	<.0001
LogCu	-.060	.015	-.457	-3.979	.0002

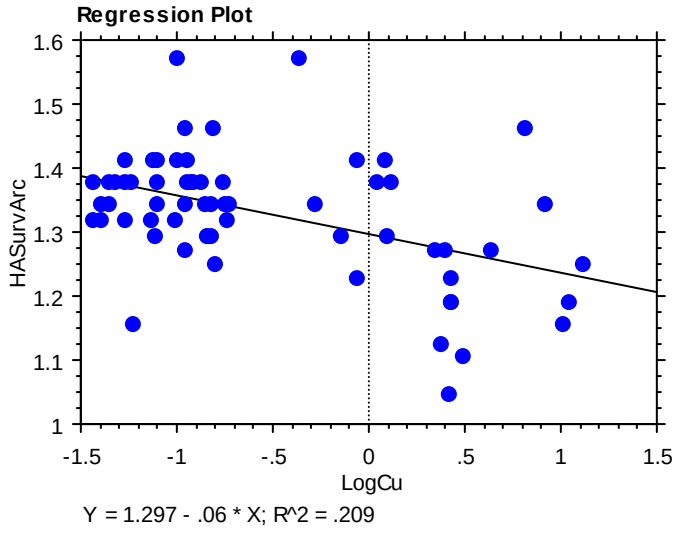


Exhibit D.1.4: ***Hyalella azteca*** **Survival vs. log PEC-Q Copper**

Regression Summary
HASurvArc vs. LogPb

Count	62
Num. Missing	0
R	.322
R Squared	.104
Adjusted R Squared	.089
RMS Residual	.094

ANOVA Table
HASurvArc vs. LogPb

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.061	.061	6.936	.0107
Residual	60	.529	.009		
Total	61	.590			

Regression Coefficients
HASurvArc vs. LogPb

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.301	.016	1.301	82.549	<.0001
LogPb	-.049	.019	-.322	-2.634	.0107

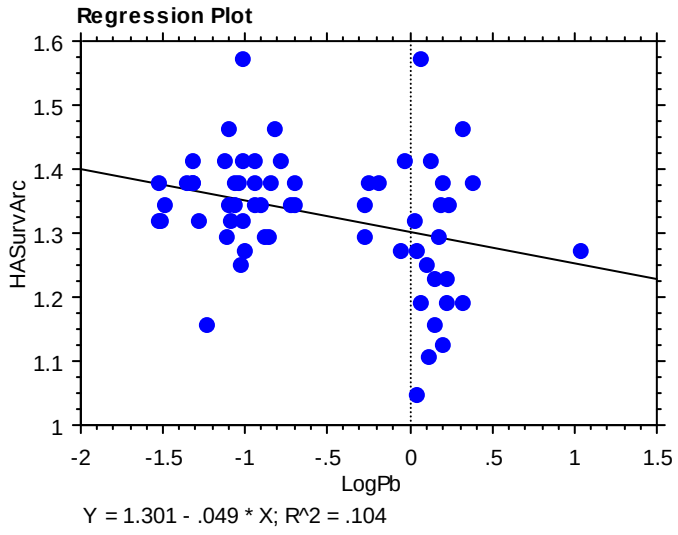


Exhibit D.1.5: *Hyalella azteca* Survival vs. PEC-Q-Pb

Regression Summary
HASurvArc vs. LogHg

Count	62
Num. Missing	0
R	.101
R Squared	.010
Adjusted R Squared	•
RMS Residual	.099

ANOVA Table
HASurvArc vs. LogHg

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.006	.006	.616	.4355
Residual	60	.584	.010		
Total	61	.590			

Regression Coefficients
HASurvArc vs. LogHg

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.307	.030	1.307	44.311	<.0001
LogHg	-.016	.021	-.101	-.785	.4355

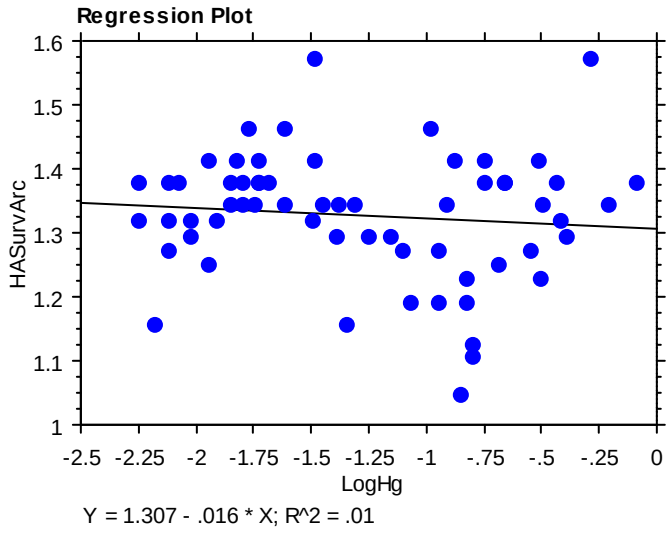


Exhibit D.1.6: *Hyalella azteca* Survival vs. PEC-Q-Hg

Regression Summary
HASurvArc vs. LogNi

Count	62
Num. Missing	0
R	.216
R Squared	.047
Adjusted R Squared	.031
RMS Residual	.097

ANOVA Table
HASurvArc vs. LogNi

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.028	.028	2.934	.0919
Residual	60	.562	.009		
Total	61	.590			

Regression Coefficients
HASurvArc vs. LogNi

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.391	.039	1.391	36.110	<.0001
LogNi	.103	.060	.216	1.713	.0919

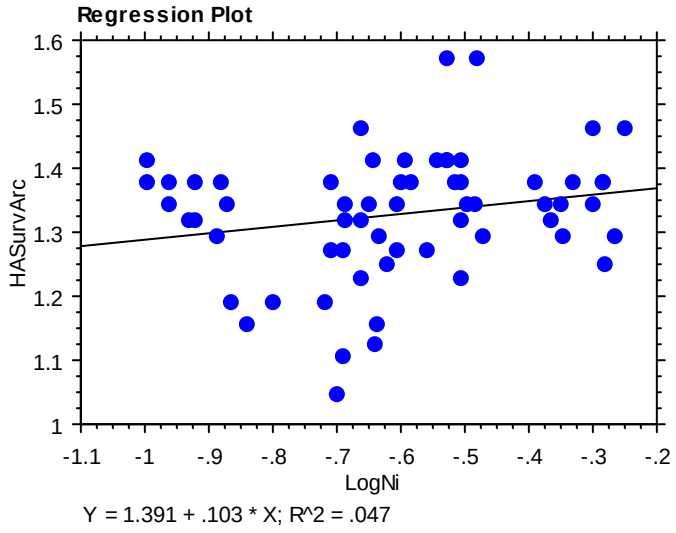


Exhibit D.1.7: *Hyalella azteca* Survival vs. PEC-Q-Ni

Regression Summary
HASurvArc vs. LogZn

Count	62
Num. Missing	0
R	.446
R Squared	.199
Adjusted R Squared	.186
RMS Residual	.089

ANOVA Table
HASurvArc vs. LogZn

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.117	.117	14.909	.0003
Residual	60	.473	.008		
Total	61	.590			

Regression Coefficients
HASurvArc vs. LogZn

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.317	.012	1.317	113.052	<.0001
LogZn	-.051	.013	-.446	-3.861	.0003

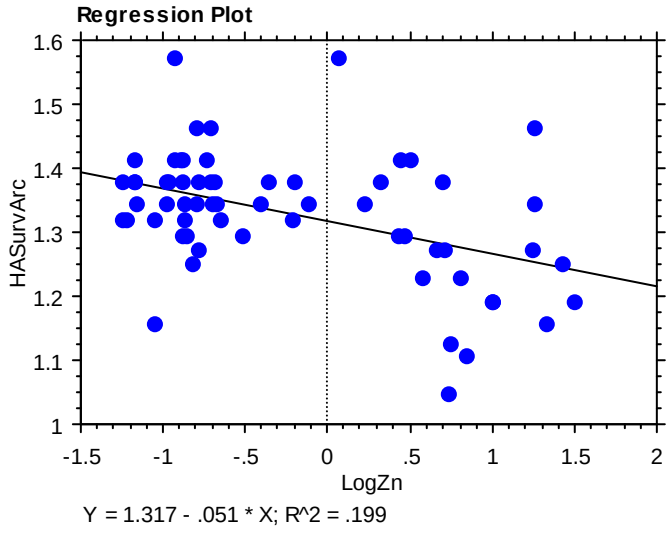


Exhibit D.1.8: ***Hyalella azteca*** **Survival vs. PEC-Q-Zn**

Regression Summary
HASurvArc vs. LogmnPECQ

Count	62
Num. Missing	0
R	.421
R Squared	.177
Adjusted R Squared	.164
RMS Residual	.090

ANOVA Table
HASurvArc vs. LogmnPECQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.105	.105	12.937	.0007
Residual	60	.485	.008		
Total	61	.590			

Regression Coefficients
HASurvArc vs. LogmnPECQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.294	.015	1.294	86.929	<.0001
LogmnPECQ	-.071	.020	-.421	-3.597	.0007

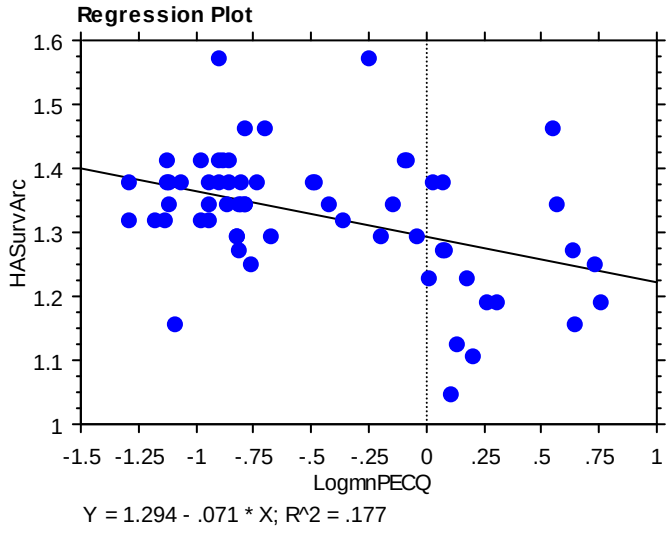


Exhibit D.1.9: *Hyalella azteca* Survival vs. Mean PEC-QMetals

Regression Summary
HASurvArc vs. LogmnMetOCPQ

Count	62
Num. Missing	0
R	.522
R Squared	.273
Adjusted R Squared	.261
RMS Residual	.085

ANOVA Table
HASurvArc vs. LogmnMetOCPQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.161	.161	22.530	<.0001
Residual	60	.429	.007		
Total	61	.590			

Regression Coefficients
HASurvArc vs. LogmnMetOCPQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.322	.011	1.322	122.166	<.0001
LogmnMetOCPQ	-.060	.013	-.522	-4.747	<.0001

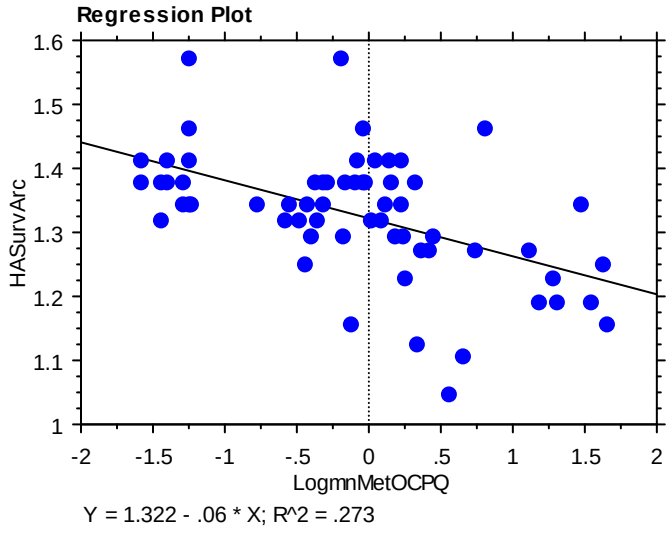


Exhibit D.1.10: ***Hyalella azteca*** **Survival vs. PEC-QMetals/FOC**

Regression Summary
HASurvArc vs. logSumPQ

Count	62
Num. Missing	0
R	.421
R Squared	.177
Adjusted R Squared	.164
RMS Residual	.090

ANOVA Table
HASurvArc vs. logSumPQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.105	.105	12.937	.0007
Residual	60	.485	.008		
Total	61	.590			

Regression Coefficients
HASurvArc vs. logSumPQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.358	.014	1.358	96.097	<.0001
logSumPQ	-.071	.020	-.421	-3.597	.0007

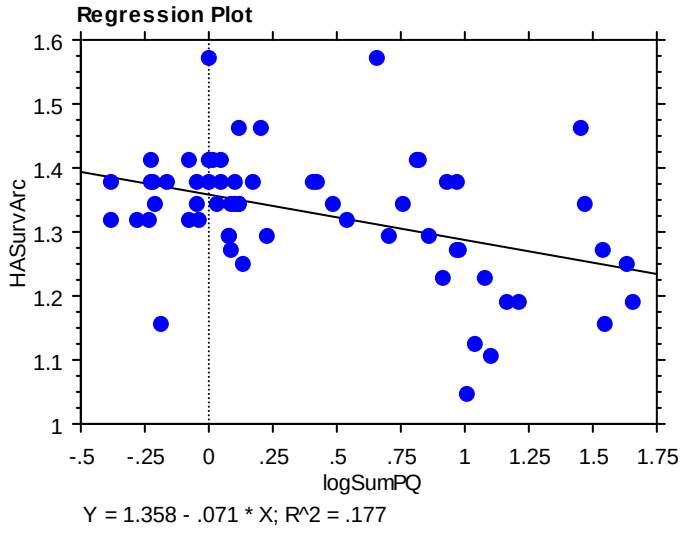


Exhibit D.1.11: ***Hyalella azteca*** **Survival vs. Sum PEC-QMetals**

Regression Summary
HASurvArc vs. LogAVS

Count	60
Num. Missing	2
R	.374
R Squared	.140
Adjusted R Squared	.125
RMS Residual	.088

ANOVA Table
HASurvArc vs. LogAVS

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.073	.073	9.452	.0032
Residual	58	.449	.008		
Total	59	.522			

Regression Coefficients
HASurvArc vs. LogAVS

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.340	.013	1.340	105.515	<.0001
LogAVS	-.036	.012	-.374	-3.074	.0032

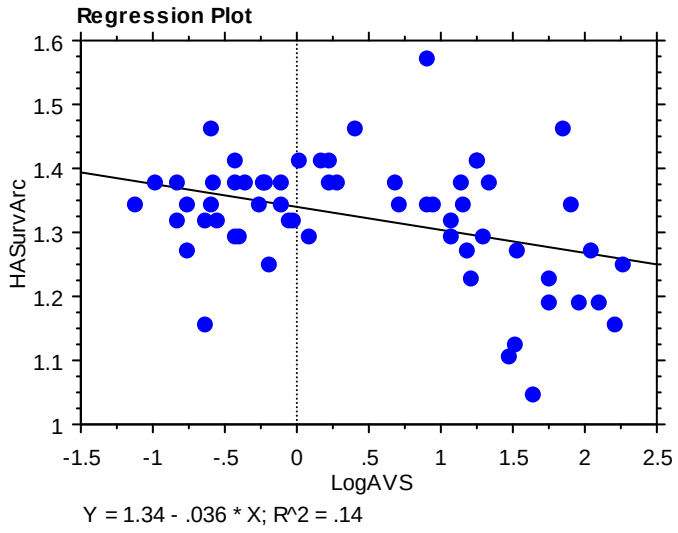


Exhibit D.1.12: ***Hyalella azteca*** **Survival vs. SEM-AVS**

Regression Summary
HASurvArc vs. LogAVSOC

Count	60
Num. Missing	2
R	.470
R Squared	.221
Adjusted R Squared	.207
RMS Residual	.084

ANOVA Table
HASurvArc vs. LogAVSOC

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.115	.115	16.422	.0002
Residual	58	.407	.007		
Total	59	.522			

Regression Coefficients
HASurvArc vs. LogAVSOC

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.434	.029	1.434	48.728	<.0001
LogAVSOC	-.039	.010	-.470	-4.052	.0002

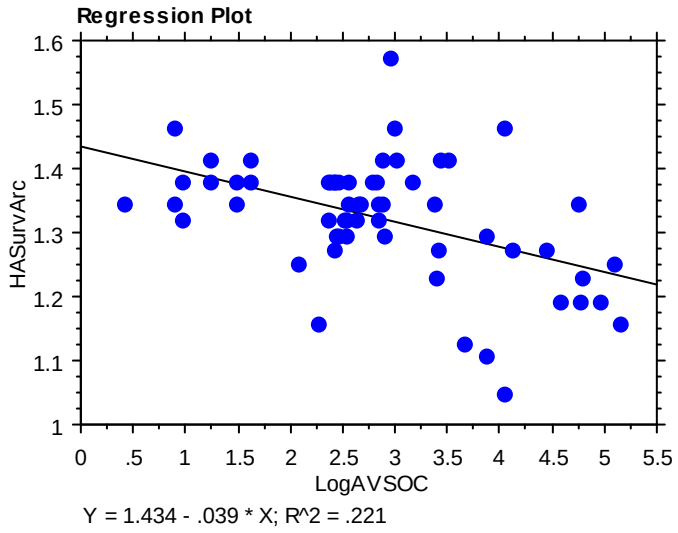


Exhibit D.1.13: *Hyalella azteca* Survival vs. SEM-AVS/FOC

Regression Summary
HASurvArc vs. LogTOC

Count	62
Num. Missing	0
R	.342
R Squared	.117
Adjusted R Squared	.102
RMS Residual	.093

ANOVA Table
HASurvArc vs. LogTOC

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.069	.069	7.965	.0065
Residual	60	.521	.009		
Total	61	.590			

Regression Coefficients
HASurvArc vs. LogTOC

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.112	.078	1.112	14.326	<.0001
LogTOC	.059	.021	.342	2.822	.0065

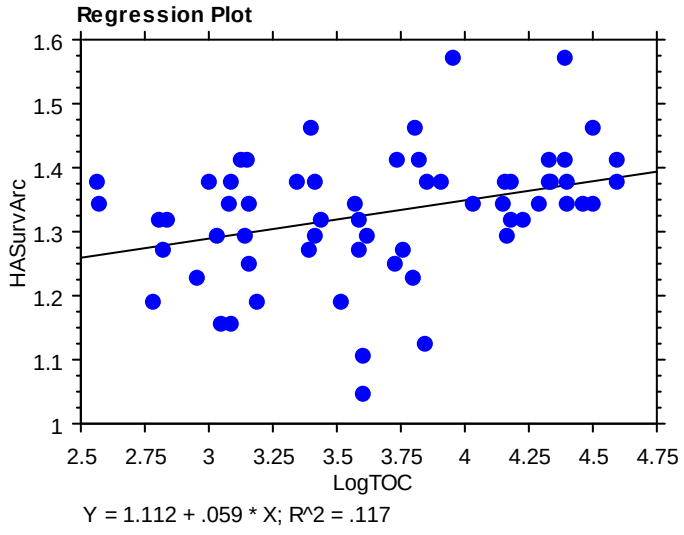


Exhibit D.1.14: *Hyalella azteca* Survival vs. Total Organic Carbon

Regression Summary
HASurvArc vs. SandArc

Count	62
Num. Missing	0
R	.388
R Squared	.151
Adjusted R Squared	.137
RMS Residual	.091

ANOVA Table
HASurvArc vs. SandArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.089	.089	10.643	.0018
Residual	60	.501	.008		
Total	61	.590			

Regression Coefficients
HASurvArc vs. SandArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.470	.045	1.470	32.724	<.0001
SandArc	-.142	.043	-.388	-3.262	.0018

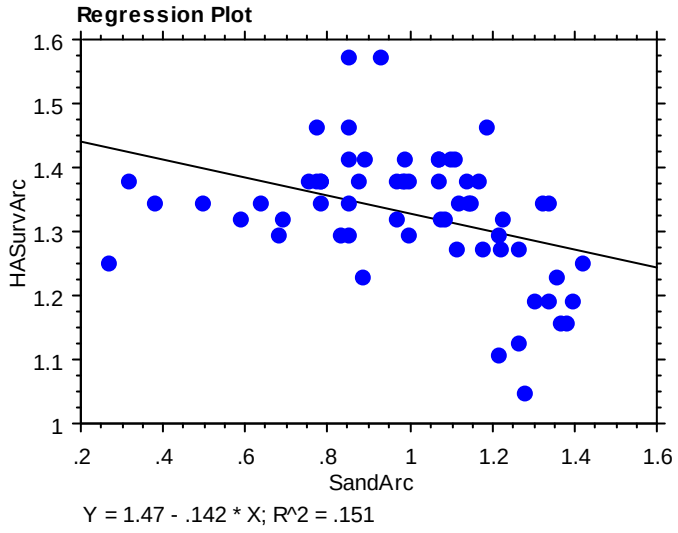


Exhibit D.1.15: *Hyalella azteca* Survival vs. Percent Sand

Regression Summary
HASurvArc vs. SandCArc

Count	62
Num. Missing	0
R	.284
R Squared	.081
Adjusted R Squared	.065
RMS Residual	.095

ANOVA Table
HASurvArc vs. SandCArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.048	.048	5.274	.0252
Residual	60	.542	.009		
Total	61	.590			

Regression Coefficients
HASurvArc vs. SandCArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.295	.019	1.295	68.159	<.0001
SandCArc	.296	.129	.284	2.297	.0252

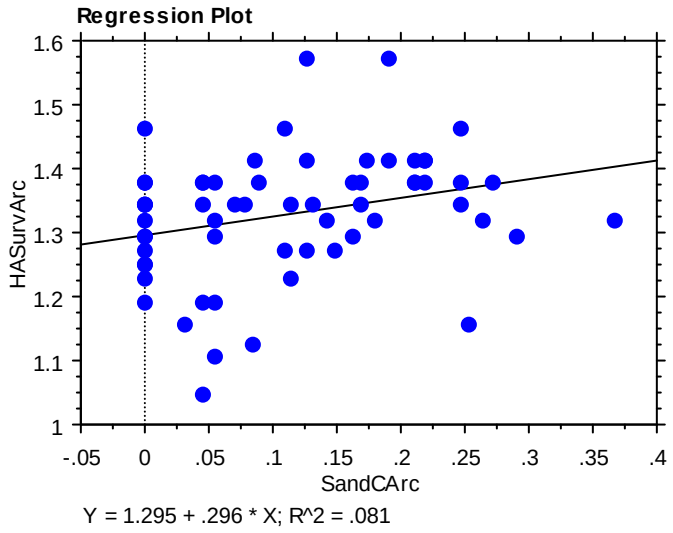


Exhibit D.1.16: *Hyalella azteca* Survival vs. Percent Coarse Sand

Regression Summary
HASurvArc vs. SandFArc

Count	62
Num. Missing	0
R	.253
R Squared	.064
Adjusted R Squared	.049
RMS Residual	.096

ANOVA Table
HASurvArc vs. SandFArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.038	.038	4.111	.0470
Residual	60	.552	.009		
Total	61	.590			

Regression Coefficients
HASurvArc vs. SandFArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.407	.041	1.407	34.591	<.0001
SandFArc	-.100	.049	-.253	-2.028	.0470

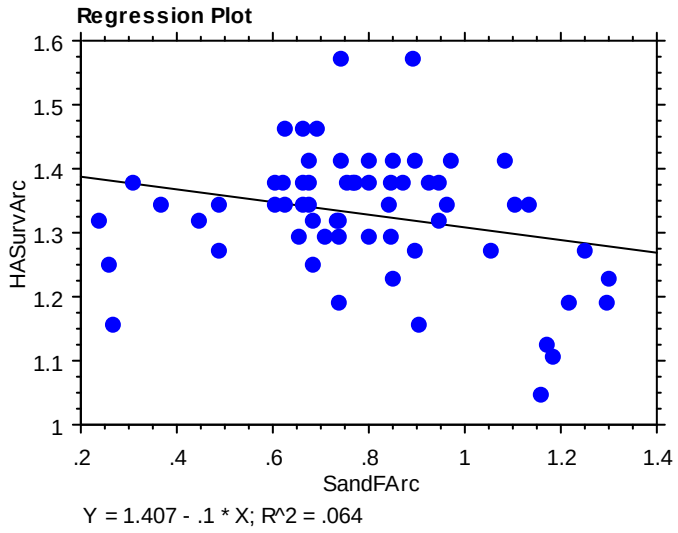


Exhibit D.1.17: *Hyalella azteca* Survival vs. Percent Fine Sand

Regression Summary
HASurvArc vs. SandMArc

Count	62
Num. Missing	0
R	.108
R Squared	.012
Adjusted R Squared	•
RMS Residual	.099

ANOVA Table
HASurvArc vs. SandMArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.007	.007	.705	.4043
Residual	60	.583	.010		
Total	61	.590			

Regression Coefficients
HASurvArc vs. SandMArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.343	.022	1.343	61.955	<.0001
SandMArc	-.042	.049	-.108	-.840	.4043

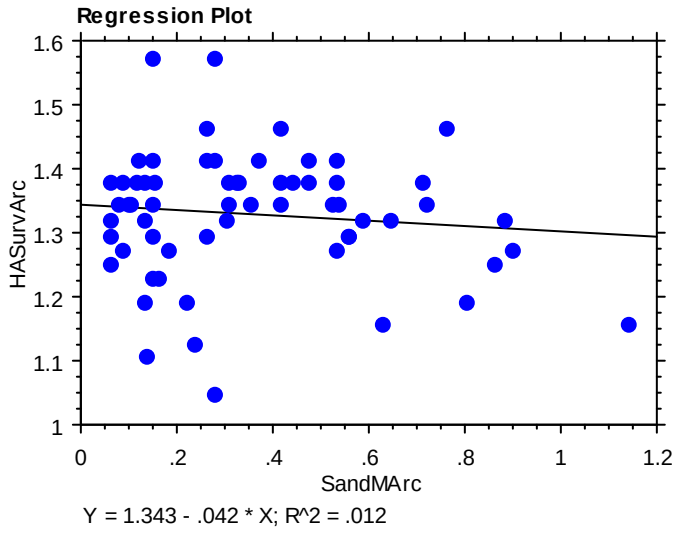


Exhibit D.1.18: ***Hyalella azteca*** **Survival vs. Percent Medium Sand**

Hyalella azteca Weight Regression Analyses

Hyalella azteca (HAGrowth = H.a. weight, mg)

Regression Summary
HAGrowth vs. logAs

Count	62
Num. Missing	0
R	.153
R Squared	.024
Adjusted R Squared	.007
RMS Residual	.116

ANOVA Table
HAGrowth vs. logAs

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.019	.019	1.447	.2337
Residual	60	.807	.013		
Total	61	.826			

Regression Coefficients
HAGrowth vs. logAs

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.339	.051	.339	6.671	<.0001
logAs	-.062	.052	-.153	-1.203	.2337

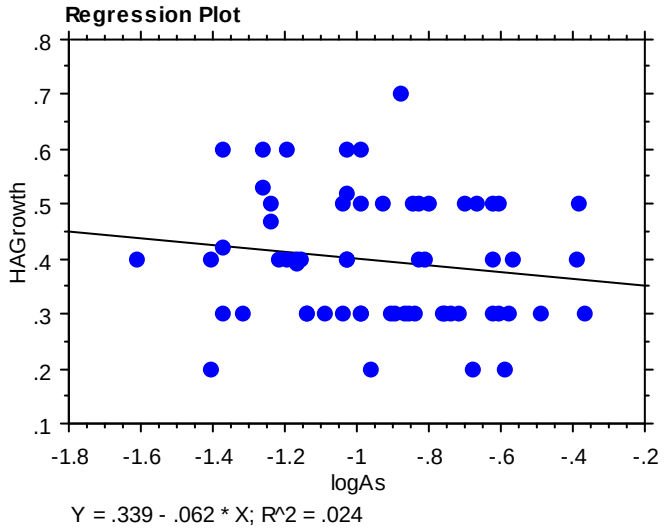


Exhibit D.2.1: *Hyalella azteca* growth vs. PEC-Q-As

Regression Summary
HAGrowth vs. LogCd

Count	62
Num. Missing	0
R	.136
R Squared	.019
Adjusted R Squared	.002
RMS Residual	.116

ANOVA Table
HAGrowth vs. LogCd

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.015	.015	1.137	.2907
Residual	60	.811	.014		
Total	61	.826			

Regression Coefficients
HAGrowth vs. LogCd

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.371	.029	.371	12.767	<.0001
LogCd	-.031	.029	-.136	-1.066	.2907

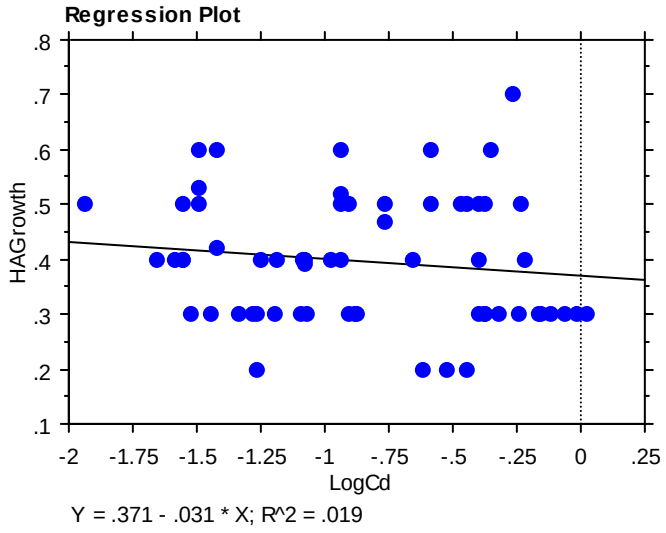


Exhibit D.2.2: *Hyalella azteca* growth vs. PEC-Q-Cd

Regression Summary
HAGrowth vs. LogCr

Count	62
Num. Missing	0
R	.450
R Squared	.203
Adjusted R Squared	.189
RMS Residual	.105

ANOVA Table
HAGrowth vs. LogCr

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.167	.167	15.255	.0002
Residual	60	.659	.011		
Total	61	.826			

Regression Coefficients
HAGrowth vs. LogCr

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.255	.039	.255	6.592	<.0001
LogCr	-.190	.049	-.450	-3.906	.0002

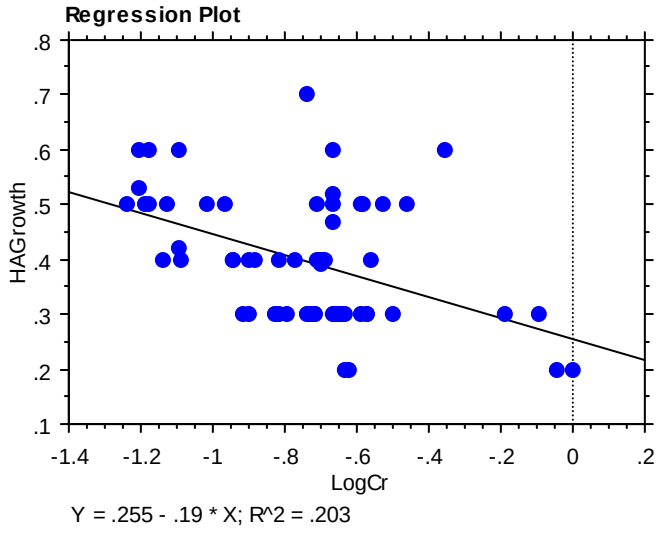


Exhibit D.2.3: *Hyalella azteca* growth vs. PEC-Q-Cr

Regression Summary
HAGrowth vs. LogCu

Count	62
Num. Missing	0
R	.313
R Squared	.098
Adjusted R Squared	.083
RMS Residual	.111

ANOVA Table
HAGrowth vs. LogCu

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.081	.081	6.498	.0134
Residual	60	.745	.012		
Total	61	.826			

Regression Coefficients
HAGrowth vs. LogCu

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.372	.017	.372	21.417	<.0001
LogCu	-.048	.019	-.313	-2.549	.0134

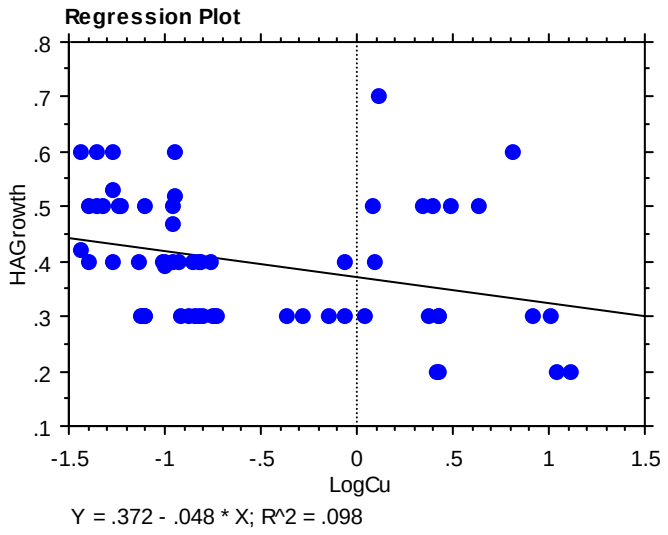


Exhibit D.2.4: *Hyalella azteca* growth vs. PEC-Q-Cu

Regression Summary
HAGrowth vs. LogPb

Count	62
Num. Missing	0
R	.292
R Squared	.085
Adjusted R Squared	.070
RMS Residual	.112

ANOVA Table
HAGrowth vs. LogPb

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.070	.070	5.573	.0215
Residual	60	.756	.013		
Total	61	.826			

Regression Coefficients
HAGrowth vs. LogPb

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.368	.019	.368	19.535	<.0001
LogPb	-.052	.022	-.292	-2.361	.0215

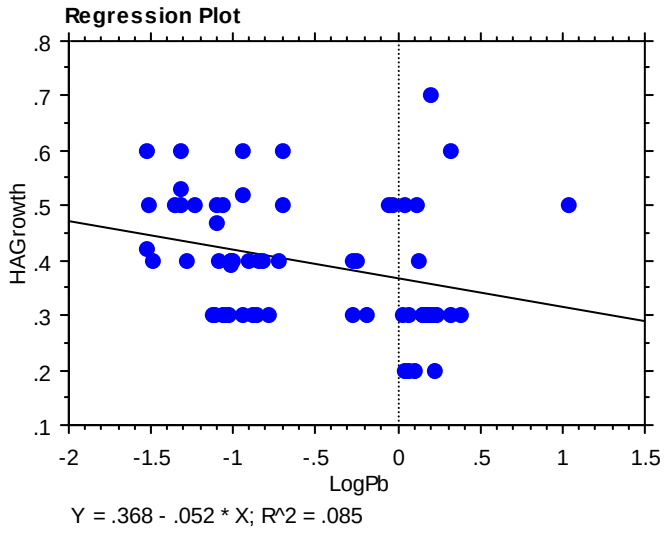


Exhibit D.2.5: *Hyalella azteca* growth vs. PEC-Q-Pb

Regression Summary
HAGrowth vs. LogHg

Count	62
Num. Missing	0
R	.247
R Squared	.061
Adjusted R Squared	.045
RMS Residual	.114

ANOVA Table
HAGrowth vs. LogHg

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.050	.050	3.883	.0534
Residual	60	.776	.013		
Total	61	.826			

Regression Coefficients
HAGrowth vs. LogHg

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.337	.034	.337	9.897	<.0001
LogHg	-.047	.024	-.247	-1.971	.0534

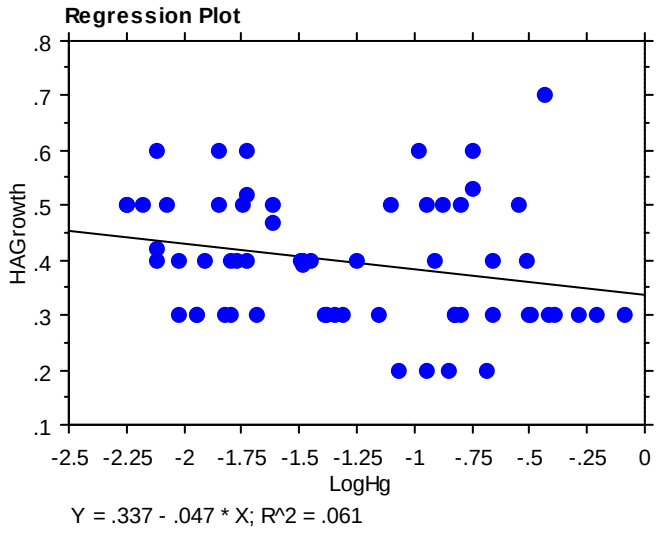


Exhibit D.2.6: ***Hyalella azteca*** **growth vs. PEC-Q-Hg**

Regression Summary
HAGrowth vs. LogNi

Count	62
Num. Missing	0
R	.354
R Squared	.126
Adjusted R Squared	.111
RMS Residual	.110

ANOVA Table
HAGrowth vs. LogNi

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.104	.104	8.611	.0047
Residual	60	.723	.012		
Total	61	.826			

Regression Coefficients
HAGrowth vs. LogNi

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.276	.044	.276	6.319	<.0001
LogNi	-.201	.068	-.354	-2.934	.0047

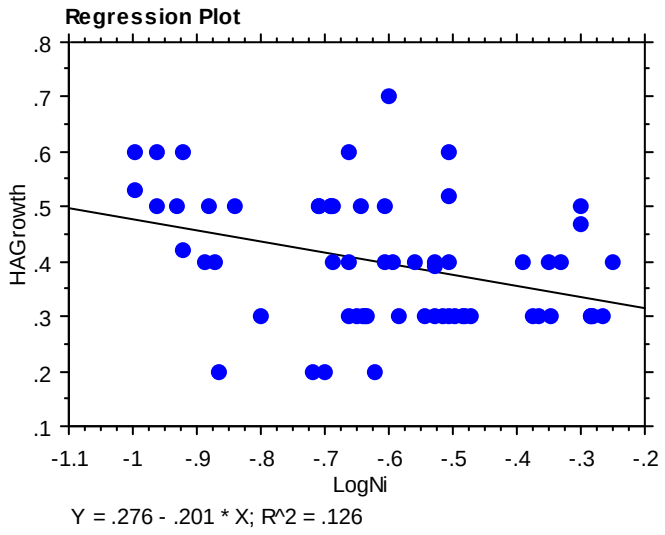


Exhibit D.2.7: *Hyalella azteca* growth vs. PEC-Q-Ni

Regression Summary
HAGrowth vs. LogZn

Count	62
Num. Missing	0
R	.321
R Squared	.103
Adjusted R Squared	.088
RMS Residual	.111

ANOVA Table
HAGrowth vs. LogZn

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.085	.085	6.872	.0111
Residual	60	.741	.012		
Total	61	.826			

Regression Coefficients
HAGrowth vs. LogZn

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.388	.015	.388	26.565	<.0001
LogZn	-.044	.017	-.321	-2.622	.0111

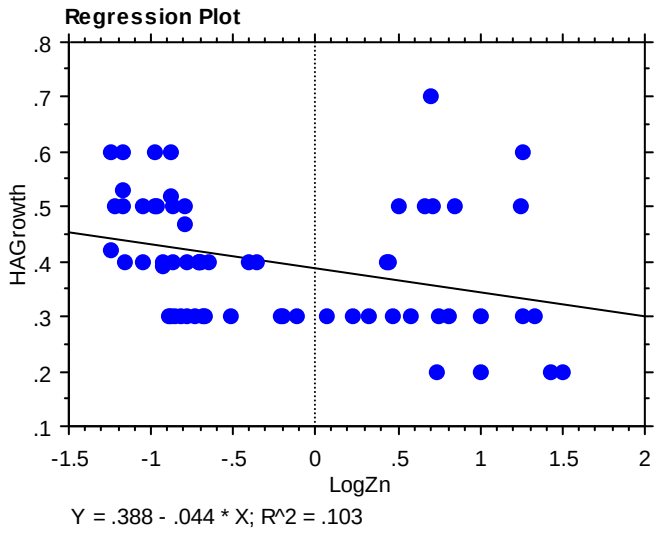


Exhibit D.2.8: ***Hyalella azteca*** **growth vs. PEC-Q-Zn**

Regression Summary
HAGrowth vs. LogmnPECQ

Count	62
Num. Missing	0
R	.332
R Squared	.110
Adjusted R Squared	.096
RMS Residual	.111

ANOVA Table
HAGrowth vs. LogmnPECQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.091	.091	7.441	.0083
Residual	60	.735	.012		
Total	61	.826			

Regression Coefficients
HAGrowth vs. LogmnPECQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.365	.018	.365	19.936	<.0001
LogmnPECQ	-.066	.024	-.332	-2.728	.0083

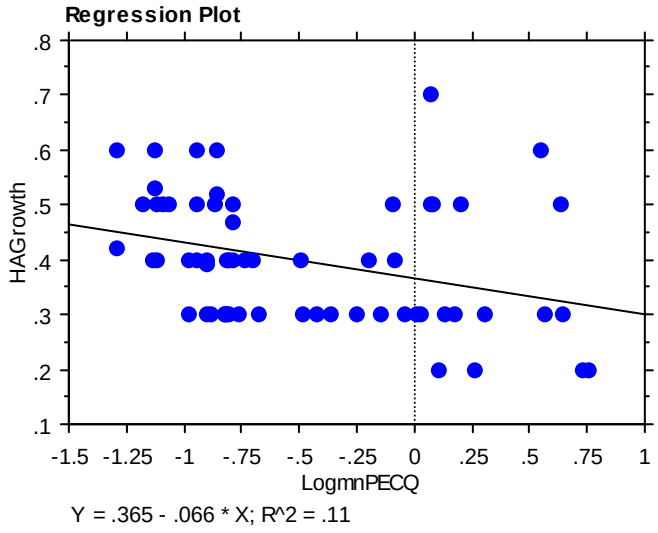


Exhibit D.2.9: *Hyalella azteca* growth vs. Mean PEC-QMetals

Regression Summary
HAGrowth vs. LogmnMetOCPQ

Count	62
Num. Missing	0
R	.428
R Squared	.183
Adjusted R Squared	.170
RMS Residual	.106

ANOVA Table
HAGrowth vs. LogmnMetOCPQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.151	.151	13.468	.0005
Residual	60	.675	.011		
Total	61	.826			

Regression Coefficients
HAGrowth vs. LogmnMetOCPQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.391	.014	.391	28.815	<.0001
LogmnMetOCPQ	-.058	.016	-.428	-3.670	.0005

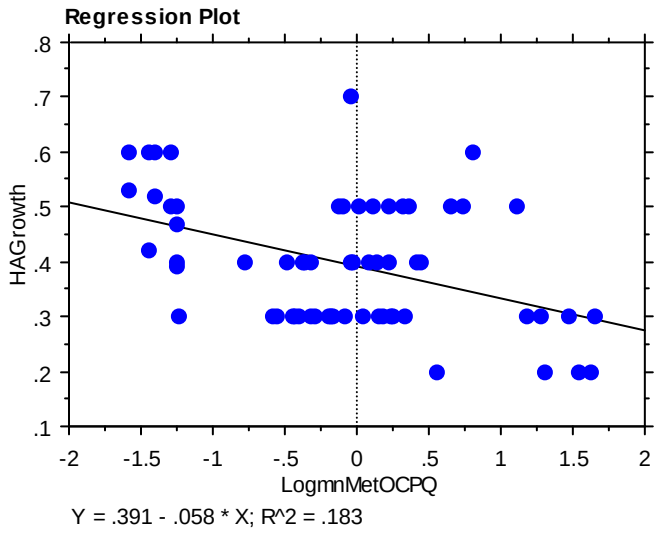


Exhibit D.2.10: *Hyalella azteca* growth vs. Mean PEC-QMetals/FOC

Regression Summary
HAGrowth vs. logSumPQ

Count	62
Num. Missing	0
R	.332
R Squared	.110
Adjusted R Squared	.096
RMS Residual	.111

ANOVA Table
HAGrowth vs. logSumPQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.091	.091	7.441	.0083
Residual	60	.735	.012		
Total	61	.826			

Regression Coefficients
HAGrowth vs. logSumPQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.425	.017	.425	24.445	<.0001
logSumPQ	-.066	.024	-.332	-2.728	.0083

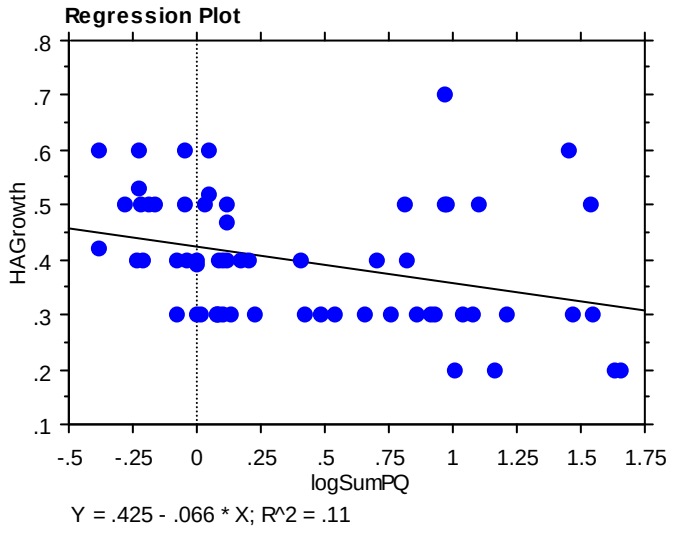


Exhibit D.2.11: *Hyalella azteca* growth vs. Sum PEC-QMetals

Regression Summary
HAGrowth vs. LogAVS

Count	60
Num. Missing	2
R	.304
R Squared	.092
Adjusted R Squared	.077
RMS Residual	.114

ANOVA Table
HAGrowth vs. LogAVS

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.076	.076	5.895	.0183
Residual	58	.750	.013		
Total	59	.826			

Regression Coefficients
HAGrowth vs. LogAVS

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.415	.016	.415	25.294	<.0001
LogAVS	-.037	.015	-.304	-2.428	.0183

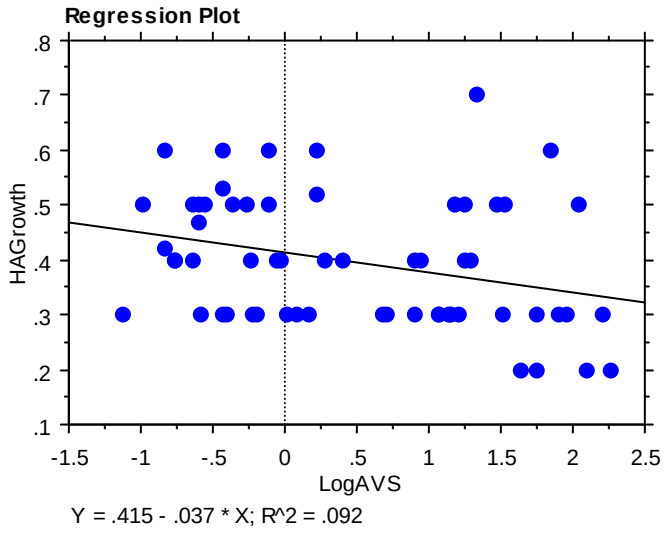


Exhibit D.2.12: *Hyalella azteca* growth vs. SEM-AVS

Regression Summary
HAGrowth vs. LogAVSOC

Count	60
Num. Missing	2
R	.412
R Squared	.170
Adjusted R Squared	.155
RMS Residual	.109

ANOVA Table
HAGrowth vs. LogAVSOC

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.140	.140	11.856	.0011
Residual	58	.686	.012		
Total	59	.826			

Regression Coefficients
HAGrowth vs. LogAVSOC

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.520	.038	.520	13.606	<.0001
LogAVSOC	-.043	.012	-.412	-3.443	.0011

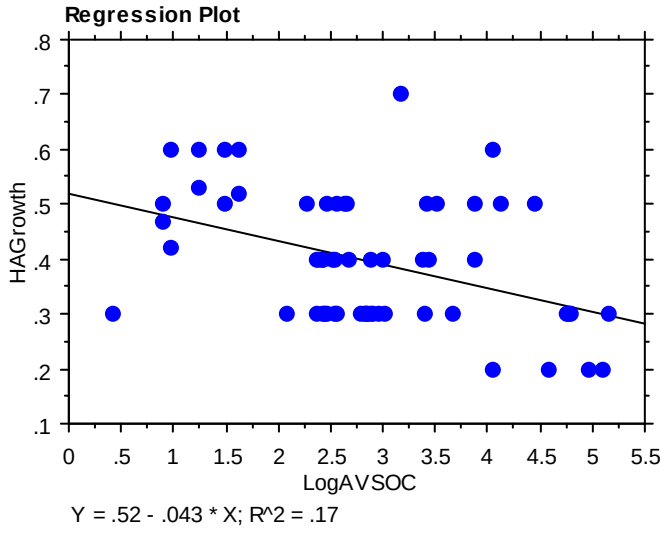


Exhibit D.2.13: *Hyalella azteca* growth vs. SEM-AVS/FOC

Regression Summary
HAGrowth vs. LogTOC

Count	62
Num. Missing	0
R	.293
R Squared	.086
Adjusted R Squared	.071
RMS Residual	.112

ANOVA Table
HAGrowth vs. LogTOC

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.071	.071	5.629	.0209
Residual	60	.755	.013		
Total	61	.826			

Regression Coefficients
HAGrowth vs. LogTOC

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.178	.093	.178	1.906	.0615
LogTOC	.060	.025	.293	2.373	.0209

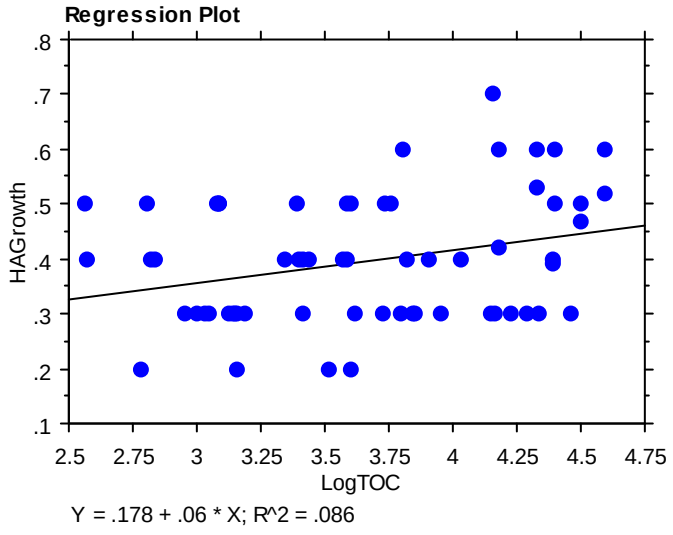


Exhibit D.2.14: *Hyalella azteca* growth vs. TOC

Regression Summary
HAGrowth vs. SandArc

Count	62
Num. Missing	0
R	.080
R Squared	.006
Adjusted R Squared	•
RMS Residual	.117

ANOVA Table
HAGrowth vs. SandArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.005	.005	.382	.5389
Residual	60	.821	.014		
Total	61	.826			

Regression Coefficients
HAGrowth vs. SandArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.363	.057	.363	6.313	<.0001
SandArc	.034	.056	.080	.618	.5389

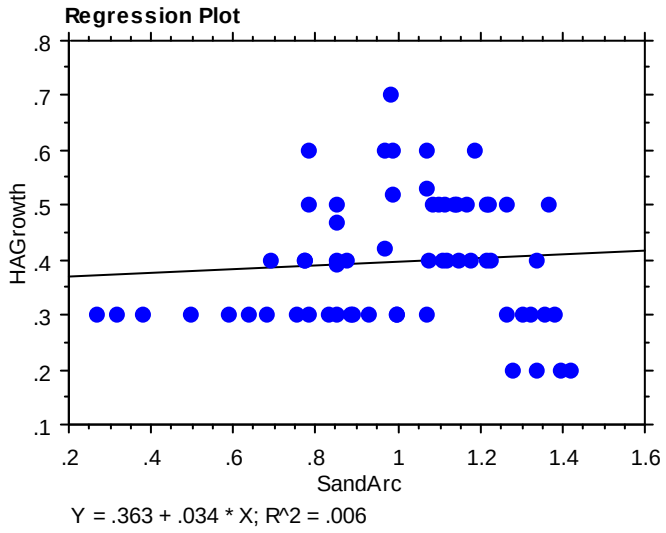


Exhibit D.2.15: *Hyalella azteca* growth vs. Percent Sand

Regression Summary
HAGrowth vs. SandCArc

Count	62
Num. Missing	0
R	.369
R Squared	.136
Adjusted R Squared	.122
RMS Residual	.109

ANOVA Table
HAGrowth vs. SandCArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.112	.112	9.439	.0032
Residual	60	.714	.012		
Total	61	.826			

Regression Coefficients
HAGrowth vs. SandCArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.346	.022	.346	15.857	<.0001
SandCArc	.454	.148	.369	3.072	.0032

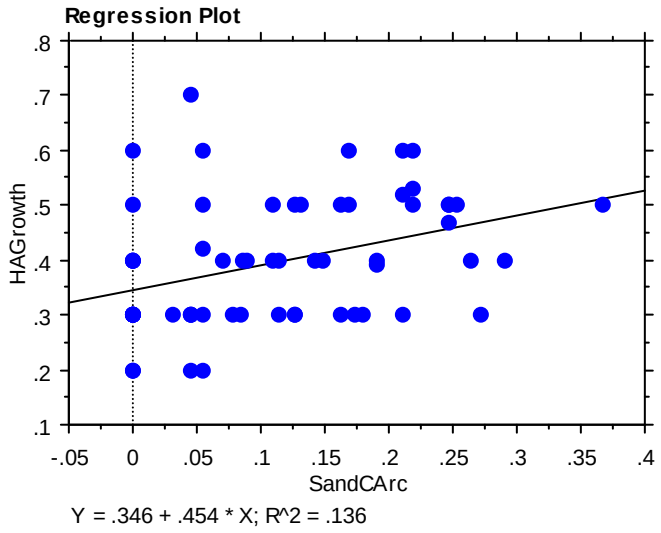


Exhibit D.2.16: *Hyalella azteca* growth vs. Percent Coarse Sand

Regression Summary
HAGrowth vs. SandFArc

Count	62
Num. Missing	0
R	.063
R Squared	.004
Adjusted R Squared	•
RMS Residual	.117

ANOVA Table
HAGrowth vs. SandFArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.003	.003	.239	.6266
Residual	60	.823	.014		
Total	61	.826			

Regression Coefficients
HAGrowth vs. SandFArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.420	.050	.420	8.467	<.0001
SandFArc	-.029	.060	-.063	-.489	.6266

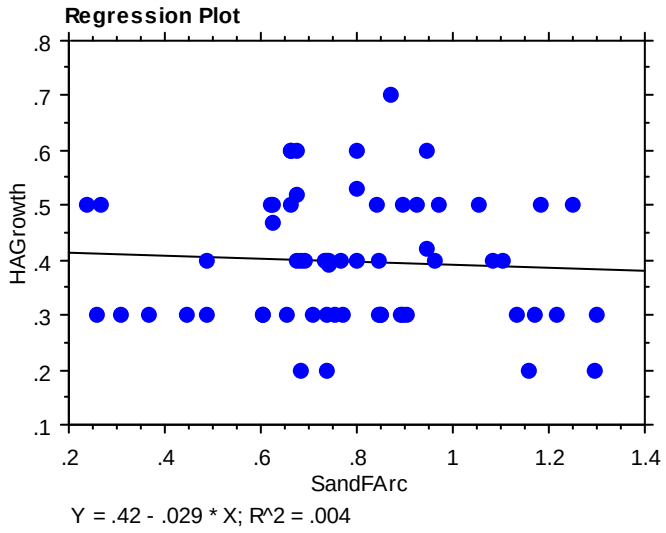


Exhibit D.2.17: *Hyalella azteca* growth vs. Percent Fine Sand

Regression Summary
HAGrowth vs. SandMArc

Count	62
Num. Missing	0
R	.219
R Squared	.048
Adjusted R Squared	.032
RMS Residual	.114

ANOVA Table
HAGrowth vs. SandMArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.040	.040	3.032	.0868
Residual	60	.786	.013		
Total	61	.826			

Regression Coefficients
HAGrowth vs. SandMArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.361	.025	.361	14.356	<.0001
SandMArc	.100	.057	.219	1.741	.0868

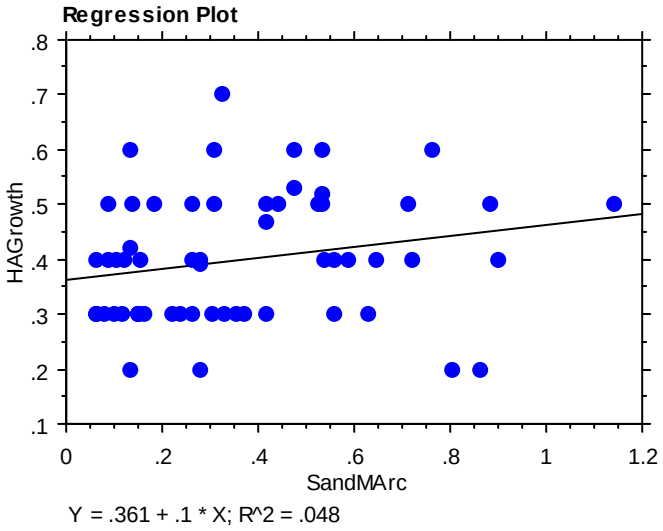


Exhibit D.2.18: *Hyalella azteca* growth vs. Percent Medium Sand

Hyalella azteca Biomass Regression Analyses

Hyalella azteca (HABiom = H.a. biomass, mg)

Regression Summary
HABiom vs. logAs

Count	62
Num. Missing	0
R	.277
R Squared	.077
Adjusted R Squared	.062
RMS Residual	.105

ANOVA Table
HABiom vs. logAs

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.055	.055	5.002	.0291
Residual	60	.665	.011		
Total	61	.721			

Regression Coefficients
HABiom vs. logAs

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.279	.046	.279	6.055	<.0001
logAs	-.105	.047	-.277	-2.236	.0291

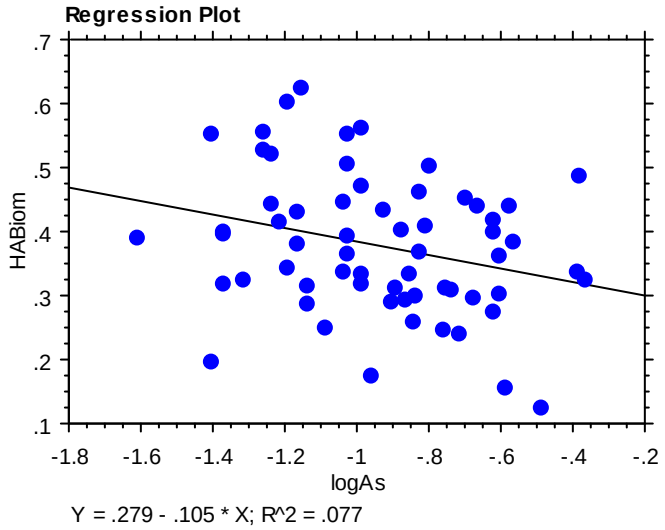


Exhibit D.3.1: *Hyalella azteca* biomass vs. PEC-Q-As

Regression Summary
HABiom vs. LogCd

Count	62
Num. Missing	0
R	.202
R Squared	.041
Adjusted R Squared	.025
RMS Residual	.107

ANOVA Table
HABiom vs. LogCd

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.029	.029	2.553	.1154
Residual	60	.692	.012		
Total	61	.721			

Regression Coefficients
HABiom vs. LogCd

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.341	.027	.341	12.724	<.0001
LogCd	-.043	.027	-.202	-1.598	.1154

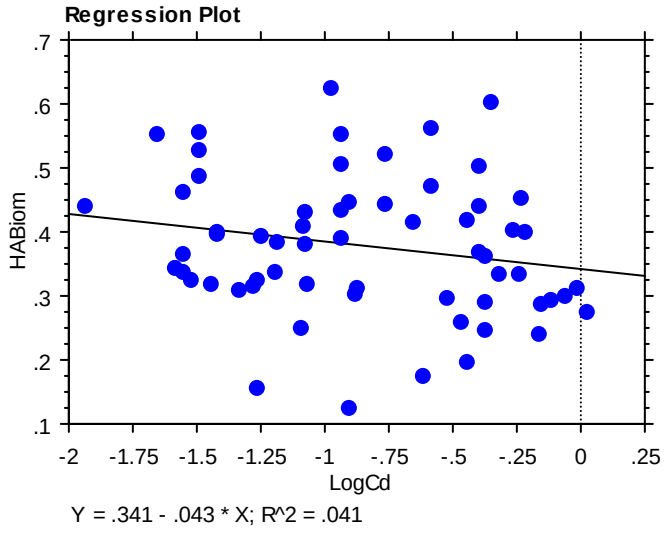


Exhibit D.3.2: ***Hyalella azteca*** **biomass vs. PEC-Q-Cd**

Regression Summary
HABiom vs. LogCr

Count	62
Num. Missing	0
R	.547
R Squared	.299
Adjusted R Squared	.287
RMS Residual	.092

ANOVA Table
HABiom vs. LogCr

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.215	.215	25.574	<.0001
Residual	60	.505	.008		
Total	61	.721			

Regression Coefficients
HABiom vs. LogCr

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.217	.034	.217	6.395	<.0001
LogCr	-.216	.043	-.547	-5.057	<.0001

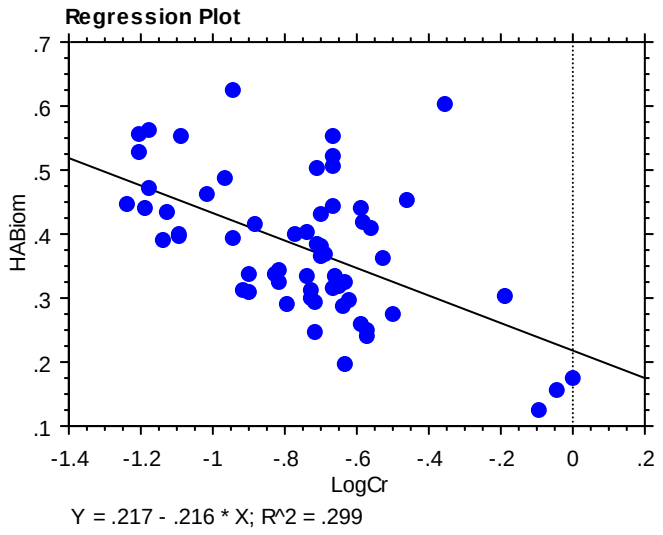


Exhibit D.3.3: *Hyalella azteca* biomass vs. PEC-Q-Cr

Regression Summary
HABiom vs. LogCu

Count	62
Num. Missing	0
R	.440
R Squared	.194
Adjusted R Squared	.180
RMS Residual	.098

ANOVA Table
HABiom vs. LogCu

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.140	.140	14.405	.0003
Residual	60	.581	.010		
Total	61	.721			

Regression Coefficients
HABiom vs. LogCu

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.344	.015	.344	22.469	<.0001
LogCu	-.063	.017	-.440	-3.795	.0003

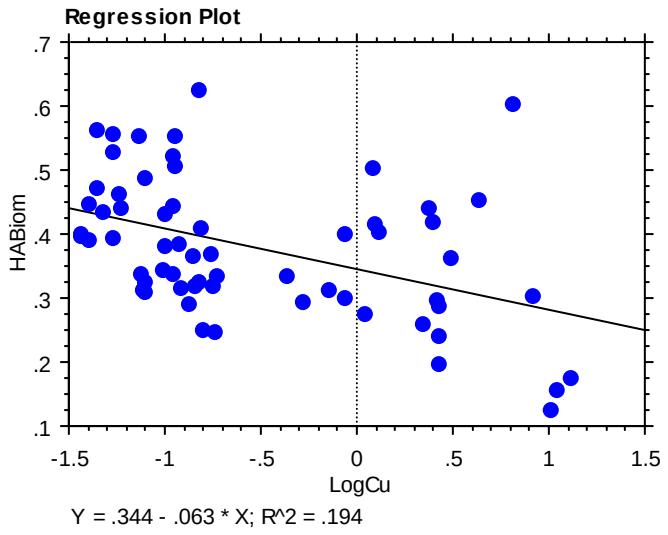


Exhibit D.3.4: ***Hyalella azteca*** **biomass vs. PEC-Q-Cu**

Regression Summary
HABiom vs. LogPb

Count	62
Num. Missing	0
R	.385
R Squared	.149
Adjusted R Squared	.134
RMS Residual	.101

ANOVA Table
HABiom vs. LogPb

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.107	.107	10.465	.0020
Residual	60	.614	.010		
Total	61	.721			

Regression Coefficients
HABiom vs. LogPb

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.342	.017	.342	20.142	<.0001
LogPb	-.065	.020	-.385	-3.235	.0020

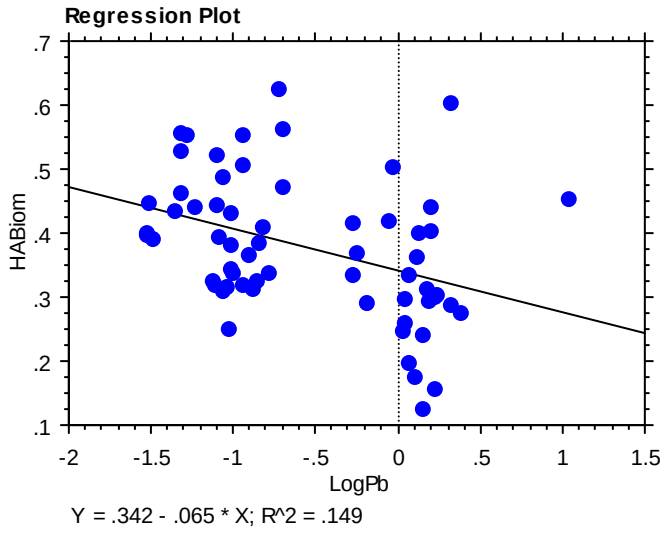


Exhibit D.3.5: *Hyalella azteca* biomass vs. PEC-Q-Pb

Regression Summary
HABiom vs. LogHg

Count	62
Num. Missing	0
R	.294
R Squared	.087
Adjusted R Squared	.071
RMS Residual	.105

ANOVA Table
HABiom vs. LogHg

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.062	.062	5.686	.0203
Residual	60	.659	.011		
Total	61	.721			

Regression Coefficients
HABiom vs. LogHg

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.310	.031	.310	9.906	<.0001
LogHg	-.053	.022	-.294	-2.385	.0203

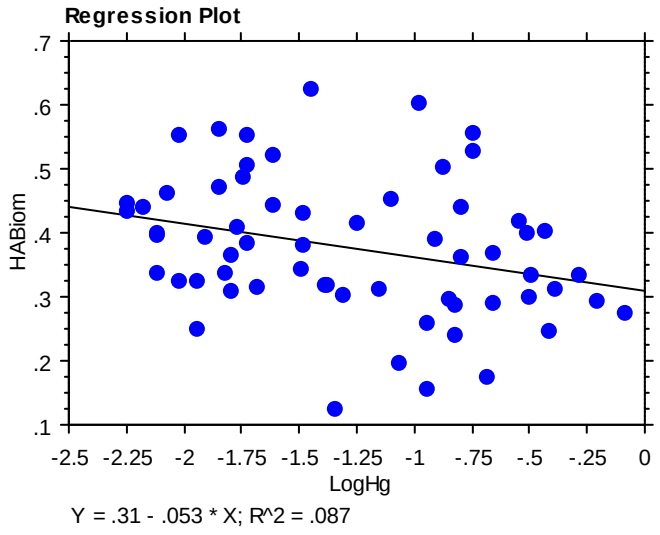


Exhibit D.3.6: ***Hyalella azteca*** **biomass vs. PEC-Q-Hg**

Regression Summary
HABiom vs. LogNi

Count	62
Num. Missing	0
R	.259
R Squared	.067
Adjusted R Squared	.051
RMS Residual	.106

ANOVA Table
HABiom vs. LogNi

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.048	.048	4.297	.0425
Residual	60	.673	.011		
Total	61	.721			

Regression Coefficients
HABiom vs. LogNi

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.295	.042	.295	7.009	<.0001
LogNi	-.137	.066	-.259	-2.073	.0425

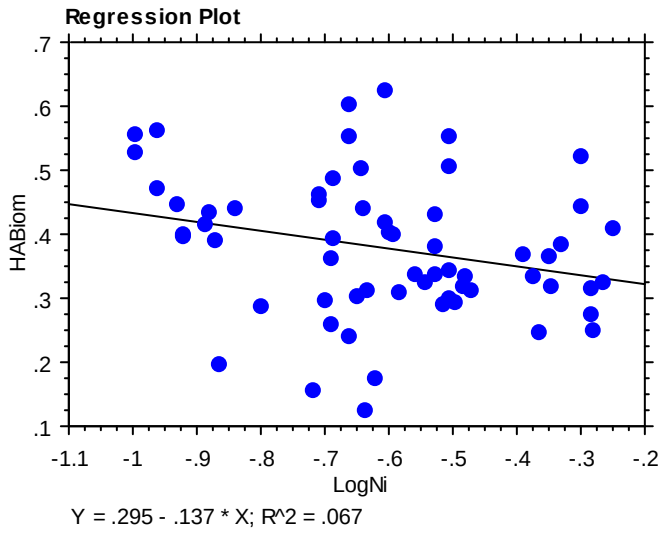


Exhibit D.3.7: *Hyalella azteca* biomass vs. PEC-Q-Ni

Regression Summary
HABiom vs. LogZn

Count	62
Num. Missing	0
R	.444
R Squared	.197
Adjusted R Squared	.183
RMS Residual	.098

ANOVA Table
HABiom vs. LogZn

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.142	.142	14.694	.0003
Residual	60	.579	.010		
Total	61	.721			

Regression Coefficients
HABiom vs. LogZn

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.365	.013	.365	28.342	<.0001
LogZn	-.057	.015	-.444	-3.833	.0003

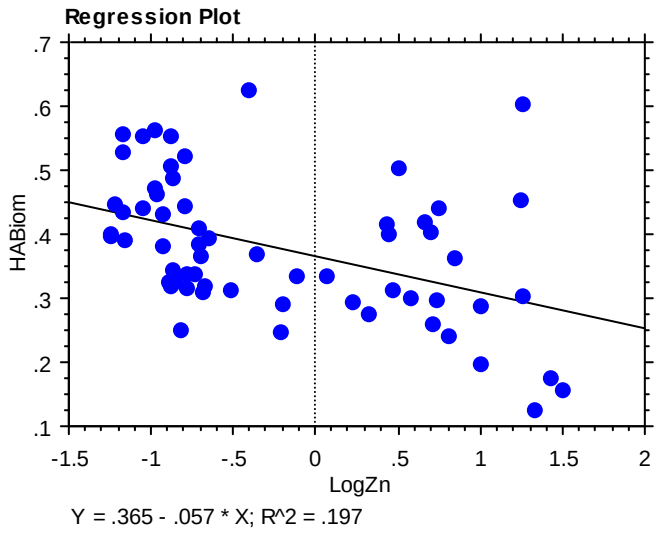


Exhibit D.3.8: *Hyalella azteca* biomass vs. PEC-Q-Zn

Regression Summary
HABiom vs. LogmnPECQ

Count	62
Num. Missing	0
R	.463
R Squared	.215
Adjusted R Squared	.202
RMS Residual	.097

ANOVA Table
HABiom vs. LogmnPECQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.155	.155	16.401	.0001
Residual	60	.566	.009		
Total	61	.721			

Regression Coefficients
HABiom vs. LogmnPECQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.336	.016	.336	20.913	<.0001
LogmnPECQ	-.087	.021	-.463	-4.050	.0001

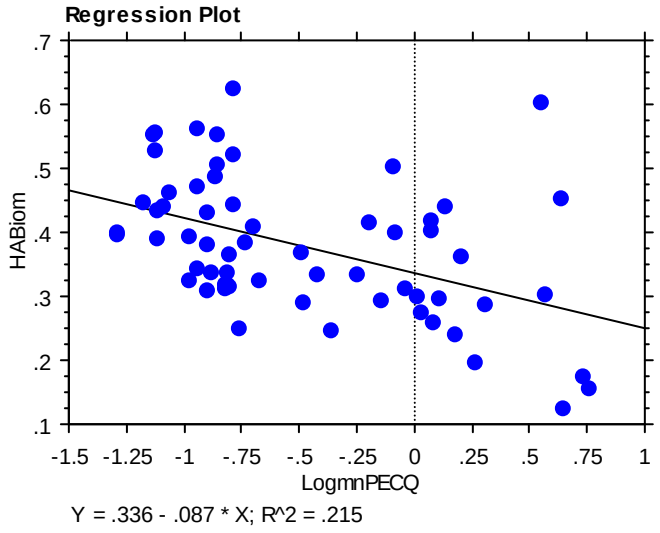


Exhibit D.3.9: ***Hyalella azteca*** **biomass vs. Mean PEC-QMetals**

Regression Summary
HABiom vs. LogmnMetOCPQ

Count	62
Num. Missing	0
R	.509
R Squared	.259
Adjusted R Squared	.247
RMS Residual	.094

ANOVA Table
HABiom vs. LogmnMetOCPQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.187	.187	20.996	<.0001
Residual	60	.534	.009		
Total	61	.721			

Regression Coefficients
HABiom vs. LogmnMetOCPQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.371	.012	.371	30.737	<.0001
LogmnMetOCPQ	-.064	.014	-.509	-4.582	<.0001

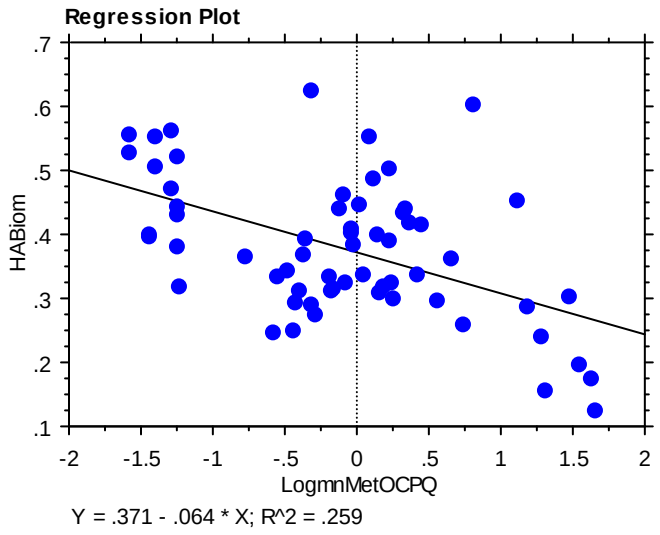


Exhibit D.3.10: ***Hyalella azteca*** **biomass vs. Mean PEC-QMetals/FOC**

Regression Summary
HABiom vs. logSumPQ

Count	62
Num. Missing	0
R	.463
R Squared	.215
Adjusted R Squared	.202
RMS Residual	.097

ANOVA Table
HABiom vs. logSumPQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.155	.155	16.401	.0001
Residual	60	.566	.009		
Total	61	.721			

Regression Coefficients
HABiom vs. logSumPQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.414	.015	.414	27.145	<.0001
logSumPQ	-.087	.021	-.463	-4.050	.0001

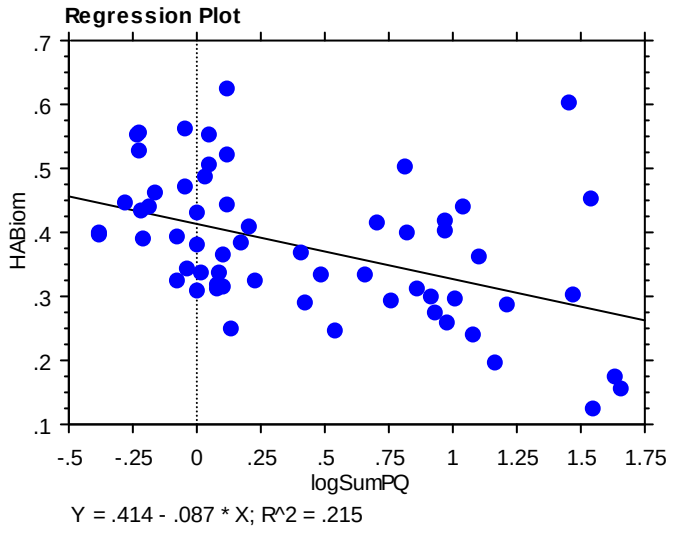


Exhibit D.3.11: *Hyalella azteca* biomass vs. Sum PEC-QMetals

Regression Summary
HABiom vs. LogAVS

Count	60
Num. Missing	2
R	.387
R Squared	.149
Adjusted R Squared	.135
RMS Residual	.103

ANOVA Table
HABiom vs. LogAVS

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.107	.107	10.190	.0023
Residual	58	.611	.011		
Total	59	.718			

Regression Coefficients
HABiom vs. LogAVS

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.398	.015	.398	26.885	<.0001
LogAVS	-.043	.014	-.387	-3.192	.0023

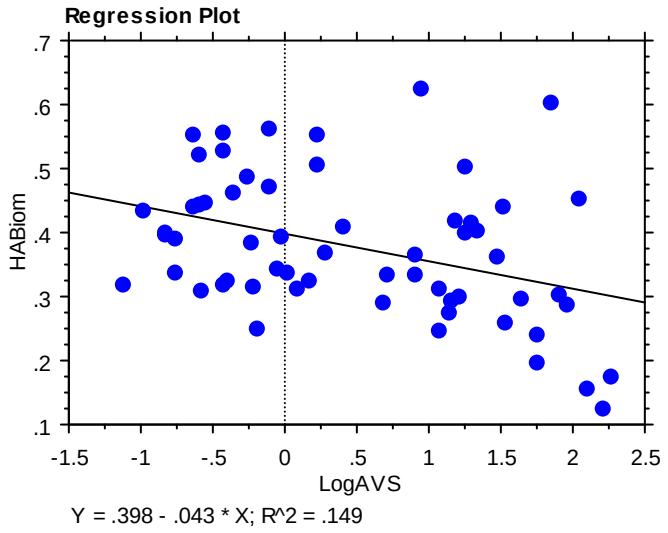


Exhibit D.3.12: *Hyalella azteca* biomass vs. SEM-AVS

Regression Summary
HABiom vs. LogAVSOC

Count	60
Num. Missing	2
R	.472
R Squared	.222
Adjusted R Squared	.209
RMS Residual	.098

ANOVA Table
HABiom vs. LogAVSOC

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.160	.160	16.588	.0001
Residual	58	.558	.010		
Total	59	.718			

Regression Coefficients
HABiom vs. LogAVSOC

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.508	.034	.508	14.731	<.0001
LogAVSOC	-.046	.011	-.472	-4.073	.0001

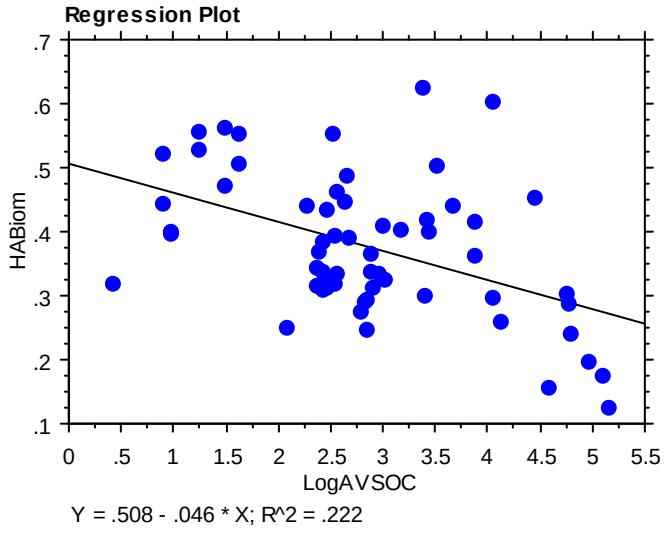


Exhibit D.3.13: *Hyalella azteca* biomass vs. SEM-AVS/FOC

Regression Summary
HABiom vs. LogTOC

Count	62
Num. Missing	0
R	.281
R Squared	.079
Adjusted R Squared	.064
RMS Residual	.105

ANOVA Table
HABiom vs. LogTOC

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.057	.057	5.137	.0270
Residual	60	.664	.011		
Total	61	.721			

Regression Coefficients
HABiom vs. LogTOC

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.182	.088	.182	2.073	.0424
LogTOC	.054	.024	.281	2.266	.0270

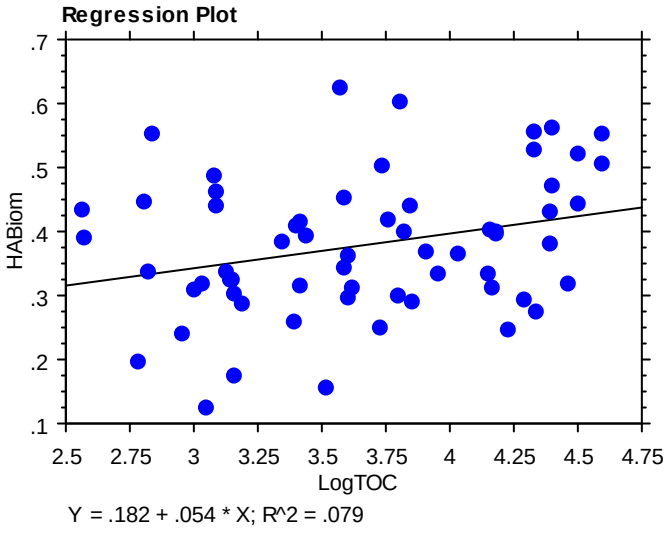


Exhibit D.3.14: *Hyalella azteca* biomass vs. TOC

Regression Summary
HABiom vs. SandArc

Count	62
Num. Missing	0
R	.044
R Squared	.002
Adjusted R Squared	•
RMS Residual	.110

ANOVA Table
HABiom vs. SandArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.001	.001	.114	.7368
Residual	60	.720	.012		
Total	61	.721			

Regression Coefficients
HABiom vs. SandArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.360	.054	.360	6.696	<.0001
SandArc	.018	.052	.044	.338	.7368

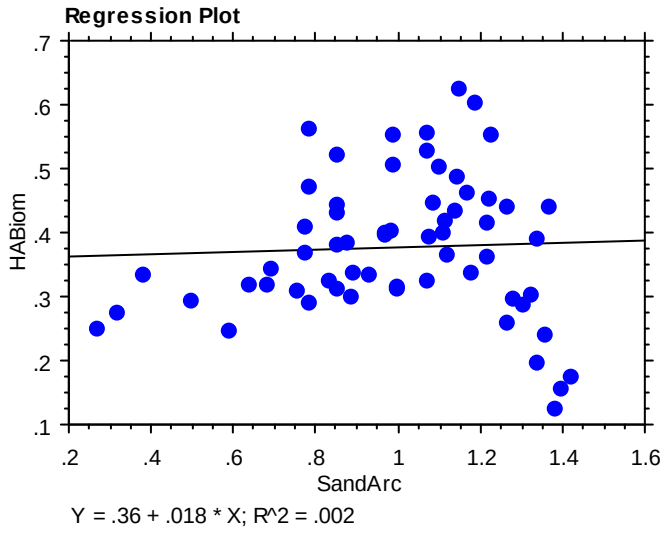


Exhibit D.3.15: *Hyalella azteca* biomass vs. Percent Sand

Regression Summary
HABiom vs. SandCArc

Count	62
Num. Missing	0
R	.511
R Squared	.261
Adjusted R Squared	.248
RMS Residual	.094

ANOVA Table
HABiom vs. SandCArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.188	.188	21.165	<.0001
Residual	60	.533	.009		
Total	61	.721			

Regression Coefficients
HABiom vs. SandCArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.311	.019	.311	16.522	<.0001
SandCArc	.587	.128	.511	4.601	<.0001

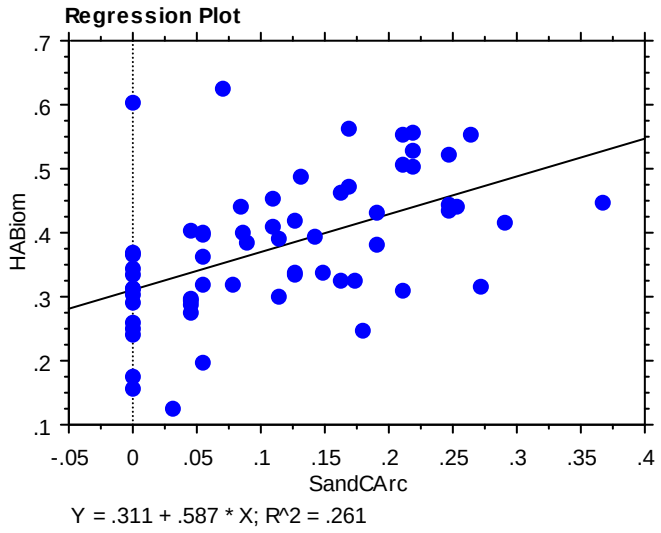


Exhibit D.3.16: *Hyalella azteca* biomass vs. Percent Coarse Sand

Regression Summary
HABiom vs. SandFArc

Count	62
Num. Missing	0
R	.133
R Squared	.018
Adjusted R Squared	.001
RMS Residual	.109

ANOVA Table
HABiom vs. SandFArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.013	.013	1.084	.3019
Residual	60	.708	.012		
Total	61	.721			

Regression Coefficients
HABiom vs. SandFArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.424	.046	.424	9.199	<.0001
SandFArc	-.058	.056	-.133	-1.041	.3019

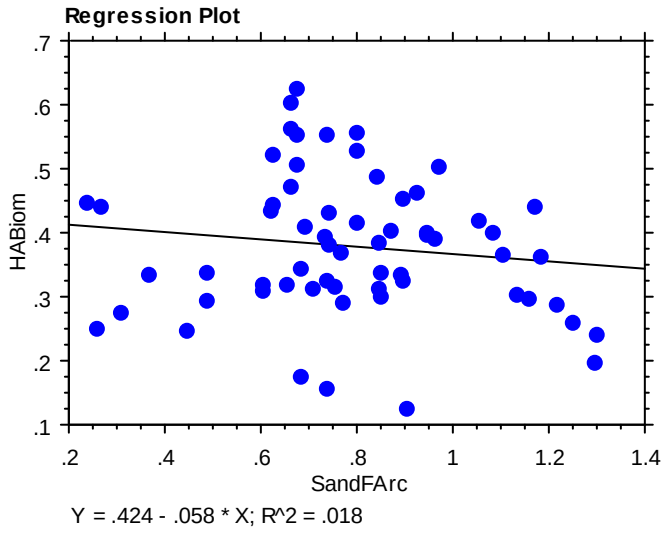


Exhibit D.3.17: *Hyalella azteca* biomass vs. Percent Fine Sand

Regression Summary
HABiom vs. SandMArc

Count	62
Num. Missing	0
R	.281
R Squared	.079
Adjusted R Squared	.063
RMS Residual	.105

ANOVA Table
HABiom vs. SandMArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.057	.057	5.133	.0271
Residual	60	.664	.011		
Total	61	.721			

Regression Coefficients
HABiom vs. SandMArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.335	.023	.335	14.487	<.0001
SandMArc	.119	.053	.281	2.266	.0271

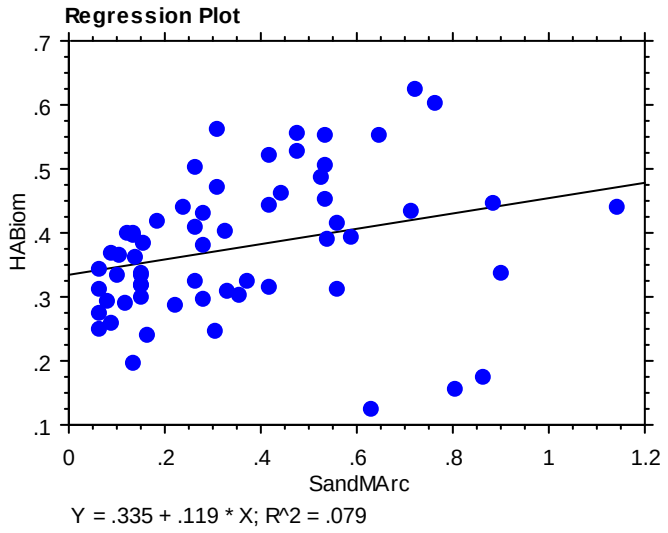


Exhibit D.3.18: *Hyalella azteca* biomass vs. Percent Medium Sand

Chironomus dilutus Survival Regression Analyses

Chironomus dilutus (CtSurvArc = arcsin C.D. survival %)

Regression Summary
CtSurvArc vs. logAs

Count	62
Num. Missing	0
R	.094
R Squared	.009
Adjusted R Squared	•
RMS Residual	.125

ANOVA Table
CtSurvArc vs. logAs

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.008	.008	.533	.4683
Residual	60	.943	.016		
Total	61	.952			

Regression Coefficients
CtSurvArc vs. logAs

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.072	.055	1.072	19.526	<.0001
logAs	.041	.056	.094	.730	.4683

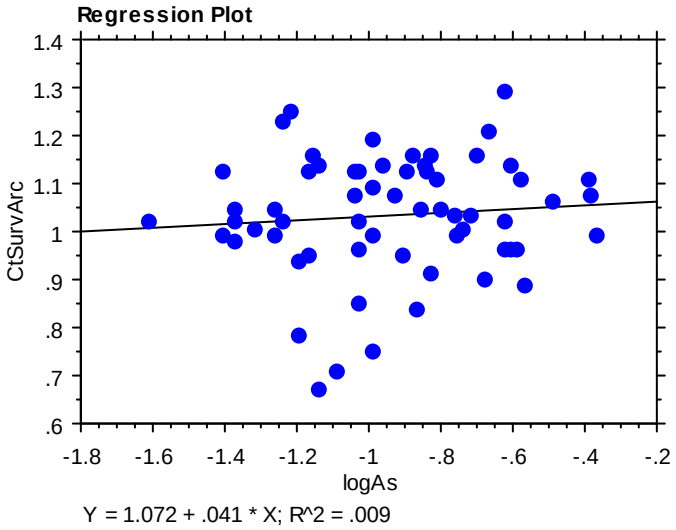


Exhibit D.4.1: *Chironomus dilutus* survival vs. PEC-Q-As

Regression Summary
CtSurvArc vs. LogCd

Count	62
Num. Missing	0
R	.199
R Squared	.040
Adjusted R Squared	.024
RMS Residual	.123

ANOVA Table
CtSurvArc vs. LogCd

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.038	.038	2.468	.1214
Residual	60	.914	.015		
Total	61	.952			

Regression Coefficients
CtSurvArc vs. LogCd

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.075	.031	1.075	34.895	<.0001
LogCd	.049	.031	.199	1.571	.1214

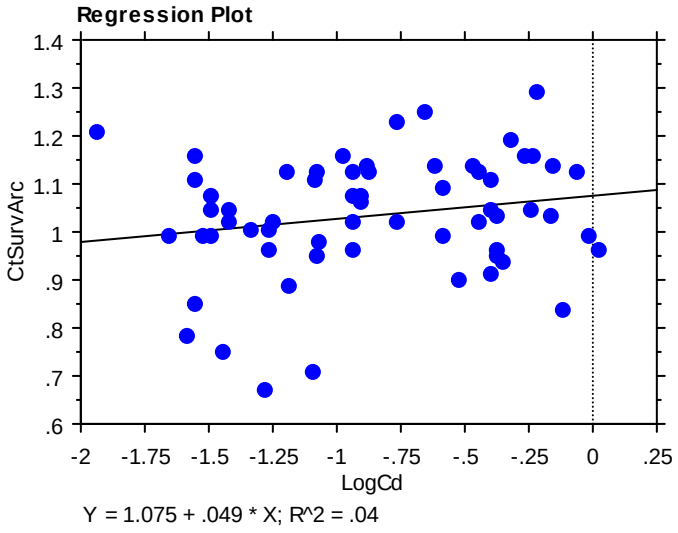


Exhibit D.4.2: *Chironomus dilutus* survival vs. PEC-Q-Cd

Regression Summary
CtSurvArc vs. LogCr

Count	62
Num. Missing	0
R	.091
R Squared	.008
Adjusted R Squared	•
RMS Residual	.125

ANOVA Table
CtSurvArc vs. LogCr

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.008	.008	.501	.4818
Residual	60	.944	.016		
Total	61	.952			

Regression Coefficients
CtSurvArc vs. LogCr

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.003	.046	1.003	21.642	<.0001
LogCr	-.041	.058	-.091	-.708	.4818

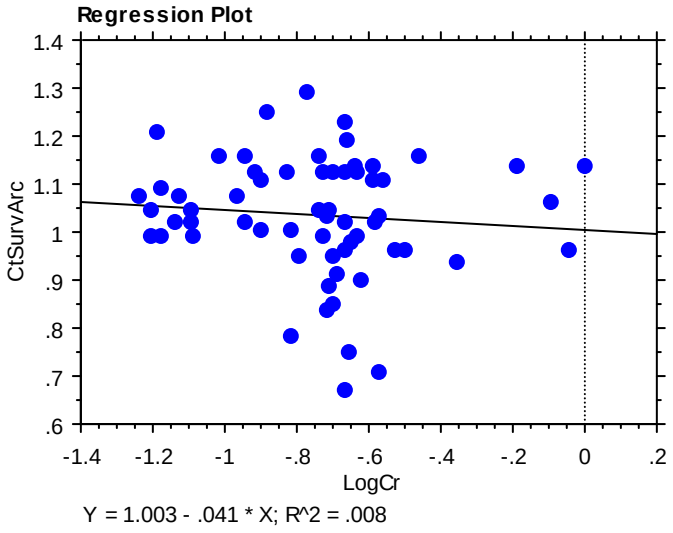


Exhibit D.4.3: *Chironomus dilutus* survival vs. PEC-Q-Cr

Regression Summary
CtSurvArc vs. LogCu

Count	62
Num. Missing	0
R	.139
R Squared	.019
Adjusted R Squared	.003
RMS Residual	.125

ANOVA Table
CtSurvArc vs. LogCu

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.018	.018	1.176	.2825
Residual	60	.933	.016		
Total	61	.952			

Regression Coefficients
CtSurvArc vs. LogCu

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.046	.019	1.046	53.868	<.0001
LogCu	.023	.021	.139	1.085	.2825

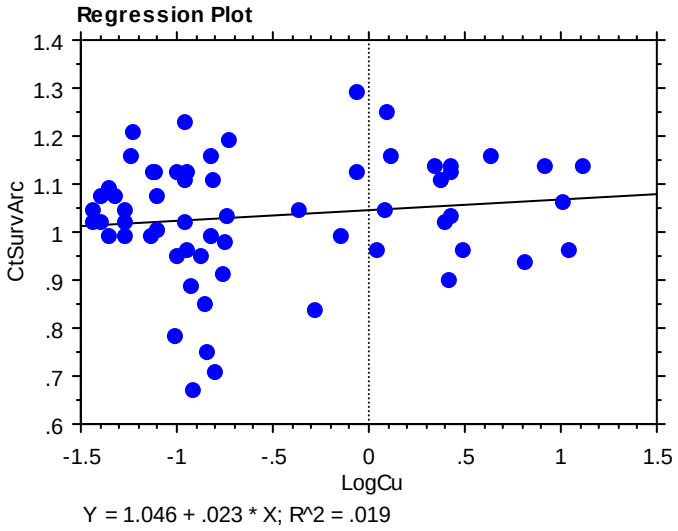


Exhibit D.4.4: *Chironomus dilutus* survival vs. PEC-Q-Cu

Regression Summary
CtSurvArc vs. LogPb

Count	62
Num. Missing	0
R	.165
R Squared	.027
Adjusted R Squared	.011
RMS Residual	.124

ANOVA Table
CtSurvArc vs. LogPb

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.026	.026	1.680	.1998
Residual	60	.926	.015		
Total	61	.952			

Regression Coefficients
CtSurvArc vs. LogPb

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.051	.021	1.051	50.421	<.0001
LogPb	.032	.025	.165	1.296	.1998

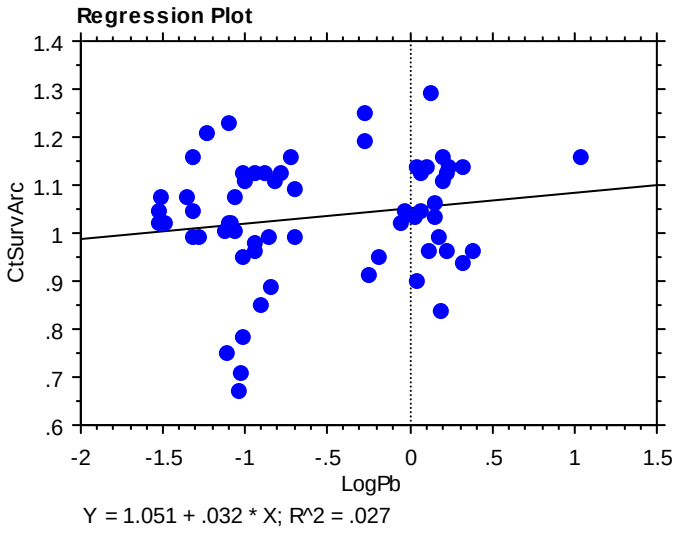


Exhibit D.4.5: *Chironomus dilutus* survival vs. PEC-Q-Pb

Regression Summary
CtSurvArc vs. LogHg

Count	62
Num. Missing	0
R	.050
R Squared	.002
Adjusted R Squared	•
RMS Residual	.126

ANOVA Table
CtSurvArc vs. LogHg

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.002	.002	.149	.7007
Residual	60	.949	.016		
Total	61	.952			

Regression Coefficients
CtSurvArc vs. LogHg

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.047	.038	1.047	27.833	<.0001
LogHg	.010	.026	.050	.386	.7007

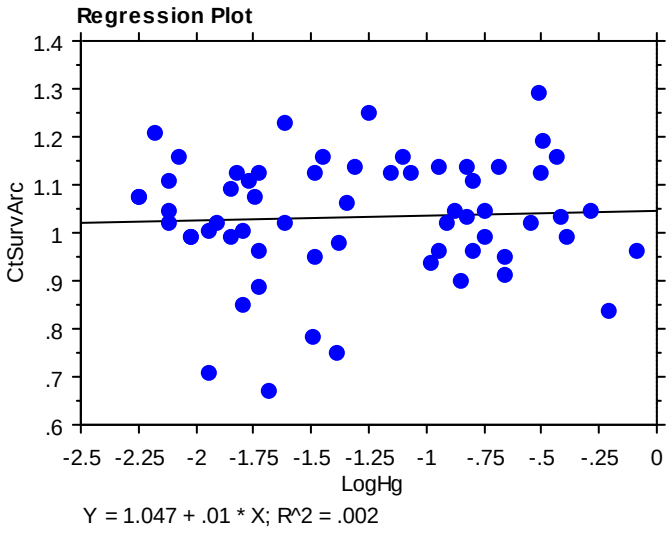


Exhibit D.4.6: *Chironomus dilutus* survival vs. PEC-Q-Hg

Regression Summary
CtSurvArc vs. LogNi

Count	62
Num. Missing	0
R	.349
R Squared	.122
Adjusted R Squared	.107
RMS Residual	.118

ANOVA Table
CtSurvArc vs. LogNi

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.116	.116	8.306	.0055
Residual	60	.836	.014		
Total	61	.952			

Regression Coefficients
CtSurvArc vs. LogNi

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.906	.047	.906	19.286	<.0001
LogNi	-.212	.074	-.349	-2.882	.0055

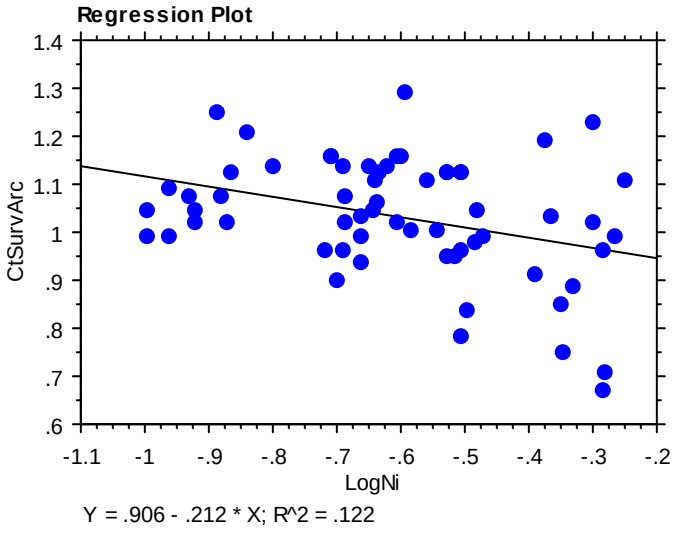


Exhibit D.4.7: *Chironomus dilutus* survival vs. PEC-Q-Ni

Regression Summary
CtSurvArc vs. LogZn

Count	62
Num. Missing	0
R	.199
R Squared	.039
Adjusted R Squared	.023
RMS Residual	.123

ANOVA Table
CtSurvArc vs. LogZn

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.038	.038	2.464	.1218
Residual	60	.914	.015		
Total	61	.952			

Regression Coefficients
CtSurvArc vs. LogZn

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.040	.016	1.040	64.206	<.0001
LogZn	.029	.019	.199	1.570	.1218

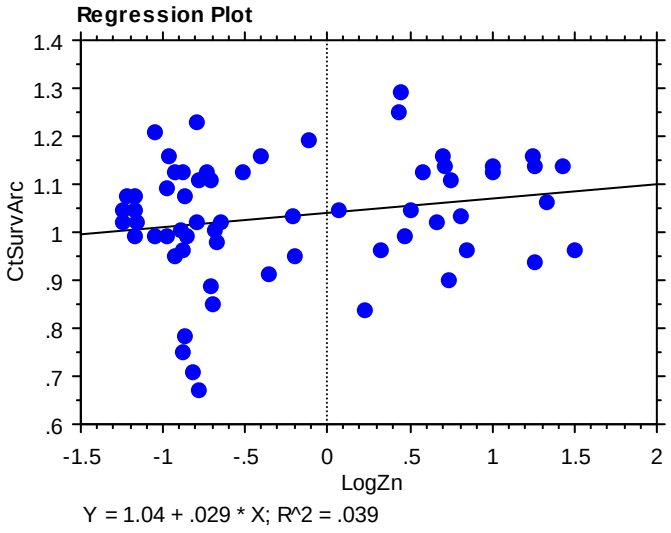


Exhibit D.4.8: *Chironomus dilutus* survival vs. PEC-Q-Zn

Regression Summary
CtSurvArc vs. LogmnPECQ

Count	62
Num. Missing	0
R	.153
R Squared	.024
Adjusted R Squared	.007
RMS Residual	.124

ANOVA Table
CtSurvArc vs. LogmnPECQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.022	.022	1.446	.2339
Residual	60	.929	.015		
Total	61	.952			

Regression Coefficients
CtSurvArc vs. LogmnPECQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.050	.021	1.050	50.962	<.0001
LogmnPECQ	.033	.027	.153	1.202	.2339

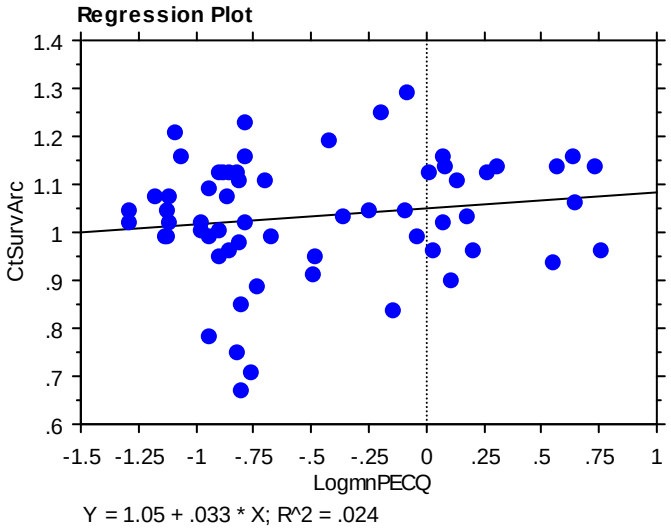


Exhibit D.4.9: *Chironomus dilutus* survival vs. Mean PEC-QMetals

Regression Summary
CtSurvArc vs. LogmnMetOCPQ

Count	62
Num. Missing	0
R	.153
R Squared	.024
Adjusted R Squared	.007
RMS Residual	.124

ANOVA Table
CtSurvArc vs. LogmnMetOCPQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.022	.022	1.446	.2340
Residual	60	.929	.015		
Total	61	.952			

Regression Coefficients
CtSurvArc vs. LogmnMetOCPQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.036	.016	1.036	65.056	<.0001
LogmnMetOCPQ	.022	.019	.153	1.202	.2340

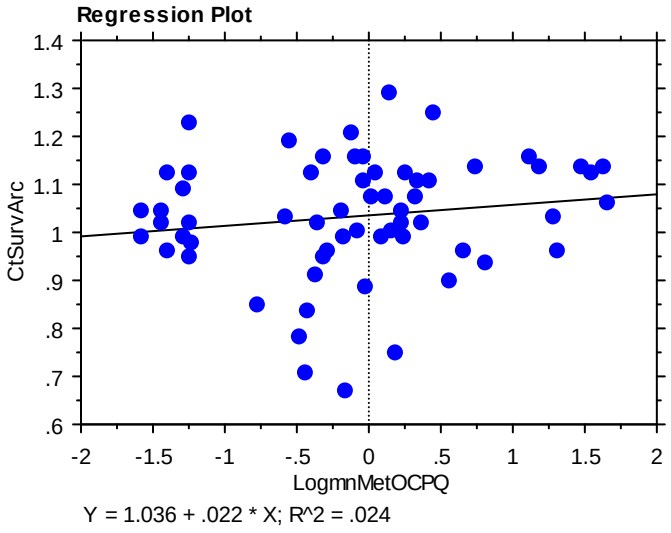


Exhibit D.4.10: *Chironomus dilutus* survival vs. Mean PEC-QMetals/FOC

Regression Summary
CtSurvArc vs. logSumPQ

Count	62
Num. Missing	0
R	.153
R Squared	.024
Adjusted R Squared	.007
RMS Residual	.124

ANOVA Table
CtSurvArc vs. logSumPQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.022	.022	1.446	.2339
Residual	60	.929	.015		
Total	61	.952			

Regression Coefficients
CtSurvArc vs. logSumPQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.020	.020	1.020	52.151	<.0001
logSumPQ	.033	.027	.153	1.202	.2339

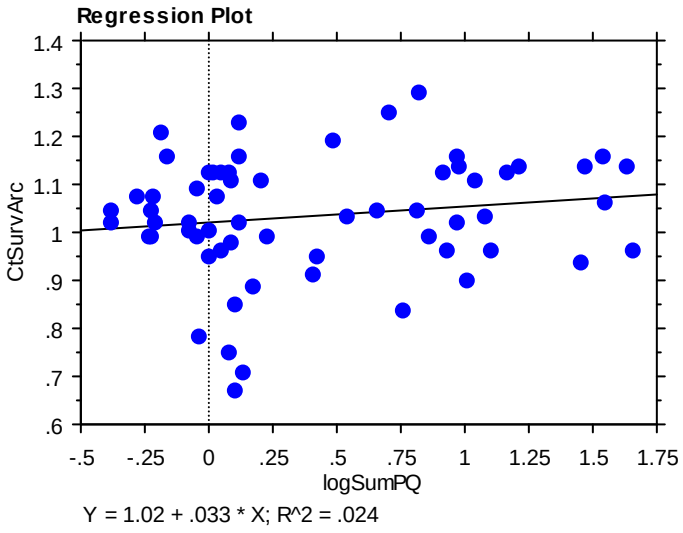


Exhibit D.4.11: *Chironomus dilutus* survival vs. Sum PEC-QMetals

Regression Summary
CtSurvArc vs. LogAVS

Count	60
Num. Missing	2
R	.184
R Squared	.034
Adjusted R Squared	.017
RMS Residual	.125

ANOVA Table
CtSurvArc vs. LogAVS

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.032	.032	2.030	.1596
Residual	58	.905	.016		
Total	59	.937			

Regression Coefficients
CtSurvArc vs. LogAVS

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.022	.018	1.022	56.690	<.0001
LogAVS	.024	.017	.184	1.425	.1596

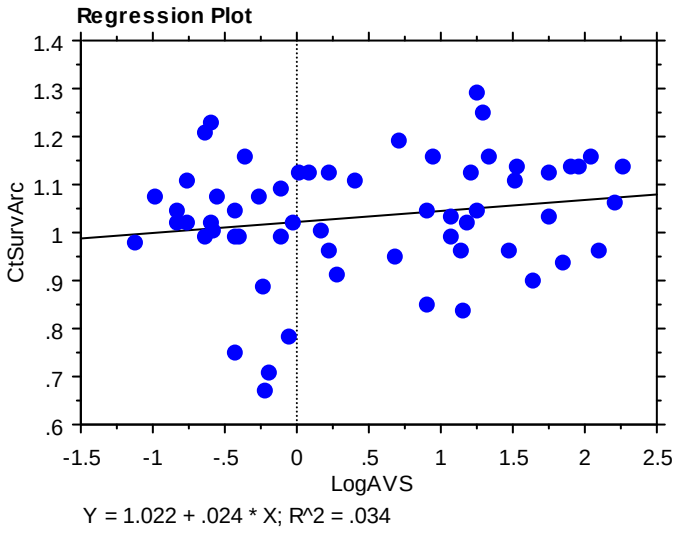


Exhibit D.4.12: *Chironomus dilutus* survival vs. SEM-AVS

Regression Summary
CtSurvArc vs. LogAVSOC

Count	60
Num. Missing	2
R	.197
R Squared	.039
Adjusted R Squared	.022
RMS Residual	.125

ANOVA Table
CtSurvArc vs. LogAVSOC

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.036	.036	2.332	.1322
Residual	58	.900	.016		
Total	59	.937			

Regression Coefficients
CtSurvArc vs. LogAVSOC

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.971	.044	.971	22.201	<.0001
LogAVSOC	.022	.014	.197	1.527	.1322

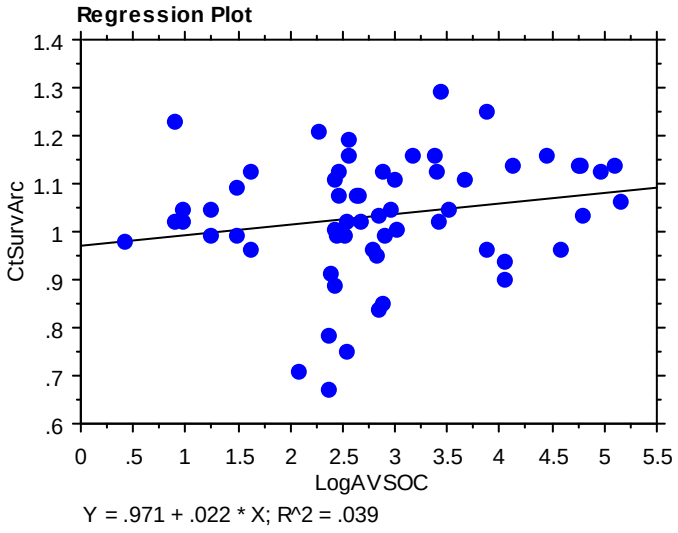


Exhibit D.4.13: *Chironomus dilutus* survival vs. SEM-AVS/FOC

Regression Summary
CtSurvArc vs. LogTOC

Count	62
Num. Missing	0
R	.072
R Squared	.005
Adjusted R Squared	•
RMS Residual	.126

ANOVA Table
CtSurvArc vs. LogTOC

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.005	.005	.314	.5773
Residual	60	.947	.016		
Total	61	.952			

Regression Coefficients
CtSurvArc vs. LogTOC

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.092	.105	1.092	10.434	<.0001
LogTOC	-.016	.028	-.072	-.560	.5773

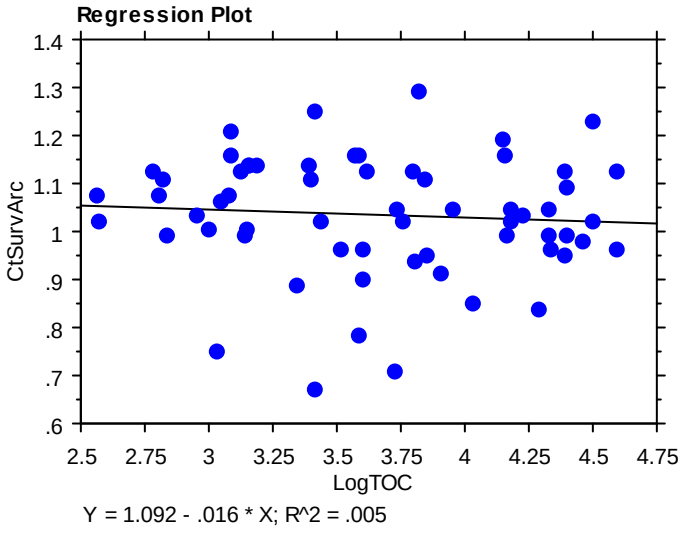


Exhibit D.4.14: *Chironomus dilutus* survival vs. TOC

Regression Summary
CtSurvArc vs. SandArc

Count	62
Num. Missing	0
R	.380
R Squared	.145
Adjusted R Squared	.130
RMS Residual	.116

ANOVA Table
CtSurvArc vs. SandArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.138	.138	10.151	.0023
Residual	60	.814	.014		
Total	61	.952			

Regression Coefficients
CtSurvArc vs. SandArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.858	.057	.858	14.981	<.0001
SandArc	.176	.055	.380	3.186	.0023

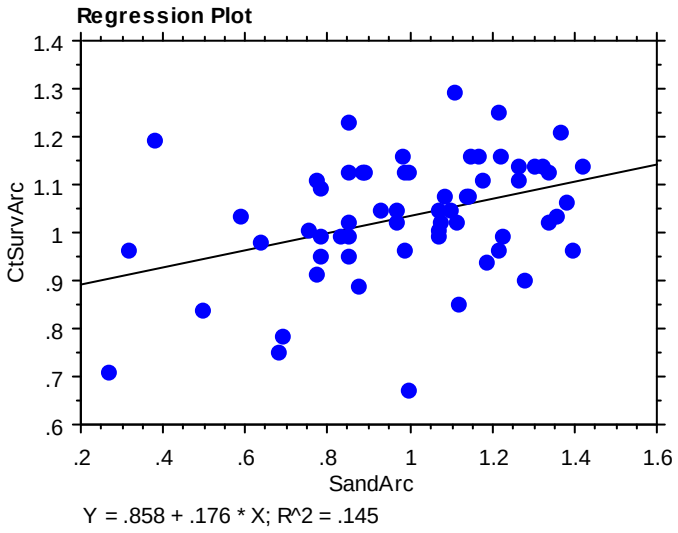


Exhibit D.4.15: *Chironomus dilutus* survival vs. Percent Sand

Regression Summary
CtSurvArc vs. SandCArc

Count	62
Num. Missing	0
R	.180
R Squared	.032
Adjusted R Squared	.016
RMS Residual	.124

ANOVA Table
CtSurvArc vs. SandCArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.031	.031	2.012	.1612
Residual	60	.921	.015		
Total	61	.952			

Regression Coefficients
CtSurvArc vs. SandCArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.007	.025	1.007	40.675	<.0001
SandCArc	.238	.168	.180	1.419	.1612

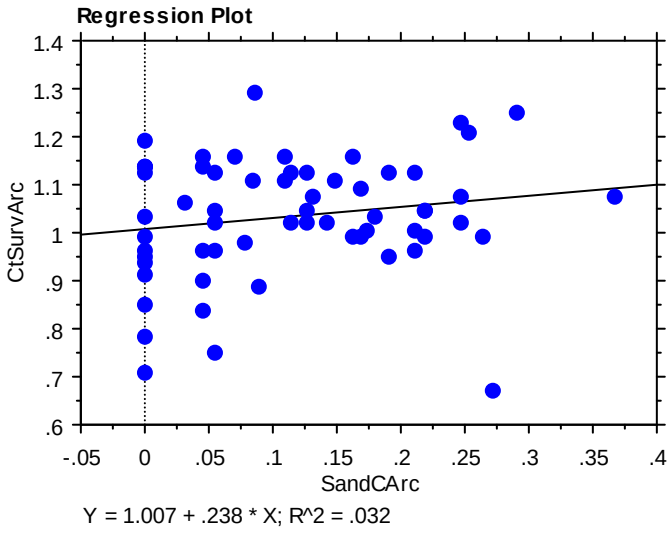


Exhibit D.4.16: *Chironomus dilutus* survival vs. Percent Coarse Sand

Regression Summary
CtSurvArc vs. SandFArc

Count	62
Num. Missing	0
R	.149
R Squared	.022
Adjusted R Squared	.006
RMS Residual	.125

ANOVA Table
CtSurvArc vs. SandFArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.021	.021	1.358	.2484
Residual	60	.930	.016		
Total	61	.952			

Regression Coefficients
CtSurvArc vs. SandFArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.975	.053	.975	18.466	<.0001
SandFArc	.074	.064	.149	1.166	.2484

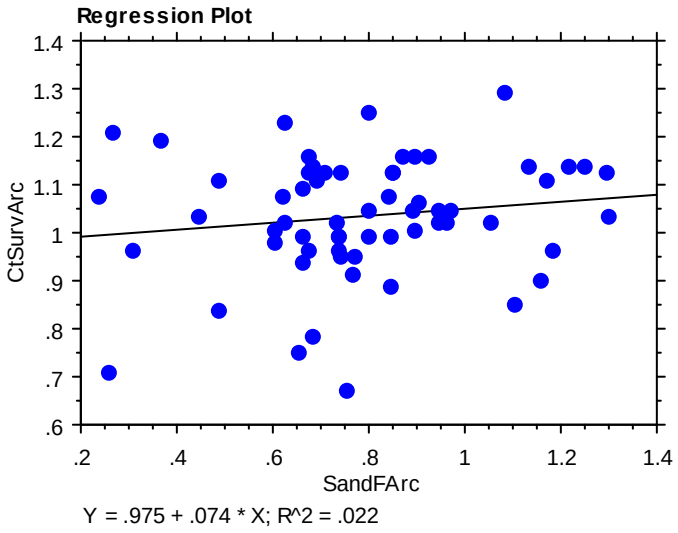


Exhibit D.4.17: *Chironomus dilutus* survival vs. Percent Fine Sand

Regression Summary
CtSurvArc vs. SandMArc

Count	62
Num. Missing	0
R	.301
R Squared	.090
Adjusted R Squared	.075
RMS Residual	.120

ANOVA Table
CtSurvArc vs. SandMArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.086	.086	5.959	.0176
Residual	60	.866	.014		
Total	61	.952			

Regression Coefficients
CtSurvArc vs. SandMArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.981	.026	.981	37.144	<.0001
SandMArc	.147	.060	.301	2.441	.0176

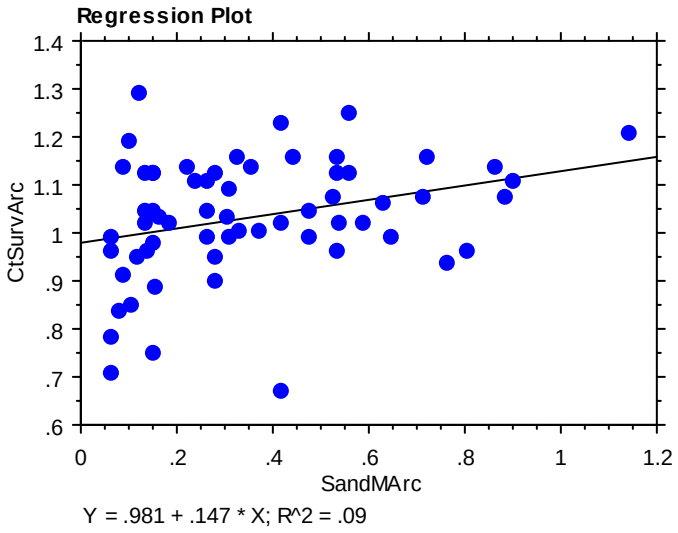


Exhibit D.4.18: *Chironomus dilutus* survival vs. Percent Medium Sand

Chironomus dilutus Growth Regression Analyses

Chironumus dilutus (CTGrowth = C.d. weight, mg)

Regression Summary
CTGrowth vs. logAs

Count	62
Num. Missing	0
R	.294
R Squared	.087
Adjusted R Squared	.071
RMS Residual	.261

ANOVA Table
CTGrowth vs. logAs

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.389	.389	5.697	.0202
Residual	60	4.092	.068		
Total	61	4.481			

Regression Coefficients
CTGrowth vs. logAs

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.631	.114	1.631	14.263	<.0001
logAs	-.278	.117	-.294	-2.387	.0202

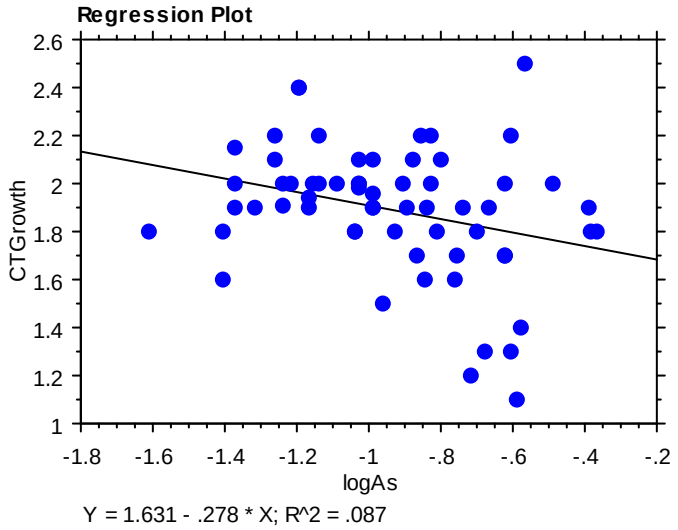


Exhibit D.5.1: *Chironomus dilutus* growth vs. PEC-Q-As

Regression Summary
CTGrowth vs. LogCd

Count	62
Num. Missing	0
R	.255
R Squared	.065
Adjusted R Squared	.049
RMS Residual	.264

ANOVA Table
CTGrowth vs. LogCd

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.291	.291	4.166	.0456
Residual	60	4.190	.070		
Total	61	4.481			

Regression Coefficients
CTGrowth vs. LogCd

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.777	.066	1.777	26.923	<.0001
LogCd	-.136	.067	-.255	-2.041	.0456

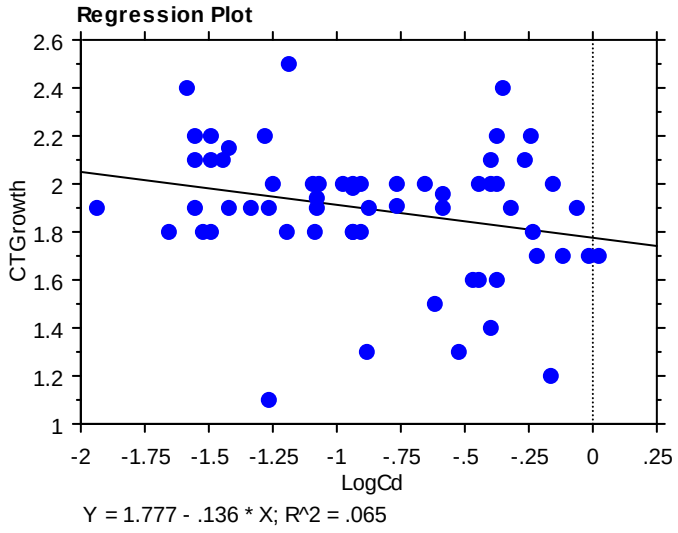


Exhibit D.5.2: *Chironomus dilutus* growth vs. PEC-Q-Cd

Regression Summary
CTGrowth vs. LogCr

Count	62
Num. Missing	0
R	.330
R Squared	.109
Adjusted R Squared	.094
RMS Residual	.258

ANOVA Table
CTGrowth vs. LogCr

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.487	.487	7.317	.0089
Residual	60	3.994	.067		
Total	61	4.481			

Regression Coefficients
CTGrowth vs. LogCr

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.650	.095	1.650	17.311	<.0001
LogCr	-.324	.120	-.330	-2.705	.0089

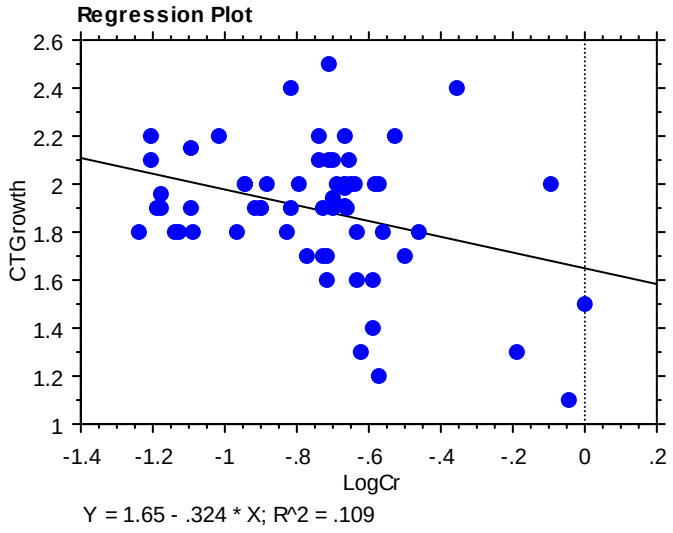


Exhibit D.5.3: *Chironomus dilutus* growth vs. PEC-Q-Cr

Regression Summary
CTGrowth vs. LogCu

Count	62
Num. Missing	0
R	.415
R Squared	.173
Adjusted R Squared	.159
RMS Residual	.249

ANOVA Table
CTGrowth vs. LogCu

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.773	.773	12.512	.0008
Residual	60	3.708	.062		
Total	61	4.481			

Regression Coefficients
CTGrowth vs. LogCu

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.813	.039	1.813	46.856	<.0001
LogCu	-.149	.042	-.415	-3.537	.0008

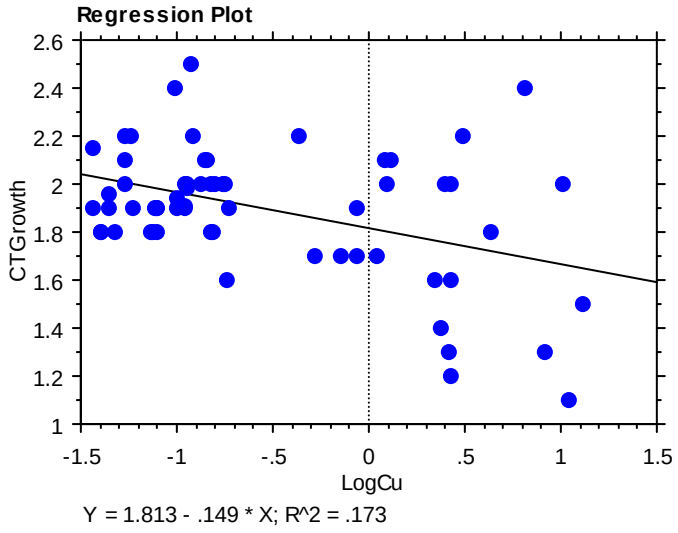


Exhibit D.5.4: *Chironomus dilutus* growth vs. PEC-Q-Cu

Regression Summary
CTGrowth vs. LogPb

Count	62
Num. Missing	0
R	.369
R Squared	.136
Adjusted R Squared	.122
RMS Residual	.254

ANOVA Table
CTGrowth vs. LogPb

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.611	.611	9.479	.0031
Residual	60	3.869	.064		
Total	61	4.481			

Regression Coefficients
CTGrowth vs. LogPb

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.807	.043	1.807	42.375	<.0001
LogPb	-.155	.050	-.369	-3.079	.0031

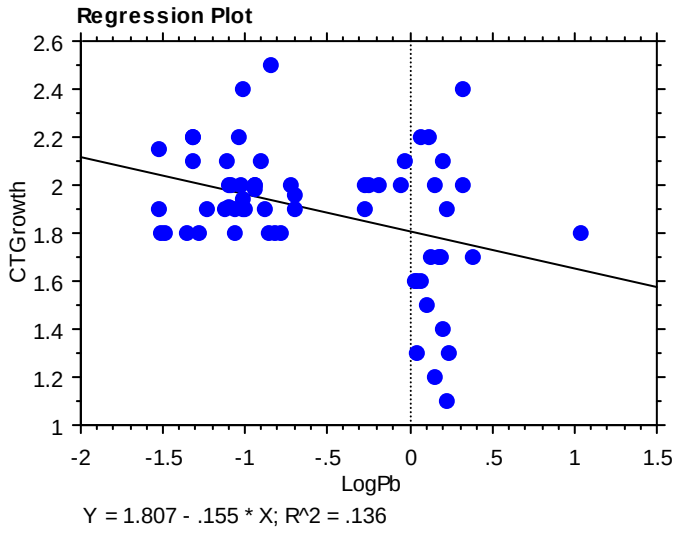


Exhibit D.5.5: *Chironomus dilutus* growth vs. PEC-Q-Pb

Regression Summary
CTGrowth vs. LogHg

Count	62
Num. Missing	0
R	.211
R Squared	.044
Adjusted R Squared	.028
RMS Residual	.267

ANOVA Table
CTGrowth vs. LogHg

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.199	.199	2.786	.1003
Residual	60	4.282	.071		
Total	61	4.481			

Regression Coefficients
CTGrowth vs. LogHg

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.772	.080	1.772	22.179	<.0001
LogHg	-.094	.056	-.211	-1.669	.1003

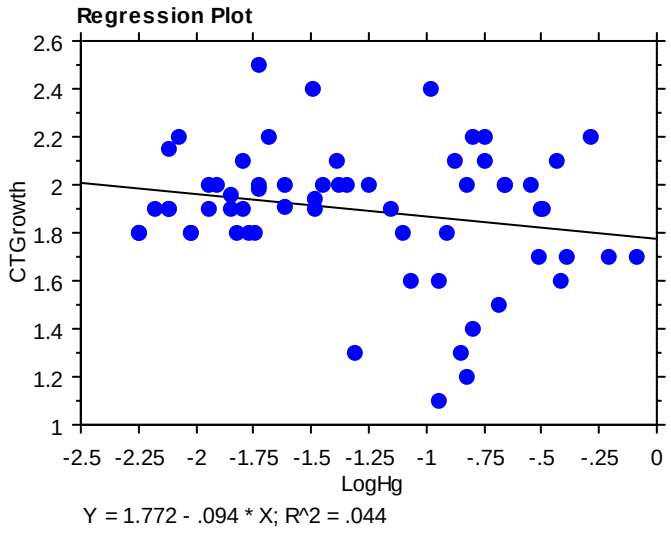


Exhibit D.5.6: *Chironomus dilutus* growth vs. PEC-Q-Hg

Regression Summary
CTGrowth vs. LogNi

Count	62
Num. Missing	0
R	.094
R Squared	.009
Adjusted R Squared	•
RMS Residual	.272

ANOVA Table
CTGrowth vs. LogNi

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.039	.039	.532	.4688
Residual	60	4.441	.074		
Total	61	4.481			

Regression Coefficients
CTGrowth vs. LogNi

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.967	.108	1.967	18.177	<.0001
LogNi	.124	.169	.094	.729	.4688

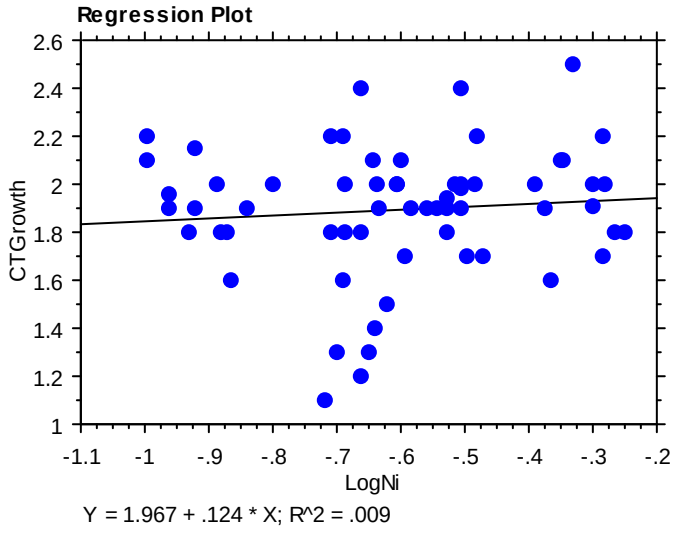


Exhibit D.5.7: *Chironomus dilutus* growth vs. PEC-Q-Ni

Regression Summary
CTGrowth vs. LogZn

Count	62
Num. Missing	0
R	.414
R Squared	.172
Adjusted R Squared	.158
RMS Residual	.249

ANOVA Table
CTGrowth vs. LogZn

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.769	.769	12.432	.0008
Residual	60	3.712	.062		
Total	61	4.481			

Regression Coefficients
CTGrowth vs. LogZn

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.863	.033	1.863	57.079	<.0001
LogZn	-.132	.037	-.414	-3.526	.0008

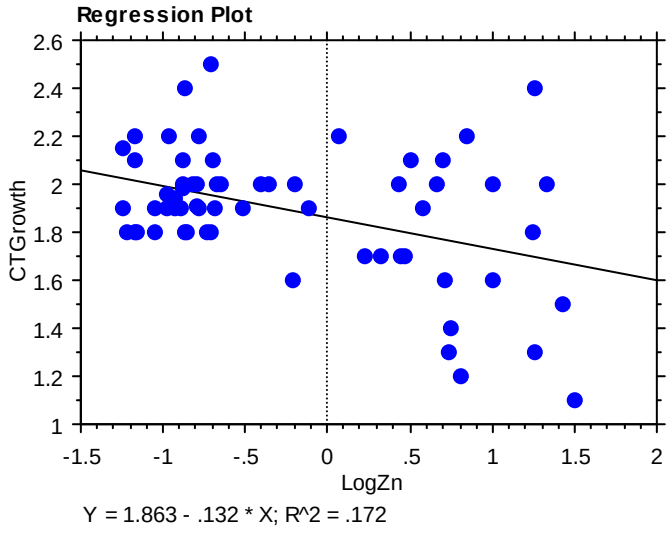


Exhibit D.5.8: *Chironomus dilutus* growth vs. PEC-Q-Zn

Regression Summary
CTGrowth vs. LogmnPECQ

Count	62
Num. Missing	0
R	.422
R Squared	.178
Adjusted R Squared	.164
RMS Residual	.248

ANOVA Table
CTGrowth vs. LogmnPECQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.798	.798	13.004	.0006
Residual	60	3.683	.061		
Total	61	4.481			

Regression Coefficients
CTGrowth vs. LogmnPECQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.798	.041	1.798	43.844	<.0001
LogmnPECQ	-.197	.055	-.422	-3.606	.0006

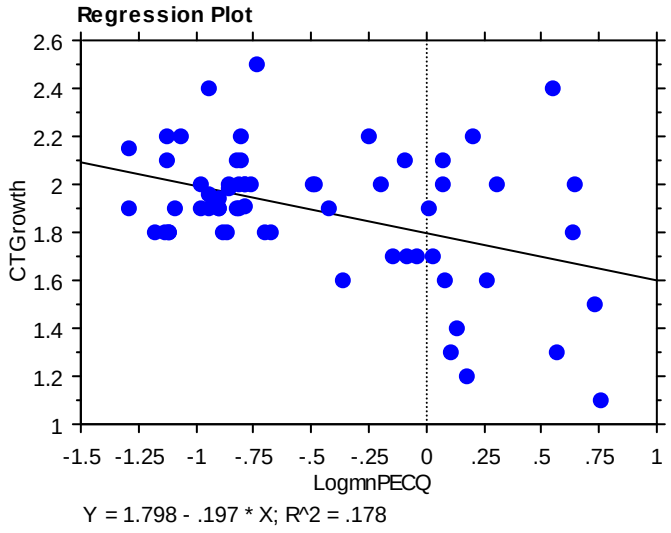


Exhibit D.5.9: *Chironomus dilutus* growth vs. Mean PEC-QMetals

Regression Summary
CTGrowth vs. LogmnMetOCPQ

Count	62
Num. Missing	0
R	.428
R Squared	.183
Adjusted R Squared	.170
RMS Residual	.247

ANOVA Table
CTGrowth vs. LogmnMetOCPQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.821	.821	13.451	.0005
Residual	60	3.660	.061		
Total	61	4.481			

Regression Coefficients
CTGrowth vs. LogmnMetOCPQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.878	.032	1.878	59.418	<.0001
LogmnMetOCPQ	-.135	.037	-.428	-3.668	.0005

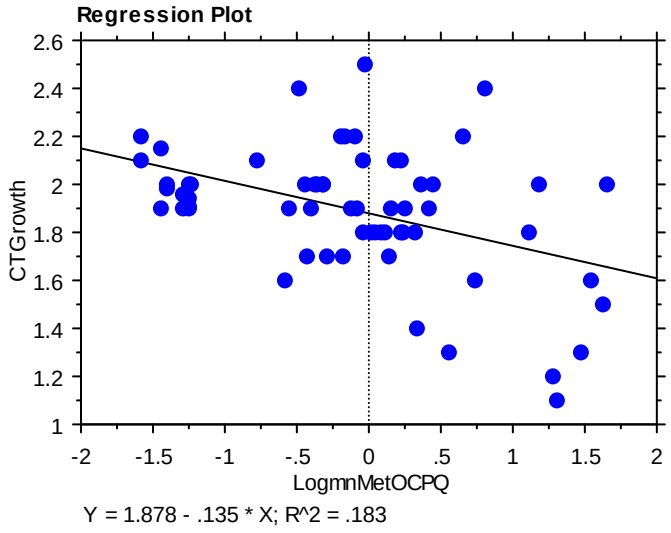


Exhibit D.5.10: *Chironomus dilutus* growth vs. Mean PEC-QMetals/FOC

Regression Summary
CTGrowth vs. logSumPQ

Count	62
Num. Missing	0
R	.422
R Squared	.178
Adjusted R Squared	.164
RMS Residual	.248

ANOVA Table
CTGrowth vs. logSumPQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.798	.798	13.004	.0006
Residual	60	3.683	.061		
Total	61	4.481			

Regression Coefficients
CTGrowth vs. logSumPQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.975	.039	1.975	50.734	<.0001
logSumPQ	-.197	.055	-.422	-3.606	.0006

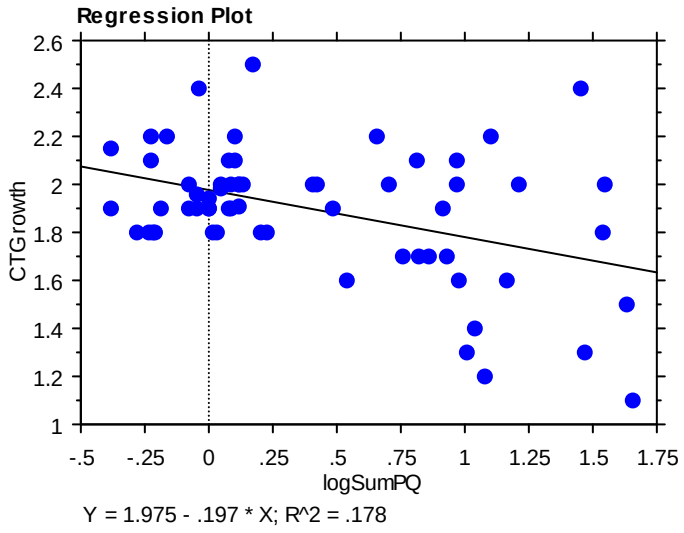


Exhibit D.5.11: *Chironomus dilutus* growth vs. Sum PEC-QMetals

Regression Summary
CTGrowth vs. LogAVS

Count	60
Num. Missing	2
R	.399
R Squared	.159
Adjusted R Squared	.145
RMS Residual	.255

ANOVA Table
CTGrowth vs. LogAVS

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.713	.713	10.991	.0016
Residual	58	3.765	.065		
Total	59	4.478			

Regression Coefficients
CTGrowth vs. LogAVS

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.946	.037	1.946	52.922	<.0001
LogAVS	-.112	.034	-.399	-3.315	.0016

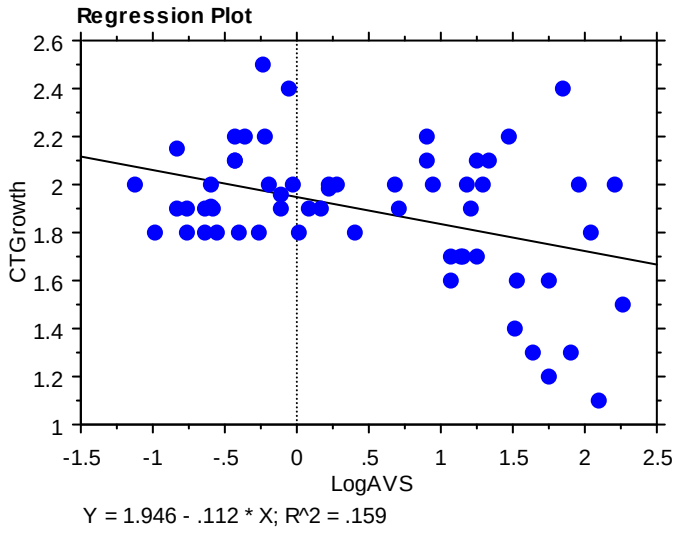


Exhibit D.5.12: *Chironomus dilutus* growth vs. SEM-AVS

Regression Summary
CTGrowth vs. LogAVSOC

Count	60
Num. Missing	2
R	.447
R Squared	.200
Adjusted R Squared	.186
RMS Residual	.249

ANOVA Table
CTGrowth vs. LogAVSOC

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.896	.896	14.502	.0003
Residual	58	3.583	.062		
Total	59	4.478			

Regression Coefficients
CTGrowth vs. LogAVSOC

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	2.201	.087	2.201	25.214	<.0001
LogAVSOC	-.108	.028	-.447	-3.808	.0003

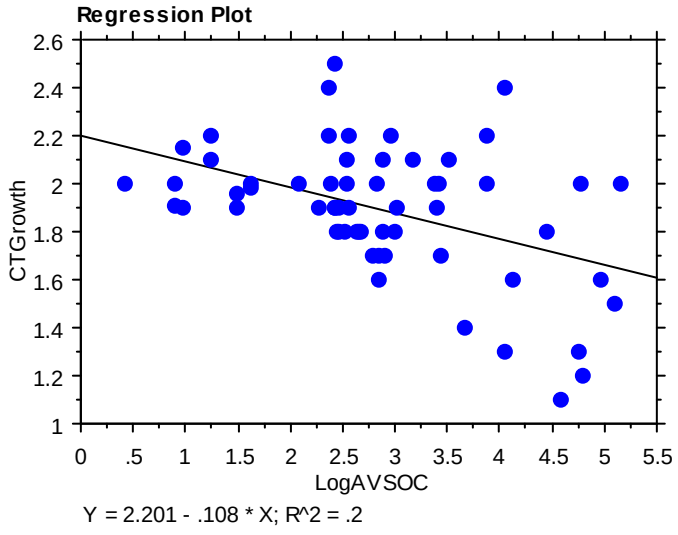


Exhibit D.5.13: *Chironomus dilutus* growth vs. SEM-AVS/FOC

Regression Summary
CTGrowth vs. LogTOC

Count	62
Num. Missing	0
R	.205
R Squared	.042
Adjusted R Squared	.026
RMS Residual	.267

ANOVA Table
CTGrowth vs. LogTOC

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.189	.189	2.641	.1094
Residual	60	4.292	.072		
Total	61	4.481			

Regression Coefficients
CTGrowth vs. LogTOC

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.535	.223	1.535	6.889	<.0001
LogTOC	.098	.060	.205	1.625	.1094

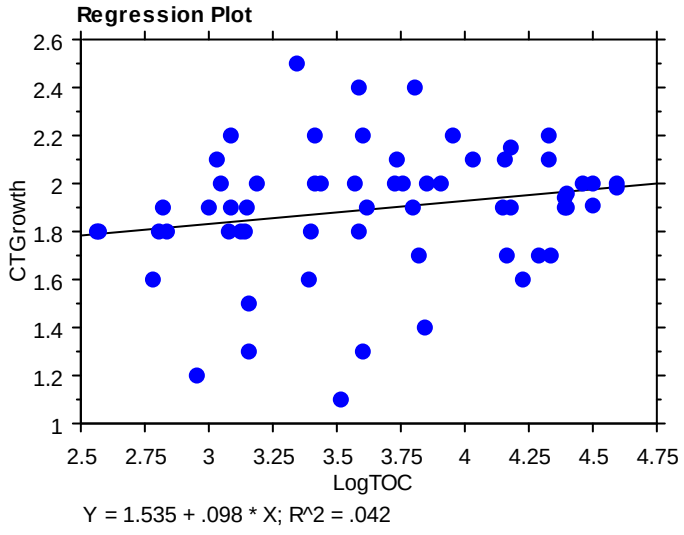


Exhibit D.5.14: *Chironomus dilutus* growth vs. TOC

Regression Summary
CTGrowth vs. SandArc

Count	62
Num. Missing	0
R	.272
R Squared	.074
Adjusted R Squared	.058
RMS Residual	.263

ANOVA Table
CTGrowth vs. SandArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.330	.330	4.777	.0327
Residual	60	4.150	.069		
Total	61	4.481			

Regression Coefficients
CTGrowth vs. SandArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	2.166	.129	2.166	16.752	<.0001
SandArc	-.273	.125	-.272	-2.186	.0327

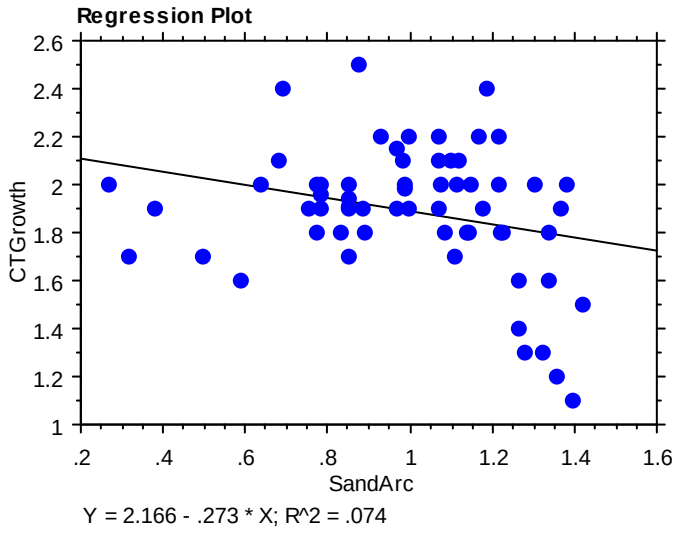


Exhibit D.5.15: *Chironomus dilutus* growth vs. Percent Sand

Regression Summary
CTGrowth vs. SandCArc

Count	62
Num. Missing	0
R	.193
R Squared	.037
Adjusted R Squared	.021
RMS Residual	.268

ANOVA Table
CTGrowth vs. SandCArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.166	.166	2.311	.1337
Residual	60	4.315	.072		
Total	61	4.481			

Regression Coefficients
CTGrowth vs. SandCArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.830	.054	1.830	34.152	<.0001
SandCArc	.552	.363	.193	1.520	.1337

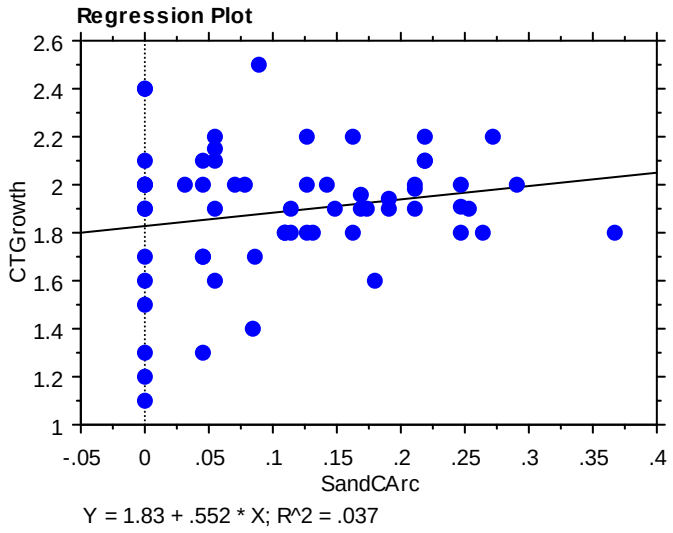


Exhibit D.5.16: *Chironomus dilutus* growth vs. Percent Coarse Sand

Regression Summary
CTGrowth vs. SandFArc

Count	62
Num. Missing	0
R	.186
R Squared	.035
Adjusted R Squared	.018
RMS Residual	.269

ANOVA Table
CTGrowth vs. SandFArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.155	.155	2.149	.1479
Residual	60	4.326	.072		
Total	61	4.481			

Regression Coefficients
CTGrowth vs. SandFArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	2.052	.114	2.052	18.022	<.0001
SandFArc	-.202	.138	-.186	-1.466	.1479

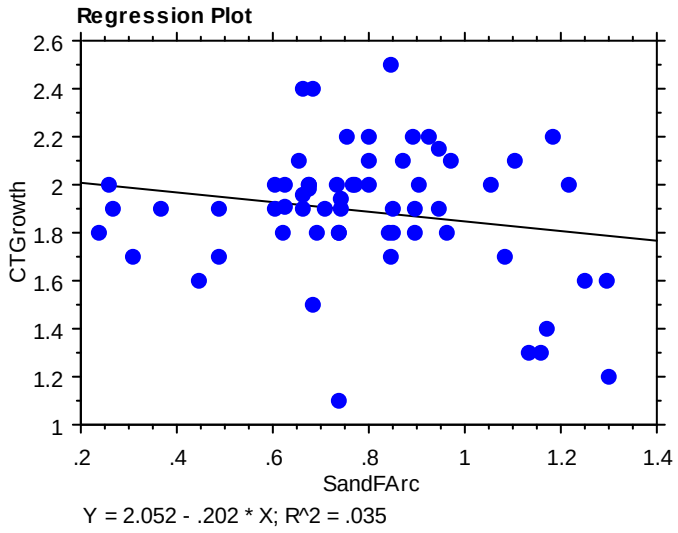


Exhibit D.5.17: *Chironomus dilutus* growth vs. Percent Fine Sand

Regression Summary
CTGrowth vs. SandMArc

Count	62
Num. Missing	0
R	.075
R Squared	.006
Adjusted R Squared	•
RMS Residual	.273

ANOVA Table
CTGrowth vs. SandMArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.025	.025	.337	.5639
Residual	60	4.456	.074		
Total	61	4.481			

Regression Coefficients
CTGrowth vs. SandMArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.921	.060	1.921	32.054	<.0001
SandMArc	-.079	.137	-.075	-.580	.5639

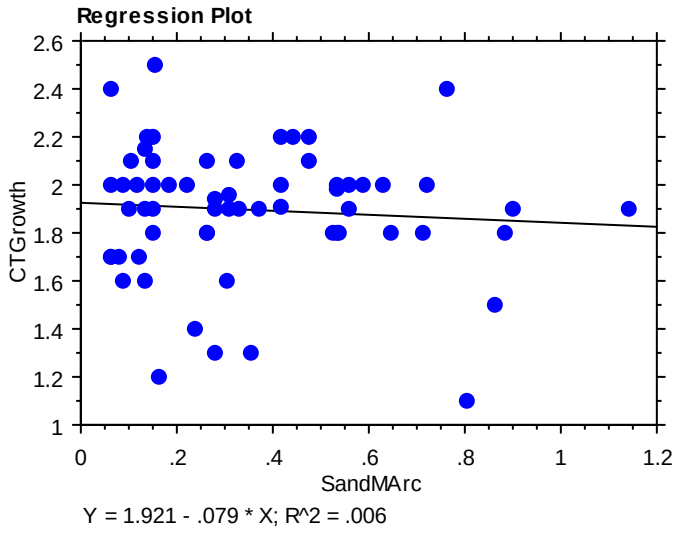


Exhibit D.5.18: *Chironomus dilutus* growth vs. Percent Medium Sand

Chironomus dilutus Biomass Regression Analyses

Chironumus dilutus (CtBiom = C.d. biomass, mg)

Regression Summary
CtBiom vs. logAs

Count	62
Num. Missing	0
R	.165
R Squared	.027
Adjusted R Squared	.011
RMS Residual	.231

ANOVA Table
CtBiom vs. logAs

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.090	.090	1.683	.1995
Residual	60	3.199	.053		
Total	61	3.289			

Regression Coefficients
CtBiom vs. logAs

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.131	.101	1.131	11.186	<.0001
logAs	-.134	.103	-.165	-1.297	.1995

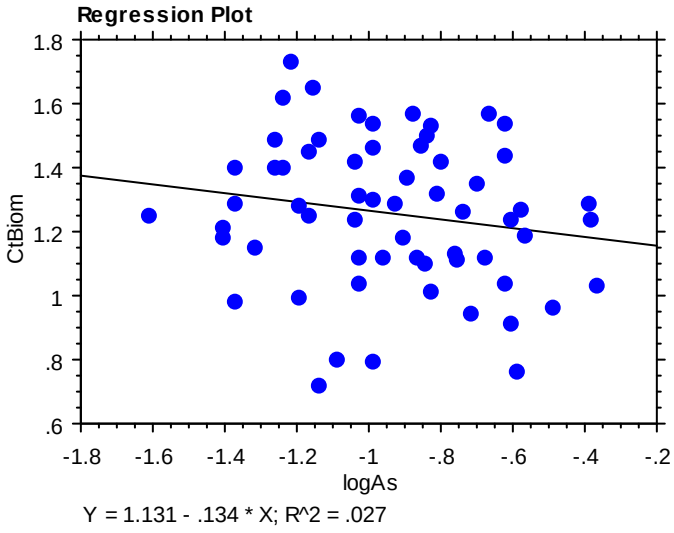


Exhibit D.6.1: *Chironomus dilutus* biomass vs. PEC-Q-As

Regression Summary
CtBiom vs. LogCd

Count	62
Num. Missing	0
R	.125
R Squared	.016
Adjusted R Squared	•
RMS Residual	.232

ANOVA Table
CtBiom vs. LogCd

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.051	.051	.950	.3337
Residual	60	3.238	.054		
Total	61	3.289			

Regression Coefficients
CtBiom vs. LogCd

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.305	.058	1.305	22.504	<.0001
LogCd	.057	.059	.125	.975	.3337

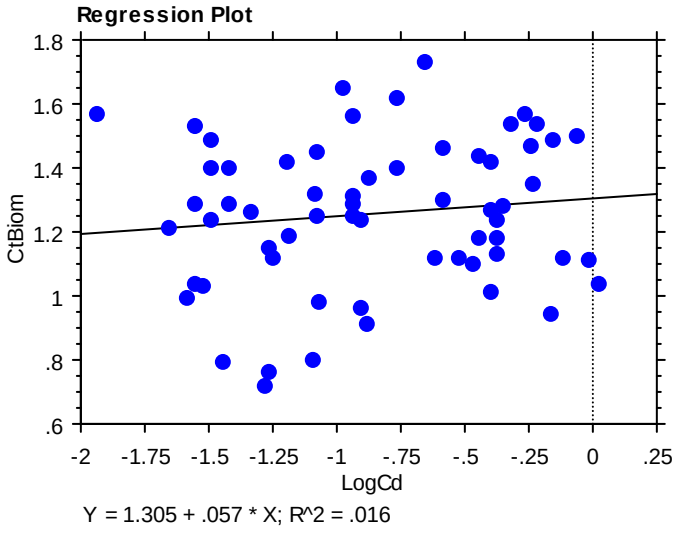


Exhibit D.6.2: *Chironomus dilutus* biomass vs. PEC-Q-Cd

Regression Summary
CtBiom vs. LogCr

Count	62
Num. Missing	0
R	.434
R Squared	.188
Adjusted R Squared	.174
RMS Residual	.211

ANOVA Table
CtBiom vs. LogCr

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.618	.618	13.888	.0004
Residual	60	2.671	.045		
Total	61	3.289			

Regression Coefficients
CtBiom vs. LogCr

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.984	.078	.984	12.619	<.0001
LogCr	-.366	.098	-.434	-3.727	.0004

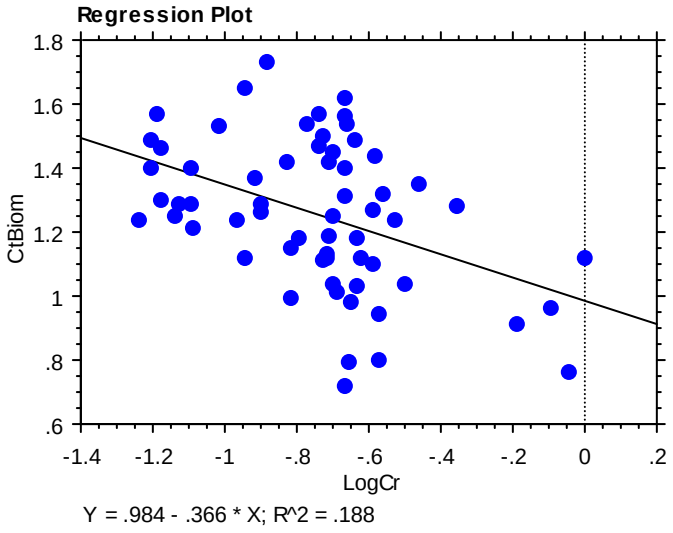


Exhibit D.6.3: *Chironomus dilutus* biomass vs. PEC-Q-Cr

Regression Summary
CtBiom vs. LogCu

Count	62
Num. Missing	0
R	.201
R Squared	.040
Adjusted R Squared	.024
RMS Residual	.229

ANOVA Table
CtBiom vs. LogCu

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.133	.133	2.519	.1177
Residual	60	3.156	.053		
Total	61	3.289			

Regression Coefficients
CtBiom vs. LogCu

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.224	.036	1.224	34.276	<.0001
LogCu	-.062	.039	-.201	-1.587	.1177

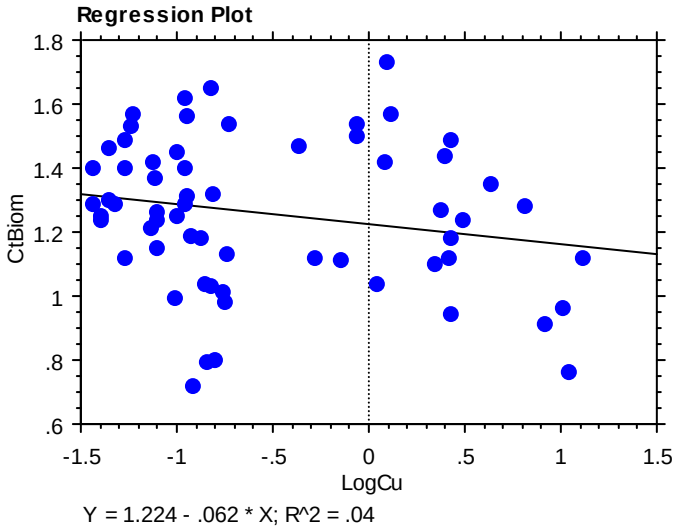


Exhibit D.6.4: *Chironomus dilutus* biomass vs. PEC-Q-Cu

Regression Summary
CtBiom vs. LogPb

Count	62
Num. Missing	0
R	.084
R Squared	.007
Adjusted R Squared	•
RMS Residual	.233

ANOVA Table
CtBiom vs. LogPb

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.023	.023	.426	.5164
Residual	60	3.266	.054		
Total	61	3.289			

Regression Coefficients
CtBiom vs. LogPb

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.240	.039	1.240	31.658	<.0001
LogPb	-.030	.046	-.084	-.653	.5164

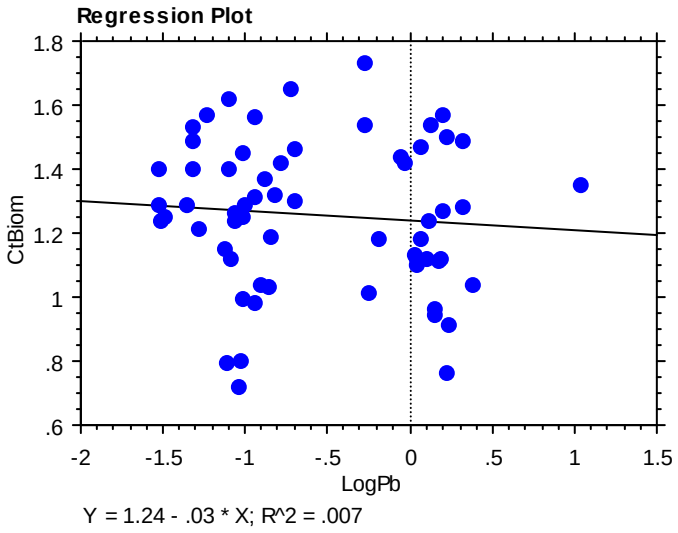


Exhibit D.6.5: *Chironomus dilutus* biomass vs. PEC-Q-Pb

Regression Summary
CtBiom vs. LogHg

Count	62
Num. Missing	0
R	.013
R Squared	1.751E-4
Adjusted R Squared	•
RMS Residual	.234

ANOVA Table
CtBiom vs. LogHg

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.001	.001	.011	.9187
Residual	60	3.288	.055		
Total	61	3.289			

Regression Coefficients
CtBiom vs. LogHg

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.263	.070	1.263	18.043	<.0001
LogHg	.005	.049	.013	.102	.9187

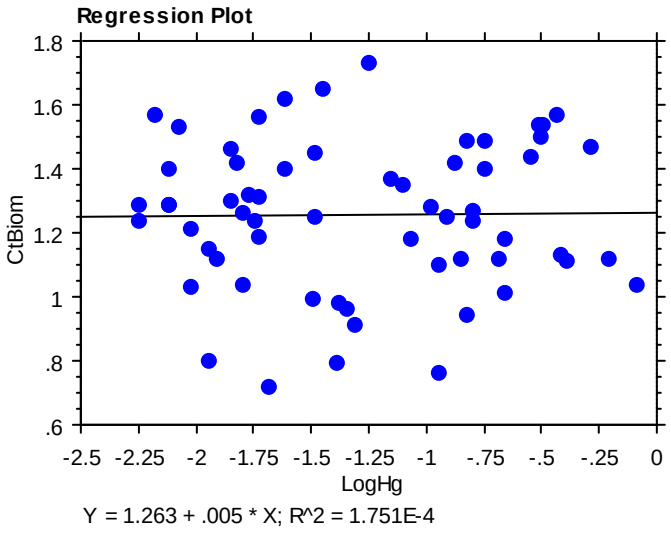


Exhibit D.6.6: *Chironomus dilutus* biomass vs. PEC-Q-Hg

Regression Summary
CtBiom vs. LogNi

Count	62
Num. Missing	0
R	.317
R Squared	.101
Adjusted R Squared	.086
RMS Residual	.222

ANOVA Table
CtBiom vs. LogNi

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.331	.331	6.709	.0120
Residual	60	2.958	.049		
Total	61	3.289			

Regression Coefficients
CtBiom vs. LogNi

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.040	.088	1.040	11.773	<.0001
LogNi	-.358	.138	-.317	-2.590	.0120

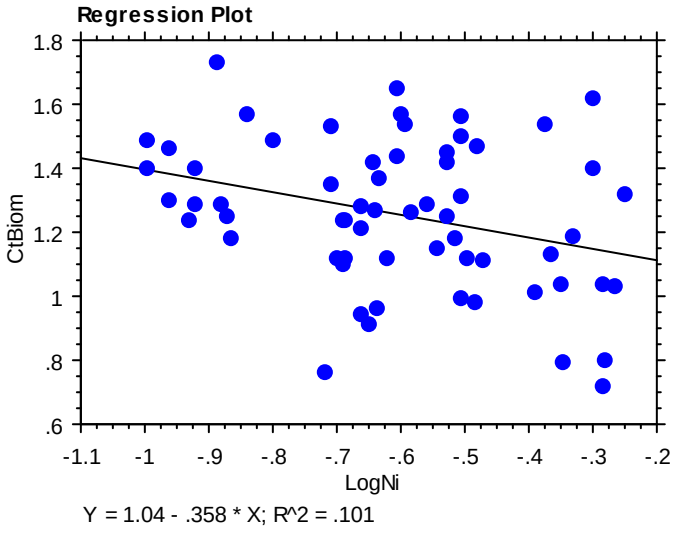


Exhibit D.6.7: *Chironomus dilutus* biomass vs. PEC-Q-Ni

Regression Summary
CtBiom vs. LogmnPECQ

Count	62
Num. Missing	0
R	.189
R Squared	.036
Adjusted R Squared	.020
RMS Residual	.230

ANOVA Table
CtBiom vs. LogmnPECQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.117	.117	2.215	.1419
Residual	60	3.172	.053		
Total	61	3.289			

Regression Coefficients
CtBiom vs. LogmnPECQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.220	.038	1.220	32.070	<.0001
LogmnPECQ	-.075	.051	-.189	-1.488	.1419

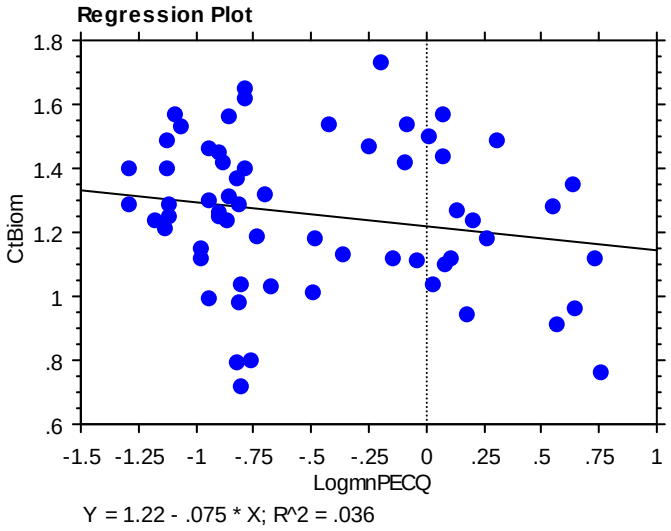


Exhibit D.6.8: *Chironomus dilutus* biomass vs. Mean PEC-QMetals

Regression Summary
CtBiom vs. LogmnMetOCPQ

Count	62
Num. Missing	0
R	.290
R Squared	.084
Adjusted R Squared	.069
RMS Residual	.224

ANOVA Table
CtBiom vs. LogmnMetOCPQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.277	.277	5.514	.0222
Residual	60	3.012	.050		
Total	61	3.289			

Regression Coefficients
CtBiom vs. LogmnMetOCPQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.248	.029	1.248	43.535	<.0001
LogmnMetOCPQ	-.078	.033	-.290	-2.348	.0222

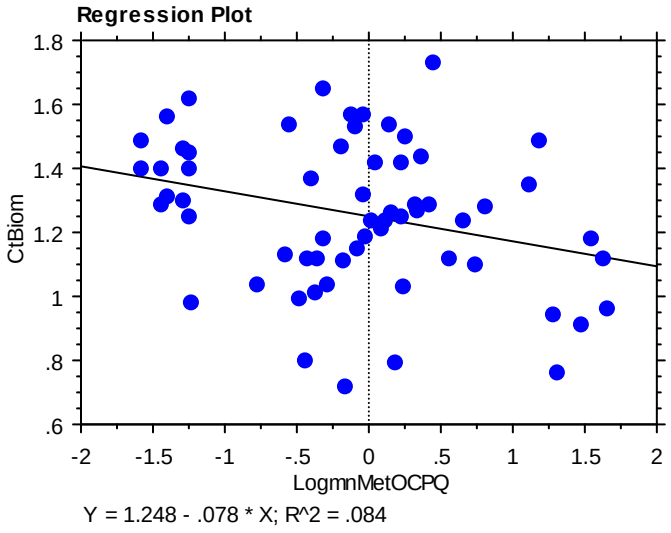


Exhibit D.6.9: *Chironomus dilutus* biomass vs. Mean PEC-QMetals/FOC

Regression Summary
CtBiom vs. logSumPQ

Count	62
Num. Missing	0
R	.189
R Squared	.036
Adjusted R Squared	.020
RMS Residual	.230

ANOVA Table
CtBiom vs. logSumPQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.117	.117	2.215	.1419
Residual	60	3.172	.053		
Total	61	3.289			

Regression Coefficients
CtBiom vs. logSumPQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.288	.036	1.288	35.657	<.0001
logSumPQ	-.075	.051	-.189	-1.488	.1419

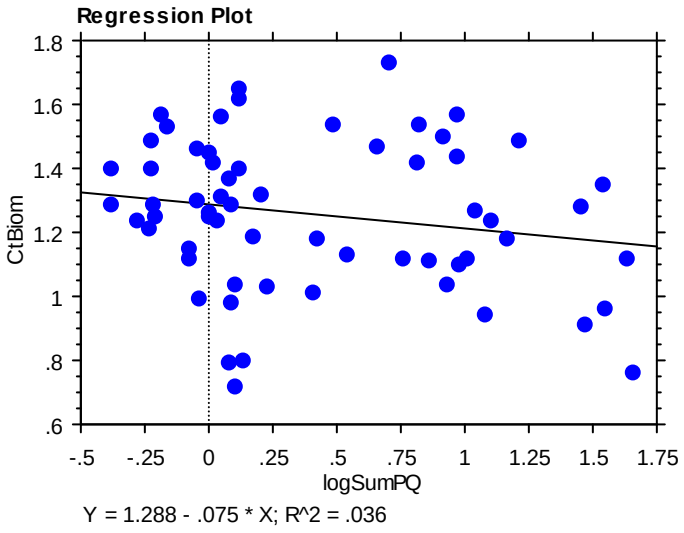


Exhibit D.6.10: *Chironomus dilutus* biomass vs. Sum PEC-QMetals

Regression Summary
CtBiom vs. LogAVS

Count	60
Num. Missing	2
R	.086
R Squared	.007
Adjusted R Squared	•
RMS Residual	.236

ANOVA Table
CtBiom vs. LogAVS

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.024	.024	.435	.5124
Residual	58	3.227	.056		
Total	59	3.251			

Regression Coefficients
CtBiom vs. LogAVS

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.264	.034	1.264	37.117	<.0001
LogAVS	-.021	.031	-.086	-.659	.5124

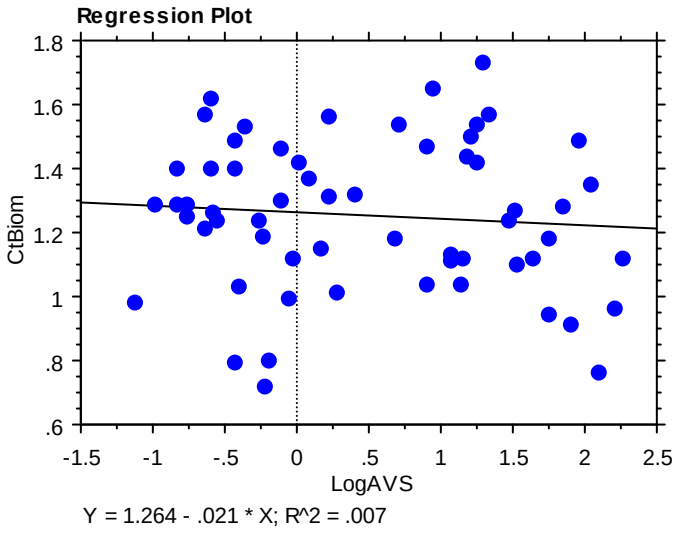


Exhibit D.6.11: *Chironomus dilutus* biomass vs. SEM-AVS

Regression Summary
CtBiom vs. LogAVSOC

Count	60
Num. Missing	2
R	.186
R Squared	.034
Adjusted R Squared	.018
RMS Residual	.233

ANOVA Table
CtBiom vs. LogAVSOC

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.112	.112	2.072	.1554
Residual	58	3.139	.054		
Total	59	3.251			

Regression Coefficients
CtBiom vs. LogAVSOC

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.363	.082	1.363	16.683	<.0001
LogAVSOC	-.038	.027	-.186	-1.439	.1554

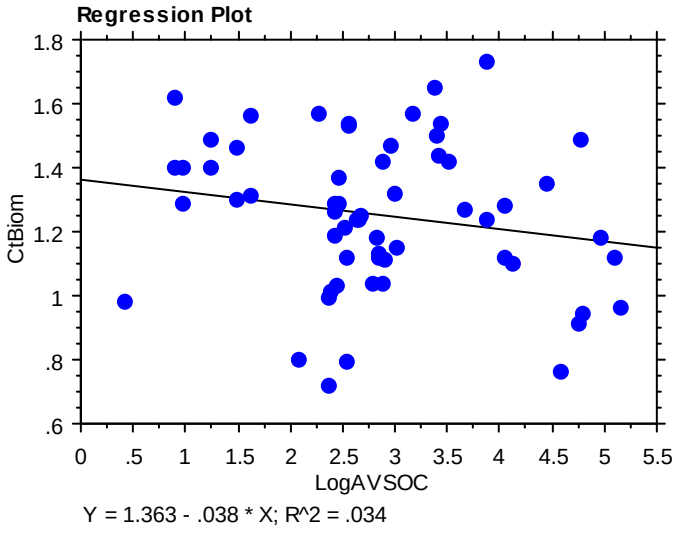


Exhibit D.6.12: *Chironomus dilutus* biomass vs. SEM-AVS/FOC

Regression Summary
CtBiom vs. LogTOC

Count	62
Num. Missing	0
R	.235
R Squared	.055
Adjusted R Squared	.039
RMS Residual	.228

ANOVA Table
CtBiom vs. LogTOC

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.181	.181	3.497	.0664
Residual	60	3.108	.052		
Total	61	3.289			

Regression Coefficients
CtBiom vs. LogTOC

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.906	.190	.906	4.781	<.0001
LogTOC	.096	.051	.235	1.870	.0664

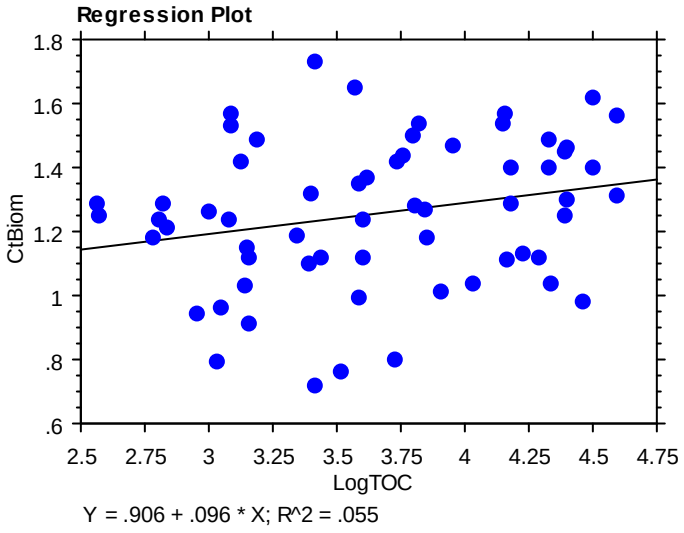


Exhibit D.6.13: *Chironomus dilutus* biomass vs. TOC

Regression Summary
CtBiom vs. SandArc

Count	62
Num. Missing	0
R	.111
R Squared	.012
Adjusted R Squared	•
RMS Residual	.233

ANOVA Table
CtBiom vs. SandArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.041	.041	.750	.3899
Residual	60	3.248	.054		
Total	61	3.289			

Regression Coefficients
CtBiom vs. SandArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.161	.114	1.161	10.152	<.0001
SandArc	.096	.111	.111	.866	.3899

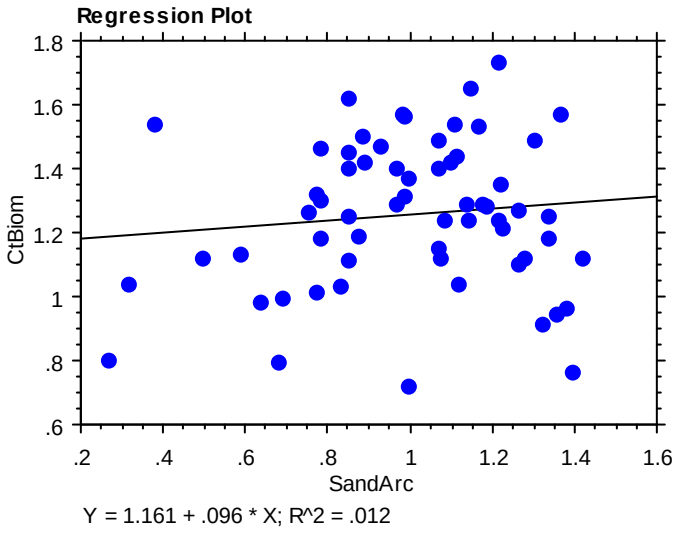


Exhibit D.6.14: *Chironomus dilutus* biomass vs. Percent Sand

Regression Summary
CtBiom vs. SandCArc

Count	62
Num. Missing	0
R	.388
R Squared	.151
Adjusted R Squared	.136
RMS Residual	.216

ANOVA Table
CtBiom vs. SandCArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.495	.495	10.634	.0018
Residual	60	2.794	.047		
Total	61	3.289			

Regression Coefficients
CtBiom vs. SandCArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.148	.043	1.148	26.633	<.0001
SandCArc	.953	.292	.388	3.261	.0018

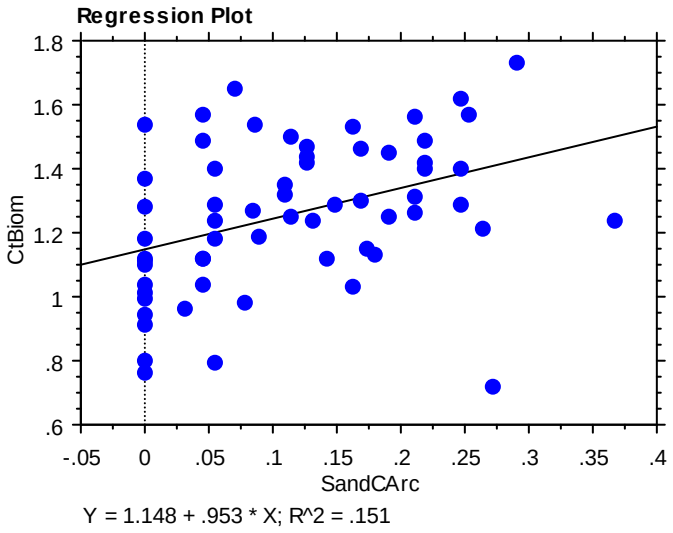


Exhibit D.6.15: *Chironomus dilutus* biomass vs. Percent Coarse Sand

Regression Summary
CtBiom vs. SandFArc

Count	62
Num. Missing	0
R	.002
R Squared	3.847E-6
Adjusted R Squared	•
RMS Residual	.234

ANOVA Table
CtBiom vs. SandFArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	1.265E-5	1.265E-5	2.308E-4	.9879
Residual	60	3.289	.055		
Total	61	3.289			

Regression Coefficients
CtBiom vs. SandFArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.258	.099	1.258	12.674	<.0001
SandFArc	-.002	.120	-.002	-.015	.9879

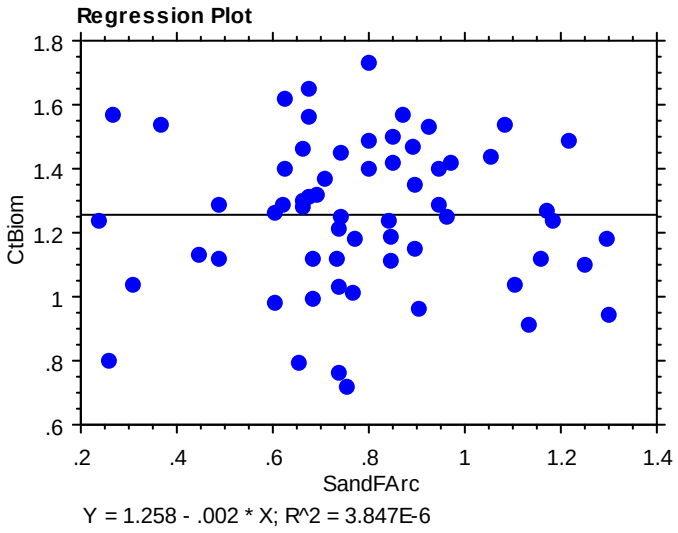


Exhibit D.6.16: *Chironomus dilutus* biomass vs. Percent Fine Sand

Regression Summary
CtBiom vs. SandMArc

Count	62
Num. Missing	0
R	.182
R Squared	.033
Adjusted R Squared	.017
RMS Residual	.230

ANOVA Table
CtBiom vs. SandMArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.109	.109	2.053	.1571
Residual	60	3.180	.053		
Total	61	3.289			

Regression Coefficients
CtBiom vs. SandMArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.198	.051	1.198	23.653	<.0001
SandMArc	.165	.115	.182	1.433	.1571

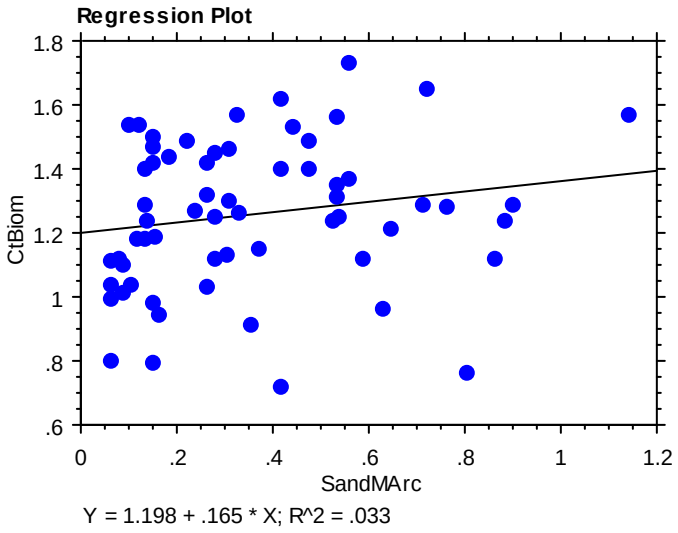


Exhibit D.6.17: *Chironomus dilutus* biomass vs. Percent Medium Sand

Ceriodaphnia dubia Survival Regression Analyses

Ceriodaphnia dubia (CDSurvArc = Arcsin C.d. survival, %)

Regression Summary
CDSurvArc vs. logAs

Count	62
Num. Missing	0
R	.097
R Squared	.009
Adjusted R Squared	•
RMS Residual	.337

ANOVA Table
CDSurvArc vs. logAs

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.064	.064	.567	.4542
Residual	60	6.801	.113		
Total	61	6.865			

Regression Coefficients
CDSurvArc vs. logAs

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.240	.147	1.240	8.410	<.0001
logAs	-.113	.150	-.097	-.753	.4542

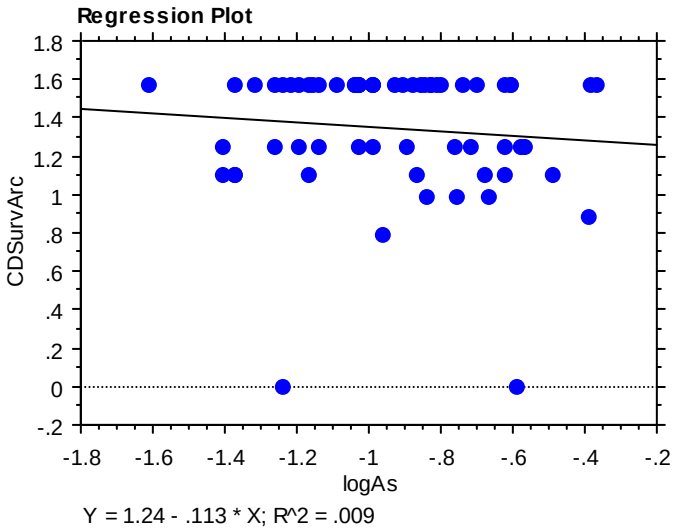


Exhibit D.7.1: ***Ceriodaphnia dubia*** **vs. PEC-Q-As**

Regression Summary
CDSurvArc vs. LogCd

Count	62
Num. Missing	0
R	.023
R Squared	.001
Adjusted R Squared	•
RMS Residual	.338

ANOVA Table
CDSurvArc vs. LogCd

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.003	.003	.031	.8619
Residual	60	6.861	.114		
Total	61	6.865			

Regression Coefficients
CDSurvArc vs. LogCd

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.359	.084	1.359	16.093	<.0001
LogCd	.015	.085	.023	.175	.8619

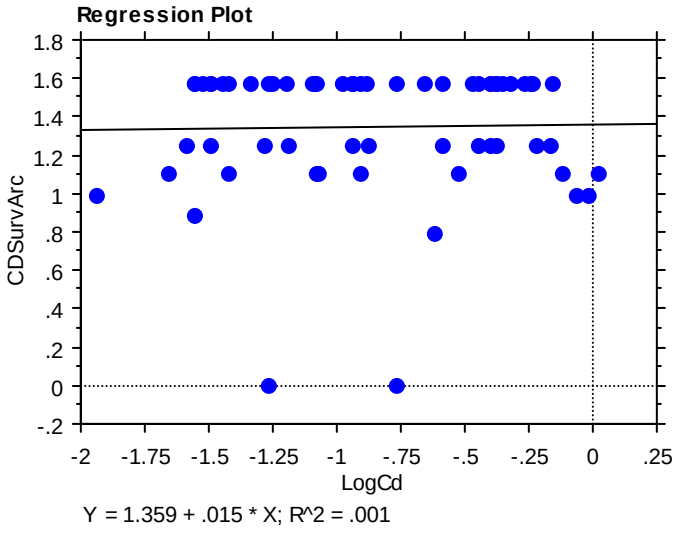


Exhibit D.7.2: ***Ceriodaphnia dubia*** **vs. PEC-Q-Cd**

Regression Summary
CDSurvArc vs. LogCr

Count	62
Num. Missing	0
R	.274
R Squared	.075
Adjusted R Squared	.060
RMS Residual	.325

ANOVA Table
CDSurvArc vs. LogCr

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.516	.516	4.879	.0310
Residual	60	6.349	.106		
Total	61	6.865			

Regression Coefficients
CDSurvArc vs. LogCr

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.097	.120	1.097	9.126	<.0001
LogCr	-.334	.151	-.274	-2.209	.0310

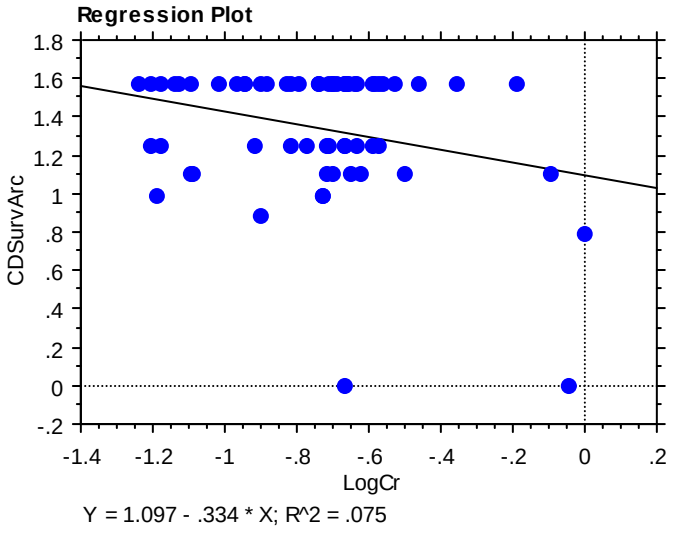


Exhibit D.7.3: ***Ceriodaphnia dubia*** **vs. PEC-Q-Cr**

Regression Summary
CDSurvArc vs. LogCu

Count	62
Num. Missing	0
R	.204
R Squared	.042
Adjusted R Squared	.026
RMS Residual	.331

ANOVA Table
CDSurvArc vs. LogCu

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.285	.285	2.598	.1122
Residual	60	6.580	.110		
Total	61	6.865			

Regression Coefficients
CDSurvArc vs. LogCu

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.298	.052	1.298	25.180	<.0001
LogCu	-.091	.056	-.204	-1.612	.1122

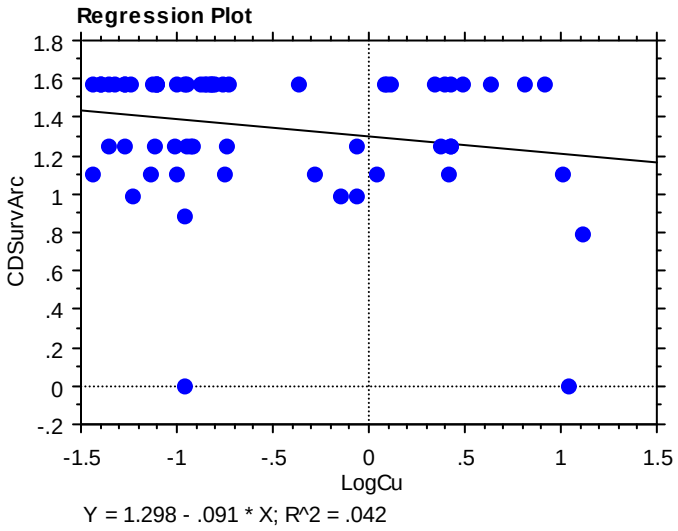


Exhibit D.7.4: ***Ceriodaphnia dubia*** **vs. PEC-Q-Cu**

Regression Summary
CDSurvArc vs. LogPb

Count	62
Num. Missing	0
R	.106
R Squared	.011
Adjusted R Squared	•
RMS Residual	.336

ANOVA Table
CDSurvArc vs. LogPb

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.078	.078	.688	.4101
Residual	60	6.787	.113		
Total	61	6.865			

Regression Coefficients
CDSurvArc vs. LogPb

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.316	.056	1.316	23.299	<.0001
LogPb	-.055	.067	-.106	-.830	.4101

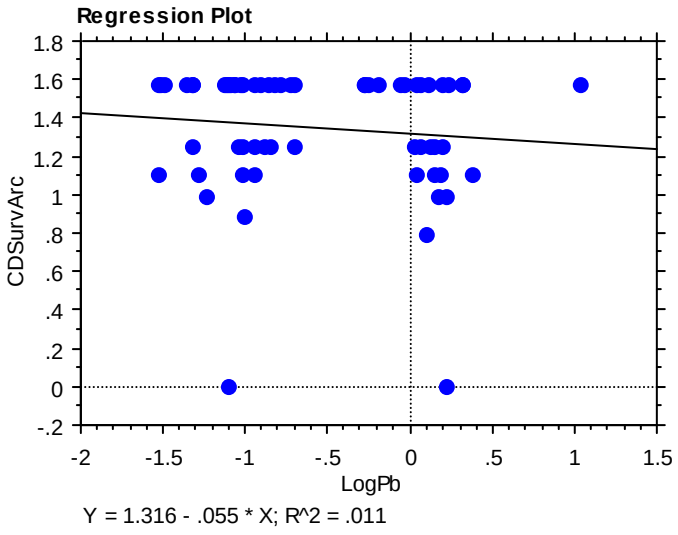


Exhibit D.7.5: *Ceriodaphnia dubia* vs. PEC-Q-Pb

Regression Summary
CDSurvArc vs. LogHg

Count	62
Num. Missing	0
R	.097
R Squared	.009
Adjusted R Squared	•
RMS Residual	.337

ANOVA Table
CDSurvArc vs. LogHg

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.064	.064	.566	.4549
Residual	60	6.801	.113		
Total	61	6.865			

Regression Coefficients
CDSurvArc vs. LogHg

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.278	.101	1.278	12.691	<.0001
LogHg	-.053	.071	-.097	-.752	.4549

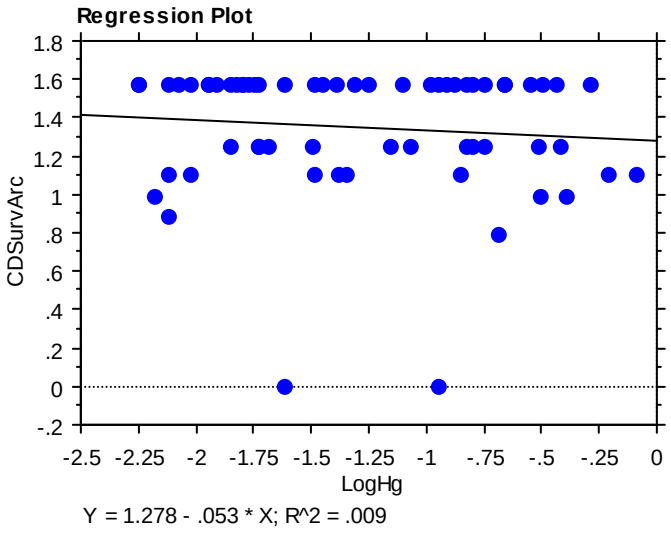


Exhibit D.7.6: *Ceriodaphnia dubia* vs. PEC-Q-Hg

Regression Summary
CDSurvArc vs. LogNi

Count	62
Num. Missing	0
R	.083
R Squared	.007
Adjusted R Squared	•
RMS Residual	.337

ANOVA Table
CDSurvArc vs. LogNi

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.047	.047	.412	.5235
Residual	60	6.818	.114		
Total	61	6.865			

Regression Coefficients
CDSurvArc vs. LogNi

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.265	.134	1.265	9.431	<.0001
LogNi	-.135	.210	-.083	-.642	.5235

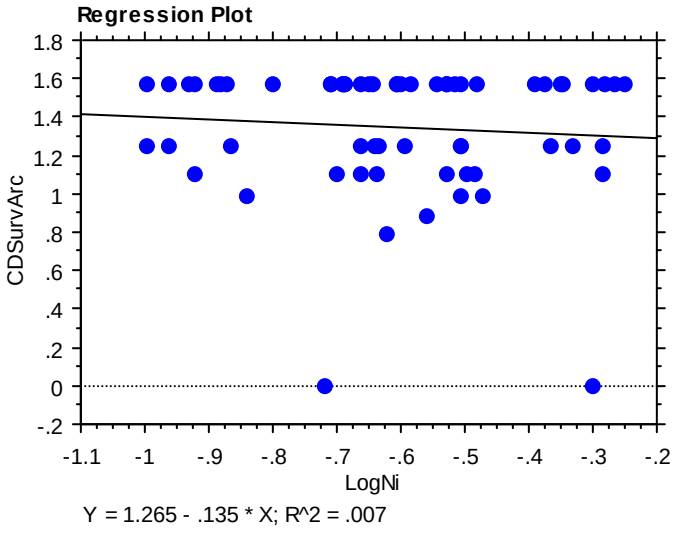


Exhibit D.7.7: *Ceriodaphnia dubia* vs. PEC-Q-Ni

Regression Summary
CDSurvArc vs. LogZn

Count	62
Num. Missing	0
R	.181
R Squared	.033
Adjusted R Squared	.017
RMS Residual	.333

ANOVA Table
CDSurvArc vs. LogZn

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.225	.225	2.037	.1587
Residual	60	6.639	.111		
Total	61	6.865			

Regression Coefficients
CDSurvArc vs. LogZn

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.331	.044	1.331	30.472	<.0001
LogZn	-.071	.050	-.181	-1.427	.1587

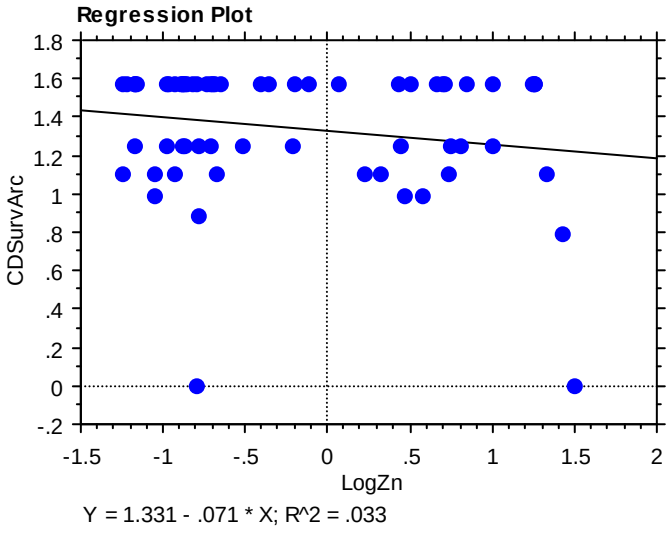


Exhibit D.7.8: ***Ceriodaphnia dubia*** **vs. PEC-Q-Zn**

Regression Summary
CDSurvArc vs. LogmnPECQ

Count	62
Num. Missing	0
R	.204
R Squared	.042
Adjusted R Squared	.026
RMS Residual	.331

ANOVA Table
CDSurvArc vs. LogmnPECQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.287	.287	2.616	.1111
Residual	60	6.578	.110		
Total	61	6.865			

Regression Coefficients
CDSurvArc vs. LogmnPECQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.289	.055	1.289	23.529	<.0001
LogmnPECQ	-.118	.073	-.204	-1.617	.1111

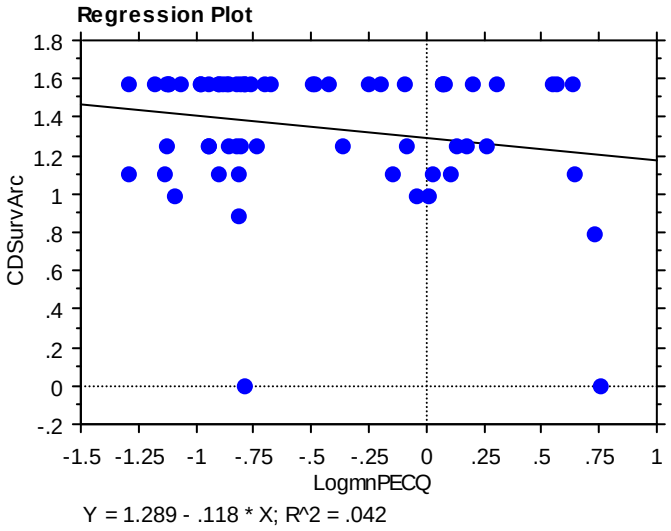


Exhibit D.7.9: *Ceriodaphnia dubia* vs. Mean PEC-QMetals

Regression Summary
CDSurvArc vs. LogmnMetOCPQ

Count	62
Num. Missing	0
R	.065
R Squared	.004
Adjusted R Squared	•
RMS Residual	.338

ANOVA Table
CDSurvArc vs. LogmnMetOCPQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.029	.029	.256	.6150
Residual	60	6.836	.114		
Total	61	6.865			

Regression Coefficients
CDSurvArc vs. LogmnMetOCPQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.344	.043	1.344	31.102	<.0001
LogmnMetOCPQ	-.025	.050	-.065	-.506	.6150

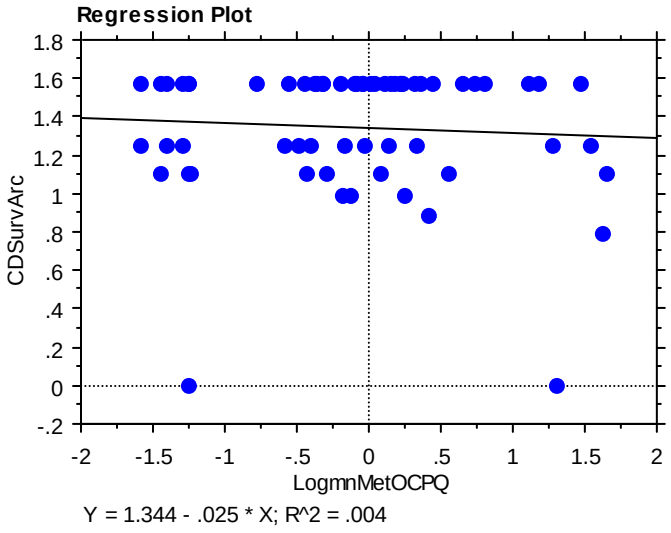


Exhibit D.7.10: *Ceriodaphnia dubia* vs. Mean PEC-QMetals/FOC

Regression Summary
CDSurvArc vs. logSumPQ

Count	62
Num. Missing	0
R	.204
R Squared	.042
Adjusted R Squared	.026
RMS Residual	.331

ANOVA Table
CDSurvArc vs. logSumPQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.287	.287	2.616	.1111
Residual	60	6.578	.110		
Total	61	6.865			

Regression Coefficients
CDSurvArc vs. logSumPQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.396	.052	1.396	26.825	<.0001
logSumPQ	-.118	.073	-.204	-1.617	.1111

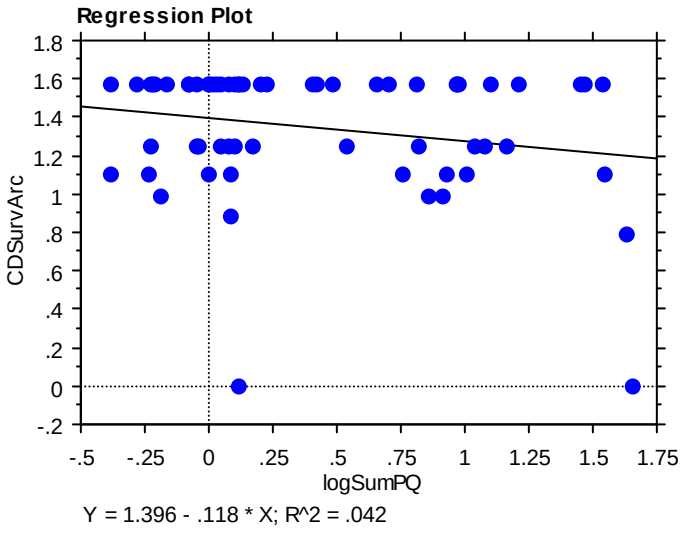


Exhibit D.7.11: *Ceriodaphnia dubia* vs. Sum PEC-QMetals

Regression Summary
CDSurvArc vs. LogAVS

Count	60
Num. Missing	2
R	.089
R Squared	.008
Adjusted R Squared	•
RMS Residual	.340

ANOVA Table
CDSurvArc vs. LogAVS

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.054	.054	.463	.4988
Residual	58	6.704	.116		
Total	59	6.757			

Regression Coefficients
CDSurvArc vs. LogAVS

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.361	.049	1.361	27.744	<.0001
LogAVS	-.031	.045	-.089	-.681	.4988

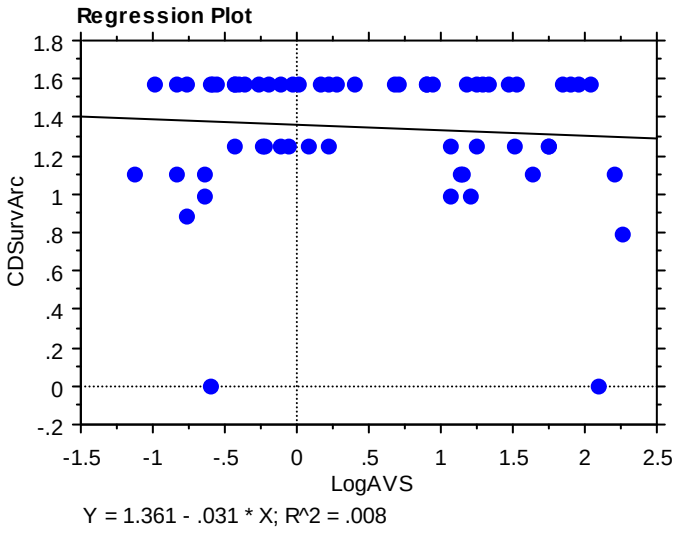


Exhibit D.7.12: ***Ceriodaphnia dubia*** **vs. SEM-AVS**

Regression Summary
CDSurvArc vs. LogAVSOC

Count	60
Num. Missing	2
R	.017
R Squared	3.060E-4
Adjusted R Squared	•
RMS Residual	.341

ANOVA Table
CDSurvArc vs. LogAVSOC

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.002	.002	.018	.8945
Residual	58	6.755	.116		
Total	59	6.757			

Regression Coefficients
CDSurvArc vs. LogAVSOC

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.361	.120	1.361	11.359	<.0001
LogAVSOC	-.005	.039	-.017	-.133	.8945

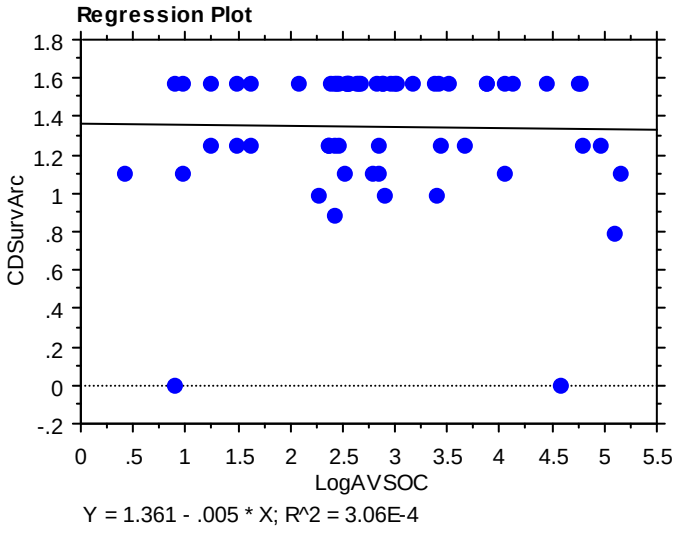


Exhibit D.7.13: *Ceriodaphnia dubia* vs. SEM-AVS/FOC

Regression Summary
CDSurvArc vs. LogTOC

Count	62
Num. Missing	0
R	.117
R Squared	.014
Adjusted R Squared	•
RMS Residual	.336

ANOVA Table
CDSurvArc vs. LogTOC

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.094	.094	.830	.3658
Residual	60	6.771	.113		
Total	61	6.865			

Regression Coefficients
CDSurvArc vs. LogTOC

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.598	.280	1.598	5.712	<.0001
LogTOC	-.069	.076	-.117	-.911	.3658

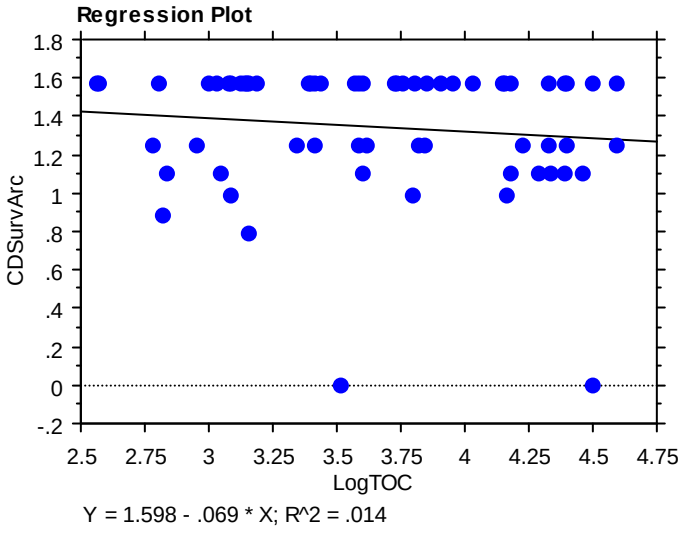


Exhibit D.7.14: ***Ceriodaphnia dubia*** **vs. TOC**

Regression Summary
CDSurvArc vs. SandArc

Count	62
Num. Missing	0
R	.097
R Squared	.009
Adjusted R Squared	•
RMS Residual	.337

ANOVA Table
CDSurvArc vs. SandArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.065	.065	.569	.4535
Residual	60	6.800	.113		
Total	61	6.865			

Regression Coefficients
CDSurvArc vs. SandArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.467	.165	1.467	8.865	<.0001
SandArc	-.121	.160	-.097	-.754	.4535

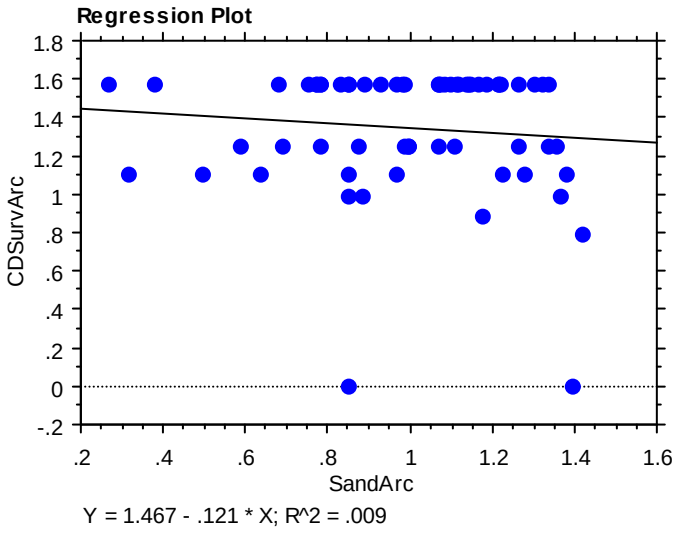


Exhibit D.7.15: *Ceriodaphnia dubia* vs. Percent Sand

Regression Summary
CDSurvArc vs. SandCArc

Count	62
Num. Missing	0
R	.048
R Squared	.002
Adjusted R Squared	•
RMS Residual	.338

ANOVA Table
CDSurvArc vs. SandCArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.016	.016	.141	.7084
Residual	60	6.849	.114		
Total	61	6.865			

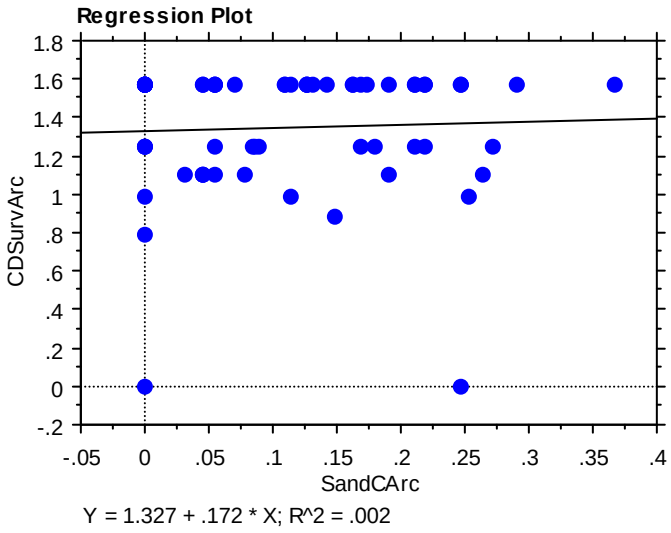


Exhibit D.7.16: *Ceriodaphnia dubia* vs. Percent Coarse Sand

Regression Summary
CDSurvArc vs. SandFArc

Count	62
Num. Missing	0
R	.146
R Squared	.021
Adjusted R Squared	.005
RMS Residual	.335

ANOVA Table
CDSurvArc vs. SandFArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.146	.146	1.307	.2575
Residual	60	6.718	.112		
Total	61	6.865			

Regression Coefficients
CDSurvArc vs. SandFArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.192	.142	1.192	8.398	<.0001
SandFArc	.196	.172	.146	1.143	.2575

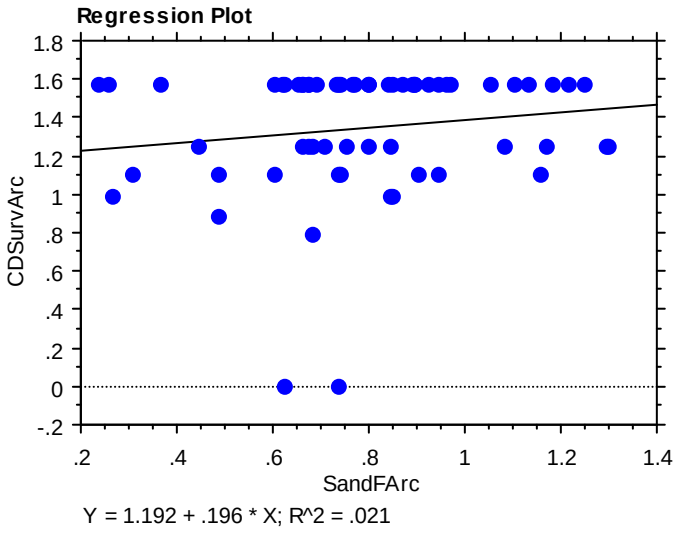


Exhibit D.7.17: *Ceriodaphnia dubia* vs. Percent Fine Sand

Regression Summary
CDSurvArc vs. SandMArc

Count	62
Num. Missing	0
R	.224
R Squared	.050
Adjusted R Squared	.035
RMS Residual	.330

ANOVA Table
CDSurvArc vs. SandMArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	.346	.346	3.183	.0795
Residual	60	6.519	.109		
Total	61	6.865			

Regression Coefficients
CDSurvArc vs. SandMArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.452	.072	1.452	20.029	<.0001
SandMArc	-.295	.165	-.224	-1.784	.0795

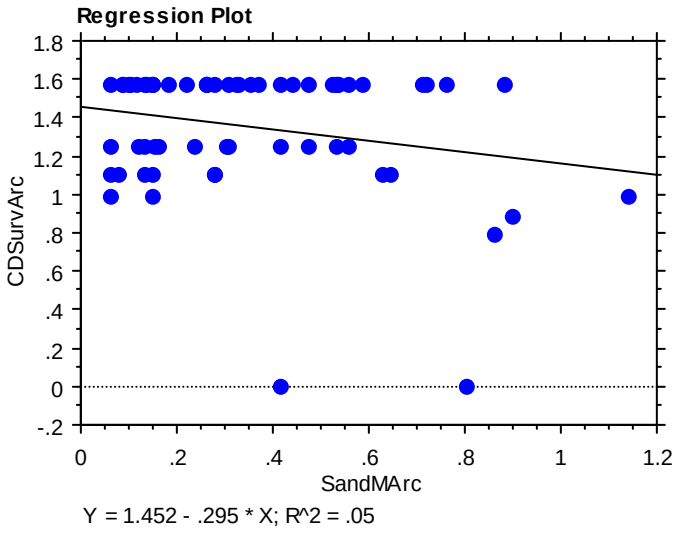


Exhibit D.7.18: *Ceriodaphnia dubia* vs. Percent Medium Sand

Ceriodaphnia dubia Reproduction Regression Analyses

Ceriodaphnia dubia (CDYoung = C.d., Number of young/female)

Regression Summary
CDYoung vs. logAs

Count	61
Num. Missing	1
R	.411
R Squared	.169
Adjusted R Squared	.155
RMS Residual	5.011

ANOVA Table
CDYoung vs. logAs

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	301.528	301.528	12.006	.0010
Residual	59	1481.744	25.114		
Total	60	1783.272			

Regression Coefficients
CDYoung vs. logAs

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	14.040	2.204	14.040	6.369	<.0001
logAs	-7.831	2.260	-.411	-3.465	.0010

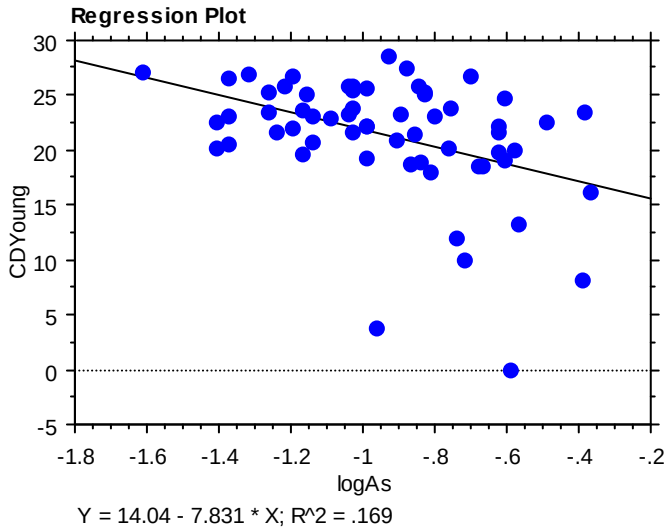


Exhibit D.8.1: *Ceriodaphnia dubia* reproduction vs. PEC-Q-As

Regression Summary
CDYoung vs. LogCd

Count	61
Num. Missing	1
R	.104
R Squared	.011
Adjusted R Squared	•
RMS Residual	5.468

ANOVA Table
CDYoung vs. LogCd

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	19.280	19.280	.645	.4252
Residual	59	1763.992	29.898		
Total	60	1783.272			

Regression Coefficients
CDYoung vs. LogCd

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	22.293	1.370	22.293	16.270	<.0001
LogCd	1.108	1.379	.104	.803	.4252

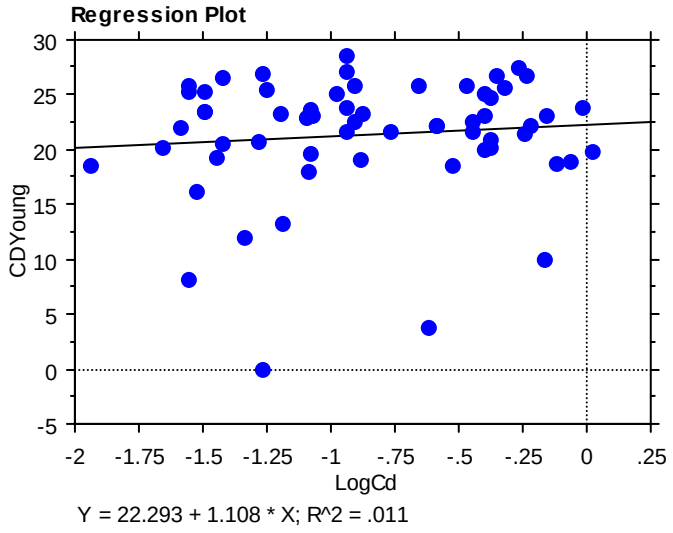


Exhibit D.8.2: *Ceriodaphnia dubia* reproduction vs. PEC-Q-Cd

Regression Summary
CDYoung vs. LogCr

Count	61
Num. Missing	1
R	.419
R Squared	.175
Adjusted R Squared	.161
RMS Residual	4.993

ANOVA Table
CDYoung vs. LogCr

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	312.511	312.511	12.536	.0008
Residual	59	1470.762	24.928		
Total	60	1783.272			

Regression Coefficients
CDYoung vs. LogCr

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	15.198	1.851	15.198	8.212	<.0001
LogCr	-8.224	2.323	-.419	-3.541	.0008

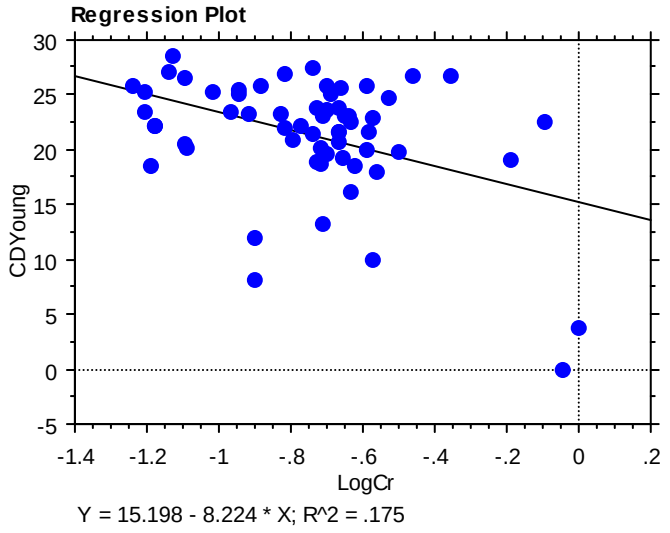


Exhibit D.8.3: *Ceriodaphnia dubia* reproduction vs. PEC-Q-Cr

Regression Summary
CDYoung vs. LogCu

Count	61
Num. Missing	1
R	.287
R Squared	.082
Adjusted R Squared	.067
RMS Residual	5.266

ANOVA Table
CDYoung vs. LogCu

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	147.072	147.072	5.303	.0248
Residual	59	1636.201	27.732		
Total	60	1783.272			

Regression Coefficients
CDYoung vs. LogCu

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	20.267	.821	20.267	24.673	<.0001
LogCu	-2.066	.897	-.287	-2.303	.0248

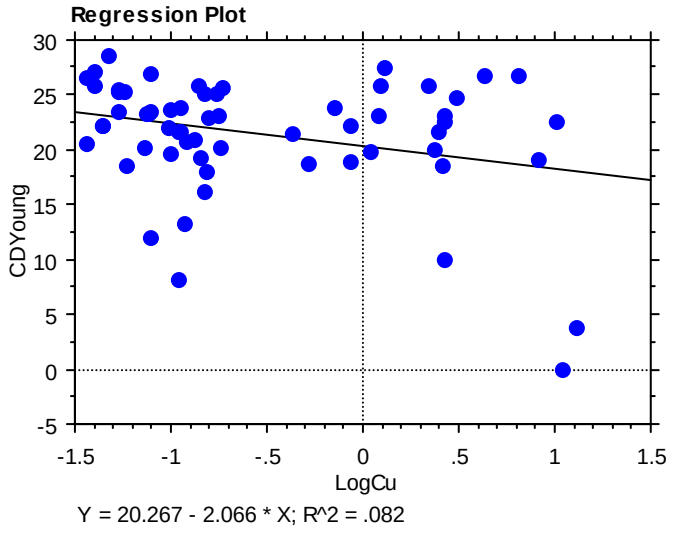


Exhibit D.8.4: *Ceriodaphnia dubia* reproduction vs. PEC-Q-As

Regression Summary
CDYoung vs. LogPb

Count	61
Num. Missing	1
R	.162
R Squared	.026
Adjusted R Squared	.010
RMS Residual	5.425

ANOVA Table
CDYoung vs. LogPb

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	47.077	47.077	1.600	.2109
Residual	59	1736.195	29.427		
Total	60	1783.272			

Regression Coefficients
CDYoung vs. LogPb

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	20.602	.911	20.602	22.613	<.0001
LogPb	-1.366	1.080	-.162	-1.265	.2109

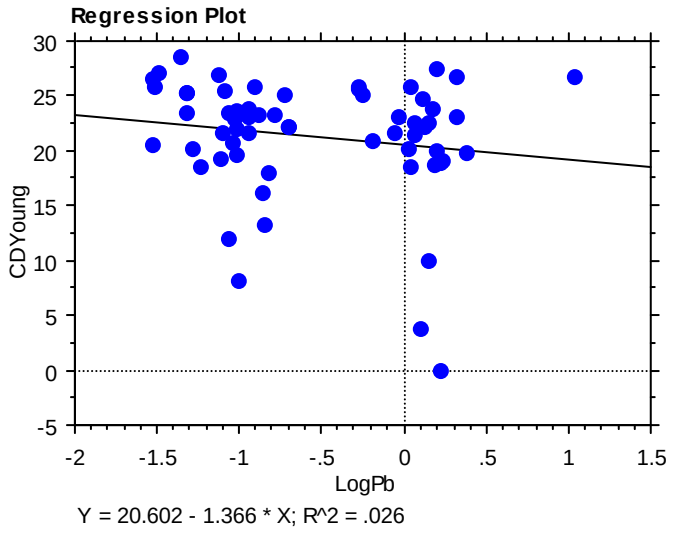


Exhibit D.8.5: *Ceriodaphnia dubia* reproduction vs. PEC-Q-Pb

Regression Summary
CDYoung vs. LogHg

Count	61
Num. Missing	1
R	.049
R Squared	.002
Adjusted R Squared	•
RMS Residual	5.491

ANOVA Table
CDYoung vs. LogHg

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	4.240	4.240	.141	.7090
Residual	59	1779.032	30.153		
Total	60	1783.272			

Regression Coefficients
CDYoung vs. LogHg

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	20.791	1.642	20.791	12.660	<.0001
LogHg	-.435	1.159	-.049	-.375	.7090

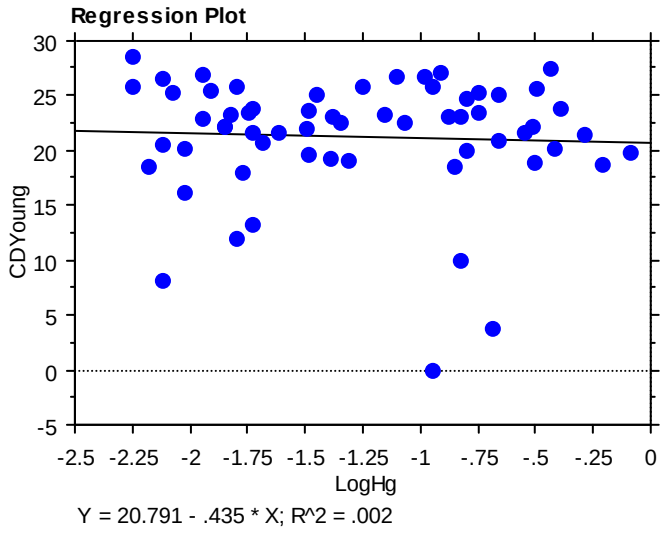


Exhibit D.8.6: *Ceriodaphnia dubia* reproduction vs. PEC-Q-Hg

Regression Summary
CDYoung vs. LogNi

Count	61
Num. Missing	1
R	.188
R Squared	.035
Adjusted R Squared	.019
RMS Residual	5.400

ANOVA Table
CDYoung vs. LogNi

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	63.110	63.110	2.165	.1465
Residual	59	1720.162	29.155		
Total	60	1783.272			

Regression Coefficients
CDYoung vs. LogNi

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	18.271	2.202	18.271	8.297	<.0001
LogNi	-5.041	3.426	-.188	-1.471	.1465

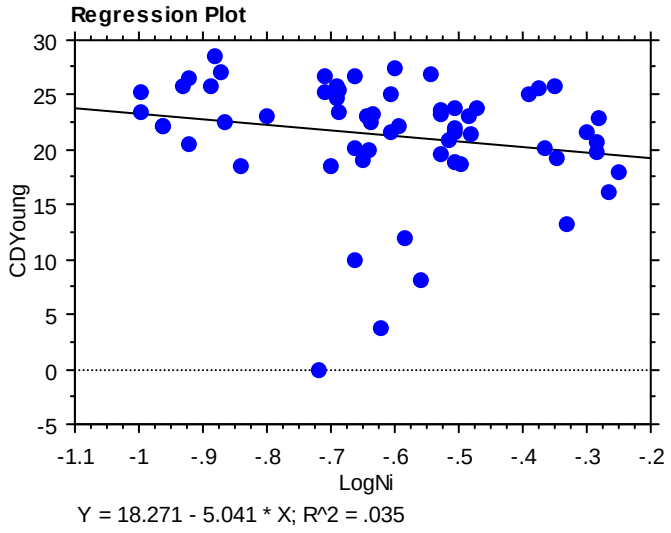


Exhibit D.8.7: *Ceriodaphnia dubia* reproduction vs. PEC-Q-Ni

Regression Summary
CDYoung vs. LogZn

Count	61
Num. Missing	1
R	.243
R Squared	.059
Adjusted R Squared	.043
RMS Residual	5.333

ANOVA Table
CDYoung vs. LogZn

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	105.406	105.406	3.706	.0590
Residual	59	1677.866	28.438		
Total	60	1783.272			

Regression Coefficients
CDYoung vs. LogZn

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	21.020	.704	21.020	29.874	<.0001
LogZn	-1.547	.804	-.243	-1.925	.0590

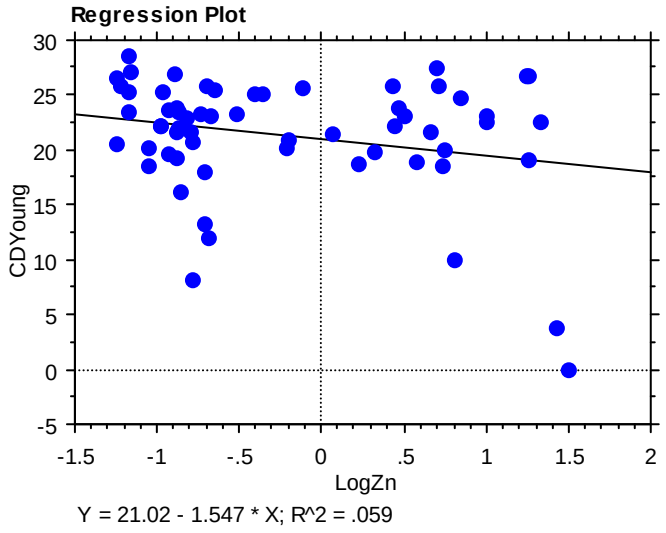


Exhibit D.8.8: *Ceriodaphnia dubia* reproduction vs. PEC-Q-Zn

Regression Summary
CDYoung vs. LogmnPECQ

Count	61
Num. Missing	1
R	.285
R Squared	.081
Adjusted R Squared	.065
RMS Residual	5.271

ANOVA Table
CDYoung vs. LogmnPECQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	144.347	144.347	5.196	.0263
Residual	59	1638.925	27.778		
Total	60	1783.272			

Regression Coefficients
CDYoung vs. LogmnPECQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	20.083	.874	20.083	22.987	<.0001
LogmnPECQ	-2.649	1.162	-.285	-2.280	.0263

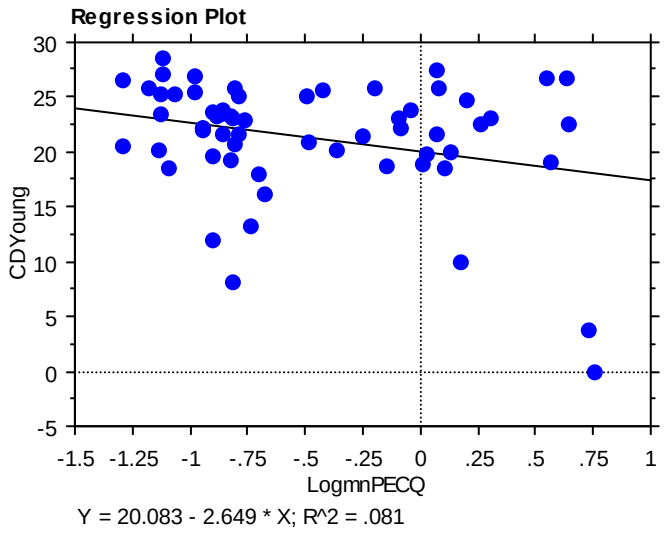


Exhibit D.8.9: *Ceriodaphnia dubia* reproduction vs. Mean PEC-QMetals

Regression Summary
CDYoung vs. LogmnMetOCPQ

Count	61
Num. Missing	1
R	.331
R Squared	.110
Adjusted R Squared	.094
RMS Residual	5.188

ANOVA Table
CDYoung vs. LogmnMetOCPQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	195.313	195.313	7.257	.0092
Residual	59	1587.959	26.915		
Total	60	1783.272			

Regression Coefficients
CDYoung vs. LogmnMetOCPQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	21.162	.668	21.162	31.690	<.0001
LogmnMetOCPQ	-2.115	.785	-.331	-2.694	.0092

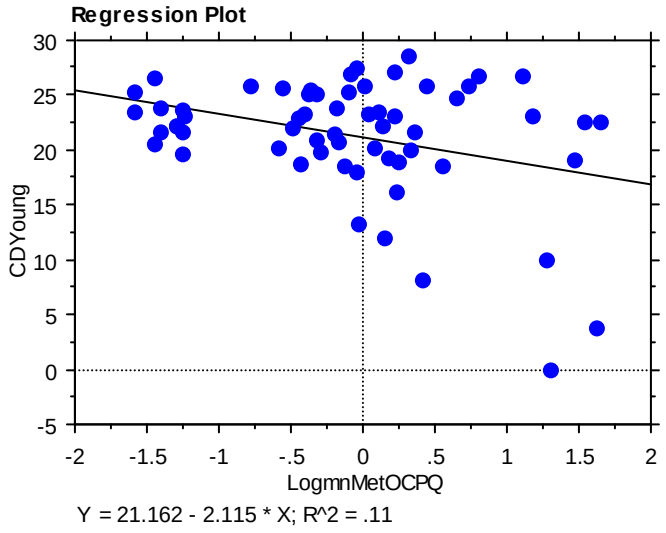


Exhibit D.8.10: *Ceriodaphnia dubia* reproduction vs. Mean PEC-QMetals/FOC

Regression Summary
CDYoung vs. logSumPQ

Count	61
Num. Missing	1
R	.285
R Squared	.081
Adjusted R Squared	.065
RMS Residual	5.271

ANOVA Table
CDYoung vs. logSumPQ

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	144.347	144.347	5.196	.0263
Residual	59	1638.925	27.778		
Total	60	1783.272			

Regression Coefficients
CDYoung vs. logSumPQ

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	22.475	.837	22.475	26.861	<.0001
logSumPQ	-2.649	1.162	-.285	-2.280	.0263

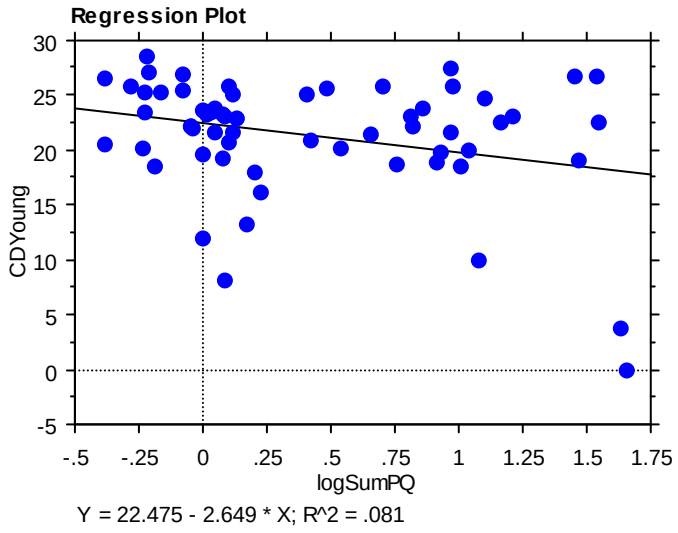


Exhibit D.8.11: *Ceriodaphnia dubia* reproduction vs. Sum PEC-QMetals

Regression Summary
CDYoung vs. LogAVS

Count	59
Num. Missing	3
R	.169
R Squared	.029
Adjusted R Squared	.012
RMS Residual	5.501

ANOVA Table
CDYoung vs. LogAVS

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	50.822	50.822	1.680	.2002
Residual	57	1724.656	30.257		
Total	58	1775.478			

Regression Coefficients
CDYoung vs. LogAVS

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	21.820	.807	21.820	27.032	<.0001
LogAVS	-.954	.736	-.169	-1.296	.2002

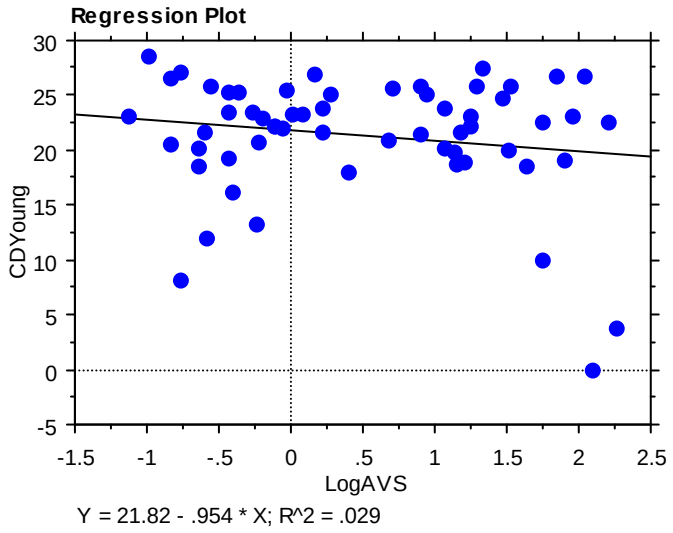


Exhibit D.8.12: *Ceriodaphnia dubia* reproduction vs. SEM-AVS

Regression Summary
CDYoung vs. LogAVSOC

Count	59
Num. Missing	3
R	.244
R Squared	.060
Adjusted R Squared	.043
RMS Residual	5.412

ANOVA Table
CDYoung vs. LogAVSOC

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	106.136	106.136	3.624	.0620
Residual	57	1669.342	29.287		
Total	58	1775.478			

Regression Coefficients
CDYoung vs. LogAVSOC

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	24.831	1.966	24.831	12.631	<.0001
LogAVSOC	-1.211	.636	-.244	-1.904	.0620

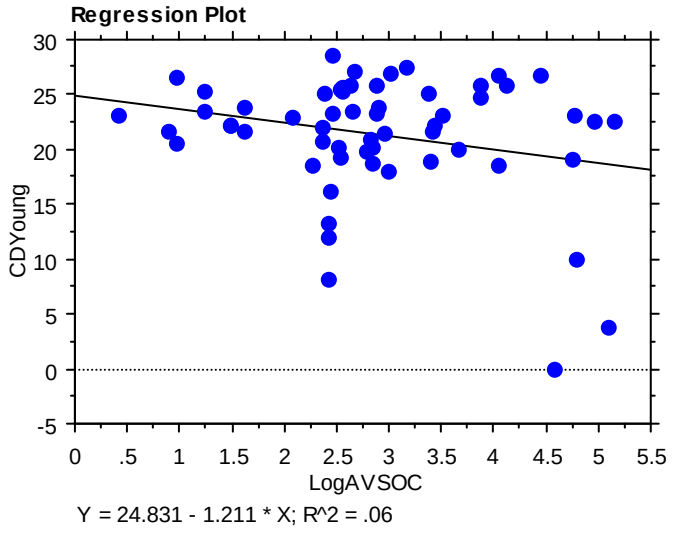


Exhibit D.8.13: *Ceriodaphnia dubia* reproduction vs. SEM-AVS/FOC

Regression Summary
CDYoung vs. LogTOC

Count	61
Num. Missing	1
R	.189
R Squared	.036
Adjusted R Squared	.020
RMS Residual	5.398

ANOVA Table
CDYoung vs. LogTOC

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	63.945	63.945	2.194	.1438
Residual	59	1719.327	29.141		
Total	60	1783.272			

Regression Coefficients
CDYoung vs. LogTOC

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	14.666	4.563	14.666	3.214	.0021
LogTOC	1.833	1.237	.189	1.481	.1438

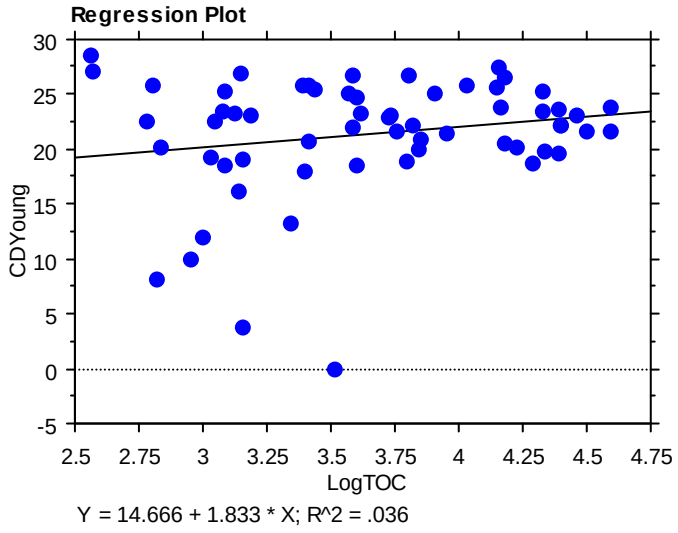


Exhibit D.8.14: *Ceriodaphnia dubia* reproduction vs. TOC

Regression Summary
CDYoung vs. SandArc

Count	61
Num. Missing	1
R	.112
R Squared	.013
Adjusted R Squared	•
RMS Residual	5.463

ANOVA Table
CDYoung vs. SandArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	22.466	22.466	.753	.3891
Residual	59	1760.806	29.844		
Total	60	1783.272			

Regression Coefficients
CDYoung vs. SandArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	23.609	2.699	23.609	8.748	<.0001
SandArc	-2.258	2.602	-.112	-.868	.3891

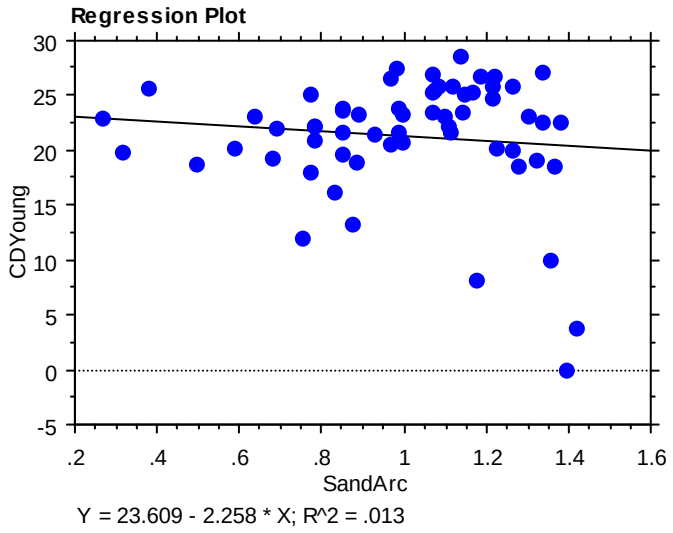


Exhibit D.8.15: *Ceriodaphnia dubia* reproduction vs. Percent Sand

Regression Summary
CDYoung vs. SandCArc

Count	61
Num. Missing	1
R	.152
R Squared	.023
Adjusted R Squared	.007
RMS Residual	5.434

ANOVA Table
CDYoung vs. SandCArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	41.270	41.270	1.398	.2418
Residual	59	1742.002	29.525		
Total	60	1783.272			

Regression Coefficients
CDYoung vs. SandCArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	20.359	1.088	20.359	18.720	<.0001
SandCArc	8.846	7.482	.152	1.182	.2418

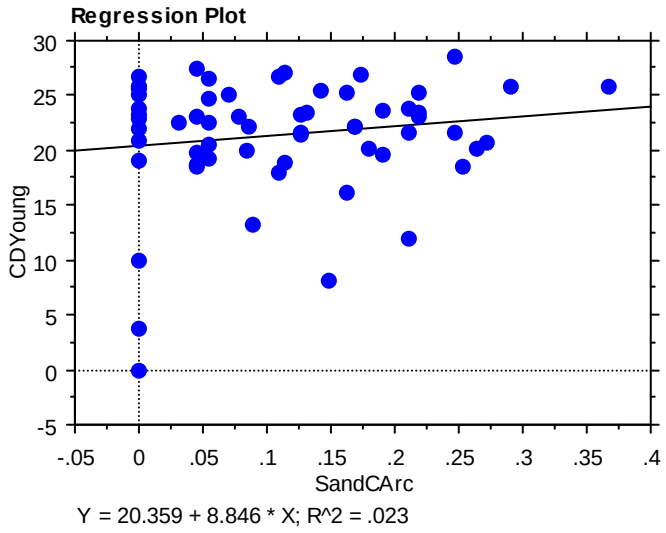


Exhibit D.8.16: *Ceriodaphnia dubia* reproduction vs. Percent Coarse Sand

Regression Summary
CDYoung vs. SandFArc

Count	61
Num. Missing	1
R	.082
R Squared	.007
Adjusted R Squared	•
RMS Residual	5.479

ANOVA Table
CDYoung vs. SandFArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	12.096	12.096	.403	.5280
Residual	59	1771.176	30.020		
Total	60	1783.272			

Regression Coefficients
CDYoung vs. SandFArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	19.931	2.340	19.931	8.518	<.0001
SandFArc	1.791	2.821	.082	.635	.5280

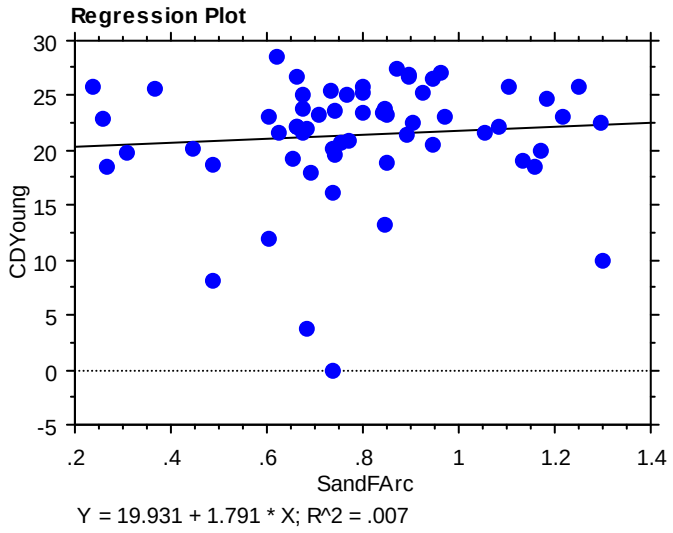


Exhibit D.8.17: *Ceriodaphnia dubia* reproduction vs. Percent Fine Sand

Regression Summary
CDYoung vs. SandMArc

Count	61
Num. Missing	1
R	.177
R Squared	.031
Adjusted R Squared	.015
RMS Residual	5.411

ANOVA Table
CDYoung vs. SandMArc

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	55.669	55.669	1.901	.1732
Residual	59	1727.603	29.281		
Total	60	1783.272			

Regression Coefficients
CDYoung vs. SandMArc

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	22.684	1.191	22.684	19.039	<.0001
SandMArc	-3.742	2.714	-.177	-1.379	.1732

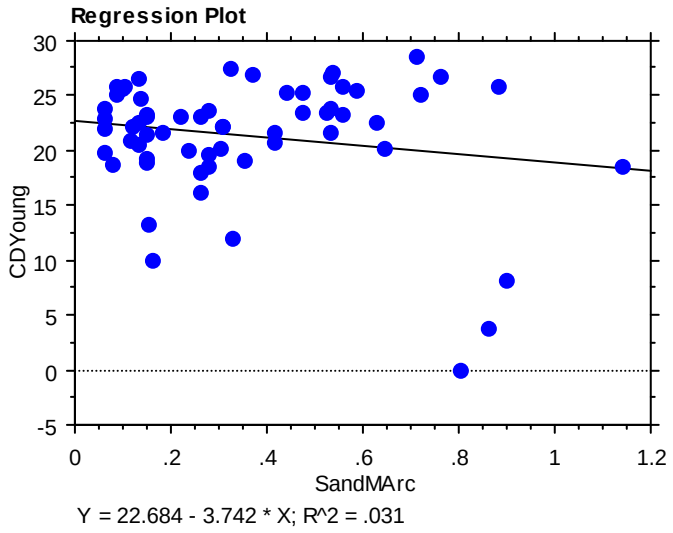


Exhibit D.8.18: *Ceriodaphnia dubia* reproduction vs. Percent Medium Sand

Expanded Analyses of 2005 UCR Sediment Toxicity Data with Consideration of Slag Characterization

1.0 Introduction

Remedial investigations at the Upper Columbia River (UCR), WA, are assessing the potential risks to ecological receptors where contaminants, primarily metals, may be present in sediment at concentrations that pose an unacceptable risk to benthic/epibenthic resources. A sediment sampling and laboratory toxicity testing program was conducted in 2005 to assess the toxicity to benthic/ epibenthic resources from sediments. Over 387 samples were collected over the 150 mile Site for chemical analyses, 50 of which were also tested for toxicity. Toxicity testing included 10-day whole-sediment toxicity tests with the midge, *Chironomus dilutus*; 28-day whole-sediment toxicity tests with the amphipod, *Hyalella azteca*; and 7-day toxicity tests with the cladoceran, *Ceriodaphnia dubia*.

A reference envelope approach, use of toxicity metrics (e.g., SEM-AVS, PEC-Qs, PW-TUs), and statistical analyses were used to identify relationships between sediment chemistry and sediment toxicity. At least one of the toxicity endpoints (i.e., survival, growth, biomass, or reproduction) for at least one test organism was reduced relative to a reference envelope in 43 of 50 site sediment samples. However, only 16 samples differed from the reference envelope by more than 20 percent in at least one species-endpoint. Effects were generally more prevalent closest to the U.S.-Canada border and were more variable downstream. Statistically significant effects were observed in a total of 28 samples and occurred throughout the sampled length of the UCR. *Hyalella* growth and biomass were the most sensitive endpoints with the most number of samples with statistically significant effects. Significant effects for *Hyalella* growth were identified in all samples where statistically significant effects were also observed for either Chironomids or *Ceriodaphnia*. Statistically significant but weak relationships existed between toxicity endpoints and metrics of sediment metals (i.e., SEM-AVS, mean PEC-$Q_{metals(1\%OC)}$, summed PEC-Q_{metals}) and PEC-Qs for chromium, copper, and zinc. Zinc and copper PEC-Qs were the highest in most samples, suggesting that these two metals were drivers of adverse effects in sediment samples. The weight-of-evidence indicated that benthic/epibenthic resources are at risk. However, there was moderate uncertainty about the cause of adverse effects due to the poor ability of exposure metric/concentration-response relationships to predict toxicity (i.e., $r^2 < 0.3$).

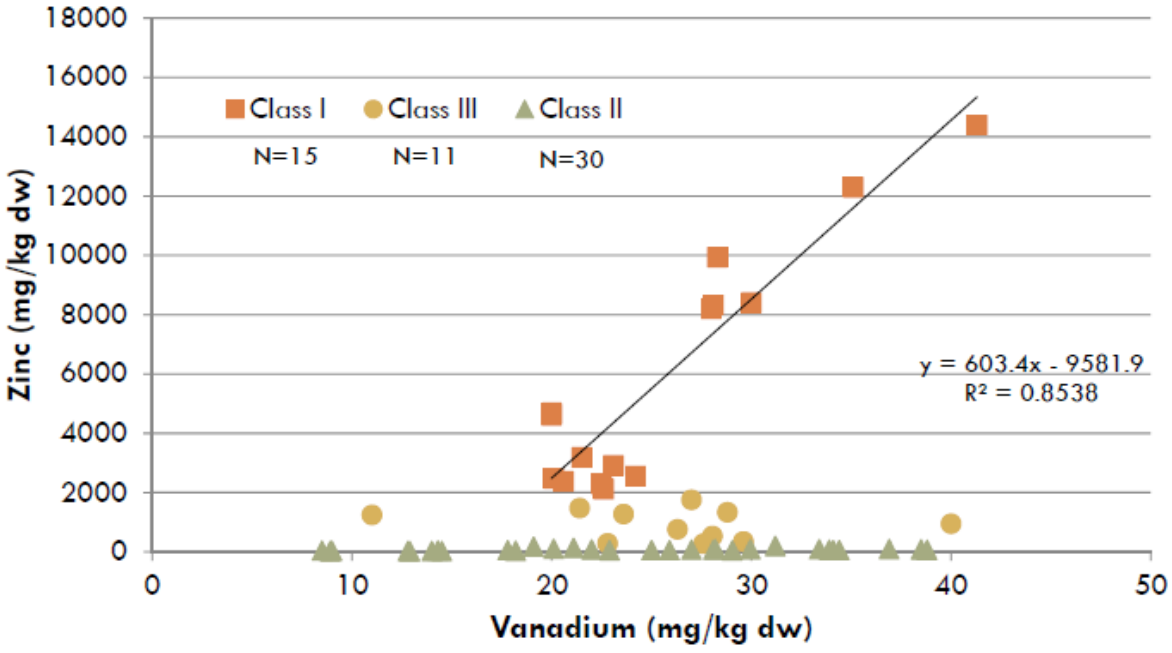
Exploratory analyses of the relationships between sediment chemical properties and toxicity results were performed to determine if the predictive power of dose-response models could be improved by incorporating slag characterization into the analyses. The proportion of slag is likely to relate to effects in toxicity tests because slag discharged from the TAI smelter in Trail (British Columbia, Canada) is a significant source of metal contamination in the UCR. Concentration-response relationships were improved when the relationships were examined for the subset of samples that could be clearly identified as "slag-affected

samples". This appendix presents a summary of the approach to separate out slag-affected samples.

2.0 Methods

UCR Phase 1 sediment samples with elevated zinc concentrations (enriched in slag discharged from the Trail smelter) were normalized by the concentrations of vanadium to identify samples that were slag-affected (TAI, 2011). Normalization of metal concentrations to a reference element (i.e., aluminum) is one method for determining anthropogenic enrichment of metals (Schropp et al. 1990). Vanadium is a reasonable baseline metal because slag is not enriched with vanadium and concentrations within UCR sediments are relatively constant (i.e., ranging from 10-40 mg/kg); TAI, 2011). The Zn:V relationship for Phase 1 UCR sediment samples indicated three sample types (Appendix E, Exhibit 1). When zinc concentrations are elevated (i.e., > 2000 mg/kg) we can see a clear relationship with vanadium indicative of a distinct sediment group. Other sediments within the same range of vanadium concentrations show no relationship between zinc and vanadium and either have very low or intermediate concentrations of zinc. Samples were divided into three sediment classes based on these apparent trends and classification was based on those in TAI (2011).

- Class I: slag affected. high Zn:V (>100); Zinc concentration > 2000 mg/kg
- Class II: not strongly slag influenced. low Zn:V (< 10); zinc concentration < 121 mg/kg
- Class III: other. 100 > Zn:V > 10; 2000 mg/kg > zinc concentration > 121 mg/kg



Appendix E, Exhibit 1
Zinc to Vanadium relationship for Phase 1 UCR sediment samples
Upper Columbia River RI/FS

When sediment classes, based on the influence of slag, are considered in evaluating the 2005 UCR concentration-response relationships there are improved regressions with Class I (slag-affected) samples. The concentration-response relationship for *Hyalella* biomass relative to mean PEC-$Q_{metals(1\%OC)}$ had an r^2 of 0.42 (Appendix E, Exhibit 2) and for *Hyalella* biomass relative to (SEM-AVS)/f_{OC} the r^2 was 0.39 (Appendix E, Exhibit 3). Coefficients of determination (i.e., r^2) for previous concentration-response relationships where the entire Phase 1 bioassay samples were included were only as high as 0.27. Likewise, concentration-response relationships for midge biomass relative to mean PEC-$Q_{metals(1\%OC)}$ had an r^2 of 0.39 (Appendix E, Exhibit 4) and the r^2 for *Hyalella* biomass relative to (SEM-AVS)/f_{OC} was 0.35 (Appendix E, Exhibit 5). Conversely, concentration-response relationships were generally very poor when regression relationships were based only on those samples from sediment classes II and III (either non-significant or r^2 less than 0.1).

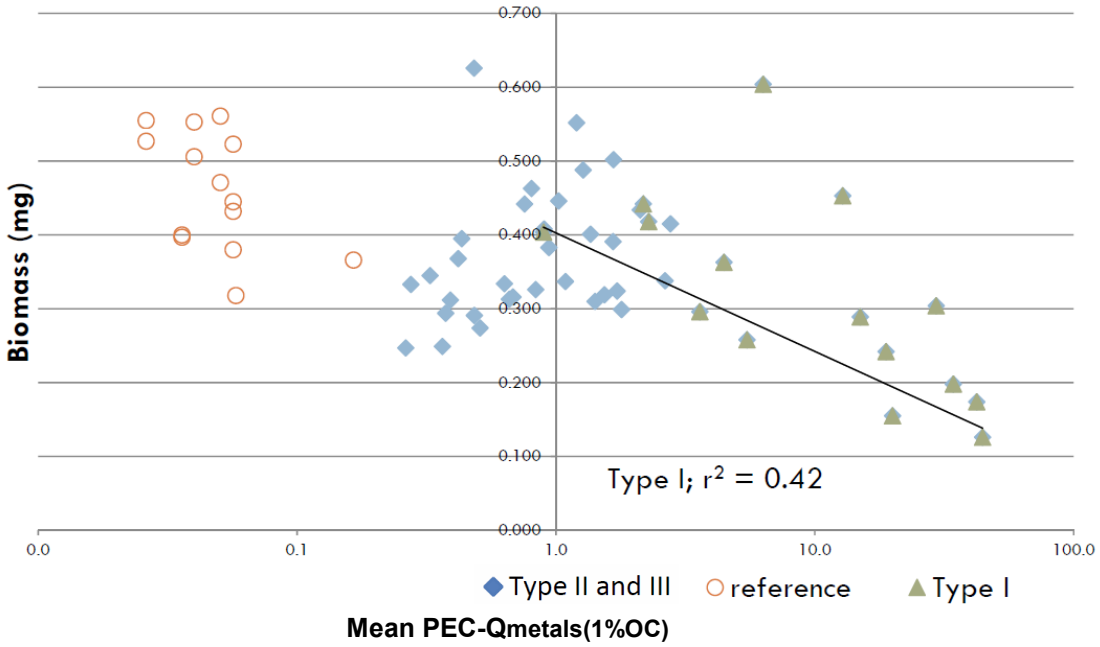
While other potential indicators of slag were not evaluated in this exploratory analysis, they should certainly be considered before extensive analyses are conducted. Alternative metals and ratios that could be considered for identifying slag-enriched sediments in UCR sediment samples are presented in Ecology (2012).

3.0 Results and Conclusions

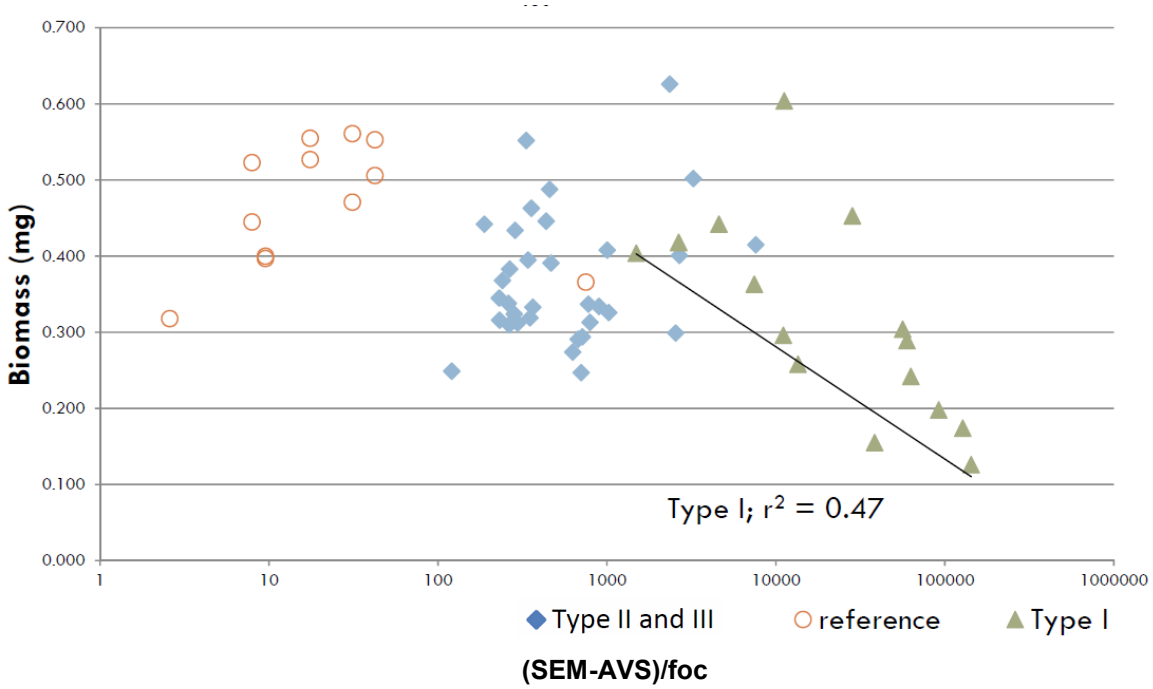
These preliminary analyses were made to illustrate the potential usefulness of similar analyses on future UCR sediment toxicity datasets. Concentration-response relationships were improved for slag-affected samples. Slag characterization identified a group (Class I) of samples with the highest concentrations of metals. These samples were determined to contain slag based on elevated concentrations of zinc and Zn:V. It was in this group of slag-affected samples that effects were most prominent and concentration-response relationships apparent. Specific conclusions included:

- The predictive power of sediment metrics was improved by limiting regressions to discrete sediment classes indicative of slag
- Sediment mean $PEQ_{metals(1\%OC)}$ and (SEM-AVS)/ f_{OC} were moderate predictors of *Hyalella* and midge biomass in Type I sediment (r^2 ranging from 0.35 to 0.47)

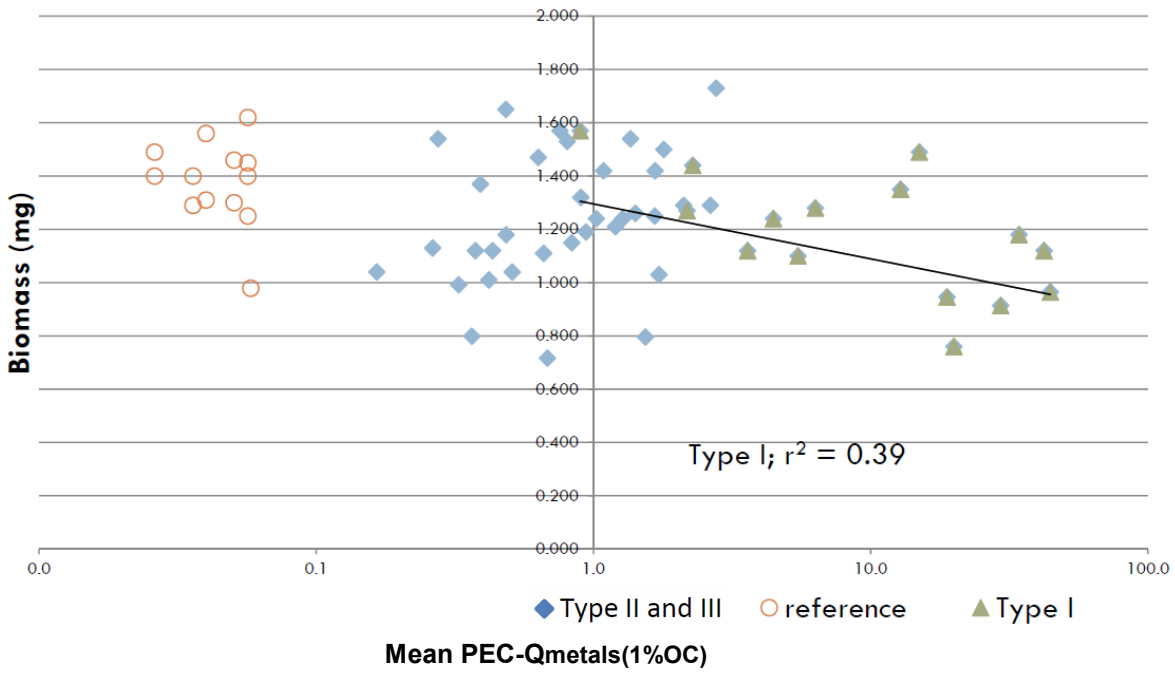
It should also be noted that the ranges of effects observed in slag-affected (Class I) samples often overlapped with the variability in toxicity responses observed in samples where metal concentrations were not elevated. This is the reason for poor concentration-response relationships when the entire dataset was considered. The responses observed in slag-affected samples were typically not indicative of high magnitudes of toxicity (i.e., species-endpoints were often <20 percent lower than reference envelope criterion) and therefore these data represent incomplete concentration-response relationships. Higher magnitude effects, if associated with higher concentrations of metals, would complete the concentration-response curve and may strengthen these relationships. Regardless, focusing data evaluations on slag-affected samples clearly yields predictive relationships where none would otherwise be apparent or only very weak (Appendix E, Exhibits 2 – 5).



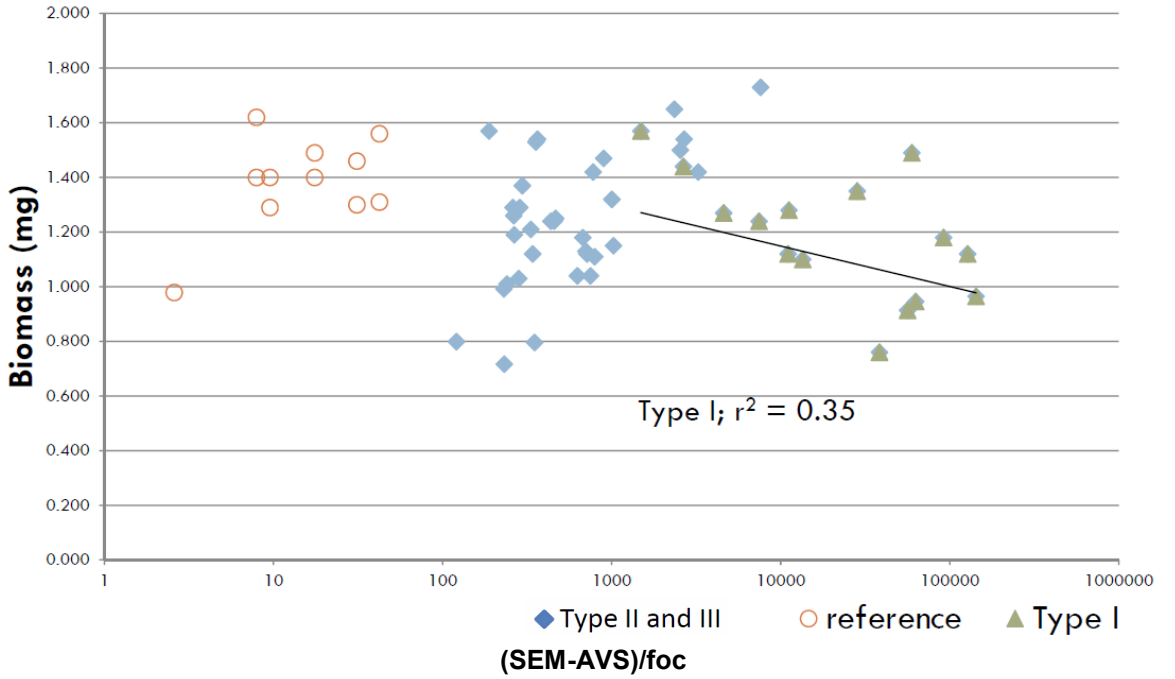
Appendix E, Exhibit 2
Hyalella Biomass v. Mean PEC-$Q_{metals(1\%OC)}$
Upper Columbia River RI/FS



Appendix E, Exhibit 3
Hyalella Biomass v. (SEM-AVS)/f_{OC}
Upper Columbia River RI/FS



Appendix E, Exhibit 4
Midge Biomass v. Mean PEC-$Q_{metals(1\%OC)}$
Upper Columbia River RI/FS



Appendix E, Exhibit 5
Midge Biomass v. (SEM-AVS)/f_{OC}
Upper Columbia River RI/FS

4.0 References

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