ATTACHMENT 8
SEDIMENT TOXICITY (BIOASSAY) ANALYSIS

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1 INTRODUCTION

This attachment presents the results and quality assurance/quality control (QA/QC) review of the sediment bioassay testing program conducted on surface sediments collected in the offshore areas adjacent to the NW Natural "Gasco" and Siltronic Corporation properties, which are located within the Portland Harbor Superfund Site. Initial sediment testing using the midge (*Chironomus dilutus*) and amphipod (*Hyalella azteca*) sediment bioassays was completed in December 2010. The retest bioassay testing with the midge was completed in May 2011. Two phases of bioassay testing were conducted because the initial results of the midge bioassay were determined to be unsuitable for regulatory decision-making based on high variability within replicate test treatments and because the performance standards established for reference sediments were not met. The initial amphipod bioassay results were determined to be suitable for use. The midge retest bioassay was conducted on sediment collected from the same test locations as the initial bioassay. Based on U.S. Environmental Protection Agency (EPA) direction, one of the reference locations was revised for the retest, in order to be consistent with Lower Willamette Group's (LWG's) historical reference locations.

Initial and retest sediment bioassay testing was conducted on the following 20 sediment samples and four upriver reference samples as part the NW Natural Gasco Sediments Cleanup Action Data Gaps Project (Project):

DGS-01	DGS-17	U2C-2[a]
DGS-02	DGS-20	U3C-2[b]
DGS-04	DGS-21	U4Q-1[ab]
DGS-05	DGS-25	U4Q-2[ab]
DGS-06	DGS-26	
DGS-08	DGS-30	
DGS-09	DGS-31	
DGS-12	DGS-33	
DGS-13	DGS-34	
DGS-16	DGS-35	

a = Initial bioassay reference samples
b = Retest bioassay reference samples (Locations U4Q-1 and U4Q-2 were retested))

Surface sediment samples were collected at 20 locations using a Van Veen grab sampler. Collection locations were selected to fill data gaps associated with benthic risk and sediment chemistry. These sediment samples were also tested for chemical and physical parameters. Chemical and physical testing was conducted by Analytical Resources, Inc. (ARI) of Tukwila, Washington, which is accredited under the National Environmental Laboratories Accreditation Program (NELAP). Sediment physical and chemical results from the initial and retest sampling program are summarized in Tables 1-4a and 1-4b of the Data Gaps Investigation Report (Appendix A).

2 BIOASSAY TESTING

The following two sediment toxicity tests were conducted on each of the 20 surface sediment samples and the reference sediment samples noted previously:

- 28-day freshwater amphipod (*Hyalella azteca)* survival and growth bioassay
- 10-day freshwater midge (*Chironomus dilutus*, formerly *C. tentans*) survival and growth bioassay

The sediment bioassays were conducted by NAS of Newport, Oregon, in accordance with ASTM Method E 1706-00 (ASTM 2001), and EPA Method 100.2 (EPA 2000). The NAS bioassay reports are included in this attachment.

Two phases of bioassay testing were conducted as part of this bioassay testing program. The initial sediment testing using the midge (*Chironomus dilutus*) and amphipod (*Hyalella azteca*) sediment bioassays was completed in December 2010. The initial results for the midge bioassays were determined to be unsuitable for regulatory decision-making due to high variability within replicate test treatments and because the performance standard established for reference sediments was not met. This information was presented and discussed with EPA at a meeting on April 8, 2011, and it was decided that a second sampling program would be initiated to retest for the midge bioassays. The initial amphipod bioassay results were determined to be suitable for regulatory use.

The retest bioassay testing with the midge (*Chironomus dilutes*) was completed in May 2011. The variability within replicate treatments was reduced and the reference sediments met required performance standards and therefore, the data were determined to be appropriate for regulatory use.

3 BIOASSAY RESULTS

The results of the amphipod and midge bioassays are presented in Table 1-7 of Appendix A. The table lists the sediment samples tested, reference sediment samples, and the test endpoint. The bioassay results are summarized as follows.

3.1 28-Day Amphipod *(Hyalella azteca)* Survival Bioassay Results

The mean survival in the test sediments ranged from 82.5 percent to 97.5 percent. The mean survival in the negative control was 95.0 percent. The mean survival in the site-specific reference sediments ranged from 87.5 percent to 93.8 percent.

3.2 28-Day Amphipod *(Hyalella azteca)* Growth Bioassay Results

The mean total biomass in the test sediment ranged from 1.3 milligrams (mg) to 1.9 mg. The mean total biomass of the negative control was 1.9 mg. The mean total biomass in the site-specific reference sediments ranged from 1.4 mg to 1.5 mg.

3.3 10-Day Midge *(Chironumus dilutus)* Survival Bioassay Results

The mean survival in the test sediment ranged from 20.0 percent to 86.3 percent. The mean survival in the negative control was 90.4 percent. The mean survival in the site-specific reference sediments ranged from 78.8 percent to 80.0 percent.

3.4 10-Day Midge *(Chironumus dilutus)* Growth Bioassay Results

The mean total ash-free dry weight (AFDW) in the test sediment ranged from 0.6 mg to 7.0 mg. The mean total AFDW in the negative control was 7.1 mg. The mean total AFDW in the site-specific reference sediments ranged from 5.2 mg to 7.1 mg.

4 DATA QUALITY REVIEW

A data quality review of the initial and retest sediment bioassay tests was conducted to ensure test results met appropriate QA/QC performance criteria established for these freshwater bioassay tests. The freshwater sediment toxicity tests were conducted in accordance with available standard protocols (EPA 2000; ASTM 2001) by NAS. The sediment toxicity test data quality review compared test results and conditions against QA/QC performance criteria provided in the *Final Data Gaps Quality Assurance Project Plan* (QAPP; Anchor QEA 2010) and the *Sediment Evaluation Framework for the Pacific Northwest* (SEF; USACE et al. 2009). Test conditions for the bioassays are presented in the NAS bioassay laboratory reports (included in this attachment).

The following criteria were evaluated as part of this data quality review:

- Holding times;
- Bioassay performance in negative control and reference sediments;
- Bioassay performance in positive control tests; and
- Bioassay test conditions.

4.1 Amphipod, *Hyalella Azteca*, 28-day Survival and Growth Test (Phase I, 2010)

The test sediment samples and three reference samples were collected by Anchor QEA between October 12 and 14, 2010, and were submitted for toxicity testing to NAS on October 15, 2010. The negative control sediment, NAS#3338G, was collected on October 11, 2010, from an area adjacent to the Highway 101 bridge at Beaver Creek, approximately 8 miles south of Newport, Oregon.

The amphipod bioassays were initiated on October 26, 2010, which was within the 56-day holding limit specified in the Final Data Gaps QAPP (Anchor QEA, 2010). All test, reference, and control sediments were held in the dark at 4 degrees Celsius (^{o}C) until used.

The water quality observations of overlying water temperature and dissolved oxygen were within ranges specified in the protocol, except on Day 13, when the temperature of one beaker measured 21.9 °C, which was slightly below the 23 ± 1 °C requirement. This minor deviation is unlikely to have affected the test results. Ammonia-N in the overlying water ranged from <0.1

milligrams per liter (mg/L) to 1.7 mg/L for all Day 0 and Day 28 measurements. Interstitial water concentrations for ammonia-N ranged from <0.5 to 21.2 mg/L.

The reference toxicant test 96-h LC_{50} (Lethal Concentration 50 percent estimate) of 0.41 grams per liter (g/L) potassium chloride (KCl) was within the laboratory's control chart warning limits (0.31 to 0.47 g/L) obtained by NAS.

The amphipod test met the survival and weight acceptability criteria specified in the QAPP and SEF with 5.0 percent mean control mortality (≤20 percent required) and a control individual mean dry weight of 0.20 mg per amphipod. The reference sediment samples also met the survival and weight acceptability criteria with mortality ranging from 6.3 percent to 12.5 percent (≤30 percent required) and individual mean dry weight ranging from 0.15 to 0.17 mg per amphipod (≥0.15 mg/individual required).

Final QA Determination. The *Hyalella azteca* data met the established performance criteria for overlying water quality, negative and positive control performance, and reference sediment performance.

4.2 Midge, *Chironomus Tentans*, 10-Day Survival and Growth Test (Phase II; 2011)

The test sediment samples and three reference samples were collected by Anchor QEA between April 19 and 21, 2011, and were submitted for toxicity testing to NAS on April 20 and 22, 2011. The negative control sediment, NAS#3655SG, was collected on April 26, 2011, from an area adjacent to the Highway 101 bridge at Beaver Creek, approximately 8 miles south of Newport, Oregon.

The midge bioassay was initiated on May 6, 2011, which was within the 56-day holding limit specified in the Final Data Gaps QAPP (Anchor QEA, 2010). All test, reference, and control sediments were held in the dark at 4°C until used.

The water quality observations of overlying water temperature and dissolved oxygen (DO) were within ranges specified in the protocol. Ammonia-N in the overlying water ranged from 0.1 mg/L to 1.5 mg/L for all Day 0 and Day 10 measurements. Interstitial water concentrations for ammonia-N ranged from 1.8 to 21.9 mg/L.

The reference toxicant test 96-h LC_{50} of 4.24 g/L KCl was within the laboratory's control chart warning limits (2.96 to 7.78 g/L) obtained by NAS.

The test met the survival and weight acceptability criteria specified in the QAPP and SEF, with 9.6 percent mean control mortality (≤30 percent required) and a control individual mean ash-free dry weight of 0.79 mg per amphipod (≥0.48 mg/individual required). The reference sediment samples also met the survival and weight acceptability criteria, with mortality ranging from 20.0 percent to 21.3 percent (≤30 percent required) and individual mean ash-free dry weight ranging from 0.64 to 0.89 mg per amphipod (≥0.63 mg/individual required).

Final QA Determination. The *Chironomus dilute*s data met the criteria for overlying water quality, negative and positive control performance, and reference sediment performance.

5 SUMMARY OF BIOASSAY RESULTS

As part of the Project, freshwater bioassays were conducted on 20 sediment samples and six reference samples. The bioassay results are presented in Table 7-1 of Appendix A. The bioassay testing program was completed in two phases because of QA issues identified in the midge bioassay results from the initial testing. The midge bioassays were repeated during the retest program. Based on a QA/QC review of the bioassay results, it has been determined that the initial amphipod bioassay results and the retest midge bioassay results meet required criteria and the results are appropriate for their intended uses.

Interpretation of bioassay results and further evaluation of the bioassay data will be provided in the Engineering Evaluation/Cost Analysis report.

6 REFERENCES

Anchor QEA, 2010. *Final Data Gaps QAPP. Attachment 1 – Field Sampling Plan*. Prepared for NW Natural, Portland, Oregon. July 2010.

ASTM (ASTM International), 2001. *Standard test methods for measuring the toxicity of sediment-associated contaminants with freshwater invertebrates*. ASTM E1706-00.

USACE (U.S. Army Corps of Engineers), 2009. *Sediment Evaluation Framework for the Pacific Northwest (SEF)*. May 2009.

EPA (United States Environmental Protection Agency), 2000. *Methods for Measuring the Toxicity and Bioaccumulation of Sediment-Associated Contaminants with Freshwater Invertebrates*. Second Edition. EPA/600/R-99/064. March 2000.

Report

of

Test No. 814-3

Assessment of Freshwater Sediments as part of the NW Natural Gasco Sediments Cleanup Action Data Gaps Project (000029-02), using a 10-day Midge, *Chironomus dilutus*, Sediment Bioassay.

Submitted to

Anchor QEA, LLC
1423 Third Ave, Suite 300
Seattle, WA 98101

Submitted by

Northwestern Aquatic Sciences
3814 Yaquina Bay Road
P.O. Box 1437
Newport, OR 97365

May 31, 2011

TOXICITY TEST REPORT

TEST IDENTIFICATION

Test No.: 814-3

Title: Toxicity of freshwater sediments using a 10-day midge, *Chironomus dilutus* (formerly *C. tentans*), sediment bioassay as part of the NW Natural Gasco Sediments Cleanup Action Data Gaps Project (000029-02).

Protocol No.: NAS-XXX-CT4b, April 7, 1998. Revision 1 (10-28-03). Based on ASTM 2001 (Standard test methods for measuring the toxicity of sediment-associated contaminants with fresh water invertebrates, E1706-00), Am. Soc. Test. Mat., Phila., PA, and EPA Method 100.2 (Methods for measuring the toxicity and bioaccumulation of sediment-associated contaminants with freshwater invertebrates, EPA/600/R-99/064).

STUDY MANAGEMENT

Study Sponsor: Anchor QEA, LLC., 1423 Third Avenue, Suite 300, Seattle, WA 98101
Sponsor's Study Monitor: Ms. Joy Dunay
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, B.A., M.B.A., QA Officer; R.S. Caldwell, PhD, Sr. Toxicologist; G.A. Buhler, B.S., Aq. Toxicologist; M.S. Redmond, M.S., Aq. Toxicologist; L.P. Sandoval, B.S., Tech.; Y. Nakahama, Tech.
Study Schedule:
Test Beginning: 5-6-11, 1000 hrs.
Test Ending: 5-16-11, 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: Freshwater test sediments collected NW Natural Gasco Sediments Cleanup Action Data Gaps Project (000029-02). Details are as follows:

NAS Sample No.	3623G	3624G	3625G	3626G
Description	DGS-05SG-110418	DGS-08SG-110418	DGS-09SG-110418	DGS-12SG-110418
Collection Date	4/18/11	4/18/11	4/18/11	4/18/11
Receipt Date	4/20/11	4/20/11	4/20/11	4/20/11

NAS Sample No.	3627G	3628G	3629G	3630G
Description	DGS-13SG-110418	DGS-16SG-110418	DGS-17SG-110418	DGS-20SG-110419
Collection Date	4/18/11	4/18/11	4/18/11	4/19/11
Receipt Date	4/20/11	4/20/11	4/20/11	4/20/11

NAS Sample No.	3631G	3632G	3633G	3634G
Description	DGS-21SG-110419	DGS-25SG-110419	DGS-26SG-110419	DGS-30SG-110419
Collection Date	4/19/11	4/19/11	4/19/11	4/19/11
Receipt Date	4/20/11	4/20/11	4/20/11	4/20/11

NAS Sample No.	3635G	3636G	3637G	3638G
Description	DGS-31SG-110419	DGS-33SG-110419	DGS-34SG-110419	DGS-35SG-110419
Collection Date	4/19/11	4/19/11	4/19/11	4/19/11
Receipt Date	4/20/11	4/20/11	4/20/11	4/20/11

NAS Sample No.	3639G	3640G	3641G	3642G
Description	DGS-01SG-110420	DGS-02SG-110420	DGS-04SG-110420	DGS-06SG-110420
Collection Date	4/20/11	4/20/11	4/20/11	4/20/11
Receipt Date	4/22/11	4/22/11	4/22/11	4/22/11

NAS Sample No.	3643G	3644G	3645G
Description	U3C2SG-110421	U4Q1SG-110421	U4Q2SG-110421
Collection Date	4/21/11	4/21/11	4/21/11
Receipt Date	4/22/11	4/22/11	4/22/11

Control Sediment: The negative control sediment (NAS#3655G) was collected on 4-26-11 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 control sediments were stored at 4°C in the dark in sealed containers until used.

TEST WATER

Source: Dechlorinated municipal tap water.
Date of Preparation: 5/2/11
Water Quality:
pH: 7.0
conductivity: 122 µmhos/cm
hardness: 34 mg/L as $CaCO_3$
alkalinity: 30 mg/L as $CaCO_3$.
total chlorine: < 0.02 mg/L
Pretreatment: Dechlorinated and aerated ≥24 hr.

TEST ORGANISMS

Species: *Chironomus dilutus* (formerly *C. tentans*), midge.
Size: 3rd instar, mean initial wt: 0.16 ± 0.01 mg
Source: NAS cultures, originally obtained from EPA, Duluth, MN.
Acclimation: Holding conditions for the two weeks prior to testing averaged: Temperature, 21.0 ± 1.0°C; dissolved oxygen, 8.4 ± 0.4 mg/L; pH, 7.0 ± 0.2; conductivity, 142 ± 5 µmhos/cm; hardness, 34 mg/L as $CaCO_3$; and alkalinity, 30 mg/L as $CaCO_3$. Photoperiod was 16:8, L:D. Half of the water in culture tanks was replaced twice weekly with dechlorinated municipal tap water during holding. Animals were fed Tetra Fin suspension and *Selenastrum*.

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 were fed 1.5 ml of Tetra Fin suspension (1.5 ml contains 6 mg dry solids) per beaker daily.

Effects Criteria: 1) survival after 10 days, and 2) average individual biomass (based on ash-free dry weight) after 10 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 10 of the test. Temperature and dissolved oxygen were measured daily in the overlying water of one replicate test container per treatment. Hardness and alkalinity were measured with titrimetric methods. Total ammonia and pH were measured in the pore water from the bulk sediment at test initiation. Interstitial water samples were obtained by centrifugation. 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 and individual biomass were calculated for each replicate as follows:

percent survival = 100 x (number surviving/initial number tested)
average individual ash-free dry wt. = (ash-free dry wt.)/number weighed,
where:
ash-free dry wt. = dry weight of organisms recovered on day 10 – ashed dry weight, in mg

Means and standard deviations for the biological endpoints described above, and for water quality data, were computed using Microsoft Excel 2000.

PROTOCOL DEVIATIONS

Beaker number 161 inadvertently received 15 animals at test initiation rather than the 10 specified in the protocol. Mortality was assessed but the weight end point was not used.

REFERENCE TOXICANT TEST

The reference toxicant test is a multi-concentration toxicity test using potassium 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.: 999-2881
Reference Toxicant and Source: Potassium Chloride (KCl), Fisher Lot #073280.
Test Date: 5-6-11.
Dilution Water Used: Moderately hard synthetic water prepared from Milli-Q® deionized water.
Result: 96-hr LC50, 4.24 g/L. This result is within the laboratory's control chart warning limits (2.96 – 7.78 g/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. Interstitial ammonia and pH measurements are listed in Table 2. The means and standard deviations of percent mortality and growth (ash-free dry wt.) of midges exposed for 10 days to sediments are summarized in Table 3. 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 between 0.1 and 1.5 mg/L for all day 0 and day 10 measurements. Interstitial bulk sediment values for ammonia-N ranged from 1.8 to 21.9 mg/L.

The test met the survival and weight acceptability criteria specified in the test protocol with 9.6% mean control mortality (≤30% required) and a control individual mean ash-free dry weight of 0.79 mg per larvae (0.48 mg required). The reference sediments resulted in mortalities of 20.0-21.3%, within the standard of 30.0% set in the Sediment Evaluation Framework for the Pacific Northwest May 2009 (SEF). The mean ash-free dry

weights of the reference sediments all met the SEF requirement. (≥80% of the negative control, i.e. ≥0.63 mg, required) The reference toxicant (positive control) EC50 result was within the laboratory's control chart limits (4.24 g/L; control chart mean ± 2 S.D. = 5.37 ± 2.41). It is concluded, therefore, that the test has developed fully acceptable data for use in making management decisions.

STUDY APPROVAL

Gerald Lissari 5-27-11
Project Manager/Study Director Date

Julie R. Fraie 5-31-11
Quality Assurance Unit Date

Linda K. Nemitz 5/25/11
Assistant Laboratory Director Date

Table 1. Summary of water quality conditions during tests of the midge, *Chironomus dilutus*, exposed to freshwater sediments.

Water Quality Parameter	Mean ± S.D.	Minimum	Maximum	N
Temperature (°C)	22.7 ± 0.3	22.2	23.6	264
Dissolved oxygen (mg/L)	6.1 ± 0.6	4.5	7.3	264
Conductivity (µmhos/cm)	143 ± 5	133	158	48
pH	6.4 ± 0.1	6.1	6.8	48
Hardness (mg/L as $CaCO_3$)	41 ± 5	34	51	48
Alkalinity (mg/L as $CaCO_3$)	31 ± 3	30	40	48
Total ammonia (mg/L)	0.4 ± 0.3	0.1	1.5	48

Table 2. Interstitial ammonia-N and pH in test sediments porewater prior to test initiation.

NAS Sample No.	Sample Description	pH	Ammonia (mg/L)
3655G	Control	6.6	2.7
3623G	DGS-05SG-110418	6.1	2.2
3624G	DGS-08SG-110418	6.5	3.5
3625G	DGS-09SG-110418	6.7	6.4
3626G	DGS-12SG-110418	6.5	2.7
3627G	DGS-13SG-110418	6.7	4.7
3628G	DGS-16SG-110418	6.5	2.3
3629G	DGS-17SG-110418	6.6	2.1
3630G	DGS-20SG-110419	7.0	1.8
3631G	DGS-21SG-110419	6.7	8.3
3632G	DGS-25SG-110419	6.7	2.3
3633G	DGS-26SG-110419	6.6	7.8
3634G	DGS-30SG-110419	6.5	2.9
3635G	DGS-31SG-110419	6.6	8.0
3636G	DGS-33SG-110419	6.6	3.2
3637G	DGS-34SG-110419	6.6	11.3
3638G	DGS-35SG-110419	6.7	12.3
3639G	DGS-01SG-110420	6.7	4.8
3640G	DGS-02SG-110420	6.8	6.9
3641G	DGS-04SG-110420	6.7	21.9
3642G	DGS-06SG-110420	6.7	9.6
3643G	U3C2SG-110421	6.6	5.0
3644G	U4Q1SG-110421	6.8	2.8
3645G	U4Q2SG-110421	6.8	3.7

Table 3. Mortality and growth results of *Chironomus dilutus* 10-day sediment toxicity test

NAS Sample No.	Sample Description	Percent mortality (Mean ± SD)	Average ash-free dry wt/midge (mg)* (Mean ± SD)
3655G	Control	9.6 ± 5.5	0.79 ± 0.10
3623G	DGS-05SG-110418	53.8 ± 32.0	0.75 ± 0.29
3624G	DGS-08SG-110418	35.0 ± 29.8	0.76 ± 0.14
3625G	DGS-09SG-110418	23.8 ± 31.1	0.76 ± 0.48
3626G	DGS-12SG-110418	25.0 ± 22.7	0.89 ± 0.16
3627G	DGS-13SG-110418	57.5 ± 25.5	0.57 ± 0.12
3628G	DGS-16SG-110418	25.0 ± 26.2	0.78 ± 0.12
3629G	DGS-17SG-110418	26.3 ± 26.7	0.85 ± 0.21
3630G	DGS-20SG-110419	13.8 ± 20.0	0.77 ± 0.09
3631G	DGS-21SG-110419	41.3 ± 27.0	0.70 ± 0.34
3632G	DGS-25SG-110419	45.0 ± 26.7	0.83 ± 0.19
3633G	DGS-26SG-110419	57.5 ± 23.1	0.37 ± 0.13
3634G	DGS-30SG-110419	27.5 ± 18.3	0.76 ± 0.20
3635G	DGS-31SG-110419	43.8 ± 21.3	0.64 ± 0.20
3636G	DGS-33SG-110419	38.8 ± 19.6	0.79 ± 0.23
3637G	DGS-34SG-110419	73.8 ± 16.0	0.34 ± 0.38
3638G	DGS-35SG-110419	70.0 ± 23.9	0.26 ± 0.23
3639G	DGS-01SG-110420	22.5 ± 17.5	0.91 ± 0.17
3640G	DGS-02SG-110420	16.3 ± 19.2	0.74 ± 0.10
3641G	DGS-04SG-110420	80.0 ± 14.1	0.26 ± 0.17
3642G	DGS-06SG-110420	18.8 ± 18.1	0.75 ± 0.13
3643G	U3C2SG-110421	20.0 ± 15.1	0.64 ± 0.07
3644G	U4Q1SG-110421	20.0 ± 18.5	0.89 ± 0.08
3645G	U4Q2SG-110421	21.3 ± 14.6	0.89 ± 0.15

*Pupae were not included in the sample to estimate ash-free dry weight (as per EPA/600/R-99/064, p. 59, section 12.3.8.2)

APPENDIX I

PROTOCOL

TEST PROTOCOL

FRESHWATER MIDGE, *CHIRONOMUS TENTANS*, 10-DAY SEDIMENT TOXICITY TEST

1. INTRODUCTION

1.1 Purpose of Study: The purpose of this study is to characterize the toxicity of freshwater sediments based on midge survival and growth using the midge, *Chironomus tentans*.

1.2 Referenced Method: This protocol is based on EPA Method 100.2 (EPA/600/R-99/064) and ASTM Method E 1706-00 (ASTM 2001).

1.3 Summary of Method: A summary of test conditions for the midge 10-day sediment toxicity test is tabulated below. The 10-day sediment toxicity test with *Chironomus tentans* is conducted at 23°C with a 16L:8D photoperiod at an illuminance of about100-1000 lux. Test chambers are 300-mL high-form lipless beakers containing 100 mL of sediment and 175 mL of overlying water. Ten second to third-instar midges are used in each replicate (all organisms must be third instar or younger and at least 50% of the larvae must be third instar). The number of replicates/treatment depends on the objective of the test. Eight replicates are recommended for routine testing. Midges in each test chamber are fed 1.5 mL of a 4 g/L fish food flakes suspension daily. Each chamber receives two volume additions per day of overlying water. Overlying water can be culture water, well water, surface water, site water, or reconstituted water. Test endpoints include survival and/or 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 to begin within 14 days of sample collection. Eight week holding times may apply in some circumstances. 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 14 days prior to testing. Eight week holding times may apply in some circumstances. If jars are 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 *C. tentans* culture water, which is moderately hard synthetic water at a hardness of 80-100 mg/L as $CaCO_3$ and alkalinity of 60-70 mg/L as $CaCO_3$. Dilution water is prepared from Milli-Q reagent grade water and reagent grade chemicals. Test water may also be well water, surface water or site water depending on the study design.

5. TEST ORGANISMS

5.1 Species: midge, *Chironomus tentans.*

5.2 Source: Cultured at NAS (Originally obtained from U.S. EPA Environmental Research Lab, Duluth, MN) or purchased from a reputable commercial supplier.

5.3 Age: Third instar or younger larvae (at least 50% of the larvae must be in the third instar at the start of the test). Third instar is normally 9 to 11 days after hatching; head capsule widths range from 0.33 to 0.45 mm; or length ranges from 4-6 mm; or dry weight ranges 0.08 to 0.23 mg/individual.

5.4 Acclimation and Pretest Observation: Cultures are maintained at 23 ± 1°C under a 16:8 L:D photoperiod. The culture water is moderately hard synthetic water. Midge are fed finely ground Tetrafin flakes in suspension (10g Tetrafin in 100 mL Milli-Q water). Mortality during the 48-hr prior to testing should not be excessive.

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 (Pyrex® 1040 or equivalent). 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 to 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 midge larvae 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 10 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 midges are introduced to the test chambers. Initial water quality measurements are taken prior to the addition of test organisms.

7.3 Effect Criterion: The acute effect criterion used in the midge bioassay is mortality, defined as the lack of movement of body or appendages on response to tactile stimulation. The optional chronic effect criterion is growth which is determined by using dry weight measurements.

7.4 Test Conditions: No aeration is employed unless dissoved oxygen falls below 2.5 mg/L. The test temperature employed is 23°C (range of ± 1°C). A 16:8, L:D photoperiod is used. Illumination is supplied by daylight fluorescent lamps at 100-1000 lux. The overlying water is replaced twice daily.

7.5 Beginning the Test: The test is begun by adding the organisms to the equilibrated test containers as previously described. Three extra replicates of midge larvae should be counted out and randomly selected for drying to determine initial average weight and instar data.

7.6 Feeding: Midge larvae are fed 1.5 mL daily per test chamber (1.5 mL contains 6.0 mg of dry solids). 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 acute toxicity test is 10 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 10
Physical And Chemical Data	
Hardness, alkalinity, ammonia-N, conductivity, pH, dissolved oxygen, and temperature	Beginning and end of test in overlying water of one replicate beaker from each treatment.
Dissolved oxygen, temperature	Daily in overlying water of one replicate beaker from each treatment.

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. Ammonia-nitrogen is measured using the salicylate colerimetric method (Clin. Chim. Acta 14:403, 1996).

7.8 Growth Measurement: Growth is measured as ash-free dry weight (AFDW) of animals in a test replicate at the end of the test on day 10. Pooled animals from each test replicate are rinsed with deionized water, gently blotted and placed into tared aluminum weigh pans. The pans are dried at 60-90°C to constant weight. The dried organisms 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 midge in each pan is divided by the number of midge weighed to obtain an average dry weight per midge. The dried larvae in the pan are then ashed at 550°C for two hours. The pan with the ashed larvae is then reweighed and the tissue mass of the larvae is determined as the difference between the weight

of the dried larvae plus pan and the weight of the ashed larvae plus pan. Pupae or adult organisms are not included in the sample to estimate AFDW.

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 70% and the average ash-free dry weight of *C. tentans* in the surviving controls is at least 0.48 mg.

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 midge ash-free 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 10-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 12, Test Method 100.2, *Chironomus tentans* 10-d Survival and Gowth Test for Sediments, pp. 55-62. 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	10 days
3. Temperature	23 ± 1°C
4. Light quality	daylight flourescent 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	2nd to 3rd instar or younger larvae (≥ 50% of organisms must be 3rd instar)
12. Organisms per test chamber	10
13. Replicates per treatment	8 recommended for routine (depends on design)
14. Organisms per treatment	80
15. Feeding regime	Fish food flakes, fed 1.5 mL chamber (1.5 mL contains 6.0 mg of dry solids) daily on days 0 - 9.
16. Aeration	None, unless DO falls below 2.5 mg/L.
17. Overlying (test) water	**Culture water**, well water, surface water, site water or reconstituted water
18. Water quality	Hardness, alkalinity, conductivity, pH, ammonia-N beginning and end; temperature and DO daily
19. Endpoints	Survival and growth (dry weight)
20. Test acceptability criteria	Minimum control survival of 70%; mean weight of surviving control organisms 0.48 mg AFDW
21. Sample holding	≤14 days at 4°C in the dark Longer under certain conditions
22. Sample volume required	1L (800 mL per sediment)
23. Reference toxicant	Concurrent testing required

APPENDIX II

RAW DATA

TEST DESCRIPTION, MONITORING, AND RESULTS BENCHSHEETS

CHIRONOMUS DILUTUS 10-DAY SOLID PHASE SEDIMENT TEST

REVIEWED PAGES 1-43 GJI

Test No. 814-3 Client Anchor QEA Investigator

STUDY MANAGEMENT

Client: Anchor QEA, LLC, 1423 Third Ave., Suite 300, Seattle, WA 98101

Client's Study Monitor: Ms. Joy Dunay

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. GA Buhler GAB
2. Yves Nalcahame YN
3. Lois Jonopol LJ
4. M.S. Redmond MSR
5. Carmen CRC
6.
7.
8.

Study Schedule:

Test Beginning: 5-6-11 1000 Test Ending: 5-16-11 1130

TEST MATERIAL

General description (see sample logbook/chain-of-custody for details):

NAS Sample No.:	3655G	3623G	3624G	3625G
Description:	Control	DGS-05SG-110418	DGS-08SG-110418	DGS-09SG-110418
Collection Date:	4/26/11	4/18/11	4/18/11	4/18/11
Receipt Date:	4/26/11	4/20/11	4/20/11	4/20/11
_____:				

NAS Sample No.:	3626G	3627G	3628G	3629G
Description:	DGS-12SG-110418	DGS-13SG-110418	DGS-16SG-110418	DGS-17SG-110418
Collection Date:	4/18/11	4/18/11	4/18/11	4/18/11
Receipt Date:	4/20/11	4/20/11	4/20/11	4/20/11
_____:				

NAS Sample No.:	3630G	3631G	3632G	3633G
Description:	DGS-20SG-110419	DGS-21SG-110419	DGS-25SG-110419	DGS-26SG-110419
Collection Date:	4/19/11	4/19/11	4/19/11	4/19/11
Receipt Date:	4/20/11	4/20/11	4/20/11	4/20/11
_____:				

NAS Sample No.:	3634G	3635G	3636G	3637G
Description:	DGS-30SG-110419	DGS-31SG-110419	DGS-33SG-110419	DGS-34SG-110419
Collection Date:	4/19/11	4/19/11	4/19/11	4/19/11
Receipt Date:	4/20/11	4/20/11	4/20/11	4/20/11
_____:				

NAS Sample No.:	3638G	3639G	3640G	3641G
Description:	DGS-35SG-110419	DGS-01SG-110420	DGS-02SG-110420	DGS-04SG-110420
Collection Date:	4/19/11	4/20/11	4/20/11	4/20/11
Receipt Date:	4/20/11	4/22/11	4/22/11	4/22/11
_____:				

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

Test No. 814-3 Client Anchor QEA Investigator

TEST MATERIAL CONTINUATION SHEET

NAS Sample No.:	3642G	3643G	3644G	3645G
Description:	DGS-06SG-110420	U3C2SG-110421	U4Q1SG-110421	U4Q2SG-110421
Collection Date:	4/20/11	4/21/11	4/21/11	4/21/11
Receipt Date:	4/22/11	4/22/11	4/22/11	4/22/11
_____:				
NAS Sample No.:				
Description:				
Collection Date:				
Receipt Date:				
_____:				
NAS Sample No.:				
Description:				
Collection Date:				
Receipt Date:				
_____:				
NAS Sample No.:				
Description:				
Collection Date:				
Receipt Date:				
_____:				
NAS Sample No.:				
Description:				
Collection Date:				
Receipt Date:				
_____:				
NAS Sample No.:				
Description:				
Collection Date:				
Receipt Date:				
_____:				
NAS Sample No.:				
Description:				
Collection Date:				
Receipt Date:				
_____:				

Test No. 814-3 Client Anchor QEA Investigator

SEDIMENT DESCRIPTIONS – SUPPLEMENTAL NOTES

Sample No.	Description
3655G	FINE BLACK MUD
3623G	Fine brown sand w/silt, some plant debris, strong hydocarbon odor, bark
3624G	Brown Sandy mud with some woody sticks
3625G	brown sandy mud; Chironomus
3626G	Fine brown sandy mud, some plant debris & bark, slight hydocarbon odor
3627G	DARK GRAY SANDY MUD, PETROLEUM ODOR
3628G	Brown Sandy mud
3629G	dark gray muddy sand; Chironomus
3630G	Fine dark gray mud, slight hydocarbon odor
3631G	Fine dark gray mud, slight hydocarbon odor
3632G	Brown Sandy mud with some plant material (decayed)
3633G	dark gray muddy sand, petroleum odor; Chironomus
3634G	dark gray coarse sand with decayed plant material; Shell
3635G	Fine gray mud, strong hydocarbon odor
3636G	DARK GRAY BROWN MUDDY SAND, PETROLEUM ODOR, SMALL BITS OF PLANT MATTER
3637G	gray-brown mud; a few wood chips
3638G	Grey-brown fine mud; petroleum odor
3639G	dark brown fine mud with twigs and plant material
3640G	Fine gray mud
3641G	charcoal gray oily mud
3642G	DARK GRAY MUDDY SAND
3643G	brown-grey sandy mud, some wood chips
3644G	Brownish green fine mud
3645G	Dark gray-green sandy mud

CHIRONOMUS DILUTUS 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-3 Client Anchor QEA Investigator

TEST WATER

Source: Dechlorinated municipal tap water

Date of Collection: 5-2-11

pH 7.0

Cond (umhos/cm2) 122

Hardness (mg/L) 34

Alkalinity (mg/L) 30

Total Chlorine (mg/L) <0.02

Treatments: Dechlorinated, aerated

TEST ORGANISMS

Species: *Chironomus dilutus* Age: 3rd instar

Source: NAS cultures Date received: N/A

Acclimation Data:

Date	Temp. (deg.C)	pH	DO (mg/L)	Cond. umhos/cm	Hardness (mg/L)	Alkalinity (mg/L)	Feeding	Water changes
4-25-11	20.9	7.4	8.9	140	—	—	Animals fed Tetra Fin	yes
4-27-11	20.3	6.8	8.3	140	34	30	and *Selenastrum*	—
4-29-11	20.6	7.1	7.8	142	—	—	Details recorded on	yes
5-2-11	22.3	7.0	8.5	153	—	—	Chironomid culture	—
5-4-11	19.9	6.9	8.5	139	34	30	data sheets	—
5-6-11	22.2	7.0	8.2	139	—	—		yes
Mean	21.0	7.0	8.4	142	34	30		
S.D.	1.0	0.2	0.4	5	—	—		
(N)	6	6	6	6	2	2		

Photoperiod during acclimation: 16:8, L:D

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

Beaker placement: Total randomization

Feeding: everyday beginning with day zero

Photoperiod: 16:8, L:D

Test temperature (°C): 23 ± 1

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: 4/26/11

Sieved through 0.5 -mm screen

Storage: darkness at 4°C, in sealed containers NAS# 3655G

MISCELLANEOUS NOTES

Light intensity:

Date	Location	Light Intensity (ft-candles*)	Initials
5-8-11	BEAKER # 16	32	GJI
	" 62	36	
	" 113	34	
	" 166	35	

*To convert ft-candles to lux multipy by 10.76

CHIRONOMUS DILUTUS 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-3 Client Anchor QEA Investigator _____

Test conducted in (circle one): room 1 room 2 trailer water bath other: _____

Randomization chart: TOP SHELF

6									192
5									191
4									190
3									189
2									188
1									187

Randomization chart: FRONT OF SHELF

Randomization chart:

Test No. 814-3 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 0 (5/6/11) GJ1/YN

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond.* (umhos/cm)	pH*	Hardness* (mg/L)	Alkalinity* (mg/L	NH3* (ppm)	Comments
1	23.6	6.1	144	6.1	34	30		
4	23.6	6.0	144	6.2	43	30		Each beaker fed 1.5 ml
6	23.6	5.4	158	6.2	43	30		Tetra Fin suspension
10	23.2	7.1	137	6.5	43	30		Initials: BB
21	22.7	7.0	136	6.4	43	30		
25	22.6	7.1	138	6.4	43	30		
26	22.4	7.0	135	6.5	43	30		
51	22.4	6.9	143	6.5	34	40		
72	22.9	6.8	138	6.5	43	30		
74	22.7	7.2	145	6.6	34	30		
102	23.0	6.7	137	6.4	43	30		
108	23.1	6.9	141	6.5	43	30		
109	22.8	7.1	144	6.6	43	40		
123	22.5	6.8	135	6.5	43	30		
127	22.6	7.1	139	6.6	43	30		
138	22.9	7.3	139	6.7	43	30		
142	22.6	6.9	137	6.4	43	30		
155	22.5	6.9	133	6.5	34	30		
169	22.5	7.0	135	6.6	34	30		
181	22.7	7.1	141	6.8	43	30		
182	22.5	6.8	138	6.6	34	30		
184	22.4	6.6	157	6.6	43	40		
191	22.8	6.7	154	6.6	51	40		
192	23.0	6.9	139	6.5	34	30		
								Water changed in all
								beakers.
								Time: 0620
								Initials: GJ1
								Water changed in all
								beakers.
								Time: 1730
								Initials: YN

*Water quality measurements to be taken.

CHIRONOMUS DILUTUS 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-3 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 1 (5/7/11) GB

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
1	23.5	6.6						
4	23.5	7.2						Each beaker fed 1.5 ml
6	23.6	5.8						Tetra Fin suspension
10	23.3	7.0						Initials: GB
21	22.9	7.2						
25	22.9	7.2						
26	22.8	7.0						
51	22.8	7.2						
72	23.1	6.8						
74	22.8	7.1						
102	22.9	7.0						
108	23.0	7.2						
109	23.0	7.2						
123	22.7	7.1						
127	22.9	6.7						
138	23.1	6.9						
142	22.8	7.0						
155	22.8	7.2						
169	22.9	7.1						
181	22.9	7.0						
182	22.9	6.9						
184	22.8	7.0						
191	23.0	7.1						
192	23.2	6.8						
								Water changed in all
								beakers.
								Time: 0550
								Initials: GB
								Water changed in all
								beakers.
								Time: 1735
								Initials: LPS

*Water quality measurements to be taken.

CHIRONOMUS DILUTUS 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-3 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 2 (5/8/11) GJL

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
1	23.3	6.3						
4	23.1	6.3						Each beaker fed 1.5 ml
6	23.2	6.3						Tetra Fin suspension
10	22.9	6.8						Initials: GJL
21	22.5	6.5						
25	22.5	6.7						
26	22.4	6.9						
51	22.4	7.0						
72	22.7	6.8						
74	22.6	5.8						
102	22.8	6.9						
108	22.9	6.2						
109	22.7	7.0						
123	22.5	6.8						
127	22.6	7.0						
138	22.8	6.7						
142	22.5	6.8						
155	22.5	6.4						
169	22.5	6.9						
181	22.5	6.8						
182	22.4	6.7						
184	22.4	6.8						
191	22.6	6.8						
192	22.9	6.8						
								Water changed in all
								beakers.
								Time: 0550
								Initials: GJL
								Water changed in all
								beakers.
								Time: 1705
								Initials: YN

*Water quality measurements to be taken.

CHIRONOMUS DILUTUS 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-3 Client Anchor QEA Investigator _____

DAILY RECORD SHEET

Day 3 (5/9/11) YP

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
1	23.4	5.9						
4	23.3	6.1						Each beaker fed 1.5 ml
6	23.3	6.1						Tetra Fin suspension
10	~~23.9~~ 23.0	6.3						Initials: GJL
21	22.5	6.4						
25	22.4	6.3						
26	22.3	6.5						
51	22.2	6.5						
72	22.6	6.7						
74	22.4	6.5						
102	22.7	6.3						
108	22.8	6.3						
109	22.4	6.9						
123	22.2	6.3						
127	22.3	6.5						
138	22.6	6.5						
142	22.3	6.4						
155	22.3	5.7						
169	22.3	6.3						
181	22.4	6.3						
182	22.3	6.3						
184	22.2	6.7						
191	22.5	6.0						
192	22.8	6.1						
								Water changed in all
								beakers.
								Time: 0530
								Initials: GJL
								Water changed in all
								beakers.
								Time: 1710
								Initials: UPS

*Water quality measurements to be taken.

CHIRONOMUS DILUTUS 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-3 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 4 (5/10/11) 631

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
1	23.4	6.4						
4	23.4	6.3						Each beaker fed 1.5 ml
6	23.6	4.6						Tetra Fin suspension
10	23.1	6.1						Initials: GTS
21	22.7	6.2						
25	22.6	6.0						
26	22.5	6.1						
51	22.4	6.0						
72	22.8	6.3						
74	22.5	6.2						
102	22.9	6.1						
108	23.0	6.3						
109	22.7	6.5						
123	22.5	6.2						
127	22.5	6.3						
138	22.8	6.1						
142	22.5	6.1						
155	22.5	5.8						
169	22.5	6.2						
181	22.6	5.9						
182	22.4	6.0						
184	22.3	6.2						
191	22.6	5.7						
192	22.9	6.1						
								Water changed in all
								beakers.
								Time: 0535
								Initials: GTS
								Water changed in all
								beakers.
								Time: 1710
								Initials: LPS

*Water quality measurements to be taken.

CHIRONOMUS DILUTUS 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-3 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 5 (5/11/11) GJ

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
1	23.3	5.2						
4	23.4	5.9						Each beaker fed 1.5 ml
6	23.4	4.9						Tetra Fin suspension
10	23.1	6.0						Initials: GJ
21	22.7	6.1						
25	22.7	5.6						
26	22.5	6.1						
51	22.5	6.3						
72	22.9	6.1						
74	22.6	6.0						
102	22.9	5.9						
108	23.1	6.1						
109	22.8	6.3						
123	22.5	6.0						
127	22.6	6.0						
138	22.9	6.2						
142	22.6	5.9						
155	22.6	5.2						
169	22.7	6.0						
181	22.7	5.9						
182	22.6	5.6						
184	22.4	6.2						
191	22.7	5.8						
192	22.9	6.0						
								Water changed in all
								beakers.
								Time: 0550
								Initials: GJ
								Water changed in all
								beakers.
								Time: 1720
								Initials: GJ

*Water quality measurements to be taken.

CHIRONOMUS DILUTUS 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-3 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 6 (5/12/11) 632

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
1	23.5	6.1						
4	23.4	5.9						Each beaker fed 1.5 ml
6	23.5	4.8						Tetra Fin suspension
10	23.1	5.8						Initials: GB
21	22.8	6.0						
25	22.7	5.6						
26	22.5	6.0						
51	22.5	6.2						
72	22.9	6.1						
74	22.6	6.0						
102	22.9	5.6						
108	23.1	6.1						
109	22.8	6.1						
123	22.6	5.9						
127	22.6	6.0						
138	22.8	6.1						
142	22.5	6.2						
155	22.5	5.2						
169	22.6	5.7						
181	22.7	6.1						
182	22.5	5.8						
184	22.4	6.3						
191	22.7	5.2						
192	23.0	6.1						
								Water changed in all
								beakers.
								Time: 0545
								Initials: GB
								Water changed in all
								beakers.
								Time: 1720
								Initials: VV

*Water quality measurements to be taken.

CHIRONOMUS DILUTUS 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-3 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 7 (5/13/11) GJL

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
1	23.1	5.3						
4	23.2	5.2						Each beaker fed 1.5 ml
6	23.3	5.2						Tetra Fin suspension
10	22.9	5.5						Initials: GJL
21	22.6	5.7						
25	22.5	5.2						
26	22.4	5.7						
51	22.3	5.7						
72	22.8	5.9						
74	22.5	5.4						
102	22.8	5.5						
108	23.0	5.7						
109	22.6	6.0						
123	22.4	5.8						
127	22.5	5.5						
138	22.7	5.7						
142	22.5	6.2						
155	22.5	5.0						
169	22.5	5.6						
181	22.6	5.6						
182	22.4	5.6						
184	22.3	5.9						
191	22.6	5.2						
192	22.8	5.5						
								Water changed in all
								beakers.
								Time: 0550
								Initials: GJL
								Water changed in all
								beakers.
								Time: 1700
								Initials:

*Water quality measurements to be taken.

CHIRONOMUS DILUTUS 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-3 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 8 (5/14/11) OB

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
1	23.4	5.5						
4	23.3	5.2						Each beaker fed 1.5 ml
6	23.4	5.3						Tetra Fin suspension
10	23.1	5.5						Initials: OB
21	23.1	5.9						
25	22.8	5.4						
26	22.8	5.6						
51	22.5	5.6						
72	22.9	5.8						
74	22.8	5.3						
102	23.0	5.9						
108	23.0	5.8						
109	22.8	5.9						
123	22.8	5.7						
127	22.7	5.8						
138	22.9	5.5						
142	22.6	5.7						
155	22.6	5.5						
169	22.6	5.6						
181	22.7	5.4						
182	22.7	5.3						
184	22.6	5.5						
191	22.8	5.4						
192	22.9	5.6						
								Water changed in all
								beakers.
								Time: 0530
								Initials: OB
								Water changed in all
								beakers.
								Time: 1745
								Initials: UPS

*Water quality measurements to be taken.

CHIRONOMUS DILUTUS 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-3 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 9 (5/15/11) GJL

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
1	23.4	4.8						
4	23.2	5.1						Each beaker fed 1.5 ml
6	23.3	4.9						Tetra Fin suspension
10	22.9	5.6						Initials: GJL
21	22.6	5.9						
25	22.6	5.3						
26	22.5	5.3						
51	22.4	5.8						
72	22.8	5.8						
74	22.5	5.2						
102	22.8	5.5						
108	22.9	5.7						
109	22.7	5.5						
123	22.5	5.6						
127	22.5	4.6						
138	22.7	5.7						
142	22.5	6.0						
155	22.5	4.8						
169	22.5	5.1						
181	22.6	5.7						
182	22.4	5.1						
184	22.4	5.8						
191	22.6	5.0						
192	22.9	5.4						
								Water changed in all
								beakers.
								Time: 0650
								Initials: GJL
								Water changed in all
								beakers.
								Time: 1705
								Initials: YR

*Water quality measurements to be taken.

CHIRONOMUS DILUTUS 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-3 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 10 (5/16/11) GSI / LPS

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond.* (umhos/cm)	pH*	Hardness* (mg/L)	Alkalinity* (mg/L	NH3* (ppm)	Comments
1	22.9	5.2	142	6.4	51	30		
4	23.1	5.2	149	6.4	34	30		Each beaker fed 1.5 ml
6	23.3	4.5	153	6.2	43	30		Tetra Fin suspension
10	23.0	5.9	147	6.4	43	30		Initials: —
21	22.6	6.3	144	6.4	34	30		
25	22.5	5.8	145	6.3	43	30		
26	22.4	5.9	144	6.4	34	30		
51	22.3	6.2	142	6.4	34	30		
72	22.8	6.1	145	6.5	51	30		
74	22.4	5.3	143	6.3	34	30		
102	22.7	5.7	144	6.3	34	30		
108	22.9	5.9	149	6.4	43	30		
109	22.6	5.9	143	6.3	51	30		
123	22.4	5.6	141	6.3	43	30		
127	22.4	6.1	142	6.4	43	30		
138	22.7	6.3	144	6.4	34	30		
142	22.4	6.2	142	6.4	43	30		
155	22.4	4.9	144	6.4	43	30		
169	22.4	5.6	141	6.3	43	30		
181	22.6	6.1	143	6.4	34	30		
182	22.4	5.5	141	6.3	34	30		
184	22.3	5.9	144	6.4	43	30		
191	22.6	5.0	145	6.3	51	30		
192	22.9	6.3	142	6.4	43	30		
								Water changed in all
								beakers.
								Time: 0650
								Initials: GSI
								Water changed in all
								beakers.
								Time: —
								Initials: —

*Water quality measurements to be taken.

CHIRONOMUS DILUTUS 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-3 Client Anchor QEA Investigator

DAY 10 TEST TERMINATION SHEET

Beaker No.	Number of survivors	Initials
1	1	GAB
2	4	GTB
3	5	GJL
4	5	GJL
5	8	GAB
6	10	GTB
7	9	GJL
8	5	GJL
9	10	GTB
10	10	GTB
11	3	GJL
12	9	GJL
13	4	GTB
14	4	GTB
15	5	GJL
16	8	GJL
17	8	GTB
18	8	GTB
19	8	GJL
20	7	GJL
21	7	GTB
22	9	GTB
23	6	GJL
24	6	GJL
25	8	GTB
26	8	GTB
27	7	GJL
28	7	GJL
29	7	GJL
30	9	GJL
31	3	GTB
32	1	GTB
33	8	GJL
34	3	GJL
35	6	GTB
36	8	GTB
37	9	GJL
38	6	GJL
39	2	GTB
40	9	GTB
41	2	GJL
42	2	GJL
43	7	GJL
44	10	GJL
45	10	GTB

Beaker No.	Number of survivors	Initials
46	9	GTB
47	9	GJL
48	2	GJL
49	4	GTB
50	4	GTB
51	6	GJL
52	10	GJL
53	3	GTB
54	1	GTB
55	3	GJL
56	10	GJL
57	7	GJL
58	1	GJL
59	7	GJL
60	6	GJL
61	5	GJL
62	8	GJL
63	9	GTB
64	9	GTB
65	5	GJL
66	~~5~~ 6	GJL
67	10	GTB
68	~~6~~ 8	GTB
69	4	GJL
70	1	GJL
71	8	GTB
72	1	GTB
73	1	GTB
74	8	GTB
75	8	GTB
76	9	GTB
77	9	GJL
78	8	GJL
79	9	GTB
80	8	GTB
81	10	GJL
82	6	GJL
83	10	GTB
84	9	GTB
85	3	GJL
86	5	GJL
87	6	GTB
88	6	GTB
89	2	GJL
90	5	

CHIRONOMUS DILUTUS 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-3 Client Anchor QEA Investigator

DAY 10 TEST TERMINATION SHEET

Beaker No.	Number of survivors	Initials
91	9	GB
92	6	GB
93	4	GB
94	6	GB
95	8	GB
96	5	GB
97	4	GJL
98	3	GJL
99	2	GB
100	2	GB
101	6	GJL
102	7	GJL
103	1	GB
104	7	GB
105	8	GB
106	3	GB
107	7	GJL
108	8	GJL
109	6	GB
110	7	GB
111	6	GJL
112	2	GJL
113	7	GB
114	9	GB
115	10	GJL
116	10	GJL
117	1	GB
118	3	GB
119	8	GB
120	7	GB
121	10	GJL
122	10	GJL
123	8	GB
124	10	GJL
125	10	GB
126	6	GJL
127	2	GB
128	5	GB
129	1	GJL
130	5	GJL
131	6	GB
132	3	GB
133	2	GJL
134	4	GJL
135	4	GJL

Beaker No.	Number of survivors	Initials
136	4	GJL
137	9	GB
138	7	GB
139	10	GJL
140	9	GJL
141	9	GB
142	2	GB
143	6	GB
144	8	GB
145	9	GB
146	6	GB
147	9	GB
148	7	GB
149	1	GB
150	8	GB
151	4	GB
152	1	GB
153	3	GB
154	4	GB
155	10	GB
156	10	GB
157	10	GJL
158	9	GJL
159	10	GJL
160	10	GJL
161	14	GB
162	9	GB
163	9	GJL
164	9	GJL
165	6	GB
166	8	GB
167	8	GJL
168	6	GJL
169	8	GB
170	10	GB
171	7	GJL
172	2	GJL
173	6	GB
174	9	GB
175	9	GJL
176	9	GJL
177	2	GB
178	3	GB
179	9	GJL
180	8	GJL

CHIRONOMUS DILUTUS 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-3 Client Anchor QEA Investigator _____

DAY 10 TEST TERMINATION SHEET

Beaker No.	Number of survivors	Initials
181	10	CAB
182	10	CAB
183	10	GJL
184	1	GJL
185	8	CAB
186	2	CAB
187	1	CAB
188	7	CAB
189	8	GJL
190	9	GJL
191	10	CAB
192	3	CAB
193		
194		
195		
196		
197		
198		
199		
200		
201		
202		
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204		
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213		
214		
215		
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218		
219		
220		
221		
222		
223		
224		
225		

Beaker No.	Number of survivors	Initials
226		
227		
228		
229		
230		
231		
232		
233		
234		
235		
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CHIRONOMUS DILUTUS 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-3 Client Anchor QEA Investigator

Tare: Date 4-21-11 Oven temp (C.) 66 Drying time (hr.) 24 Initials JRF
Standard Weights: 10 mg: 10.009 100mg: 100.019

Final #1 Date 5-16-11 Oven temp (C.) 64 Drying time (hr.) 24 Initials GJL
Standard Weights: 10 mg: 10.007 100mg: 100.009

Final: #2 Date 5-17-11 Oven temp (C.) 63 Drying time (hr.) 24 Initials GJL
Standard Weights: 10 mg: 10.008 100mg: 100.013

Equip. used: Oven: BLUE M #1 Balance: SARTORIUS M3P

(Dry overnight at 60-90 degrees C)

Pan #	Tare wt. (mg)	Total wt. (mg) 1	Total wt. (mg) 2	#weighed	
1	83.76	85.25	85.23	10	
2	154.44	156.20	156.19	10	
3	84.42	86.09	86.07	10	
4	93.41	95.05	95.03	10	
5	81.03	82.66	82.64	10	

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-CT4b

CHIRONOMUS DILUTUS 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-3 Client Anchor QEA Investigator

WEIGHING DATA SHEET

Tare:	Date 4-21-11	Oven temp (C.) 550	Drying time (hr.) 2	Initials JRF
	Standard Weights:	10 mg: 10.009	100mg: 100.019	
Final #1:	Date 5-18-11	Oven temp (C.) 63	Drying time (hr.) 24	Initials JRF
	Standard Weights:	10 mg: 10.006	100mg: 100.011	
Final #2:	Date 5-19-11	Oven temp (C.) 64	Drying time (hr.) 24	Initials JRF
	Standard Weights:	10 mg: 10.008	100mg: 100.010	
Final #3:	Date 5-20-11	Oven temp (C.) 550	Drying time (hr.) 2	Initials GJL
	Standard Weights:	10 mg: 10.009	100mg: 100.014	

Equip. used: Oven BLUE M #1, ISOTHERM MUFFLE FURNACE Balance SARTORIUS M3P

(Dry overnight at 60-90 degrees C) **(Final ashing is at 550 degrees C for 2 hours)**

Bkr. #	Pan #	Tare wt. (mg)	Dry total wt. (mg) 1	Dry total wt. (mg) 2	no. weighed	put into pans-initials	Ash weight (mg)	Comments
1	1	91.19	91.40	91.40	1	MLR	91.30	
2	2	84.29	86.92	86.90	4	MLR	84.83	
3	3	84.66	87.24	87.23	5	MLR	85.34	
4	4	82.87	87.10	87.07	5	MLR	83.84	
5	5	82.44	91.73	91.68	8	MLR	84.85	
6	6	76.16	81.64	81.61	10	MLR	76.89	
7	7	85.66	91.98	91.93	9	MLR	87.20	
8	8	85.25	85.94	85.92	5	MLR	85.37	
9	9	83.74	94.08	94.02	10	MLR	86.15	
10	10	82.59	92.09	92.04	10	MLR	85.15	
11	11	81.51	84.91	84.88	3	MLR	82.13	
12	12	80.22	87.73	87.68	9	MLR	81.47	
13	13	80.20	82.28	82.26	4	MLR	80.64	
14	14	81.18	87.27	87.24	4	MLR	82.81	
15	15	85.57	89.89	89.86	5	MLR	86.48	
16	16	84.60	91.53	91.49	8	MLR	85.69	
17	17	86.21	92.89	92.86	8	MLR	88.03	
18	18	84.02	92.13	92.09	8	MLR	85.93	
19	19	97.82	107.31	107.26	8	MLR	(1) GJL 5-24-11 ~~10~~ 99.98	
20	20	83.56	87.66	87.62	7	MLR	84.29	
21	21	79.18	85.74	85.70	7	MLR	80.42	
22	22	77.42	85.64	85.59	9	MLR	78.97	
23	23	77.16	83.37	83.33	6	MLR	78.68	
24	24	78.42	84.46	84.43	6	MLR	80.19	
25	25	88.40	97.38	97.33	8	MLR	90.34	
26	26	83.35	89.31	89.28	8	MLR	84.53	
27	27	75.79	81.95	81.91	7	MLR	76.96	
28	28	80.83	88.93	88.89	7	MLR	82.31	
29	29	77.68	85.53	85.49	7	UPS	79.38	
30	30	78.78	86.63	86.60	9	UPS	79.97	
31	31	81.88	82.54	82.54	3	UPS	82.02	
32	32	83.63	84.14	84.13	1	UPS	83.85	
33	33	86.69	94.44	94.41	8	UPS	88.27	

Test No. 814-3 Client Anchor QEA Investigator

WEIGHING DATA SHEET

See page _____ for information on drying times and temperatures, standard weights,etc.

Bkr. #	Pan #	Tare wt. (mg)	Dry total wt. (mg) 1	Dry total wt. (mg) 2	no. weighed	put into pans-initials	Ash weight (mg)	
34	34	80.77	81.11	81.12	3	LPS	80.86	
35	35	82.22	87.50	87.47	6	LPS	83.52	
36	36	80.70	87.60	87.57	8	LPS	82.25	
37	37	76.24	83.40	83.36	9	LPS	77.75	
38	38	85.62	93.23	93.20	6	LPS	87.23	
39	39	81.05	82.56	82.56	2	LPS	81.28	
40	40	78.86	88.38	88.33	9	LPS	81.09	
41	41	75.20	76.25	76.24	2	LPS	75.45	
42	42	83.23	83.73	83.72	2	LPS	83.31	
43	43	82.47	89.68	89.65	7	LPS	83.85	
44	44	88.19	96.07	96.03	10	LPS	90.03	
45	45	77.45	85.80	85.74	10	LPS	79.37	
46	46	74.73	86.09	86.03	9	LPS	77.73	
47	47	85.01	92.52	92.48	9	LPS	86.73	
48	48	76.39	78.71	78.69	2	LPS	76.66	
49	49	82.27	84.58	84.59	4	LPS	82.65	
50	50	79.15	84.45	84.44	4	LPS	80.51	
51	51	79.60	84.18	84.17	6	LPS	80.53	
52	52	81.77	91.64	91.62	10	LPS	83.74	
53	53	77.84	78.34	78.36	3	LPS	77.93	
54	54	79.83	79.93	79.92	1	LPS	79.87	
55	55	76.46	78.01	78.00	3	LPS	76.65	
56	56	85.08	95.24	95.18	10	LPS	86.95	
57	57	76.63	82.00	81.97	7	LPS	77.54	
58	58	88.84	88.95	88.95	1	LPS	88.90	
59	59	80.42	86.86	86.83	7	LPS	81.46	
60	60	82.48	89.95	89.91	6	LPS	84.17	
61	61	80.08	82.89	82.87	5	LPS	80.55	
62	62	87.94	92.49	92.46	8	LPS	88.84	
63	63	83.43	91.27	91.22	9	LPS	84.92	
64	64	84.09	93.79	93.76	9	LPS	86.78	
65	65	94.28	98.49	98.46	5	LPS	95.19	
66	66	80.78	84.56	84.54	6	LPS	81.63	
67	67	77.59	87.18	87.13	10	LPS	80.28	
68	68	80.46	87.52	87.48	8	LPS	81.78	
69	69	79.09	80.87	80.86	4	LPS	79.38	
70	70	83.20	84.70	84.68	1	LPS	83.36	
71	71	85.83	95.25	95.21	8	LPS	88.48	
72	72	80.72	81.68	81.67	1	LPS	80.97	
73	73	84.73	84.84	84.83	1	LPS	84.78	
74	74	82.69	89.58	89.55	8	LPS	83.88	
75	75	81.90	88.58	88.55	8	LPS	83.77	
76	76	77.96	88.05	88.00	9	LPS	79.66	

Test No. 814-3 Client Anchor QEA Investigator

WEIGHING DATA SHEET

See page _____ for information on drying times and temperatures, standard weights,etc.

Bkr. #	Pan #	Tare wt. (mg)	Dry total wt. (mg) 1	Dry total wt. (mg) 2	no. weighed	put into pans-Initials	Ash weight (mg)	
77	77	86.85	96.69	96.60	9	LPS	89.32	
78	78	77.34	85.70	85.67	8	LPS	79.27	
79	79	82.20	92.09	91.97	9	MLR	84.77	
80	80	78.64	88.69	88.58	8	MLR	81.20	
81	81	79.12	88.83	88.74	10	MLR	81.83	
82	82	83.68	89.12	89.07	6	MLR	84.94	
83	83	82.25	92.18	92.09	10	MLR	85.17	
84	84	83.11	91.01	90.95	9	MLR	85.42	
85	85	74.82	75.49	75.48	3	MLR	74.98	
86	86	79.74	85.15	85.10	5	MLR	81.01	
87	87	86.03	92.68	92.62	6	MLR	87.49	
88	88	79.36	87.03	86.96	6	MLR	81.21	
89	89	79.53	82.09	82.06	2	MLR	80.01	
90	90	89.50	95.32	95.27	5	MLR	90.63	
91	91	85.45	92.68	92.62	9	MLR	87.32	
92	92	77.26	83.99	83.95	6	MLR	79.02	
93	93	78.16	80.50	80.48	4	MLR	78.58	
94	94	81.83	90.02	89.98	6	MLR	84.73	
95	95	85.05	95.52	95.46	8	MLR	87.86	
96	96	88.70	97.02	96.97	5	MLR	90.94	
97	97	87.67	92.76	92.72	4	MLR	88.70	
98	98	87.30	89.22	89.21	3	MLR	87.74	
99	99	86.05	87.22	87.22	2	MLR	86.24	
100	100	84.10	86.50	86.49	2	MLR	84.47	
101	101	84.74	91.90	91.87	6	MLR	86.39	
102	102	80.48	86.87	86.84	7	MLR	81.85	
103	103	84.65	85.10	85.10	1	MLR	84.71	
104	104	86.81	94.93	94.87	7	MLR	88.77	
105	105	79.12	88.56	88.51	8	MLR	81.45	
106	106	82.95	85.28	85.26	3	MLR	83.68	
107	107	82.79	89.10	89.07	7	MLR	84.04	
108	108	84.75	86.14	86.12	8	YP	85.02	
109	109	84.75	88.60	88.55	6	YP	85.68	
110	110	81.12	87.88	87.81	7	YP	83.06	
111	111	80.00	88.11	88.01	6	YP	81.99	
112	112	79.48	80.69	80.67	2	YP	79.78	
113	113	82.01	88.46	88.39	7	YP	84.22	
114	114	86.63	97.75	97.64	9	YP	90.52	
115	115	81.13	94.39	94.25	10	YP	85.59	
116	116	77.70	90.07	90.00	10	YP	82.10	
117	117	84.48	84.64	84.64	1	YP	84.50	
118	118	80.45	81.10	81.09	3	YP	80.59	
119	119	76.23	87.75	87.64	8	YP	80.42	

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-CT4b

CHIRONOMUS DILUTUS 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-3 Client Anchor QEA Investigator

WEIGHING DATA SHEET

See page _____ for information on drying times and temperatures, standard weights,etc.

Bkr. #	Pan #	Tare wt. (mg)	Dry total wt. (mg) 1	Dry total wt. (mg) 2	no. weighed	put into pans-initials	Ash weight (mg)	
120	120	77.63	86.13	86.05	7	YR	80.36	
121	121	92.85	103.70	103.60	10	YR	96.75	
122	122	84.00	96.04	95.88	10	YR	86.93	
123	123	82.77	90.71	90.63	8	YR	85.13	
124	124	92.38	104.66	104.55	10	YR	96.89	
125	125	81.76	94.81	94.69	10	YR	86.81	
126	126	95.89	106.21	106.11	6	YR	98.87	
127	127	79.75	83.56	83.52	2	YR	80.87	
128	128	81.79	85.24	85.21	5	YR	82.70	
129	129	82.16	84.67	84.63	1	YR	82.72	
130	130	79.42	83.64	83.59	5	YR	80.45	
131	131	85.00	92.07	92.00	6	YR	87.11	
132	132	81.06	85.79	85.74	3	YR	82.44	
133	133	82.18	84.06	84.05	2	UPS	82.70	
134	134	80.05	84.63	84.60	4	UPS	81.07	
135	135	86.54	87.50	87.51	4	UPS	86.77	
136	136	80.72	82.57	82.56	4	UPS	81.09	
137	137	83.18	92.46	92.43	9	UPS	86.16	
138	138	73.82	80.48	80.46	7	UPS	75.88	
139	139	75.82	85.64	85.55	10	UPS	79.50	
140	140	77.16	87.47	87.40	9	UPS	80.50	
141	141	81.38	87.80	87.77	9	UPS	83.28	
142	142	84.18	84.64	84.65	2	UPS	84.27	
143	143	77.71	85.45	85.45	6	UPS	80.12	
144	144	85.65	95.57	95.56	8	UPS	89.38	
145	145	88.47	98.30	98.23	9	UPS	91.94	
146	146	82.56	90.00	89.95	6	UPS	84.88	
147	147	84.69	* ~~94.83~~ 95.29	95.22	9	UPS	~~89.38~~ 88.04	GJ 05-20-11
148	148	87.34	94.83	94.78	7	UPS	~~79.67~~ 89.38	
149	149	79.24	80.90	80.90	1	UPS	~~81.94~~ 79.67	
150	150	77.41	89.16	89.11	8	UPS	81.94	
151	151	79.32	81.74	81.73	4	UPS	79.83	
152	152	78.39	79.62	79.60	1	UPS	78.73	
153	153	80.36	80.80	80.79	3	UPS	80.44	
154	154	80.54	87.01	86.96	4	UPS	82.18	
155	155	80.69	95.16	95.07	10	UPS	85.81	
156	156	83.19	95.17	95.10	10	UPS	87.32	
157	157	87.51	98.75	98.71	10	UPS	90.95	
158	158	84.59	92.84	92.74	9	UPS	86.74	
159	159	87.40	96.34	96.25	10	UPS	89.91	
160	160	82.52	93.82	93.75	10	UPS	85.74	
161	161	84.56	96.55	96.48	14	UPS	87.26	
162	162	79.95	82.68	82.67	9	UPS	80.30	

Test No. 814-3 Client Anchor QEA Investigator

WEIGHING DATA SHEET

See page _____ for information on drying times and temperatures, standard weights,etc.

Bkr. #	Pan #	Tare wt. (mg)	Dry total wt. (mg) 1	Dry total wt. (mg) 2	no. weighed	put into pans-initials	Ash weight (mg)	
163	163	79.72	89.37	89.36	9	MLR	83.32	
164	164	90.13	102.85	102.84	9	MLR	94.41	
165	165	86.34	89.95	89.94	6	MLR	87.00	
166	166	81.40	95.46	95.40	8	MLR	86.64	
167	167	77.80	89.67	89.60	8	MLR	81.22	
168	168	80.15	87.30	87.25	6	MLR	82.06	
169	169	81.06	90.09	90.07	8	MLR	84.10	
170	170	90.66	99.53	99.50	10	MLR	93.38	
171	171	76.52	81.76	81.72	7	LPS	77.88	
172	172	84.42	85.05	85.03	2	LPS	84.54	
173	173	81.62	88.17	88.10	6	LPS	83.45	
174	174	84.33	94.15	94.05	9	LPS	86.44	
175	175	83.82	92.47	92.43	9	LPS	86.43	
176	176	83.51	93.78	93.73	9	LPS	86.57	
177	177	81.96	84.58	84.56	2	LPS	82.66	
178	178	81.77	84.63	84.60	3	LPS	82.51	
179	179	73.48	81.93	81.86	9	LPS	75.98	
180	180	80.87	89.72	89.63	8	LPS	83.48	
181	181	80.61	91.37	91.32	10	LPS	83.76	
182	182	78.36	87.66	87.60	10	LPS	81.30	
183	183	82.87	93.62	93.54	10	LPS	86.11	
184	184	84.31	84.78	84.77	1	LPS	84.39	
185	185	77.68	88.98	88.88	8	LPS	81.31	
186	186	82.11	83.10	83.08	2	LPS	82.30	
187	187	76.14	76.31	76.30	1	LPS	76.17	
188	188	83.52	93.70	93.64	7	LPS	87.20	
189	189	79.42	87.77	87.70	8	LPS	81.80	
190	190	81.94	90.89	90.82	9	LPS	84.64	
191	191	75.69	88.24	88.13	10	LPS	79.96	
192	192	85.46	89.76	89.71	3	LPS	86.60	
193	193							
194	194							
195	195							
196	196							
197	197							
198	198							
199	199							
200	200							
201	201							
202	202							
203	203							
204	204							
205	205							

TEST DATA ANALYSIS RECORDS

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 biomass=DRY WT-TARE WT
WT=average individual biomass=TWT/WT COUNT

ASHED DRY WT= weight of ashed pan + weight of ashed test organisms recovered at test termination
TAFDW=DRY WT - ASHED DRY WT= total ash-free organism weight for given replicate
AFDW=average individual ash-free biomass=TAFDW/WT COUNT

INITIAL WEIGHT				
pan #	tare wt (mg)	final wt (mg)	wt count	avg. wt/ organism
1	83.76	85.23	10	0.15
2	154.44	156.19	10	0.18
3	84.42	86.07	10	0.16
4	93.41	95.03	10	0.16
5	81.03	82.64	10	0.16
			Mean	0.16
			SD	0.01

INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL		INIT	SURV	MORT	PSURV	PMORT	TARE WT (mg)	WT COUNT	DRY WT (mg)	ASHED DRY WT (mg)	TWT (mg)	WT (mg)	TAFDW (mg)	AFDW (mg)		SURV	MORT	PSURV	PMORT	WT	AFDW
1	30	3655G	Control	1		10	9	1	90.0	10.0	78.78	9	86.60	79.97	7.82	0.87	6.63	0.74							
2	63	3655G	Control	2		10	9	1	90.0	10.0	83.43	9	91.22	84.92	7.78	0.87	6.30	0.70							
3	12	3655G	Control	3		10	9	1	90.0	10.0	80.22	9	87.68	81.47	7.46	0.83	6.21	0.69							
4	161	3655G	Control	4*		15	14	1	93.3	6.7															
5	122	3655G	Control	5		10	10	0	100.0	0.0	84.00	10	95.88	86.93	11.88	1.19	8.95	0.89	Mean	9.6	1.0	90.4	9.6	0.97	0.79
6	174	3655G	Control	6		10	9	1	90.0	10.0	84.33	9	94.05	86.44	9.72	1.08	7.61	0.85	SD	1.8	0.5	5.5	5.5	0.15	0.10
7	76	3655G	Control	7		10	9	1	90.0	10.0	77.96	9	88.00	79.66	10.04	1.12	8.34	0.93	n	8	8	8	8	7	7
8	74	3655G	Control	8	wq replicate	10	8	2	80.0	20.0	82.69	8	89.55	83.88	6.86	0.86	5.67	0.71							
9	177	3623G	DGS-05SG-101018	1		10	2	8	20.0	80.0	81.96	2	84.56	82.66	2.60	1.30	1.90	0.95							
10	143	3623G	DGS-05SG-101018	2		10	6	4	60.0	40.0	77.71	6	85.45	80.12	7.74	1.29	5.33	0.89							
11	140	3623G	DGS-05SG-101018	3		10	9	1	90.0	10.0	77.16	9	87.40	80.50	10.24	1.14	6.90	0.77							
12	39	3623G	DGS-05SG-101018	4		10	2	8	20.0	80.0	81.05	2	82.56	81.28	1.51	0.76	1.28	0.64							
13	71	3623G	DGS-05SG-101018	5		10	8	2	80.0	20.0	85.83	8	95.21	88.48	9.38	1.17	6.73	0.84	Mean	4.6	5.4	46.3	53.8	1.02	0.75
14	89	3623G	DGS-05SG-101018	6		10	2	8	20.0	80.0	79.53	2	82.06	80.01	2.53	1.27	2.05	1.03	SD	3.2	3.2	32.0	32.0	0.37	0.29
15	43	3623G	DGS-05SG-101018	7		10	7	3	70.0	30.0	82.47	7	89.85	83.85	7.18	1.03	5.80	0.83	n	8	8	8	8	8	8
16	1	3623G	DGS-05SG-101018	8	wq replicate	10	1	9	10.0	90.0	91.19	1	91.40	91.30	0.21	0.21	0.10	0.10							
17	94	3624G	DGS-08SG-101018	1		10	6	4	60.0	40.0	81.83	6	89.98	84.73	8.15	1.36	5.25	0.88							
18	27	3624G	DGS-08SG-101018	2		10	7	3	70.0	30.0	75.79	7	81.91	76.96	6.12	0.87	4.95	0.71							
19	50	3624G	DGS-08SG-101018	3		10	4	6	40.0	60.0	79.15	4	84.44	80.51	5.29	1.32	3.93	0.98							
20	77	3624G	DGS-08SG-101018	4		10	9	1	90.0	10.0	86.85	9	96.60	89.32	9.75	1.08	7.28	0.81							
21	152	3624G	DGS-08SG-101018	5		10	1	9	10.0	90.0	78.39	1	79.60	78.73	1.21	1.21	0.87	0.87	Mean	6.5	3.5	65.0	35.0	1.05	0.76
22	139	3624G	DGS-08SG-101018	6		10	10	0	100.0	0.0	75.82	10	85.55	79.50	9.73	0.97	6.05	0.61	SD	3.0	3.0	29.8	29.8	0.23	0.14
23	47	3624G	DGS-08SG-101018	7		10	9	1	90.0	10.0	85.01	9	92.48	86.73	7.47	0.83	5.75	0.64	n	8	8	8	8	8	8
24	51	3624G	DGS-08SG-101018	8	wq replicate	10	6	4	60.0	40.0	79.60	6	84.17	80.53	4.57	0.76	3.64	0.61							
25	91	3625G	DGS-09SG-101018	1		10	9	1	90.0	10.0	85.45	9	92.62	87.32	7.17	0.80	5.30	0.59							
26	115	3625G	DGS-09SG-101018	2		10	10	0	100.0	0.0	81.13	10	94.25	85.59	13.12	1.31	8.66	0.87							
27	3	3625G	DGS-09SG-101018	3		10	5	5	50.0	50.0	84.66	5	87.23	85.34	2.57	0.51	1.89	0.38							
28	7	3625G	DGS-09SG-101018	4		10	9	1	90.0	10.0	85.66	9	91.93	87.20	6.27	0.70	4.73	0.53							
29	84	3625G	DGS-09SG-101018	5		10	9	1	90.0	10.0	83.11	9	90.95	85.42	7.84	0.87	5.53	0.61	Mean	7.6	2.4	76.3	23.8	1.02	0.76
30	44	3625G	DGS-09SG-101018	6		10	10	0	100.0	0.0	88.19	10	96.03	90.03	7.84	0.78	6.00	0.60	SD	3.1	3.1	31.1	31.1	0.63	0.48
31	129	3625G	DGS-09SG-101018	7		10	1	9	10.0	90.0	82.16	1	84.63	82.72	2.47	2.47	1.91	1.91	n	8	8	8	8	8	8
32	26	3625G	DGS-09SG-101018	8	wq replicate	10	8	2	80.0	20.0	83.35	8	89.28	84.53	5.93	0.74	4.75	0.59							
33	15	3626G	DGS-12SG-101018	1		10	5	5	50.0	50.0	85.57	5	89.86	86.48	4.29	0.86	3.38	0.68							
34	60	3626G	DGS-12SG-101018	2		10	6	4	60.0	40.0	82.48	6	89.91	84.17	7.43	1.24	5.74	0.96							
35	105	3626G	DGS-12SG-101018	3		10	8	2	80.0	20.0	79.12	8	88.51	81.45	9.39	1.17	7.06	0.88							
36	40	3626G	DGS-12SG-101018	4		10	9	1	90.0	10.0	78.86	9	88.33	81.09	9.47	1.05	7.24	0.80							
37	14	3626G	DGS-12SG-101018	5		10	4	6	40.0	60.0	81.18	4	87.24	82.81	6.06	1.52	4.43	1.11	Mean	7.5	2.5	75.0	25.0	1.20	0.89
38	9	3626G	DGS-12SG-101018	6		10	10	0	100.0	0.0	83.74	10	94.02	86.15	6.06	1.52	4.43	1.11	SD	2.3	2.3	22.7	22.7	0.22	0.16
39	160	3626G	DGS-12SG-101018	7		10	10	0	100.0	0.0	82.52	10	93.75	85.74	11.23	1.12	8.01	0.80	n	8	8	8	8	8	8
40	169	3626G	DGS-12SG-101018	8	wq replicate	10	8	2	80.0	20.0	81.06	8	90.07	84.10	9.01	1.13	5.97	0.75							

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Test Number: 814-3

Freshwater Sediment Test
10-Day Chironomus dilutus

INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL		INIT	SURV	MORT	PSURV	PMORT	TARE WT (mg)	WT COUNT	DRY WT (mg)	ASHED DRY WT (mg)	TWT (mg)	WT (mg)	TAFDW (mg)	AFDW (mg)		SURV	MORT	PSURV	PMORT	WT	AFDW
41	106	3627G	DGS-13SG-101018	1		10	3	7	30.0	70.0	82.95	3	85.26	83.68	2.31	0.77	1.58	0.53							
42	65	3627G	DGS-13SG-101018	2		10	5	5	50.0	50.0	94.28	5	98.46	95.19	4.18	0.84	3.27	0.65							
43	82	3627G	DGS-13SG-101018	3		10	6	4	60.0	40.0	83.88	6	89.07	84.94	5.39	0.90	4.13	0.69							
44	61	3627G	DGS-13SG-101018	4		10	5	5	50.0	50.0	80.08	5	82.87	80.55	2.79	0.56	2.32	0.46							
45	55	3627G	DGS-13SG-101018	5		10	3	7	30.0	70.0	76.46	3	78.00	76.85	1.54	0.51	1.35	0.45	Mean	4.3	5.8	42.5	57.5	0.74	0.57
46	41	3627G	DGS-13SG-101018	6		10	2	8	20.0	80.0	75.20	2	76.24	75.45	1.04	0.52	0.79	0.39	SD	2.5	2.5	25.5	25.5	0.18	0.12
47	158	3627G	DGS-13SG-101018	7		10	9	1	90.0	10.0	84.59	9	92.74	86.74	8.15	0.91	6.00	0.67	n	8	8	8	8	8	8
48	72	3627G	DGS-13SG-101018	8	wq replicate	10	1	9	10.0	90.0	80.72	1	81.67	80.97	0.95	0.95	0.70	0.70							
49	146	3628G	DGS-16SG-101018	1		10	6	4	60.0	40.0	82.58	6	89.95	84.88	7.39	1.23	5.07	0.85							
50	100	3628G	DGS-16SG-101018	2		10	2	8	20.0	80.0	84.10	2	86.49	84.47	2.39	1.20	2.02	1.01							
51	59	3628G	DGS-16SG-101018	3		10	7	3	70.0	30.0	80.42	7	86.83	81.46	6.41	0.92	5.37	0.77							
52	33	3628G	DGS-16SG-101018	4		10	8	2	80.0	20.0	86.69	8	94.41	88.27	7.72	0.97	6.14	0.77							
53	75	3628G	DGS-16SG-101018	5		10	8	2	80.0	20.0	81.90	8	88.55	83.77	6.65	0.83	4.78	0.60	Mean	7.5	2.5	75.0	25.0	1.03	0.78
54	147	3628G	DGS-16SG-101018	6		10	9	1	90.0	10.0	84.89	9	95.22	88.04	10.53	1.17	7.18	0.80	SD	2.6	2.6	26.2	26.2	0.15	0.12
55	52	3628G	DGS-16SG-101018	7		10	10	0	100.0	0.0	81.77	10	91.62	83.74	9.85	0.99	7.88	0.79	n	8	8	8	8	8	8
56	10	3628G	DGS-16SG-101018	8	wq replicate	10	10	0	100.0	0.0	82.59	10	92.04	85.15	9.45	0.95	6.89	0.69							
57	92	3629G	DGS-17SG-101018	1		10	6	4	60.0	40.0	77.26	6	83.95	79.02	6.89	1.12	4.93	0.82							
58	80	3629G	DGS-17SG-101018	2		10	8	2	80.0	20.0	78.64	8	88.58	81.20	9.94	1.24	7.38	0.92							
59	114	3629G	DGS-17SG-101018	3		10	9	1	90.0	10.0	86.83	9	97.64	90.52	11.01	1.22	7.12	0.79							
60	81	3629G	DGS-17SG-101018	4		10	10	0	100.0	0.0	79.12	10	88.74	81.83	9.82	0.96	6.91	0.69							
61	56	3629G	DGS-17SG-101018	5		10	10	0	100.0	0.0	85.08	10	95.18	86.95	10.10	1.01	8.23	0.82	Mean	7.4	2.6	73.8	26.3	1.16	0.85
62	16	3629G	DGS-17SG-101018	6		10	8	2	80.0	20.0	84.60	8	91.49	85.69	6.89	0.86	5.80	0.73	SD	2.7	2.7	26.7	26.7	0.32	0.21
63	24	3629G	DGS-17SG-101018	7		10	6	4	60.0	40.0	78.42	6	84.43	80.19	6.01	1.00	4.24	0.71	n	8	8	8	8	8	8
64	127	3629G	DGS-17SG-101018	8	wq replicate	10	2	8	20.0	80.0	79.75	2	83.52	80.87	3.77	1.89	2.65	1.33							
65	183	3630G	DGS-20SG-101019	1		10	10	0	100.0	0.0	82.87	10	93.54	86.11	10.67	1.07	7.43	0.74							
66	175	3630G	DGS-20SG-101019	2		10	9	1	90.0	10.0	83.82	9	92.43	86.43	8.61	0.96	6.00	0.67							
67	116	3630G	DGS-20SG-101019	3		10	10	0	100.0	0.0	77.70	10	90.00	82.10	12.30	1.23	7.90	0.79							
68	79	3630G	DGS-20SG-101019	4		10	9	1	90.0	10.0	82.20	9	91.97	84.77	9.77	1.09	7.20	0.80							
69	90	3630G	DGS-20SG-101019	5		10	5	5	50.0	50.0	89.50	5	95.27	90.63	5.77	1.15	4.64	0.93	Mean	8.6	1.4	86.3	13.8	1.06	0.77
70	45	3630G	DGS-20SG-101019	6		10	10	0	100.0	0.0	77.45	10	85.74	79.37	8.29	0.83	6.37	0.64	SD	2.0	2.0	20.0	20.0	0.12	0.09
71	87	3630G	DGS-20SG-101019	7		10	6	4	60.0	40.0	86.03	6	92.62	87.49	6.59	1.10	5.13	0.86	n	8	8	8	8	8	8
72	181	3630G	DGS-20SG-101019	8	wq replicate	10	10	0	100.0	0.0	80.61	10	91.32	83.76	10.71	1.07	7.56	0.76							
73	168	3631G	DGS-21SG-101019	1		10	8	4	60.0	40.0	80.15	6	87.25	82.06	7.10	1.18	5.19	0.87							
74	179	3631G	DGS-21SG-101019	2		10	9	1	90.0	10.0	73.48	9	81.86	75.98	8.38	0.93	5.88	0.65							
75	62	3631G	DGS-21SG-101019	3		10	8	2	80.0	20.0	87.94	8	92.46	88.84	4.52	0.57	3.62	0.45							
76	135	3631G	DGS-21SG-101019	4		10	4	6	40.0	60.0	86.54	4	87.51	86.77	0.97	0.24	0.74	0.19							
77	70	3631G	DGS-21SG-101019	5		10	1	9	10.0	90.0	83.20	1	84.68	83.36	1.48	1.48	1.32	1.32	Mean	5.9	4.1	58.8	41.3	0.91	0.70
78	134	3631G	DGS-21SG-101019	6		10	4	6	40.0	60.0	80.05	4	84.60	81.07	4.55	1.14	3.53	0.88	SD	2.7	2.7	27.0	27.0	0.39	0.34
79	171	3631G	DGS-21SG-101019	7		10	7	3	70.0	30.0	76.52	7	81.72	77.88	5.20	0.74	3.84	0.55	n	8	8	8	8	8	8
80	123	3631G	DGS-21SG-101019	8	wq replicate	10	8	2	80.0	20.0	82.77	8	90.63	85.13	7.86	0.98	5.50	0.69							
81	111	3632G	DGS-25SG-101019	1		10	6	4	60.0	40.0	80.00	6	88.01	81.99	8.01	1.34	6.02	1.00							
82	88	3632G	DGS-25SG-101019	2		10	6	4	60.0	40.0	79.36	6	86.96	81.21	7.60	1.27	5.75	0.96							
83	11	3632G	DGS-25SG-101019	3		10	3	7	30.0	70.0	81.51	3	84.88	82.13	3.37	1.12	2.75	0.92							
84	48	3632G	DGS-25SG-101019	4		10	2	8	20.0	80.0	76.39	2	78.89	76.66	2.30	1.15	2.03	1.02							
85	83	3632G	DGS-25SG-101019	5		10	10	0	100.0	0.0	82.25	10	92.09	85.17	9.84	0.98	6.92	0.69	Mean	5.5	4.5	55.0	45.0	1.07	0.83
86	104	3632G	DGS-25SG-101019	6		10	7	3	70.0	30.0	86.81	7	94.87	88.77	8.06	1.15	6.10	0.87	SD	2.7	2.7	28.7	28.7	0.22	0.19
87	98	3632G	DGS-25SG-101019	7		10	3	7	30.0	70.0	87.30	3	89.21	87.74	1.91	0.64	1.47	0.49	n	8	8	8	8	8	8
88	136	3632G	DGS-25SG-101019	8	wq replicate	10	7	3	70.0	30.0	73.82	7	80.46	75.68	6.84	0.95	4.58	0.85							
89	112	3633G	DGS-26SG-101019	1		10	2	8	20.0	80.0	79.48	2	80.67	79.78	1.19	0.59	0.89	0.45							
90	151	3633G	DGS-26SG-101019	2		10	4	6	40.0	60.0	79.32	4	81.73	79.83	2.41	0.60	1.90	0.48							
91	85	3633G	DGS-26SG-101019	3		10	3	7	30.0	70.0	74.82	3	75.48	74.98	0.66	0.22	0.50	0.17							
92	162	3633G	DGS-26SG-101019	4		10	9	1	90.0	10.0	79.95	9	82.67	80.30	2.72	0.30	2.37	0.26							
93	13	3633G	DGS-26SG-101019	5		10	4	6	40.0	60.0	80.20	4	82.26	80.64	2.06	0.52	1.62	0.41	Mean	4.3	5.8	42.5	57.5	0.47	0.37
94	49	3633G	DGS-26SG-101019	6		10	4	6	40.0	60.0	82.27	4	84.59	82.65	2.32	0.58	1.94	0.48	SD	2.3	2.3	23.1	23.1	0.17	0.13
95	172	3633G	DGS-26SG-101019	7		10	2	8	20.0	80.0	84.42	2	85.03	84.54	0.61	0.31	0.49	0.24	n	8	8	8	8	8	8
96	109	3633G	DGS-26SG-101019	8	wq replicate	10	6	4	60.0	40.0	84.75	6	88.55	85.68	3.80	0.63	2.87	0.48							

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Test Number: 814-3

Freshwater Sediment Test
10-Day Chironomus dilutus

INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL		INIT	SURV	MORT	PSURV	PMORT	TARE WT (mg)	WT COUNT	DRY WT (mg)	ASHED DRY WT (mg)	TWT (mg)	WT (mg)	TAFDW (mg)	AFDW (mg)		SURV	MORT	PSURV	PMORT	WT	AFDW
97	169	3634G	DGS-30SG-101019	1		10	8	2	80.0	20.0	79.42	8	87.70	81.80	8.28	1.04	5.90	0.74							
98	120	3634G	DGS-30SG-101019	2		10	7	3	70.0	30.0	77.63	7	86.05	80.36	8.42	1.20	5.69	0.81							
99	154	3634G	DGS-30SG-101019	3		10	4	6	40.0	60.0	80.54	4	86.96	82.18	6.42	1.81	4.78	1.20							
100	148	3634G	DGS-30SG-101019	4		10	7	3	70.0	30.0	87.34	7	94.78	89.38	7.44	1.06	5.40	0.77							
101	107	3634G	DGS-30SG-101019	5		10	7	3	70.0	30.0	82.79	7	89.07	84.04	6.28	0.90	5.03	0.72	Mean	7.3	2.8	72.5	27.5	1.03	0.76
102	190	3634G	DGS-30SG-101019	6		10	9	1	90.0	10.0	81.94	9	90.82	84.84	8.88	0.99	6.18	0.69	SD	1.8	1.8	18.3	18.3	0.30	0.20
103	35	3634G	DGS-30SG-101019	7		10	6	4	60.0	40.0	82.22	6	87.47	83.52	5.25	0.88	3.95	0.66	n	8	8	8	8	8	8
104	6	3634G	DGS-30SG-101019	8	wq replicate	10	10	0	100.0	0.0	76.16	10	81.61	76.89	5.45	0.55	4.72	0.47							
105	68	3635G	DGS-31SG-101019	1		10	6	4	60.0	40.0	80.78	6	84.54	81.63	3.76	0.63	2.91	0.49							
106	2	3635G	DGS-31SG-101019	2		10	4	6	40.0	60.0	84.29	4	86.90	84.83	2.61	0.65	2.07	0.52							
107	141	3635G	DGS-31SG-101019	3		10	9	1	90.0	10.0	81.38	9	87.77	83.28	6.39	0.71	4.49	0.50							
108	178	3635G	DGS-31SG-101019	4		10	3	7	30.0	70.0	81.77	3	84.60	82.51	2.83	0.94	2.09	0.70							
109	173	3635G	DGS-31SG-101019	5		10	6	4	60.0	40.0	81.62	6	88.10	83.45	6.48	1.08	4.65	0.77	Mean	5.6	4.4	56.3	43.8	0.87	0.64
110	113	3635G	DGS-31SG-101019	6		10	7	3	70.0	30.0	82.01	7	88.39	84.22	6.38	0.91	4.17	0.60	SD	2.1	2.1	21.3	21.3	0.28	0.20
111	20	3635G	DGS-31SG-101019	7		10	7	3	70.0	30.0	83.56	7	87.62	84.29	4.06	0.58	3.33	0.48	n	8	8	8	8	8	8
112	192	3635G	DGS-31SG-101019	8	wq replicate	10	3	7	30.0	70.0	85.46	3	89.71	86.80	4.25	1.42	3.11	1.04							
113	167	3636G	DGS-33SG-101019	1		10	8	2	80.0	20.0	77.80	8	89.60	81.22	11.80	1.48	8.38	1.05							
114	131	3636G	DGS-33SG-101019	2		10	6	4	60.0	40.0	85.00	6	92.00	87.11	7.00	1.17	4.89	0.82							
115	78	3636G	DGS-33SG-101019	3		10	8	2	80.0	20.0	77.34	8	85.67	79.27	8.33	1.04	6.40	0.80							
116	130	3636G	DGS-33SG-101019	4		10	5	5	50.0	50.0	79.42	5	83.59	80.45	4.17	0.83	3.14	0.63							
117	69	3636G	DGS-33SG-101019	5		10	4	6	40.0	60.0	79.09	4	80.86	79.38	1.77	0.44	1.48	0.37	Mean	6.1	3.9	61.3	38.8	1.07	0.79
118	132	3636G	DGS-33SG-101019	6		10	3	7	30.0	70.0	81.06	3	85.74	82.44	4.68	1.56	3.30	1.10	SD	2.0	2.0	19.6	19.6	0.36	0.23
119	180	3636G	DGS-33SG-101019	7		10	8	2	80.0	20.0	80.87	8	89.63	83.48	8.76	1.10	6.15	0.77	n	8	8	8	8	8	8
120	21	3636G	DGS-33SG-101019	8	wq replicate	10	7	3	70.0	30.0	79.18	7	85.70	80.42	6.52	0.93	5.28	0.75							
121	53	3637G	DGS-34SG-101019	1		10	3	7	30.0	70.0	77.84	3	78.36	77.93	0.52	0.17	0.43	0.14							
122	149	3637G	DGS-34SG-101019	2		10	1	9	10.0	90.0	79.24	1	80.90	79.67	1.66	1.66	1.23	1.23							
123	42	3637G	DGS-34SG-101019	3		10	2	8	20.0	80.0	83.23	2	83.72	83.31	0.49	0.24	0.41	0.20							
124	31	3637G	DGS-34SG-101019	4		10	3	7	30.0	70.0	81.88	3	82.54	82.02	0.66	0.22	0.52	0.17							
125	118	3637G	DGS-34SG-101019	5		10	3	7	30.0	70.0	80.45	3	81.09	80.59	0.64	0.21	0.50	0.17	Mean	2.6	7.4	26.3	73.8	0.44	0.34
126	165	3637G	DGS-34SG-101019	6		10	6	4	60.0	40.0	86.34	6	89.94	87.00	3.60	0.60	2.94	0.49	SD	1.6	1.6	16.0	16.0	0.51	0.38
127	187	3637G	DGS-34SG-101019	7		10	1	9	10.0	90.0	76.14	1	76.30	76.17	0.16	0.16	0.13	0.13	n	8	8	8	8	8	8
128	142	3637G	DGS-34SG-101019	8	wq replicate	10	2	8	20.0	80.0	84.18	2	84.65	84.27	0.47	0.23	0.38	0.19							
129	153	3638G	DGS-35SG-101019	1		10	3	7	30.0	70.0	80.36	3	80.79	80.44	0.43	0.14	0.35	0.12							
130	186	3638G	DGS-35SG-101019	2		10	2	8	20.0	80.0	82.11	2	83.08	82.30	0.97	0.48	0.78	0.39							
131	8	3638G	DGS-35SG-101019	3		10	5	5	50.0	50.0	85.25	5	85.92	85.37	0.67	0.13	0.55	0.11							
132	73	3638G	DGS-35SG-101019	4		10	1	9	10.0	90.0	84.73	1	84.83	84.78	0.10	0.10	0.05	0.05							
133	99	3638G	DGS-35SG-101019	5		10	2	8	20.0	80.0	86.05	2	87.22	86.24	1.17	0.59	0.98	0.49	Mean	3.0	7.0	30.0	70.0	0.34	0.26
134	117	3638G	DGS-35SG-101019	6		10	1	9	10.0	90.0	84.48	1	84.64	84.50	0.16	0.16	0.14	0.14	SD	2.4	2.4	23.9	23.9	0.30	0.23
135	133	3638G	DGS-35SG-101019	7		10	2	8	20.0	80.0	82.18	2	84.05	82.70	1.87	0.93	1.35	0.67	n	8	8	8	8	8	8
136	108	3638G	DGS-35SG-101019	8	wq replicate	10	8	2	80.0	20.0	84.75	8	86.12	85.02	1.37	0.17	1.10	0.14							
137	5	3639G	DGS-01SG-101020	1		10	8	2	80.0	20.0	82.44	8	91.68	84.85	9.24	1.16	6.83	0.85							
138	88	3639G	DGS-01SG-101020	2		10	5	5	50.0	50.0	79.74	5	85.10	81.01	5.36	1.07	4.09	0.82							
139	188	3639G	DGS-01SG-101020	3		10	7	3	70.0	30.0	83.52	7	93.64	87.20	10.12	1.45	8.44	0.92							
140	188	3639G	DGS-01SG-101020	4		10	8	2	80.0	20.0	81.40	8	95.40	86.64	14.00	1.75	8.76	1.10							
141	67	3639G	DGS-01SG-101020	5		10	10	0	100.0	0.0	77.59	10	87.13	80.28	9.54	0.95	6.85	0.68	Mean	7.8	2.3	77.5	22.5	1.34	0.91
142	119	3639G	DGS-01SG-101020	6		10	8	2	80.0	20.0	76.23	8	87.64	80.42	11.41	1.43	7.22	0.90	SD	1.8	1.8	17.5	17.5	0.29	0.17
143	126	3639G	DGS-01SG-101020	7		10	6	4	60.0	40.0	95.89	6	106.11	98.67	10.22	1.70	7.24	1.21	n	8	8	8	8	8	8
144	191	3639G	DGS-01SG-101020	8	wq replicate	10	10	0	100.0	0.0	75.69	10	88.13	79.96	12.44	1.24	8.17	0.82							
145	144	3640G	DGS-02SG-101020	1		10	8	2	80.0	20.0	85.65	8	95.56	89.38	9.91	1.24	6.18	0.77							
146	124	3640G	DGS-02SG-101020	2		10	10	0	100.0	0.0	92.38	10	104.55	96.89	12.17	1.22	7.66	0.77							
147	23	3640G	DGS-02SG-101020	3		10	6	4	60.0	40.0	77.16	6	83.33	78.68	6.17	1.03	4.85	0.77							
148	156	3640G	DGS-02SG-101020	4		10	10	0	100.0	0.0	83.19	10	95.10	87.32	11.91	1.19	7.78	0.78							
149	164	3640G	DGS-02SG-101020	5		10	9	1	90.0	10.0	90.13	9	102.84	94.41	12.71	1.41	8.43	0.94	Mean	8.4	1.6	83.8	16.3	1.11	0.74
150	163	3640G	DGS-02SG-101020	6		10	9	1	90.0	10.0	79.72	9	89.36	83.32	9.64	1.07	6.04	0.67	SD	1.9	1.9	19.2	19.2	0.19	0.10
151	170	3640G	DGS-02SG-101020	7		10	10	0	100.0	0.0	90.66	10	99.50	93.38	8.84	0.88	6.12	0.61	n	8	8	8	8	8	8
152	4	3640G	DGS-02SG-101020	8	wq replicate	10	5	5	50.0	50.0	82.87	5	87.07	83.84	4.20	0.84	3.23	0.65							

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Test Number: 814-3

Freshwater Sediment Test
10-Day Chironomus dilutus

INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL		INIT	SURV	MORT	PSURV	PMORT	TARE WT (mg)	WT COUNT	DRY WT (mg)	ASHED DRY WT (mg)	TWT (mg)	WT (mg)	TAFDW (mg)	AFDW (mg)		SURV	MORT	PSURV	PMORT	WT	AFDW
153	34	3641G	DGS-04SG-101020	1		10	3	7	30.0	70.0	80.77	3	81.12	80.86	0.35	0.12	0.26	0.09							
154	93	3641G	DGS-04SG-101020	2		10	4	6	40.0	60.0	78.16	4	80.48	78.58	2.32	0.58	1.90	0.48							
155	103	3641G	DGS-04SG-101020	3		10	1	9	10.0	90.0	84.85	1	85.10	84.71	0.45	0.45	0.39	0.39							
156	54	3641G	DGS-04SG-101020	4		10	1	9	10.0	90.0	79.83	1	79.92	79.87	0.09	0.09	0.05	0.05							
157	136	3641G	DGS-04SG-101020	5		10	4	6	40.0	60.0	80.72	4	82.56	81.09	1.84	0.46	1.47	0.37	Mean	2.0	8.0	20.0	80.0	0.35	0.26
158	32	3641G	DGS-04SG-101020	6		10	1	9	10.0	90.0	83.83	1	84.13	83.85	0.50	0.50	0.28	0.28	SD	1.4	1.4	14.1	14.1	0.20	0.17
159	58	3641G	DGS-04SG-101020	7		10	1	9	10.0	90.0	88.84	1	88.95	88.90	0.11	0.11	0.05	0.05	n	8	8	8	8	8	8
160	184	3641G	DGS-04SG-101020	8	wq replicate	10	1	9	10.0	90.0	84.31	1	84.77	84.39	0.46	0.46	0.38	0.38							
161	101	3642G	DGS-06SG-101020	1		10	6	4	60.0	40.0	84.74	6	91.87	86.39	7.13	1.19	5.48	0.91							
162	57	3642G	DGS-06SG-101020	2		10	7	3	70.0	30.0	76.83	7	81.97	77.54	5.34	0.76	4.43	0.63							
163	145	3642G	DGS-06SG-101020	3		10	9	1	90.0	10.0	88.47	9	98.23	91.94	9.76	1.08	6.29	0.70							
164	110	3642G	DGS-06SG-101020	4		10	7	3	70.0	30.0	81.12	7	87.81	83.06	8.69	0.96	4.75	0.68							
165	121	3642G	DGS-06SG-101020	5		10	10	0	100.0	0.0	92.85	10	103.60	96.75	10.75	1.08	6.85	0.68	Mean	8.1	1.9	81.3	18.8	1.05	0.75
166	157	3642G	DGS-06SG-101020	6		10	10	0	100.0	0.0	87.51	10	98.71	90.95	11.20	1.12	7.76	0.76	SD	1.8	1.8	18.1	18.1	0.16	0.13
167	38	3642G	DGS-06SG-101020	7		10	6	4	60.0	40.0	85.62	6	93.20	87.23	7.58	1.26	5.97	1.00	n	8	8	8	8	8	8
168	182	3642G	DGS-06SG-101020	8	wq replicate	10	10	0	100.0	0.0	78.36	10	87.60	81.30	9.24	0.92	6.30	0.83							
169	37	3643G	U3C2SG-101021	1		10	9	1	90.0	10.0	76.24	9	83.36	77.75	7.12	0.79	5.61	0.62							
170	137	3643G	U3C2SG-101021	2		10	9	1	90.0	10.0	83.18	9	92.43	86.16	9.25	1.03	6.27	0.70							
171	128	3643G	U3C2SG-101021	3		10	5	5	50.0	50.0	81.79	5	85.21	82.70	3.42	0.68	2.51	0.50							
172	17	3643G	U3C2SG-101021	4		10	8	2	80.0	20.0	86.21	8	92.86	88.03	6.65	0.83	4.83	0.60							
173	159	3643G	U3C2SG-101021	5		10	10	0	100.0	0.0	87.40	10	96.25	89.91	8.85	0.88	6.34	0.63	Mean	8.0	2.0	80.0	20.0	0.86	0.64
174	88	3643G	U3C2SG-101021	6		10	8	2	80.0	20.0	80.46	8	87.48	81.78	7.02	0.88	5.70	0.71	SD	1.5	1.5	15.1	15.1	0.10	0.07
175	38	3643G	U3C2SG-101021	7		10	8	2	80.0	20.0	80.70	8	87.57	82.25	6.87	0.88	5.32	0.66	n	8	8	8	8	8	8
176	102	3643G	U3C2SG-101021	8	wq replicate	10	7	3	70.0	30.0	80.48	7	86.84	81.85	6.36	0.91	4.99	0.71							
177	46	3644G	U4Q1SG-101021	1		10	9	1	90.0	10.0	74.73	9	86.03	77.73	11.30	1.26	8.30	0.92							
178	95	3644G	U4Q1SG-101021	2		10	8	2	80.0	20.0	85.05	8	95.46	87.86	10.41	1.30	7.60	0.95							
179	64	3644G	U4Q1SG-101021	3		10	9	1	90.0	10.0	84.09	9	93.76	86.78	9.67	1.07	6.98	0.78							
180	29	3644G	U4Q1SG-101021	4		10	7	3	70.0	30.0	77.68	7	85.49	79.38	7.81	1.12	6.11	0.87							
181	97	3644G	U4Q1SG-101021	5		10	4	6	40.0	60.0	87.87	4	92.72	88.70	5.05	1.26	4.02	1.01	Mean	8.0	2.0	80.0	20.0	1.22	0.89
182	176	3644G	U4Q1SG-101021	6		10	9	1	90.0	10.0	83.51	9	93.73	86.57	10.22	1.14	7.16	0.80	SD	1.9	1.9	18.5	18.5	0.12	0.08
183	19	3644G	U4Q1SG-101021	7		10	8	2	80.0	20.0	97.82	8	107.26	99.98	9.44	1.18	7.28	0.91	n	8	8	8	8	8	8
184	155	3644G	U4Q1SG-101021	8	wq replicate	10	10	0	100.0	0.0	80.69	10	95.07	85.81	14.38	1.44	9.26	0.93							
185	22	3645G	U4Q2SG-101021	1		10	9	1	90.0	10.0	77.42	9	85.59	78.97	8.17	0.91	6.62	0.74							
186	18	3645G	U4Q2SG-101021	2		10	8	2	80.0	20.0	84.02	8	92.09	85.93	8.07	1.01	6.16	0.77							
187	125	3645G	U4Q2SG-101021	3		10	10	0	100.0	0.0	81.76	10	94.69	86.61	12.93	1.29	7.68	0.79							
188	28	3645G	U4Q2SG-101021	4		10	7	3	70.0	30.0	80.83	7	88.89	82.31	8.06	1.15	6.58	0.94							
189	96	3645G	U4Q2SG-101021	5		10	5	5	50.0	50.0	88.70	5	96.97	90.94	8.27	1.65	6.03	1.21	Mean	7.9	2.1	78.8	21.3	1.25	0.89
190	150	3645G	U4Q2SG-101021	6		10	8	2	80.0	20.0	77.41	8	89.11	81.94	11.70	1.46	7.17	0.90	SD	1.5	1.5	14.6	14.6	0.25	0.15
191	185	3645G	U4Q2SG-101021	7		10	8	2	80.0	20.0	77.68	8	88.88	81.31	11.20	1.40	7.57	0.95	n	8	8	8	8	8	8
192	25	3645G	U4Q2SG-101021	8	wq replicate	10	8	2	80.0	20.0	88.40	8	97.33	90.34	8.93	1.12	6.99	0.87							

data entry verified against laboratory bench sheets 5 24-11 JRF

Test Number: 814-3

Freshwater Sediment Test
10-Day Chironomus dilutus

Water Quality Data

BKR	NAS SMPL	CLIENT DESCRIP	Interstitial water pH	Interstitial water NH3
	3655G	Control	6.6	2.7
	3623G	DGS-05SG-101018	6.1	2.2
	3624G	DGS-08SG-101018	6.5	3.5
	3625G	DGS-09SG-101018	6.7	6.4
	3626G	DGS-12SG-101018	6.5	2.7
	3627G	DGS-13SG-101018	6.7	4.7
	3628G	DGS-16SG-101018	6.5	2.3
	3629G	DGS-17SG-101018	6.6	2.1
	3630G	DGS-20SG-101019	7.0	1.8
	3631G	DGS-21SG-101019	6.7	8.3
	3632G	DGS-25SG-101019	6.7	2.3
	3633G	DGS-26SG-101019	6.6	7.8
	3634G	DGS-30SG-101019	6.5	2.9
	3635G	DGS-31SG-101019	6.6	8.0
	3636G	DGS-33SG-101019	6.6	3.2
	3637G	DGS-34SG-101019	6.6	11.3
	3638G	DGS-35SG-101019	6.7	12.3
	3639G	DGS-01SG-101020	6.7	4.8
	3640G	DGS-02SG-101020	6.8	6.9
	3641G	DGS-04SG-101020	6.7	21.9
	3642G	DGS-06SG-101020	6.7	9.6
	3643G	U3C2SG-101021	6.6	5.0
	3644G	U4Q1SG-101021	6.8	2.8
	3645G	U4Q2SG-101021	6.8	3.7

BKR	NAS SMPL	CLIENT DESCRIP	REPL	DAY	Overlying water TEMP	DO	COND	pH	NH3	HARD	ALK
1	3623G	DGS-05SG-101018	8	0	23.6	6.1	144	6.1	0.3	34	30
4	3640G	DGS-02SG-101020	8	0	23.6	6.0	144	6.2	0.8	43	30
6	3634G	DGS-30SG-101019	8	0	23.6	5.4	158	6.2	0.4	43	30
10	3628G	DGS-16SG-101018	8	0	23.2	7.1	137	6.5	0.2	43	30
21	3636G	DGS-33SG-101019	8	0	22.7	7.0	136	6.4	0.3	43	30
25	3645G	U4Q2SG-101021	8	0	22.6	7.1	138	6.4	0.4	43	30
26	3625G	DGS-09SG-101018	8	0	22.4	7.0	135	6.5	0.6	43	30
51	3624G	DGS-08SG-101018	8	0	22.4	6.9	143	6.5	0.5	34	40
72	3627G	DGS-13SG-101018	8	0	22.9	6.8	138	6.5	0.5	43	30
74	3655G	Control	8	0	22.7	7.2	145	6.6	0.2	34	30
102	3643G	U3C2SG-101021	8	0	23.0	6.7	137	6.4	0.5	43	30
108	3638G	DGS-35SG-101019	8	0	23.1	6.9	141	6.5	1.0	43	30
109	3633G	DGS-26SG-101019	8	0	22.8	7.1	144	6.6	0.7	43	40
123	3631G	DGS-21SG-101019	8	0	22.5	6.8	135	6.5	0.7	43	30
127	3629G	DGS-17SG-101018	8	0	22.6	7.1	139	6.6	0.3	43	30
138	3632G	DGS-25SG-101019	8	0	22.9	7.3	139	6.7	0.2	43	30
142	3637G	DGS-34SG-101019	8	0	22.6	6.9	137	6.4	0.9	43	30
155	3644G	U4Q1SG-101021	8	0	22.5	6.9	133	6.5	0.3	34	30
169	3626G	DGS-12SG-101018	8	0	22.5	7.0	135	6.6	0.3	34	30
181	3630G	DGS-20SG-101019	8	0	22.7	7.1	141	6.8	0.2	43	30
182	3642G	DGS-06SG-101020	8	0	22.5	6.8	138	6.6	0.8	34	30
184	3641G	DGS-04SG-101020	8	0	22.4	6.6	157	6.6	1.5	43	40
191	3639G	DGS-01SG-101020	8	0	22.8	6.7	154	6.6	0.5	51	40
192	3635G	DGS-31SG-101019	8	0	23.0	6.9	139	6.5	0.7	34	30
1	3623G	DGS-05SG-101018	8	1	23.5	6.6					
4	3640G	DGS-02SG-101020	8	1	23.5	7.2					
6	3634G	DGS-30SG-101019	8	1	23.6	5.8					
10	3628G	DGS-16SG-101018	8	1	23.3	7.0					
21	3636G	DGS-33SG-101019	8	1	22.9	7.2					
25	3645G	U4Q2SG-101021	8	1	22.9	7.2					

26	3625G	DGS-09SG-101018	8	1	22.8	7.0
51	3624G	DGS-08SG-101018	8	1	22.8	7.2
72	3627G	DGS-13SG-101018	8	1	23.1	6.8
74	3655G	Control	8	1	22.8	7.1
102	3643G	U3C2SG-101021	8	1	22.9	7.0
108	3638G	DGS-35SG-101019	8	1	23.0	7.2
109	3633G	DGS-26SG-101019	8	1	23.0	7.2
123	3631G	DGS-21SG-101019	8	1	22.7	7.1
127	3629G	DGS-17SG-101018	8	1	22.9	6.7
138	3632G	DGS-25SG-101019	8	1	23.1	6.9
142	3637G	DGS-34SG-101019	8	1	22.8	7.0
155	3644G	U4Q1SG-101021	8	1	22.8	7.2
169	3626G	DGS-12SG-101018	8	1	22.9	7.1
181	3630G	DGS-20SG-101019	8	1	22.9	7.0
182	3642G	DGS-06SG-101020	8	1	22.9	6.9
184	3641G	DGS-04SG-101020	8	1	22.8	7.0
191	3639G	DGS-01SG-101020	8	1	23.0	7.1
192	3635G	DGS-31SG-101019	8	1	23.2	6.8
1	3623G	DGS-05SG-101018	8	2	23.3	6.3
4	3640G	DGS-02SG-101020	8	2	23.1	6.3
6	3634G	DGS-30SG-101019	8	2	23.2	6.3
10	3628G	DGS-16SG-101018	8	2	22.9	6.8
21	3636G	DGS-33SG-101019	8	2	22.5	6.5
25	3645G	U4Q2SG-101021	8	2	22.5	6.7
26	3625G	DGS-09SG-101018	8	2	22.4	6.9
51	3624G	DGS-08SG-101018	8	2	22.4	7.0
72	3627G	DGS-13SG-101018	8	2	22.7	6.8
74	3655G	Control	8	2	22.6	5.8
102	3643G	U3C2SG-101021	8	2	22.8	6.9
108	3638G	DGS-35SG-101019	8	2	22.9	6.2
109	3633G	DGS-26SG-101019	8	2	22.7	7.0
123	3631G	DGS-21SG-101019	8	2	22.5	6.8
127	3629G	DGS-17SG-101018	8	2	22.6	7.0
138	3632G	DGS-25SG-101019	8	2	22.8	6.7
142	3637G	DGS-34SG-101019	8	2	22.5	6.8
155	3644G	U4Q1SG-101021	8	2	22.5	6.4
169	3626G	DGS-12SG-101018	8	2	22.5	6.9
181	3630G	DGS-20SG-101019	8	2	22.5	6.8
182	3642G	DGS-06SG-101020	8	2	22.4	6.7
184	3641G	DGS-04SG-101020	8	2	22.4	6.8
191	3639G	DGS-01SG-101020	8	2	22.6	6.8
192	3635G	DGS-31SG-101019	8	2	22.9	6.8
1	3623G	DGS-05SG-101018	8	3	23.4	5.9
4	3640G	DGS-02SG-101020	8	3	23.3	6.1
6	3634G	DGS-30SG-101019	8	3	23.3	6.1
10	3628G	DGS-16SG-101018	8	3	22.9	6.3
21	3636G	DGS-33SG-101019	8	3	22.5	6.4
25	3645G	U4Q2SG-101021	8	3	22.4	6.3
26	3625G	DGS-09SG-101018	8	3	22.3	6.5
51	3624G	DGS-08SG-101018	8	3	22.2	6.5
72	3627G	DGS-13SG-101018	8	3	22.6	6.7
74	3655G	Control	8	3	22.4	6.5
102	3643G	U3C2SG-101021	8	3	22.7	6.3
108	3638G	DGS-35SG-101019	8	3	22.8	6.3
109	3633G	DGS-26SG-101019	8	3	22.4	6.9
123	3631G	DGS-21SG-101019	8	3	22.2	6.3
127	3629G	DGS-17SG-101018	8	3	22.3	6.5
138	3632G	DGS-25SG-101019	8	3	22.6	6.5
142	3637G	DGS-34SG-101019	8	3	22.3	6.4
155	3644G	U4Q1SG-101021	8	3	22.3	5.7
169	3626G	DGS-12SG-101018	8	3	22.3	6.3

181	3630G	DGS-20SG-101019	8	3	22.4	6.3
182	3642G	DGS-06SG-101020	8	3	22.3	6.3
184	3641G	DGS-04SG-101020	8	3	22.2	6.7
191	3639G	DGS-01SG-101020	8	3	22.5	6.0
192	3635G	DGS-31SG-101019	8	3	22.8	6.1
1	3623G	DGS-05SG-101018	8	4	23.4	6.4
4	3640G	DGS-02SG-101020	8	4	23.4	6.3
6	3634G	DGS-30SG-101019	8	4	23.6	4.6
10	3628G	DGS-16SG-101018	8	4	23.1	6.1
21	3636G	DGS-33SG-101019	8	4	22.7	6.2
25	3645G	U4Q2SG-101021	8	4	22.6	6.0
26	3625G	DGS-09SG-101018	8	4	22.5	6.1
51	3624G	DGS-08SG-101018	8	4	22.4	6.0
72	3627G	DGS-13SG-101018	8	4	22.8	6.3
74	3655G	Control	8	4	22.5	6.2
102	3643G	U3C2SG-101021	8	4	22.9	6.1
108	3638G	DGS-35SG-101019	8	4	23.0	6.3
109	3633G	DGS-26SG-101019	8	4	22.7	6.5
123	3631G	DGS-21SG-101019	8	4	22.5	6.2
127	3629G	DGS-17SG-101018	8	4	22.5	6.3
138	3632G	DGS-25SG-101019	8	4	22.8	6.1
142	3637G	DGS-34SG-101019	8	4	22.5	6.1
155	3644G	U4Q1SG-101021	8	4	22.5	5.8
169	3626G	DGS-12SG-101018	8	4	22.5	6.2
181	3630G	DGS-20SG-101019	8	4	22.6	5.9
182	3642G	DGS-06SG-101020	8	4	22.4	6.0
184	3641G	DGS-04SG-101020	8	4	22.3	6.2
191	3639G	DGS-01SG-101020	8	4	22.6	5.7
192	3635G	DGS-31SG-101019	8	4	22.9	6.1
1	3623G	DGS-05SG-101018	8	5	23.3	5.2
4	3640G	DGS-02SG-101020	8	5	23.4	5.9
6	3634G	DGS-30SG-101019	8	5	23.4	4.9
10	3628G	DGS-16SG-101018	8	5	23.1	6.0
21	3636G	DGS-33SG-101019	8	5	22.7	6.1
25	3645G	U4Q2SG-101021	8	5	22.7	5.6
26	3625G	DGS-09SG-101018	8	5	22.5	6.1
51	3624G	DGS-08SG-101018	8	5	22.5	6.3
72	3627G	DGS-13SG-101018	8	5	22.9	6.1
74	3655G	Control	8	5	22.6	6.0
102	3643G	U3C2SG-101021	8	5	22.9	5.9
108	3638G	DGS-35SG-101019	8	5	23.1	6.1
109	3633G	DGS-26SG-101019	8	5	22.8	6.3
123	3631G	DGS-21SG-101019	8	5	22.5	6.0
127	3629G	DGS-17SG-101018	8	5	22.6	6.0
138	3632G	DGS-25SG-101019	8	5	22.9	6.2
142	3637G	DGS-34SG-101019	8	5	22.6	5.9
155	3644G	U4Q1SG-101021	8	5	22.6	5.2
169	3626G	DGS-12SG-101018	8	5	22.7	6.0
181	3630G	DGS-20SG-101019	8	5	22.7	5.9
182	3642G	DGS-06SG-101020	8	5	22.6	5.6
184	3641G	DGS-04SG-101020	8	5	22.4	6.2
191	3639G	DGS-01SG-101020	8	5	22.7	5.8
192	3635G	DGS-31SG-101019	8	5	22.9	6.0
1	3623G	DGS-05SG-101018	8	6	23.5	6.1
4	3640G	DGS-02SG-101020	8	6	23.4	5.9
6	3634G	DGS-30SG-101019	8	6	23.5	4.8
10	3628G	DGS-16SG-101018	8	6	23.1	5.8
21	3636G	DGS-33SG-101019	8	6	22.8	6.0
25	3645G	U4Q2SG-101021	8	6	22.7	5.6
26	3625G	DGS-09SG-101018	8	6	22.5	6.0
51	3624G	DGS-08SG-101018	8	6	22.5	6.2

72	3627G	DGS-13SG-101018	8	6	22.9	6.1
74	3655G	Control	8	6	22.6	6.0
102	3643G	U3C2SG-101021	8	6	22.9	5.6
108	3638G	DGS-35SG-101019	8	6	23.1	6.1
109	3633G	DGS-26SG-101019	8	6	22.8	6.1
123	3631G	DGS-21SG-101019	8	6	22.6	5.9
127	3629G	DGS-17SG-101018	8	6	22.6	6.0
138	3632G	DGS-25SG-101019	8	6	22.8	6.1
142	3637G	DGS-34SG-101019	8	6	22.5	6.2
155	3644G	U4Q1SG-101021	8	6	22.5	5.2
169	3626G	DGS-12SG-101018	8	6	22.6	5.7
181	3630G	DGS-20SG-101019	8	6	22.7	6.1
182	3642G	DGS-06SG-101020	8	6	22.5	5.8
184	3641G	DGS-04SG-101020	8	6	22.4	6.3
191	3639G	DGS-01SG-101020	8	6	22.7	5.2
192	3635G	DGS-31SG-101019	8	6	23.0	6.1
1	3623G	DGS-05SG-101018	8	7	23.1	5.3
4	3640G	DGS-02SG-101020	8	7	23.2	5.2
6	3634G	DGS-30SG-101019	8	7	23.3	5.2
10	3628G	DGS-16SG-101018	8	7	22.9	5.5
21	3636G	DGS-33SG-101019	8	7	22.6	5.7
25	3645G	U4Q2SG-101021	8	7	22.5	5.2
26	3625G	DGS-09SG-101018	8	7	22.4	5.7
51	3624G	DGS-08SG-101018	8	7	22.3	5.7
72	3627G	DGS-13SG-101018	8	7	22.8	5.9
74	3655G	Control	8	7	22.5	5.4
102	3643G	U3C2SG-101021	8	7	22.8	5.5
108	3638G	DGS-35SG-101019	8	7	23.0	5.7
109	3633G	DGS-26SG-101019	8	7	22.6	6.0
123	3631G	DGS-21SG-101019	8	7	22.4	5.8
127	3629G	DGS-17SG-101018	8	7	22.5	5.5
138	3632G	DGS-25SG-101019	8	7	22.7	5.7
142	3637G	DGS-34SG-101019	8	7	22.5	6.2
155	3644G	U4Q1SG-101021	8	7	22.5	5.0
169	3626G	DGS-12SG-101018	8	7	22.5	5.6
181	3630G	DGS-20SG-101019	8	7	22.6	5.6
182	3642G	DGS-06SG-101020	8	7	22.4	5.6
184	3641G	DGS-04SG-101020	8	7	22.3	5.9
191	3639G	DGS-01SG-101020	8	7	22.6	5.2
192	3635G	DGS-31SG-101019	8	7	22.8	5.5
1	3623G	DGS-05SG-101018	8	8	23.4	5.5
4	3640G	DGS-02SG-101020	8	8	23.3	5.2
6	3634G	DGS-30SG-101019	8	8	23.4	5.3
10	3628G	DGS-16SG-101018	8	8	23.1	5.5
21	3636G	DGS-33SG-101019	8	8	23.1	5.9
25	3645G	U4Q2SG-101021	8	8	22.8	5.4
26	3625G	DGS-09SG-101018	8	8	22.8	5.6
51	3624G	DGS-08SG-101018	8	8	22.5	5.6
72	3627G	DGS-13SG-101018	8	8	22.9	5.8
74	3655G	Control	8	8	22.8	5.3
102	3643G	U3C2SG-101021	8	8	23.0	5.9
108	3638G	DGS-35SG-101019	8	8	23.0	5.8
109	3633G	DGS-26SG-101019	8	8	22.8	5.9
123	3631G	DGS-21SG-101019	8	8	22.8	5.7
127	3629G	DGS-17SG-101018	8	8	22.7	5.8
138	3632G	DGS-25SG-101019	8	8	22.9	5.5
142	3637G	DGS-34SG-101019	8	8	22.6	5.7
155	3644G	U4Q1SG-101021	8	8	22.6	5.5
169	3626G	DGS-12SG-101018	8	8	22.6	5.6
181	3630G	DGS-20SG-101019	8	8	22.7	5.4
182	3642G	DGS-06SG-101020	8	8	22.7	5.3

184	3641G	DGS-04SG-101020	8	8	22.6	5.5							
191	3639G	DGS-01SG-101020	8	8	22.8	5.4							
192	3635G	DGS-31SG-101019	8	8	22.9	5.6							
1	3623G	DGS-05SG-101018	8	9	23.4	4.8							
4	3640G	DGS-02SG-101020	8	9	23.2	5.1							
6	3634G	DGS-30SG-101019	8	9	23.3	4.9							
10	3628G	DGS-16SG-101018	8	9	22.9	5.6							
21	3636G	DGS-33SG-101019	8	9	22.6	5.9							
25	3645G	U4Q2SG-101021	8	9	22.6	5.3							
26	3625G	DGS-09SG-101018	8	9	22.5	5.3							
51	3624G	DGS-08SG-101018	8	9	22.4	5.8							
72	3627G	DGS-13SG-101018	8	9	22.8	5.8							
74	3655G	Control	8	9	22.5	5.2							
102	3643G	U3C2SG-101021	8	9	22.8	5.5							
108	3638G	DGS-35SG-101019	8	9	22.9	5.7							
109	3633G	DGS-26SG-101019	8	9	22.7	5.5							
123	3631G	DGS-21SG-101019	8	9	22.5	5.6							
127	3629G	DGS-17SG-101018	8	9	22.5	4.6							
138	3632G	DGS-25SG-101019	8	9	22.7	5.7							
142	3637G	DGS-34SG-101019	8	9	22.5	6.0							
155	3644G	U4Q1SG-101021	8	9	22.5	4.8							
169	3626G	DGS-12SG-101018	8	9	22.5	5.1							
181	3630G	DGS-20SG-101019	8	9	22.6	5.7							
182	3642G	DGS-06SG-101020	8	9	22.4	5.1							
184	3641G	DGS-04SG-101020	8	9	22.4	5.8							
191	3639G	DGS-01SG-101020	8	9	22.6	5.0							
192	3635G	DGS-31SG-101019	8	9	22.9	5.4							
1	3623G	DGS-05SG-101018	8	10	22.9	5.2	142	6.4	0.3	51	30		
4	3640G	DGS-02SG-101020	8	10	23.1	5.2	149	6.4	0.5	34	30		
6	3634G	DGS-30SG-101019	8	10	23.3	4.5	153	6.2	0.4	43	30		
10	3628G	DGS-16SG-101018	8	10	23.0	5.9	147	6.4	1.3	43	30		
21	3636G	DGS-33SG-101019	8	10	22.6	6.3	144	6.4	0.2	34	30		
25	3645G	U4Q2SG-101021	8	10	22.5	5.8	145	6.3	0.3	43	30		
26	3625G	DGS-09SG-101018	8	10	22.4	5.9	144	6.4	0.4	34	30		
51	3624G	DGS-08SG-101018	8	10	22.3	6.2	142	6.4	0.2	34	30		
72	3627G	DGS-13SG-101018	8	10	22.8	6.1	145	6.5	0.3	51	30		
74	3655G	Control	8	10	22.4	5.3	143	6.3	0.4	34	30		
102	3643G	U3C2SG-101021	8	10	22.7	5.7	144	6.3	0.4	34	30		
108	3638G	DGS-35SG-101019	8	10	22.9	5.9	149	6.4	0.5	43	30		
109	3633G	DGS-26SG-101019	8	10	22.6	5.9	143	6.3	0.4	51	30		
123	3631G	DGS-21SG-101019	8	10	22.4	5.6	141	6.3	0.4	43	30		
127	3629G	DGS-17SG-101018	8	10	22.4	6.1	142	6.4	0.1	43	30		
138	3632G	DGS-25SG-101019	8	10	22.7	6.3	144	6.4	0.2	34	30		
142	3637G	DGS-34SG-101019	8	10	22.4	6.2	142	6.4	0.4	43	30		
155	3644G	U4Q1SG-101021	8	10	22.4	4.9	144	6.4	0.4	43	30		
169	3626G	DGS-12SG-101018	8	10	22.4	5.6	141	6.3	0.2	43	30		
181	3630G	DGS-20SG-101019	8	10	22.6	6.1	143	6.4	0.2	34	30		
182	3642G	DGS-06SG-101020	8	10	22.4	5.5	141	6.3	0.5	34	30		
184	3641G	DGS-04SG-101020	8	10	22.3	5.9	144	6.4	0.5	43	30		
191	3639G	DGS-01SG-101020	8	10	22.6	5.0	145	6.3	0.4	51	30		
192	3635G	DGS-31SG-101019	8	10	22.9	6.3	142	6.4	0.4	43	30		
				Mean	22.7	6.1	143	6.4	0.4	41	31	6.6	5.8
				SD	0.3	0.6	5	0.1	0.3	5	3	0.2	4.6
				n	264	264	48	48	48	48	48	24	24
				Min	22.2	4.5	133	6.1	0.1	34	30	6.1	1.8
				Max	23.6	7.3	158	6.8	1.5	51	40	7.0	21.9

AMMONIA EXPOSURE BENCHSHEETS AND ANALYSIS

Total Ammonia-N in Sediment Pore Water: Computation Worksheet
Salicylate Method (SOP #5492)

Result

	Sample description	Dilution factor	OD655	NH_3-N (mg/L)	pH	Salinity (ppt)
	Blank	----	-----	-----		
	1.0 mg/L NH_3-N Std.	-----	0.131	1.00		
	3.0 mg/L NH_3-N Std.	-----	0.332	3.00		
	6.0 mg/L NH_3-N Std.	-----	0.642	6.00		
	10.0 mg/L NH_3-N Std.	-----	1.100	10.00		
	3.0 mg/L spike	-----	0.340	3.11		
	3.0 mg/L spike dupl.	-----	0.338	3.09		
	5.0 mg/L 2nd source		0.548	5.00		
1.	3623G	5	0.049	2.24		
2.	3624G	5	0.076	3.47		
3.	3625G	5	0.141	6.44		
4.	3626G	5	0.060	2.74		
5.	3627G	5	0.102	4.66		
6.	3628G	5	0.051	2.33		
7.	3629G	5	0.046	2.10		
8.	3630G	5	0.039	1.78		
9.	3631G	5	0.181	8.27		
10.	3632G	5	0.051	2.33		
11.	3633G	5	0.171	7.81		
12.	3634G	5	0.063	2.88		
13.	3635G	5	0.175	7.99		
14.	3636G	5	0.069	3.15		
15.	3637G	5	0.248	11.33		
16.	3638G	5	0.269	12.28		
17.	3639G	5	0.105	4.79		
18.	3640G	5	0.150	6.85		
19.	3641G	5	0.480	21.92		
20.	3642G	5	0.210	9.59		
21.	3643G	5	0.110	5.02		
22.	3644G	5	0.061	2.79		
23.	3645G	5	0.080	3.65		
24.	3655G	5	0.058	2.65		
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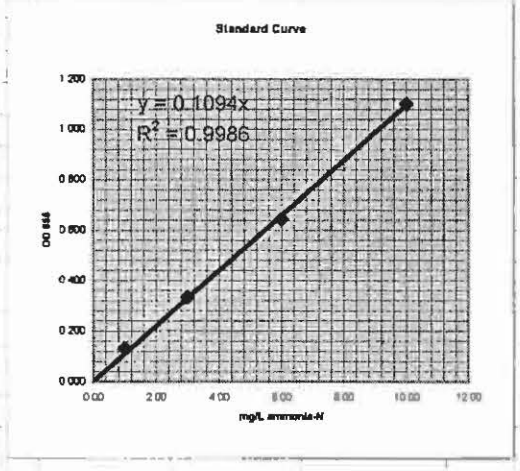

Reporting limit (mg/L) =	0.5
Recovery (%) =	103.2
Precision (RPD) =	0.59
2nd source (%) =	100.1
Sample volume (ml):	0.10
Dilution factor	5

Sample Set Description:

Proj.No.: 814-3
Test Day:
Species:

Bulk sediments

Analyst: RSC
Date analysed: 5/16/2011

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.	-----	.131	1.00		
	3.0 mg/L NH3-N Std.	-----	.332	3.00		
	6.0 mg/L NH3-N Std.	-----	.642	6.00		
	10.0 mg/L NH3-N Std.	-----	1.1	10.00		
	3.0 mg/L spike	-----	.340			
	3.0 mg/L spike dupl.	-----	.338			
	5.0 mg/L 2nd source		.548			
1.	3623G	5	.049		6.1	
2.	3624G	5	.076		6.5	
3.	3625G	5	.141		6.7	
4.	3626G	5	.060		6.5	
5.	3627G	5	.102		6.7	
6.	3628G	5	.051		6.5	
7.	3629G	5	.046		6.6	
8.	3630G	5	.039		7.0	
9.	3631G	5	.181		6.7	
10.	3632G	5	.051		6.7	
11.	3633G	5	.171		6.6	
12.	3634G	5	.063		6.5	
13.	3635G	5	.175		6.6	
14.	3636G	5	.069		6.6	
15.	3637G	5	.248		6.6	
16.	3638G	5	.269		6.7	
17.	3639G	5	.105		6.7	
18.	3640G	5	.150		6.8	
19.	3641G	5	.480		6.7	
20.	3642G	5	.210		6.7	
21.	3643G	5	.118		6.6	
22.	3644G	5	.061		6.8	
23.	3645G	5	.080		6.8	
24.	3655G	5	.058		6.6	
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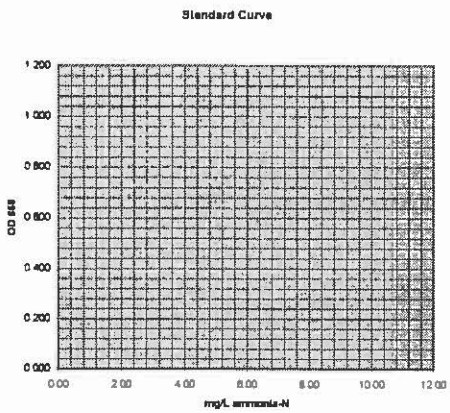

Reporting limit (mg/L) =	0.5
Recovery (%) =	#VALUE!
Precision (RPD) =	#VALUE!
2nd source (%) =	#VALUE!
Sample volume (ml):	0.10
Dilution factor	5

Sample Set Description:
Proj.No.: 814-3
Test Day:
Species:

Bulk sediments

Analyst: RSC
Date analysed: 5/16/2011

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.	-----	0.131	1.00
	3.0 mg/L NH_3-N Std.	-----	0.332	3.00
	6.0 mg/L NH_3-N Std.	-----	0.642	6.00
	10.0 mg/L NH_3-N Std.	-----	1.100	10.00
	3.0 mg/L spike	-----	0.340	3.11
	3.0 mg/L spike dupl.	-----	0.338	3.09
	5.0 mg/L 2nd source	-----	0.548	5.00
1.	1	1	0.027	0.25
2.	4	1	0.082	0.75
3.	6	1	0.041	0.37
4.	10	1	0.020	0.18
5.	21	1	0.032	0.29
6.	25	1	0.040	0.37
7.	26	1	0.066	0.60
8.	51	1	0.050	0.46
9.	72	1	0.050	0.46
10.	74	1	0.024	0.22
11.	102	1	0.057	0.52
12.	108	1	0.112	1.02
13.	109	1	0.080	0.73
14.	123	1	0.081	0.74
15.	127	1	0.027	0.25
16.	138	1	0.021	0.19
17.	142	1	0.097	0.89
18.	155	1	0.032	0.29
19.	169	1	0.030	0.27
20.	181	1	0.022	0.20
21.	182	1	0.092	0.84
22.	184	1	0.159	1.45
23.	191	1	0.049	0.45
24.	192	1	0.071	0.65
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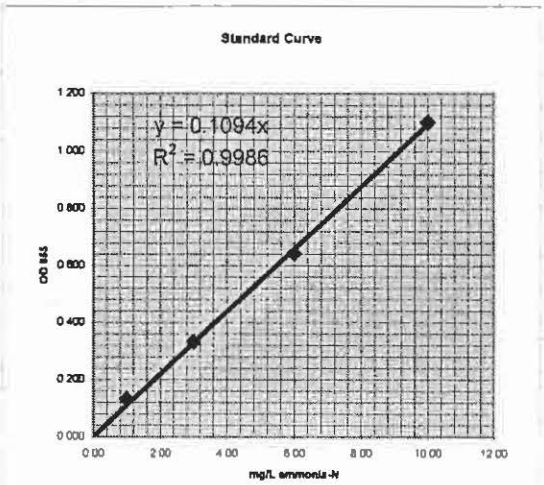

Reporting limit (mg/L) =	0.1
Recovery (%) =	103.2
Precision (RPD) =	0.59
2nd source (%) =	100.1
Sample volume (ml):	0.50
Dilution factor	1

Sample Set Description:

Test No.: 814-3
Test Day: 0 (5-6-11)
Species: *Chironomus*

Overlying water

Analyst: RSC RSC
Date analysed: 5/16/2011

Total Ammonia-N in Water: Computation Worksheet
Salicylate Method (SOP #5492)

Result

	Sample description	Dilution factor	OD655	NH3-N (mg/L)
	Blank	-----	-----	-----
	1.0 mg/L NH3-N Std.	-----	.131	1.00
	3.0 mg/L NH3-N Std.	-----	.332	3.00
	6.0 mg/L NH3-N Std.	-----	.642	6.00
	10.0 mg/L NH3-N Std.	-----	1.1	10.00
	3.0 mg/L spike	-----	.340	
	3.0 mg/L spike dupl.	-----	.338	
	5.0 mg/L 2nd source	-----	.548	
1.	1	1	.027	
2.	4	1	.082	
3.	6	1	.041	
4.	10	1	.020	
5.	21	1	.032	
6.	25	1	.040	
7.	26	1	.066	
8.	51	1	.050	
9.	72	1	.050	
10.	74	1	.024	
11.	102	1	.057	
12.	108	1	.112	
13.	109	1	.080	
14.	123	1	.081	
15.	127	1	.027	
16.	138	1	.021	
17.	142	1	.097	
18.	155	1	.032	
19.	169	1	.030	
20.	181	1	.022	
21.	182	1	.092	
22.	184	1	.159	
23.	191	1	.049	
24.	192	1	.071	
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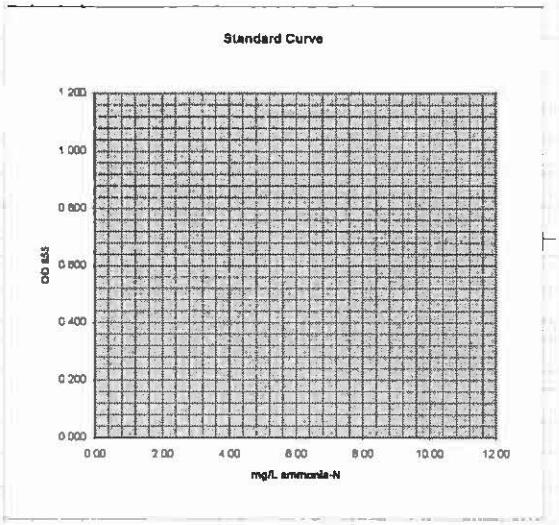


Reporting limit (mg/L) =	0.1
Recovery (%) =	#VALUE!
Precision (RPD) =	#VALUE!
2nd source (%) =	#VALUE!
Sample volume (ml):	0.50
Dilution factor	1

Sample Set Description:

Test No.: 814-3
Test Day: 0 (5-6-11)
Species: *Chironomus*

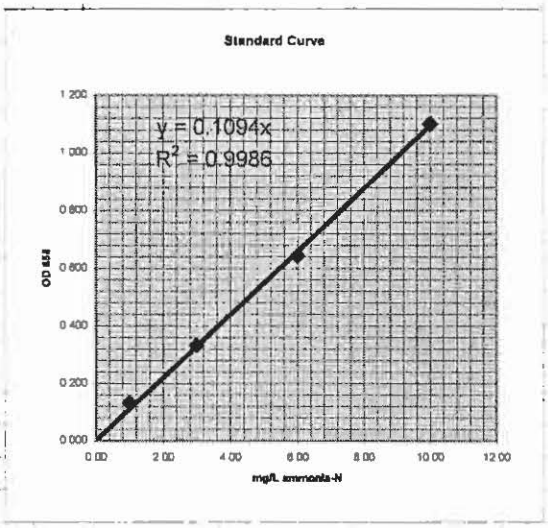
Overlying water

Analyst: RSC
Date analysed: 5/16/2011

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.	-----	0.131	1.00
	3.0 mg/L NH_3-N Std.	-----	0.332	3.00
	6.0 mg/L NH_3-N Std.	-----	0.642	6.00
	10.0 mg/L NH_3-N Std.	-----	1.100	10.00
	3.0 mg/L spike	-----	0.340	3.11
	3.0 mg/L spike dupl.	-----	0.338	3.09
	5.0 mg/L 2nd source	-----	0.548	5.00
1.	1	1	0.035	0.32
2.	4	1	0.050	0.46
3.	6	1	0.040	0.37
4.	10	1	0.140	1.28
5.	21	1	0.020	0.18
6.	25	1	0.027	0.25
7.	26	1	0.041	0.37
8.	51	1	0.024	0.22
9.	72	1	0.031	0.28
10.	74	1	0.046	0.42
11.	102	1	0.041	0.37
12.	108	1	0.053	0.48
13.	109	1	0.039	0.36
14.	123	1	0.039	0.36
15.	127	1	0.015	0.14
16.	138	1	0.018	0.16
17.	142	1	0.042	0.38
18.	155	1	0.040	0.37
19.	169	1	0.024	0.22
20.	181	1	0.018	0.16
21.	182	1	0.052	0.47
22.	184	1	0.054	0.49
23.	191	1	0.039	0.36
24.	192	1	0.038	0.35
25.				
26.				
27.				
28.				
29.				
30.				
31.				
32.				
33.				
34.				
35.				
36.				



Reporting limit (mg/L) =	0.1
Recovery (%) =	103.2
Precision (RPD) =	0.59
2nd source (%) =	100.1
Sample volume (ml):	0.50
Dilution factor	1

Sample Set Description:

Test No.: 814-3
Test Day: 10 (5-16-11)
Species: *Chironomus*

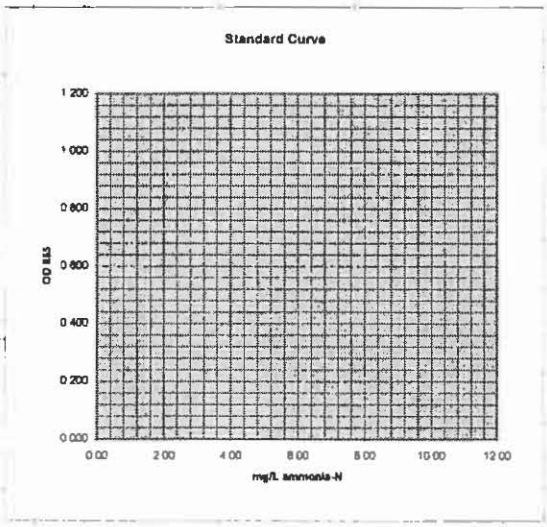
Overlying water

Analyst: RSC
Date analysed: 5/16/2011

Total Ammonia-N in Water: Computation Worksheet
Salicylate Method (SOP #5492)

Result

	Sample description	Dilution factor	OD655	NH3-N (mg/L)
	Blank	-----	-----	-----
	1.0 mg/L NH3-N Std.	-----	.131	1.00
	3.0 mg/L NH3-N Std.	-----	.332	3.00
	6.0 mg/L NH3-N Std.	-----	.642	6.00
	10.0 mg/L NH3-N Std.	-----	1.1	10.00
	3.0 mg/L spike	-----	.340	
	3.0 mg/L spike dupl.	-----	.338	
	5.0 mg/L 2nd source	-----	.548	
1.	1	1	.035	
2.	4	1	.050	
3.	6	1	.040	
4.	10	1	.140	
5.	21	1	.020	
6.	25	1	.027	
7.	26	1	.041	
8.	51	1	.024	
9.	72	1	.031	
10.	74	1	.046	
11.	102	1	.041	
12.	108	1	.053	
13.	109	1	.039	
14.	123	1	.039	
15.	127	1	.015	
16.	138	1	.018	
17.	142	1	.042	
18.	155	1	.040	
19.	169	1	.024	
20.	181	1	.015	
21.	182	1	.052	
22.	184	1	.054	
23.	191	1	.039	
24.	192	1	.038	
25.				
26.				
27.				
28.				
29.				
30.				
31.				
32.				
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.: 814-3
Test Day: 10 (5-16-11)
Species: *Chironomus*

Overlying water

Analyst: RSC
Date analysed: 5/16/2011

CHAIN-OF-CUSTODY RECORDS

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number:

Date:

Project Name: Gasco Data Gaps

Project Number: 000029-02

Project Manager: Ryan Barth

Phone Number: 206.903.3334

Shipment Method:

ANCHOR QEA

Line	Field Sample ID	Collection Date/Time	Matrix	No. of Containers	Test Parameters: Bioassay																			Comments/Preservation
1	DGS-08SG-110418	4/18/11 0947	SED	1	X			NAS	#	36	24	G												Cooler #1 - 1.0°C
2	DGS-09SG-110418	1042		1	X			NAS	#	36	25	G												Cooler #2 - 1.0°C
3	DGS-05SG-110418	1128		1	X			NAS	#	36	23	G												Cooler #3 1.0°C
4	DGS-12SG-110418	1317		1	X			NAS	#	36	26	G												Cooler #4 1.0°C
5	DGS-13SG-110418	1406		1	X			NAS	#	36	27	G												Cooler #5 1.5°C
6	DGS-16SG-110418	1455		1	X			NAS	#	36	28	G												
7	DGS-17SG-110418	1532		1	X			NAS	#	36	29	G												
8	DGS-20SG-110419	4/19/11 0849		1	X			NAS	#	36	30	G												
9	DGS-25SG-110419	0941		1	X			NAS	#	36	32	G												
10	DGS-30SG-110419	1023		1	X			NAS	#	36	34	G												
11	DGS-33SG-110419	1131		1	X			NAS	#	36	36	G												
12	DGS-34SG-110419	1238		1	X			NAS	#	36	37	G												
13	DGS-35SG-110419	1339		1	X			NAS	#	36	38	G												
14	DGS-21SG-110419	1420		1	X			NAS	#	36	31	G												
15	DGS-26SG-110419	1501		1	X			NAS	#	36	33	G												

Notes:

Relinquished By:	Company: Anchor QEA, LLC	Received By:	Company SENVOY
Signature/Printed Name	Date/Time 4/20/11 0730	Signature/Printed Name	Date/Time 4-20-11 7:30
Relinquished By:	Company:	Received By: GERALD IRISSARRI	Company: NAS
Signature/Printed Name	Date/Time	Signature/Printed Name	Date/Time 4-20-11 1045

Distribution: A copy will be made for the laboratory and client. The Project file will retain the original

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number:

Date: 4/19/11
Project Name: Gasco Data Gaps
Project Number: 000029-02
Project Manager: Ryan Barth
Phone Number: 206.903.3334
Shipment Method:

ANCHOR QEA

Line	Field Sample ID	Collection Date/Time	Matrix	No. of Containers	Test Parameters: Bioassay																			Comments/Preservation
1	DGS-31SG-110419	4/19/11 1534	SED	1	X			NAS # 3635G																
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13																								
14																								
15																								

PAGE 42 OF 43

Notes:

Relinquished By:	Company: Anchor QEA, LLC	Received By:	Company: SENWA
[signature]	4/20/11 0730	[signature]	4-20-11 7:50
Signature/Printed Name	Date/Time	Signature/Printed Name	Date/Time
Relinquished By:	Company:	Received By: [signature] GERALD IRISSARRI	Company: NAS
Signature/Printed Name	Date/Time	Signature/Printed Name	4-20-11 1045 Date/Time

Distribution: A copy will be made for the laboratory and client. The Project file will retain the original.

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number:

Date: 4/21/11
Project Name: Gasco Data Gaps
Project Number: 000029-02
Project Manager: Ryan Barth
Phone Number: 206.903.3334
Shipment Method: Courier

ANCHOR QEA

Line	Field Sample ID	Collection Date/Time	Matrix	No. of Containers	Bioassay	Hold	Test Parameters	Comments/Preservation
1	DGS-04SG-110420	4/20/11 0953	SED	1	X		NAS# 3641G	COOLER #1 - 1.5°C
2	DGS-06SG-110420	0917		1	X		NAS# 3642G	COOLER #2 - 0.5°C
3	DGS-02SG-110420	1031		1	X		NAS# 3640G	COOLER #3 - 1.0°C
4	DGS-01SG-110420	1110		1	X		NAS# 3639G	COOLER #4 - 1.5°C
5	DGS-44SG-110420	1344		1		X	NAS# 3647G	
6	DGS-46SG-110420	1426		1		X	NAS# 3646G	
7	DGS-50SG-110420	1504		1		X	NAS# 3648G	
8	DGS-53SG-110420	1618		1		X	NAS# 3651G	
9	DGS-52SG-110420	4/21/11 0800		1		X	NAS# 3650G	
10	DGS-51SG-110421	0851		1		X	NAS# 3649G	
11	U3C2SG-110421	1200		1	X		NAS# 3643G	
12	U4Q2SG-110421	1255		1	X		NAS# 3645G	
13	U4Q1SG-110421	1337		1	X		NAS# 3644G	
14							4/21/11	
15								

Notes:

Relinquished By:	Company: Anchor QEA, LLC	Received By:	Company: SENVOY
Signature/Printed Name	4/22/11 0910 Date/Time	Signature/Printed Name	(0910) 4.22.11 Date/Time
Relinquished By:	Company: SENVOY	Received By:	Company:
Signature/Printed Name	1245 4.22.11 Date/Time	Signature/Printed Name	4-22-11 1245 Date/Time

Distribution: A copy will be made for the laboratory and client. The Project file will retain the original.

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. 999-2881 Client: QC Test Investigator _____

Test Type (rangefinding/definitive) Test Length (hr) 96

Species *Chironomus dilutus*

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. [illegible] 2. [illegible]

3. 4.

Study Schedule:

Test Beginning: 5-6-11 1045 Test Ending: 5-10-11 1040

TEST MATERIAL

Description: Potassium Chloride Crystals - Lot No.: FISHER 073280

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: 4-25-11

Water Quality: Cond. (umhos/cm): 297 Salinity (ppt) [redacted] pH 7.7

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:

Ø	2.5	20	5	10	5	20	Ø	1.25	5
5	Ø	1.25	2.5	Ø	1.25	5	10	5	2.5
1.25	5	2.5	20	5	10	Ø	2.5	10	Ø
10	20	5	Ø	1.25	20	10	20	2.5	1.25
20	10	Ø	10	20	2.5	2.5	5	Ø	10
2.5	1.25	10	1.25	2.5	Ø	1.25	1.25	20	20

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

Revised 12-5-01

ACUTE TOXICITY TEST (ALL SPECIES)

Test No. 999-2881 Client QC Test Investigator _____

TEST ORGANISMS

Species: *Chironomus dilutus* Age: 3rd instar

Source: NAS cultures Date received: N/A

Acclimation Data:

Date	Temp. (deg.C)	DO (mg/L)	pH	Cond. umhos/cm	Hardness (mg/L)	Alkalinity (mg/L)	Feeding	Water changes
4-25-11	20.9	8.9	7.4	140	–	–	Animals fed Tetra Fin	YES
4-27-11	20.3	8.3	6.8	140	34	30	and *Selenastrum*	–
4-29-11	20.6	7.8	7.1	142	–	–	Details recorded on	YES
5-2-11	22.3	8.5	7.0	153	–	–	Chironomid culture	–
5-4-11	19.8	8.5	6.9	139	34	30	data sheets	–
5-6-11	22.2	8.2	7.0	139	–	–		YES
6J2 ② 5-17-11 Mean	21.0	8.5 ~~7.0~~	7.0	142	34	30		
S.D.	1.0	0.4 ~~0.2~~	0.2	5	–	–		
(N)	6	6	6	6	2	2		

Photoperiod during acclimation: 16:8 L:D

TEST PROCEDURES AND CONDITIONS

Test concentrations (50% series recommended): 20, 10, 5, 2.5, 1.25, 0 g/L

Test chamber: 30 ml plastic cups Test volume: 20 ml

Replicates/treatment: 10 Organisms/treatment: 10 (1/rep)

Test water changes: None Aeration during test: None

Feeding: 0.25 ml Prime Tropical Flakes (4g/L) suspension per cup on days 0 and 2

Duration: 24-hr, 48-hr, 96-hr Test temperature (deg.C): 23 ± 1

Beaker placement: Stratified randomization Photoperiod: 16:8, L:D

MISCELLANEOUS NOTES

Test solution preparation:

Working stock: Dissolve 10g KCl crystals in dilution water and dilute to 500 mL.
Final conc.: 20 g/L.

	Test concentration (g/L)	KCl working stock (ml/200ml)	ml of dilution water per 200 ml
	20	200	0
5-6-11	10	100	100
6J2	5	50	150
	2.5	25	175
	1.25	12.5	187.5
	0	0	0

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-_____

ACUTE TOXICITY TEST (ALL SPECIES)

Test No. 999-2881 Client QC Test

DAILY RECORD SHEET

Day 0 (5 / 6 /11) GJL Temp Beaker (°C): 23.4

Conc. (g/L)	Temp. (deg.C)	pH	Cond. (umhos/cm)	DO (ppm)	Hardness (mg/L)	Alkalinity (mg/L)	Comments
1. 20	23.2	7.8	13850	8.5	94	70	
2. 10	23.2	7.8	11310	8.5			
3. 5	23.2	7.8	7290	8.4			
4. 2.5	23.4	7.8	4050	8.4			
5. 1.25	23.3	7.7	2180	8.4			
6. 0	23.3	7.6	267	8.3	94	70	
All animals fed 0.25 ml Tetra Fin suspension. Initials: GJL							

Day 1 (5 / 7 /11) GJL Temp Beaker (°C): 23.2

Conc. (g/L)	Temp. (deg.C)	pH	Cond. (umhos/cm)	DO (ppm)	Hardness (mg/L)	Alkalinity (mg/L)	Comments
1. 20							
2. 10							
3. 5							
4. 2.5							
5. 1.25							
6. 0							

Day 2 (5 / 8 /11) GJL Temp Beaker (°C): 23.0

Conc. (g/L)	Temp. (deg.C)	pH	Cond. (umhos/cm)	DO (ppm)	Hardness (mg/L)	Alkalinity (mg/L)	Comments
1. 20							
2. 10							
3. 5							
4. 2.5							
5. 1.25							
6. 0							
All animals fed 0.25 ml Tetra Fin suspension. Initials: GJL							

Day 3 (5 / 9 /11) YN Temp Beaker (°C): 23.1

Conc. (g/L)	Temp. (deg.C)	pH	Cond. (umhos/cm)	DO (ppm)	Hardness (mg/L)	Alkalinity (mg/L)	Comments
1. 20							
2. 10							
3. 5							
4. 2.5							
5. 1.25							
6. 0							

Day 4 (5 / 10 /11) GJL Temp Beaker (°C): 23.0

Conc. (g/L)	Temp. (deg.C)	pH	Cond. (umhos/cm)	DO (ppm)	Hardness (mg/L)	Alkalinity (mg/L)	Comments
1. 20	—	—	—	—	—	—	
2. 10	—	—	—	—			
3. 5	23.6	7.8	8080	7.5			
4. 2.5	23.7	7.8	4700	7.4			
5. 1.25	23.7	7.7	2730	7.4			
6. 0	23.8	7.6	356	7.3	103	90	
Mean	23.4	7.7	CONTROL 312	8.0	97	77	
SD	0.2	0.1	—	0.5	5	12	
n	10	10	2	10	3	3	

Revised 12-5-01

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS- _____

ACUTE TOXICITY TEST (ALL SPECIES)

Test No. 999-2881 Client QC Test Investigator _____

DAILY RECORD SHEET - Survivors

Day 0 (5/6/11) GJL

Conc. (g/L)	Survivors in Replicate: 1	2	3	4	5	6	7	8	9	10	Total
1. 20	1	1	1	1	1	1	1	1	1	1	10
2. 10	1	1	1	1	1	1	1	1	1	1	10
3. 5	1	1	1	1	1	1	1	1	1	1	10
4. 2.5	1	1	1	1	1	1	1	1	1	1	10
5. 1.25	1	1	1	1	1	1	1	1	1	1	10
6. 0	1	1	1	1	1	1	1	1	1	1	10

Day 1 (5/7/11) GJL

Conc. (g/L)	Survivors in Replicate: 1	2	3	4	5	6	7	8	9	10	Total
1. 20	1	1	1	1	1	1	1	1	1	1	10
2. 10	1	1	1	1	1	1	1	1	1	1	10
3. 5	1	1	1	1	1	1	1	1	1	1	10
4. 2.5	1	1	1	1	1	1	1	1	1	1	10
5. 1.25	1	1	1	1	1	1	1	1	1	1	10
6. 0	1	1	1	1	1	1	1	1	1	1	10

Day 2 (5/8/11) GJL

Conc. (g/L)	Survivors in Replicate: 1	2	3	4	5	6	7	8	9	10	Total
1. 20	0	0	0	0	0	0	0	0	0	0	∅ (10D)
2. 10	0	0	0	0	0	0	0	0	0	0	∅ (10D)
3. 5	0	1	0	1	0	1	0	1	1	1	6 (4D)
4. 2.5	0	1	1	1	1	1	1	1	1	1	9 (1D)
5. 1.25	1	1	1	1	1	1	1	1	1	1	10
6. 0	1	1	1	1	1	1	1	1	1	1	10

Day 3 (5/9/11) GJL

Conc. (g/L)	Survivors in Replicate: 1	2	3	4	5	6	7	8	9	10	Total
1. 20	0	0	0	0	0	0	0	0	0	0	∅
2. 10	0	0	0	0	0	0	0	0	0	0	∅
3. 5	0	1	0	1	0	1	0	1	0	0	4 (2D)
4. 2.5	0	1	1	1	1	1	1	1	1	1	9
5. 1.25	1	1	1	1	1	1	1	1	1	1	10
6. 0	1	1	1	1	1	1	1	1	1	1	10

Day 4 (5/10/11) GJL

Conc. (g/L)	Survivors in Replicate: 1	2	3	4	5	6	7	8	9	10	Total
1. 20	0	0	0	0	0	0	0	0	0	0	∅
2. 10	0	0	0	0	0	0	0	0	0	0	∅
3. 5	0	1	0	1	0	0	0	1	0	0	3 (1D)
4. 2.5	0	1	1	1	1	1	1	1	1	1	9
5. 1.25	1	1	1	1	1	1	1	1	1	1	10
6. 0	1	1	1	1	1	1	1	1	0	1	9 (1D)

Revised 12-5-01

Acute 96-hr Toxicity Test-96 Hr Survival

Start Date:	5/6/2011 10:45	Test ID:	999-2881	Sample ID:	REF-Ref Toxicant
End Date:	5/10/2011 10:40	Lab ID:	ORNAS-Northwestern Aquati	Sample Type:	KCL-Potassium chloride
Sample Date:		Protocol:	EPAF 91-EPA Freshwater	Test Species:	CT-Chironomus dilutus
Comments:					

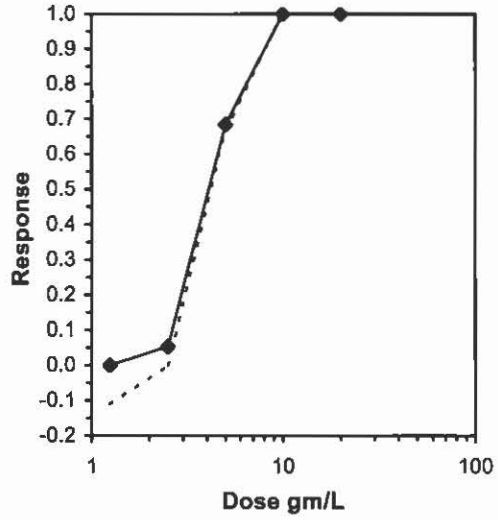
Conc-gm/L	1
D-Control	0.9000
1.25	1.0000
2.5	0.9000
5	0.3000
10	0.0000
20	0.0000

Conc-gm/L	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's Exact P	1-Tailed Critical	Number Resp	Total Number
D-Control	0.9000	1.0000	1	9	10	1			1	10
1.25	1.0000	1.1111	0	10	10	1	0.5000	0.0500	0	10
2.5	0.9000	1.0000	1	9	10	1	0.7632	0.0500	1	10
*5	0.3000	0.3333	7	3	10	1	0.0099	0.0500	7	10
*10	0.0000	0.0000	10	0	10	1	0.0001	0.0500	10	10
*20	0.0000	0.0000	10	0	10	1	0.0001	0.0500	10	10

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Fisher's Exact Test	2.5	5	3.53553	

Trimmed Spearman-Karber

Trim Level	EC50	95% CL	
0.0%	4.2430	3.3845	5.3193
5.0%	4.2644	3.3834	5.3747
10.0%	4.2174	3.2903	5.4057
20.0%	4.1352	3.1103	5.4978
Auto-0.0%	4.2430	3.3845	5.3193



ToxCalc v5.0.23

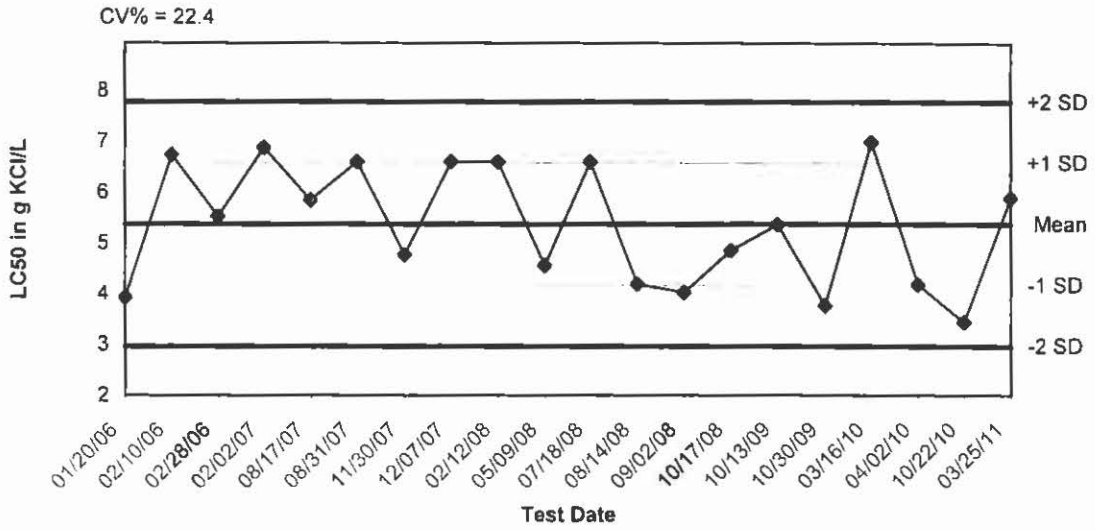
Reviewed by:_____

Test: AT-Acute 96-hr Toxicity Test | Test ID: 999-2881
Species: CT-Chironomus dilutus | Protocol: EPAF 91-EPA Freshwater
Sample ID: REF-Ref Toxicant | Sample Type: KCL-Potassium chloride
Start Date: 5/6/2011 10:45 | End Date: 5/10/2011 10:40 | 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	9	
	2	1	1.250	10	10	10	10	10	
	3	1	2.500	10	10	9	9	9	
	4	1	5.000	10	10	6	4	3	
	5	1	10.000	10	10	0	0	0	
	6	1	20.000	10	10	0	0	0	

Comments: data entry verified against laboratory bench sheets 5-24-11 JRF

Midge, Chironomus dilutus, larvae (3rd instar) acute reference toxicant test



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
01/20/06	3.9300	5.3685	4.1646	2.9608	6.5724	7.7762
02/10/06	6.7400	5.3685	4.1646	2.9608	6.5724	7.7762
02/28/06	5.5300	5.3685	4.1646	2.9608	6.5724	7.7762
02/02/07	6.8800	5.3685	4.1646	2.9608	6.5724	7.7762
08/17/07	5.8400	5.3685	4.1646	2.9608	6.5724	7.7762
08/31/07	6.6000	5.3685	4.1646	2.9608	6.5724	7.7762
11/30/07	4.7700	5.3685	4.1646	2.9608	6.5724	7.7762
12/07/07	6.6000	5.3685	4.1646	2.9608	6.5724	7.7762
02/12/08	6.6000	5.3685	4.1646	2.9608	6.5724	7.7762
05/09/08	4.5600	5.3685	4.1646	2.9608	6.5724	7.7762
07/18/08	6.6000	5.3685	4.1646	2.9608	6.5724	7.7762
08/14/08	4.1900	5.3685	4.1646	2.9608	6.5724	7.7762
09/02/08	4.0300	5.3685	4.1646	2.9608	6.5724	7.7762
10/17/08	4.8500	5.3685	4.1646	2.9608	6.5724	7.7762
10/13/09	5.3600	5.3685	4.1646	2.9608	6.5724	7.7762
10/30/09	3.7700	5.3685	4.1646	2.9608	6.5724	7.7762
03/16/10	6.9900	5.3685	4.1646	2.9608	6.5724	7.7762
04/02/10	4.1900	5.3685	4.1646	2.9608	6.5724	7.7762
10/22/10	3.4500	5.3685	4.1646	2.9608	6.5724	7.7762
03/25/11	5.8900	5.3685	4.1646	2.9608	6.5724	7.7762

msl
4-15-11

Report

of

Test No. 814-1

Assessment of Freshwater Sediments as part of the NW Natural Gasco Sediments Cleanup Action Data Gaps Project (000029-02), using a 28-day Amphipod, *Hyalella azteca*, Sediment Bioassay.

Submitted to

Anchor QEA, LLC
1423 Third Ave, Suite 300
Seattle, WA 98101

Submitted by

Northwestern Aquatic Sciences
3814 Yaquina Bay Road
P.O. Box 1437
Newport, OR 97365

December 6, 2010

TOXICITY TEST REPORT

TEST IDENTIFICATION

Test No.: 814-1

Title: Toxicity of freshwater sediments using a 28-day Amphipod, *Hyalella azteca*, sediment bioassay as part of the NW Natural Gasco Sediments Cleanup Action Data Gaps Project (000029-02).

Protocol No.: NAS-XXX-HA4c, February 11, 2000. Revision 3 (4-26-05). Based on ASTM 2001 (Standard test methods for measuring the toxicity of sediment-associated contaminants with fresh water invertebrates, E1706-00), Am. Soc. Test. Mat., Phila., PA, and EPA Method 100.1 (Methods for measuring the toxicity and bioaccumulation of sediment-associated contaminants with freshwater invertebrates, EPA/600/R-99/064).

STUDY MANAGEMENT

Study Sponsor: Anchor QEA, LLC., 1423 Third Avenue, Suite 300, Seattle, WA 98101

Sponsor's Study Monitor: Ms. Joy Dunay

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, B.A., M.B.A., QA Officer; R.S. Caldwell, PhD, Sr. Toxicologist; G.A. Buhler, B.S., Aq. Toxicologist; M.S. Redmond, M.S., Aq. Toxicologist; L.P. Sandoval, B.S., Tech.; Y. Nakahama, Tech.

Study Schedule:

Test Beginning: 10-26-10, 1100 hrs.

Test Ending: 11-23-10, 1045 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: Freshwater test sediments collected NW Natural Gasco Sediments Cleanup Action Data Gaps Project (000029-02). Details are as follows:

NAS Sample No.	3342G	3343G	3344G	3345G
Description	DGS-01SG-101014	DGS-02SG-101014	DGS-04SG-101013	DGS-05SG-101014
Collection Date	10/14/10	10/14/10	10/13/10	10/14/10
Receipt Date	10/15/10	10/15/10	10/15/10	10/15/10
NAS Sample No.	3346G	3347G	3348G	3349G
Description	DGS-06SG-101014	DGS-08SG-101013	DGS-09SG-101013	DGS-12SG-101013
Collection Date	10/14/10	10/13/10	10/13/10	10/13/10
Receipt Date	10/15/10	10/15/10	10/15/10	10/15/10
NAS Sample No.	3350G	3351G	3352G	3353G
Description	DGS-13SG-101013	DGS-16SG-101013	DGS-17SG-101013	DGS-20SG-101013
Collection Date	10/13/10	10/13/10	10/13/10	10/13/10
Receipt Date	10/15/10	10/15/10	10/15/10	10/15/10

NAS Sample No.	3354G	3355G	3356G	3357G
Description	DGS-21SG-101013	DGS-25SG-101012	DGS-26SG-101013	DGS-30SG-101012
Collection Date	10/13/10	10/12/10	10/13/10	10/12/10
Receipt Date	10/15/10	10/15/10	10/15/10	10/15/10

NAS Sample No.	3358G	3359G	3360G	3361G
Description	DGS-31SG-101012	DGS-33SG-101012	DGS-34SG-101012	DGS-35SG-101012
Collection Date	10/12/10	10/12/10	10/12/10	10/12/10
Receipt Date	10/15/10	10/15/10	10/15/10	10/15/10

NAS Sample No.	3362G	3363G	3364G
Description	U2C-2-101014	U4Q-1-101014	U4Q-2-101014
Collection Date	10/14/10	10/14/10	10/14/10
Receipt Date	10/15/10	10/15/10	10/15/10

Control Sediment: The negative control sediment (NAS#3338G) was collected on 10-11-10 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, reference, and control sediments were stored at 4°C in the dark in sealed containers until used.

TEST WATER

Source: Dechlorinated municipal tap water.
Date of Preparation: Six batches of test water were collected on: 10/18/10, 10/25/10, 10/29/10, 11/1/10, 11/11/10, 11/14/10.
Water Quality (mean ± S.D.):
pH: 7.2 ± 0.1 (n=6)
conductivity: 122 ± 3 µmhos/cm (n=6)
hardness: 34 ± 0 mg/L as $CaCO_3$ (n=6)
alkalinity: 30 ± 0 mg/L as $CaCO_3$. (n=6)
total chlorine: All batches were < 0.02 mg/L (n=6)
Pretreatment: Dechlorinated and aerated ≥24 hr.

TEST ORGANISMS

Species: *Hyalella azteca,* amphipod.
Age/Size: 7-8 days old
Source: Chesapeake Cultures, Hayes, VA; received 10-22-10
Acclimation: Holding conditions for the five days prior to testing averaged: Temperature, 21.8 ± 1.1 °C; dissolved oxygen, 9.5 ± 3.1 mg/L; pH, 7.4 ± 0.5; conductivity, 276 ± 107 µmhos/cm; hardness, 101 ± 45 mg/L as $CaCO_3$; and alkalinity, 94 ± 55 mg/L as $CaCO_3$. Photoperiod, 16:8, L:D. Half of the water was replaced daily with dechlorinated municipal tap 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, pH and dissolved oxygen 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. Total ammonia and pH were measured in the pore water from the bulk sediment prior to test initiation. Interstitial water samples were obtained by centrifugation. 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.

PROTOCOL DEVIATIONS

The temperature of one breaker on day 13 measured 21.9 °C, which was slightly below the 23 ± 1°C requirement.

REFERENCE TOXICANT TEST

The reference toxicant test is a multi-concentration toxicity test using potassium 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.: 999-2805
Reference Toxicant and Source: Potassium Chloride (KCl), Fisher Lot #073280.
Test Date: 10-26-10.
Dilution Water Used: Moderately hard synthetic water prepared from Milli-Q® deionized water.
Result: 96-hr LC50, 0.41 g/L. This result is within the laboratory's control chart warning limits (0.31 – 0.47 g/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. Interstitial ammonia measurements and pH of bulk sediments are listed in Table 2. The means and standard deviations of percent mortality and average dry weight of *Hyalella* exposed for 28 days to sediments are summarized in Table 3. 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 between <0.1 and 1.7 mg/L for all day 0 and day 28 measurements. Interstitial bulk sediment values for ammonia-N ranged from <0.5 to 21.2 mg/L.

The test met the survival and weight acceptability criteria specified in the test protocol with 5.0% mean control mortality (≤20% required) and a control individual mean dry weight of 0.20 mg per amphipod. The reference sediments resulted in mortalities of 6.3-12.5%, which were within the requirements (≤ 30 %) set in the Sediment Evaluation Framework for the Pacific Northwest -May 2009 (SEF). The mean dry weights of the reference sediments met the SEF requirement of ≥ 0.15mg/ind. The reference toxicant (positive control) EC50 result was within the laboratory's control chart limits (0.41 g/L; control chart mean ± 2 S.D. = 0.39 ± 0.08). It is concluded, therefore, that the test has developed fully acceptable data for use in making management decisions.

STUDY APPROVAL

Gerald Anissari 12-3-10
Project Manager/Study Director Date

Julie R. Fiore 12-6-10
Quality Assurance Unit Date

Lynda K. Jennetta 12/3/10
Assistant Laboratory Director Date

Table 1. Summary of water quality conditions during tests of the amphipod, *Hyalella azteca*, exposed to freshwater sediments.

Water Quality Parameter	Mean ± S.D.	Minimum	Maximum	N
Temperature (°C)	22.7 ± 0.4	21.9	23.7	696
Dissolved oxygen (mg/L)	6.7 ± 0.4	5.1	7.8	336
Conductivity (µmhos/cm)	133 ± 11	119	228	144
pH	6.9 ± 0.2	6.4	7.3	336
Hardness (mg/L as $CaCO_3$)	38 ± 5	34	51	48
Alkalinity (mg/L as $CaCO_3$)	30 ± 7	20	40	48
Total ammonia (mg/L)	---	<0.1	1.7	48

Table 2. Interstitial ammonia-N and pH in test sediments porewater prior to test initiation.

NAS Sample No.	Sample Description	pH	Ammonia (mg/L)
3338G	Control	6.2	2.4
3342G	DGS-01SG-101014	6.5	4.9
3343G	DGS-02SG-101014	6.7	8.8
3344G	DGS-04SG-101013	6.8	21.2
3345G	DGS-05SG-101014	6.9	1.9
3346G	DGS-06SG-101014	6.7	8.5
3347G	DGS-08SG-101013	6.9	2.6
3348G	DGS-09SG-101013	6.8	6.2
3349G	DGS-12SG-101013	6.8	4.1
3350G	DGS-13SG-101013	6.8	7.1
3351G	DGS-16SG-101013	7.0	3.4
3352G	DGS-17SG-101013	7.2	3.9
3353G	DGS-20SG-101013	7.2	<0.5
3354G	DGS-21SG-101013	7.2	7.6
3355G	DGS-25SG-101012	7.1	1.6
3356G	DGS-26SG-101013	6.7	5.4
3357G	DGS-30SG-101012	6.8	2.9
3358G	DGS-31SG-101012	6.8	5.3
3359G	DGS-33SG-101012	6.9	2.9
3360G	DGS-34SG-101012	6.7	8.1
3361G	DGS-35SG-101012	6.6	15.0
3362G	U2C-2-101014	6.8	1.7
3363G	U4Q-1-101014	6.7	4.9
3364G	U4Q-2-101014	6.7	3.7

Table 3. Mortality and growth results of *Hyalella azteca* 28-day sediment toxicity test.

NAS Sample No.	Sample Description	Percent mortality (Mean ± SD)	Average dry wt/amphipod (mg) (Mean ± SD)
3338G	Control	5.0 ± 7.6	0.20 ± 0.02
3342G	DGS-01SG-101014	11.3 ± 11.3	0.21 ± 0.01
3343G	DGS-02SG-101014	6.3 ± 7.4	0.15 ± 0.01
3344G	DGS-04SG-101013	8.8 ± 11.3	0.18 ± 0.12
3345G	DGS-05SG-101014	8.8 ± 8.3	0.21 ± 0.06
3346G	DGS-06SG-101014	7.5 ± 7.1	0.17 ± 0.02
3347G	DGS-08SG-101013	11.3 ± 9.9	0.20 ± 0.05
3348G	DGS-09SG-101013	10.0 ± 14.1	0.16 ± 0.02
3349G	DGS-12SG-101013	7.5 ± 10.4	0.14 ± 0.01
3350G	DGS-13SG-101013	2.5 ± 4.6	0.16 ± 0.01
3351G	DGS-16SG-101013	6.3 ± 7.4	0.15 ± 0.02
3352G	DGS-17SG-101013	5.0 ± 10.7	0.17 ± 0.03
3353G	DGS-20SG-101013	3.8 ± 5.3	0.17 ± 0.01
3354G	DGS-21SG-101013	3.8 ± 7.4	0.14 ± 0.02
3355G	DGS-25SG-101012	10.0 ± 17.7	0.15 ± 0.03
3356G	DGS-26SG-101013	2.5 ± 4.6	0.15 ± 0.01
3357G	DGS-30SG-101012	12.5 ± 11.6	0.15 ± 0.02
3358G	DGS-31SG-101012	5.0 ± 7.6	0.15 ± 0.03
3359G	DGS-33SG-101012	2.5 ± 4.6	0.14 ± 0.01
3360G	DGS-34SG-101012	11.3 ± 8.3	0.15 ± 0.02
3361G	DGS-35SG-101012	17.5 ± 14.9	0.19 ± 0.06
3362G	U2C-2-101014	12.5 ± 10.4	0.17 ± 0.02
3363G	U4Q-1-101014	7.5 ± 10.4	0.17 ± 0.04
3364G	U4Q-2-101014	6.3 ± 7.4	0.15 ± 0.02

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

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

REVIEWED PAGES 1-73 -GJI

Test No. 814-1 Client Anchor QEA Investigator

STUDY MANAGEMENT

Client: Anchor QEA, LLC, 1423 Third Ave., Suite 300, Seattle, WA 98101

Client's Study Monitor: Ms. Joy Dunay

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. [illegible] 2. Lidia P. Sandoval LPS
3. D.S. Caldwell DSC 4. Wes Nakahama [illegible]
5. M.S. Redmond MSR 6.
7. 8.

Study Schedule:

Test Beginning: 10-26-10 1100 Test Ending: 11-23-10 ~~10-15-10~~ 1045 GJI 11-23-10

TEST MATERIAL

General description (see sample logbook/chain-of-custody for details):

NAS Sample No.:	3338G	3342G	3343G	3344G
Description:	Control	DGS-01SG-101014	DGS-02SG-101014	DGS-04SG-101013
Collection Date:	10/11/10	10/14/10	10/14/10	10/13/10
Receipt Date:	10/11/10	10/15/10	10/15/10	10/15/10
:				

NAS Sample No.:	3345G	3346G	3347G	3348G
Description:	DGS-05SG-101014	DGS-06SG-101014	DGS-08SG-101013	DGS-09SG-101013
Collection Date:	10/14/10	10/14/10	10/13/10	10/13/10
Receipt Date:	10/15/10	10/15/10	10/15/10	10/15/10
:				

NAS Sample No.:	3349G	3350G	3351G	3352G
Description:	DGS-12SG-101013	DGS-13SG-101013	DGS-16SG-101013	DGS-17SG-101013
Collection Date:	10/13/10	10/13/10	10/13/10	10/13/10
Receipt Date:	10/15/10	10/15/10	10/15/10	10/15/10
:				

NAS Sample No.:	3353G	3354G	3355G	3356G
Description:	DGS-20SG-101013	DGS-21SG-101013	DGS-25SG-101012	DGS-26SG-101013
Collection Date:	10/13/10	10/13/10	10/12/10	10/13/10
Receipt Date:	10/15/10	10/15/10	10/15/10	10/15/10
:				

NAS Sample No.:	3357G	3358G	3359G	3360G
Description:	DGS-30SG-101012	DGS-31SG-101012	DGS-33SG-101012	DGS-34SG-101012
Collection Date:	10/12/10	10/12/10	10/12/10	10/12/10
Receipt Date:	10/15/10	10/15/10	10/15/10	10/15/10
:				

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. 814-1 Client Anchor QEA Investigator

TEST MATERIAL CONTINUATION SHEET

NAS Sample No.:	3361G	3362G	3363G	3364G
Description:	DGS-35SG-101012	U2C-2-101014	U4Q-1-101014	U4Q-2-101014
Collection Date:	10/12/10	10/14/10	10/14/10	10/14/10
Receipt Date:	10/15/10	10/15/10	10/15/10	10/15/10
:				
NAS Sample No.:				
Description:				
Collection Date:				
Receipt Date:				
:				
NAS Sample No.:				
Description:				
Collection Date:				
Receipt Date:				
:				
NAS Sample No.:				
Description:				
Collection Date:				
Receipt Date:				
:				
NAS Sample No.:				
Description:				
Collection Date:				
Receipt Date:				
:				
NAS Sample No.:				
Description:				
Collection Date:				
Receipt Date:				
:				
NAS Sample No.:				
Description:				
Collection Date:				
Receipt Date:				
:				
NAS Sample No.:				
Description:				
Collection Date:				
Receipt Date:				
:				

Test No. 814-1 Client Anchor QEA Investigator

SEDIMENT DESCRIPTIONS – SUPPLEMENTAL NOTES

Sample No.	Description
3338G	BLACK FINE MUD
3342G	Gray-Green muddy with plant material
3343G	Gray-green mud with some sand
3344G	dark gray fine mud ; hydrocarbon odor
3345G	Brown-green, sandy-mud with some plant material; hydrocarbon odor
3346G	DARK GRAY GREEN SANDY MUD, BITS OF TAR, ROCKS
3347G	Gray green sand with some plant material
3348G	Dark gray-green sandy mud with some plant material
3349G	gray-green sandy mud
3350G	dark gray sandy mud; hydromarbon odor
3351G	DARK GRAY MUDDY SAND
3352G	thick gravelly/sandy gray green mud
3353G	DARK GRAY MUDDY COARSE SAND
3354G	dark brown gray fine mud: hydrocarbon odor
3355G	gray-green sandy mud
3356G	DARK GRAY FINE MUD, PETROLEUM ODOR
3357G	dark grey sandy mud
3358G	Brown-gray fine mud; hydrocarbon odor
3359G	brown muddy sand
3360G	DARK GRAY SANDY MUD
3361G	dark brown grey fine mud; hydrocarbon odor
3362G	Dark gray sandy mud
3363G	Brown sandy mud
3364G	brown-gray fine sandy mud

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-1 Client Anchor QEA Investigator

TEST WATER

Source: Dechlorinated Newport, OR tap water

Date of Collection/Preparation: 10-18-10, 10-25-10, 10-29-10, 11-1-10, 11-11-10, 11-14-10

pH 7.4, 7.3, 7.1, 7.2, 7.0, 7.2 $\bar{X}$ = 7.2 ± 0.1

Cond (umhos/cm2) 121, 123, 119, 119, 127, 120 umhos/cm $\bar{X}$ = 122 ± 3

Hardness (mg/La0 34, 34, 34, 34, 34, 34 mg/L $\bar{X}$ = 34 ± 0.0

Alkalinity (mg/L) 30, 30, 30, 30, 30, 30 mg/L $\bar{X}$ = 30 ± 0.0

Total Chlorine (mg/l) ALL MEASURED < 0.02 mg/L

Treatments: Aerated ≥ 24 hrs

TEST ORGANISMS

Species: *Hyalella azteca* Age: 7-8 DAYS Date received: 10-22-10

Source: Chesapeake Cultures, Hayes, VA

Acclimation Data:

Date	Temp. (deg.C)	pH	DO (mg/L)	Cond umhos/cm	Feeding amount	Feeding description	Water changes	Hardness	Alkalinity (mg/L)
10-22-10	19.8	7.3	>15.0	142	10ml/PAN	YTC	½ WATER REPLACED W/ DILUTION WATER	171	180
10-23-10	22.3	8.1	8.3	320	"	"	"	120	110
10-24-10	22.5	7.7	7.9	227	"	"	"	86	80
10-25-10	22.2	6.9	8.2	212	"	"	"	69	60
10-26-10	22.0	7.2	8.3	179	"	"	—	60	40
Mean	21.8	7.4	9.5	276				101	94
S.D.	1.1	0.5	3.1	107				45	55
(N)	5	5	5	5				5	5

Photoperiod during acclimation: 16:8, L:D

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

Beaker placement: Total randomization

Feeding: everyday beginning with day zero

Photoperiod: 16:8, L:D

Test temperature (deg.C): 23

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: 10-11-10

Sieved through 0.5 -mm screen

Storage: 4°C in the dark in closed containers. NAS# 3338G

MISCELLANEOUS NOTES

Light Intensity:

Date	Location	Light Intensity (ft-candles*)	Initials
10-29-10	BEAKER# 29	38	GJ
	105	22	
	159	23	

*To convert ft-candles to lux multipy by 10.76

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-1 Client Anchor QEA Investigator _____

Test conducted in (circle one): room 1 (room 2) trailer water bath other:_____

Randomization chart: TOP SHELF

5								190	
4								189	
3								188	
2								187	192
1								186	191

FRONT

Randomization chart:

Randomization chart:

Randomization chart:

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 0 (10/26/10) GJL/YN

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond.* (umhos/cm)	pH*	Hardness* (mg/L)	Alkalinity* (mg/L	NH3* (ppm)	Comments
3	23.0	7.1	129	7.1	34	30		Each beaker fed 1.0 ml
9	22.8	~~6.9~~ GJL	125	6.9	43	40		YTC suspension
21	22.7	~~5.8~~ 6.8 GJL	228	6.8	43	30		Initials: GJL
30	22.9	7.1 ~~6.9~~	132	6.9	34	30		
32	22.7	6.1	120	6.8	43	30		
38	22.5	6.9	131	6.8	51	40		
42	22.4	6.9	130	6.8	43	40		
48	22.3	6.8	134	6.8	51	40		
70	22.6	7.3	137	6.9	43	40		
76	22.5	7.3	138	7.1	43	40		
95	22.6	7.3	132	7.1	43	30		
99	22.4	7.1	133	6.9	43	30		
101	22.4	7.2	135	6.9	43	40		
103	22.3	7.0	142 ~~130~~ GJL	7.0	43	40		
109	22.3	7.1	130	7.0	43	30		
112	22.2	7.3	130	7.1	34	30		
124	22.3	7.3	136	7.1	51	30		
133	22.5	6.8	130	7.0	34	30		
139	22.7	7.4	122	7.0	34	30		
146	22.5	7.3	133	7.0	43	40		
154	22.7	7.2	133	6.9	43	40		
157	22.4	7.3	126	7.0	34	30		
181	22.4	7.2	129	7.0	43	40		
186	22.4	7.3	129	7.0	34	30		
								Water changed in all beakers.
								Time: 0610
								Initials: GJL
								Water changed in all beakers.
								Time: 1720
								Initials: LB

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 1 (10/27/10) GB

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond.* (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.2	7.0	137	7.0				Each beaker fed 1.0 ml
9	23.1	6.8	139	6.8				YTC suspension
21	23.2	6.9	200	6.8				Initials: GB
30	23.5	7.0	139	6.6				
32	23.2	7.0	135	6.7				
38	23.2	6.7	139	6.7				
42	23.1	6.9	139	6.7				
48	23.0	7.1	139	6.6				
70	23.4	7.0	146	6.6				
76	23.2	7.0	142	6.8				
95	23.4	7.0	139	6.9				
99	23.2	7.2	139	6.8				
101	23.2	7.0	141	6.7				
103	23.2	7.1	144	6.7				
109	23.1	7.1	139	6.6				
112	23.1	7.0	136	6.6				
124	23.1	7.2	139	6.7				
133	23.4	7.2	138	6.9				
139	23.4	7.2	139	6.8				
146	23.3	7.0	136	6.8				
154	23.3	7.1	140	6.6				
157	23.4	6.9	137	6.7				
181	23.2	7.0	139	6.7				
186	23.2	7.2	137	6.8				
								Water changed in all beakers.
								Time: 0625
								Initials: GB
								Water changed in all beakers.
								Time: 1720
								Initials: YN / LA

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 2 (10/28/10)

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
9	23.1							YTC suspension
21	23.1							Initials: GJL
30	23.2							
32	23.0							
38	23.0							
42	23.0							
48	22.9							
70	23.2							
76	23.1							
95	23.2							
99	23.1							
101	23.1							
103	23.0							
109	23.0							
112	23.0							
124	23.0							
133	23.2							
139	23.2							
146	23.2							
154	23.3							
157	23.1							
181	23.0							
186	23.1							
								Water changed in all
								beakers.
								Time: 0620
								Initials: GJL
								Water changed in all
								beakers.
								Time: 1720
								Initials: LPS/GJB

*Water quality measurements to be taken.

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 3 (10/29/20) OAD/GJI

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.0	6.8		7.2				Each beaker fed 1.0 ml
9	23.0	6.6		7.1				YTC suspension
21	23.1	6.9		7.0				Initials: GJI
30	23.3	6.9		7.1				
32	23.1	7.0		7.1				
38	23.0	6.8		7.1				
42	23.0	6.8		7.1				
48	22.9	6.6		7.0				
70	23.2	6.7		7.1				
76	23.1	6.9		7.2				
95	23.2	6.8		7.1				
99	23.1	6.8		7.1				
101	23.1	6.6		7.1				
103	23.0	6.8		7.2				
109	22.9	6.6		7.1				
112	23.0	7.0		7.2				
124	23.0	6.9		7.2				
133	23.2	6.9		7.1				
139	23.2	6.9		7.1				
146	23.2	6.9		7.1				
154	23.3	6.9		7.0				
157	23.1	6.7		7.0				
181	23.0	6.8		7.1				
186	23.2	6.8		7.1				
								Water changed in all
								beakers.
								Time: 0625
								Initials: OB
								Water changed in all
								beakers.
								Time: 1725
								Initials: YL

*Water quality measurements to be taken.

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 4 (10/30/10) GB

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.6							Each beaker fed 1.0 ml
9	23.6							YTC suspension
21	23.7							Initials: GB
30	23.6							
32	23.5							
38	23.5							
42	23.5							
48	23.6							
70	23.4							
76	23.6							
95	23.6							
99	23.4							
101	23.4							
103	23.5							
109	23.6							
112	23.6							
124	23.5							
133	23.6							
139	23.6							
146	23.5							
154	23.6							
157	23.6							
181	23.6							
186	23.6							
								Water changed in all
								beakers.
								Time: 0625
								Initials: GB
								Water changed in all
								beakers.
								Time: 1725
								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. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 5 (10/31/10) GJ

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.7							Each beaker fed 1.0 ml
9	22.9							YTC suspension
21	22.9							Initials: GJ
30	23.0							
32	22.8							
38	22.8							
42	22.8							
48	22.7							
70	23.0							
76	22.8							
95	22.9							
99	22.8							
101	22.8							
103	22.7							
109	22.7							
112	22.7							
124	22.7							
133	23.0							
139	23.0							
146	22.9							
154	23.0							
157	22.9							
181	22.9							
186	22.9							
								Water changed in all
								beakers.
								Time: 0630
								Initials: GJ
								Water changed in all
								beakers.
								Time: ~~UPS~~ 1730 UPS 10-31-10
								Initials: UPS

*Water quality measurements to be taken.

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 6 (11 / 1 / 10) Y/N

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.6	6.6		7.0				Each beaker fed 1.0 ml
9	22.7	6.9		7.0				YTC suspension
21	22.7	6.3		7.0				Initials: GJ
30	23.0	6.7		7.0				
32	22.7	6.7		7.0				
38	22.7	6.5		7.0				
42	22.6	6.3		7.0				
48	22.6	6.5		7.0				
70	22.9	6.3		6.9				
76	22.7	6.5		7.0				
95	22.9	6.7		7.0				
99	22.7	6.7		7.0				
101	22.7	6.4		7.0				
103	22.6	6.6		7.0				
109	22.5	6.3		7.0				
112	22.6	6.5		7.0				
124	22.6	6.6		7.1				
133	22.9	6.5		7.0				
139	22.9	6.3		7.0				
146	22.8	6.1		6.9				
154	22.9	6.4		7.0				
157	22.7	6.3		6.9				
181	22.6	6.1		7.0				
186	22.7	6.5		7.0				
								Water changed in all
								beakers.
								Time: 0620
								Initials: BVS
								Water changed in all
								beakers.
								Time: 1715
								Initials: GJ

*Water quality measurements to be taken.

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 7 (11 / 2 / 10) EJ1

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.6							Each beaker fed 1.0 ml
9	22.6							YTC suspension
21	22.6							Initials: EJ1
30	22.8							
32	22.5							
38	22.5							
42	22.5							
48	22.4							
70	22.7							
76	22.6							
95	22.7							
99	22.6							
101	22.6							
103	22.5							
109	22.4							
112	22.5							
124	22.5							
133	22.8							
139	22.7							
146	22.6							
154	22.8							
157	22.6							
181	22.6							
186	22.6							
								Water changed in all
								beakers.
								Time: 0615
								Initials: EJ1
								Water changed in all
								beakers.
								Time: 1700
								Initials: LPS

*Water quality measurements to be taken.

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 8 (11/3 /2012

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond.* (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.5	6.3	127	7.0				Each beaker fed 1.0 ml
9	23.3	6.5	127	6.9				YTC suspension
21	23.2	6.4	143	7.0				Initials: GB
30	23.5	6.2	127	6.9				
32	23.2	6.4	126	6.9				
38	23.1	6.3	127	7.0				
42	23.0	6.4	126	7.0				
48	22.9	6.0	127	6.9				
70	23.2	5.9	130	6.8				
76	23.2	6.4	128	7.0				
95	23.3	6.4	127	7.0				
99	23.2	6.3	127	6.9				
101	23.1	6.2	128	7.0				
103	23.0	6.2	129	7.0				
109	23.0	6.3	126	6.9				
112	23.0	6.5	125	7.0				
124	23.0	6.4	127	7.0				
133	23.3	6.3	126	7.0				
139	23.3	6.4	126	6.9				
146	23.2	6.2	125	6.9				
154	23.4	6.3	127	6.9				
157	23.1	6.2	126	6.8				
181	23.1	6.2	127	6.9				
186	23.2	6.3	128	7.0				
								Water changed in all
								beakers.
								Time: 0605
								Initials: GB
								Water changed in all
								beakers.
								Time: 1705
								Initials: YN

*Water quality measurements to be taken.

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 9 (11 / 4 /10) LPS

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
9	23.2							YTC suspension
21	23.1							Initials: GJI
30	23.4							
32	23.0							
38	23.0							
42	22.9							
48	22.9							
70	23.3							
76	23.1							
95	23.3							
99	23.0							
101	23.1							
103	22.9							
109	22.9							
112	22.9							
124	23.0							
133	23.3							
139	23.3							
146	23.1							
154	23.3							
157	23.0							
181	23.0							
186	23.1							
								Water changed in all
								beakers.
								Time: 0615
								Initials: GJI
								Water changed in all
								beakers.
								Time: 1725
								Initials: GJI

*Water quality measurements to be taken.

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 10 (11/5/10) UPS

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.4	6.8		7.0				Each beaker fed 1.0 ml
9	23.0	6.9		7.0				YTC suspension
21	23.0	6.8		7.0				Initials: GTB
30	23.3	7.0		6.9				
32	22.9	7.0		6.9				
38	22.9	6.8		7.0				
42	22.8	6.9		7.1				
48	22.8	6.6		7.1				
70	23.1	6.4		~~7.8~~ 6.8	UPS 11.5.10			
76	22.9	6.8		7.1				
95	23.2	6.8		6.9				
99	23.0	6.9		6.9				
101	23.0	6.7		7.0				
103	22.8	6.8		7.1				
109	22.8	6.6		7.0				
112	22.9	6.9		7.0				
124	22.9	6.6		7.0				
133	23.3	6.8		6.9				
139	23.3	6.6		6.9				
146	23.1	6.9		6.9				
154	23.2	6.5		6.7				
157	22.9	6.2		6.8				
181	22.9	6.5		7.0				
186	23.0	6.3		7.0				
								Water changed in all
								beakers.
								Time: 0605
								Initials: GTB
								Water changed in all
								beakers.
								Time: 1655
								Initials: UPS

*Water quality measurements to be taken.

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 11 (11/6/10) GJI

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
9	22.9							YTC suspension
21	22.7							Initials: GJI
30	23.0							
32	22.8							
38	22.7							
42	22.7							
48	22.7							
70	23.0							
76	22.8							
95	22.9							
99	23.0							
101	22.8							
103	22.8							
109	22.9							
112	22.8							
124	22.9							
133	22.9							
139	23.0							
146	22.8							
154	22.9							
157	22.8							
181	22.7							
186	22.8							
								Water changed in all
								beakers.
								Time: 0625
								Initials: GJI
								Water changed in all
								beakers.
								Time: 1720
								Initials: IPS

*Water quality measurements to be taken.

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 12 (11/7/10) YP

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.5							Each beaker fed 1.0 ml
9	22.5							YTC suspension
21	22.4							Initials: YP
30	22.6							
32	22.4							
38	22.4							
42	22.4							
48	22.3							
70	22.4							
76	22.4							
95	22.5							
99	22.4							
101	22.5							
103	22.4							
109	22.4							
112	22.4							
124	22.4							
133	22.5							
139	22.5							
146	22.5							
154	22.4							
157	22.3							
181	22.3							
186	22.4							
								Water changed in all
								beakers.
								Time: 0625
								Initials: YP
								Water changed in all
								beakers.
								Time: 1700
								Initials: LPS

*Water quality measurements to be taken.

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 13 (11/8 1/10) yr

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.1	7.7		7.0				Each beaker fed 1.0 ml
9	22.0	7.5		7.1				YTC suspension
21	22.0	7.3		7.0				Initials: LPS
30	22.1	7.7		7.1				
32	22.1	7.7		7.0				
38	22.0	7.6		7.2				
42	22.0	7.7		7.2				
48	21.9	7.3		7.3				
70	22.4	7.3		6.9				
76	22.2	7.7		7.2				
95	22.4	7.8		7.1				
99	22.2	7.7		7.1				
101	22.2	7.7		7.1				
103	22.0	7.7		7.2				
109	22.0	7.6		7.2				
112	22.0	7.7		7.1				
124	22.0	7.7		7.2				
133	22.4	7.8		7.2				
139	22.4	7.7		7.2				
146	22.3	7.7		7.1				
154	22.4	7.5		7.1				
157	22.1	7.1		6.9				
181	22.1	7.5		7.1				
186	22.2	7.5		7.1				
								Water changed in all
								beakers.
								Time: 0630
								Initials: yr
								Water changed in all
								beakers.
								Time: 1715
								Initials: LPS

*Water quality measurements to be taken.

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 14 (11/9/10) YN

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.6							Each beaker fed 1.0 ml
9	22.6							YTC suspension
21	22.5							Initials: YN
30	22.8							
32	22.5							
38	22.5							
42	22.5							
48	22.5							
70	22.6							
76	22.6							
95	22.7							
99	22.6							
101	22.5							
103	22.5							
109	22.5							
112	22.6							
124	22.5							
133	22.7							
139	22.7							
146	22.6							
154	22.7							
157	22.4							
181	22.4							
186	22.5							
								Water changed in all
								beakers.
								Time: 0555
								Initials: YN
								Water changed in all
								beakers.
								Time: 1700
								Initials: UPS

*Water quality measurements to be taken.

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 15 (11/10/10) LRS

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond.* (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.7	6.6	130	6.7				Each beaker fed 1.0 ml
9	22.6	6.8	136	6.9				YTC suspension
21	22.5	6.7	134	6.8				Initials: GD
30	22.8	6.1	133	6.6				
32	22.4	6.7	128	6.6				
38	22.3	6.5	126	6.8				
42	22.2	6.4	128	6.9				
48	22.2	6.1	128	7.1				
70	22.7	6.2	127	6.6				
76	22.5	6.6	131	7.0				
95	22.7	6.3	123	6.8				
99	22.4	6.5	126	6.7				
101	22.5	6.6	122	6.7				
103	22.3	6.4	128	7.0				
109	22.3	6.6	126	7.0				
112	22.3	6.9	122	6.8				
124	22.4	7.0	127	7.0				
133	23.0	6.8	123	6.8				
139	23.0	6.7	125	6.8				
146	22.7	6.5	122	6.8				
154	23.0	6.6	125	6.9				
157	22.5	6.1	119	6.6				
181	22.4	6.2	125	6.9				
186	22.5	6.6	124	6.9				
								Water changed in all beakers.
								Time: 0605
								Initials: UB
								Water changed in all beakers.
								Time: 1705
								Initials: LR

*Water quality measurements to be taken.

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 16 (11 / 11 /10) YY

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.7							Each beaker fed 1.0 ml
9	22.6							YTC suspension
21	22.6							Initials: GJ
30	22.8							
32	22.5							
38	22.4							
42	22.3							
48	22.3							
70	22.7							
76	22.5							
95	22.7							
99	22.5							
101	22.5							
103	22.3							
109	22.3							
112	22.4							
124	22.4							
133	22.7							
139	22.7							
146	22.5							
154	22.7							
157	22.4							
181	22.4							
186	22.5							
								Water changed in all
								beakers.
								Time: 0625
								Initials: GJ
								Water changed in all
								beakers.
								Time: 1700
								Initials: US

*Water quality measurements to be taken.

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 17 (11/12/10) GJL

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.3	6.7		7.1				Each beaker fed 1.0 ml
9	22.3	6.4		7.2				YTC suspension
21	22.4	6.1		7.2				Initials: GTB
30	22.7	6.4		7.0				
32	22.3	6.7		7.0				
38	22.2	6.4		7.0				
42	22.2	6.3		6.9				
48	22.2	6.0		7.1				
70	22.5	6.0		6.8				
76	22.4	6.6		7.1				
95	22.6	6.4		6.9				
99	22.3	6.5		6.9				
101	22.4	6.3		6.8				
103	22.2	6.4		7.0				
109	22.2	6.1		7.0				
112	22.2	6.4		6.9				
124	22.3	6.7		7.1				
133	22.6	6.7		7.0				
139	22.6	6.5		7.0				
146	22.4	6.4		6.9				
154	22.6	6.4		6.9				
157	22.3	6.2		6.8				
181	22.2	6.3		7.0				
186	22.3	6.5		7.0				
								Water changed in all
								beakers.
								Time: 0600
								Initials: GTB
								Water changed in all
								beakers.
								Time: 1705
								Initials: YN

*Water quality measurements to be taken.

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 18 (1/13/2009

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.6							Each beaker fed 1.0 ml
9	22.6							YTC suspension
21	22.6							Initials: GD
30	22.8							
32	22.6							
38	22.5							
42	22.4							
48	22.2							
70	22.7							
76	22.6							
95	22.7							
99	22.8							
101	22.4							
103	22.4							
109	22.3							
112	22.4							
124	22.4							
133	22.8							
139	22.7							
146	22.8							
154	22.7							
157	22.5							
181	22.5							
186	22.5							
								Water changed in all
								beakers.
								Time: 0605
								Initials: GD
								Water changed in all
								beakers.
								Time: 1730
								Initials: CPS

*Water quality measurements to be taken.

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 19 (11 /14 /10) GJI

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.6							Each beaker fed 1.0 ml
9	22.6							YTC suspension
21	22.6							Initials: GJI
30	22.8							
32	22.6							
38	22.5							
42	22.5							
48	22.5							
70	22.7							
76	22.7							
95	22.8							
99	22.6							
101	22.7							
103	22.6							
109	22.5							
112	22.6							
124	22.6							
133	22.7							
139	22.8							
146	22.7							
154	22.8							
157	22.6							
181	22.5							
186	22.6							
								Water changed in all
								beakers.
								Time: 0600
								Initials: GJI
								Water changed in all
								beakers.
								Time: 1845
								Initials: YK

*Water quality measurements to be taken.

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 20 (11/15/18) 632

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	23.1	6.4		6.8				Each beaker fed 1.0 ml
9	22.9	5.6		6.7				YTC suspension
21	22.8	5.1		6.7				Initials: GR
30	23.1	6.2		6.8				
32	22.7	6.6		6.7				
38	22.7	6.5		6.9				
42	22.6	6.4		6.8				
48	22.5	5.8		6.8				
70	22.9	6.2		6.7				
76	22.8	6.4		6.9				
95	22.9	6.6		6.8				
99	22.7	6.8		6.8				
101	22.8	6.5		6.7				
103	22.6	6.1		6.9				
109	22.7	6.3		6.9				
112	22.7	6.4		6.8				
124	22.7	6.5		7.2				
133	23.0	6.7		6.9				
139	23.0	6.7		6.9				
146	22.9	6.6		6.8				
154	23.0	6.6		6.8				
157	22.7	6.2		6.6				
181	22.6	6.2		6.8				
186	22.5	6.5		6.9				
								Water changed in all
								beakers.
								Time: 0615
								Initials: GR
								Water changed in all
								beakers.
								Time: 1710
								Initials: LPS/NP

*Water quality measurements to be taken.

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 21 (11 /16 /10) GJL

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
9	22.7							YTC suspension
21	22.7							Initials: GJL
30	22.8							
32	22.6							
38	22.5							
42	22.4							
48	22.4							
70	22.7							
76	22.6							
95	22.8							
99	22.6							
101	22.6							
103	22.5							
109	22.5							
112	22.5							
124	22.5							
133	22.8							
139	22.8							
146	22.7							
154	22.8							
157	22.5							
181	22.5							
186	22.7							
								Water changed in all
								beakers.
								Time: 0605
								Initials: GJL
								Water changed in all
								beakers.
								Time: 1705
								Initials: YR

*Water quality measurements to be taken.

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 22 (11/17/10) YR/DJ

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond.* (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.8	6.5	141	6.8				Each beaker fed 1.0 ml
9	22.7	6.0	143	6.8				YTC suspension
21	22.7	5.2	150	6.9				Initials: BJS
30	22.9	6.3	140	6.9				
32	22.7	6.6	127	6.8				
38	22.6	6.3	139	6.9				
42	22.5	6.1	137	6.8				
48	22.5	6.1	136	6.8				
70	22.9	5.9	136	6.7				
76	22.8	6.3	137	7.0				
95	22.9	6.4	135	6.9				
99	22.7	6.5	135	6.9				
101	22.7	6.1	134	6.8				
103	22.6	6.2	137	6.9				
109	22.5	6.0	136	7.0				
112	22.5	6.3	134	6.9				
124	22.7	6.2	140	7.3				
133	23.0	6.4	136	7.0				
139	23.0	6.1	137	7.0				
146	22.8	6.0	136	6.9				
154	23.0	6.2	133	6.8				
157	22.7	5.8	130	6.7				
181	22.6	5.8	135	6.8				
186	22.7	6.2	133	6.8				
								Water changed in all
								beakers.
								Time: 0550
								Initials: BJS
								Water changed in all
								beakers.
								Time: 1705
								Initials: LRS

*Water quality measurements to be taken.

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 23 (11 /18 /10) LPS

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.7							Each beaker fed 1.0 ml
9	22.5							YTC suspension
21	22.5							Initials: GJL
30	22.7							
32	22.4							
38	22.3							
42	22.2							
48	22.2							
70	22.6							
76	22.5							
95	22.7							
99	22.4							
101	22.5							
103	22.3							
109	22.3							
112	22.3							
124	22.4							
133	22.7							
139	22.7							
146	22.5							
154	22.7							
157	22.3							
181	22.3							
186	22.4							
								Water changed in all
								beakers.
								Time: 0610
								Initials: GJL
								Water changed in all
								beakers.
								Time: 1700
								Initials: YL

*Water quality measurements to be taken.

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 24 (11 / 19/10) 602

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.7	6.8		6.8				Each beaker fed 1.0 ml
9	22.5	6.3		6.8				YTC suspension
21	22.5	6.1		7.0				Initials: GB
30	22.8	6.6		7.0				
32	22.5	6.8		6.8				
38	22.3	6.5		6.9				
42	22.3	6.5		6.9				
48	22.2	6.3		6.8				
70	22.6	6.3		6.8				
76	22.5	6.8		6.9				
95	22.7	6.6		6.9				
99	22.4	6.7		6.9				
101	22.4	6.5		6.8				
103	22.3	6.5		6.9				
109	22.3	6.2		7.0				
112	22.3	6.6		7.0				
124	22.3	6.6		7.2				
133	22.7	7.0		7.2				
139	22.8	6.9		7.1				
146	22.6	6.9		7.1				
154	22.8	7.0		6.9				
157	22.5	6.8		6.8				
181	22.4	6.3		6.9				
186	22.4	6.4		6.9				
								Water changed in all
								beakers.
								Time: 0600
								Initials: GB
								Water changed in all
								beakers.
								Time: 1655
								Initials: GB

*Water quality measurements to be taken.

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 25 (11/20/10) GD

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.7							Each beaker fed 1.0 ml
9	22.6							YTC suspension
21	22.4							Initials: GD
30	22.7							
32	22.3							
38	22.3							
42	22.2							
48	22.2							
70	22.6							
76	22.4							
95	22.7							
99	22.4							
101	22.4							
103	22.4							
109	22.4							
112	22.3							
124	22.4							
133	22.6							
139	22.7							
146	22.5							
154	22.6							
157	22.3							
181	22.2							
186	22.3							
								Water changed in all
								beakers.
								Time: 0550
								Initials: GD
								Water changed in all
								beakers.
								Time: 1700
								Initials: YL

*Water quality measurements to be taken.

139	3362G	U2C-2-101014	8	23	22.7		
146	3350G	DGS-13SG-101013	8	23	22.5		
154	3360G	DGS-34SG-101012	8	23	22.7		
157	3361G	DGS-35SG-101012	8	23	22.3		
181	3343G	DGS-02SG-101014	8	23	22.3		
186	3348G	DGS-09SG-101013	8	23	22.4		
3	3345G	DGS-05SG-101014	8	24	22.7	6.8	6.8
9	3363G	U4Q-1-101014	8	24	22.5	6.3	6.8
21	3338G	Control	8	24	22.5	6.1	7.0
30	3349G	DGS-12SG-101013	8	24	22.8	6.6	7.0
32	3364G	U4Q-2-101014	8	24	22.5	6.8	6.8
38	3356G	DGS-26SG-101013	8	24	22.3	6.5	6.9
42	3354G	DGS-21SG-101013	8	24	22.3	6.5	6.9
48	3342G	DGS-01SG-101014	8	24	22.2	6.3	6.8
70	3344G	DGS-04SG-101013	8	24	22.6	6.3	6.8
76	3352G	DGS-17SG-101013	8	24	22.5	6.8	6.9
95	3351G	DGS-16SG-101013	8	24	22.7	6.6	6.9
99	3357G	DGS-30SG-101012	8	24	22.4	6.7	6.9
101	3358G	DGS-31SG-101012	8	24	22.4	6.5	6.8
103	3355G	DGS-25SG-101013	8	24	22.3	6.5	6.9
109	3346G	DGS-06SG-101014	8	24	22.3	6.2	7.0
112	3347G	DGS-08SG-101013	8	24	22.3	6.6	7.0
124	3353G	DGS-20SG-101013	8	24	22.3	6.6	7.2
133	3359G	DGS-33SG-101012	8	24	22.7	7.0	7.2
139	3362G	U2C-2-101014	8	24	22.8	6.9	7.1
146	3350G	DGS-13SG-101013	8	24	22.6	6.9	7.1
154	3360G	DGS-34SG-101012	8	24	22.8	7.0	6.9
157	3361G	DGS-35SG-101012	8	24	22.5	6.8	6.8
181	3343G	DGS-02SG-101014	8	24	22.4	6.3	6.9
186	3348G	DGS-09SG-101013	8	24	22.4	6.4	6.9
3	3345G	DGS-05SG-101014	8	25	22.7		
9	3363G	U4Q-1-101014	8	25	22.6		
21	3338G	Control	8	25	22.4		
30	3349G	DGS-12SG-101013	8	25	22.7		
32	3364G	U4Q-2-101014	8	25	22.3		
38	3356G	DGS-26SG-101013	8	25	22.3		
42	3354G	DGS-21SG-101013	8	25	22.2		
48	3342G	DGS-01SG-101014	8	25	22.2		
70	3344G	DGS-04SG-101013	8	25	22.6		
76	3352G	DGS-17SG-101013	8	25	22.4		
95	3351G	DGS-16SG-101013	8	25	22.7		
99	3357G	DGS-30SG-101012	8	25	22.4		
101	3358G	DGS-31SG-101012	8	25	22.4		
103	3355G	DGS-25SG-101013	8	25	22.4		
109	3346G	DGS-06SG-101014	8	25	22.4		
112	3347G	DGS-08SG-101013	8	25	22.3		
124	3353G	DGS-20SG-101013	8	25	22.4		
133	3359G	DGS-33SG-101012	8	25	22.6		
139	3362G	U2C-2-101014	8	25	22.7		
146	3350G	DGS-13SG-101013	8	25	22.5		
154	3360G	DGS-34SG-101012	8	25	22.6		
157	3361G	DGS-35SG-101012	8	25	22.3		
181	3343G	DGS-02SG-101014	8	25	22.2		
186	3348G	DGS-09SG-101013	8	25	22.3		
3	3345G	DGS-05SG-101014	8	26	22.3		
9	3363G	U4Q-1-101014	8	26	22.3		
21	3338G	Control	8	26	22.2		
30	3349G	DGS-12SG-101013	8	26	22.5		
32	3364G	U4Q-2-101014	8	26	22.1		
38	3356G	DGS-26SG-101013	8	26	22.1		

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 26 (11/21/10) GJL

Beaker No.	Temp.* (deg.C)	DO (ppm)	Cond. (umhos/cm)	pH	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.3							Each beaker fed 1.0 ml
9	22.3							YTC suspension
21	22.2							Initials: GJL
30	22.5							
32	22.1							
38	22.1							
42	22.0							
48	22.1							
70	22.4							
76	22.3							
95	22.5							
99	22.2							
101	22.3							
103	22.1							
109	22.0							
112	22.1							
124	22.2							
133	22.5							
139	22.5							
146	22.4							
154	22.5							
157	22.1							
181	22.0							
186	22.1							
								Water changed in all
								beakers.
								Time: 0600
								Initials: GJL
								Water changed in all
								beakers.
								Time: 1720
								Initials: LPS

*Water quality measurements to be taken.

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 27 (11/22/10) LPS

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond. (umhos/cm)	pH*	Hardness (mg/L)	Alkalinity (mg/L	NH3 (ppm)	Comments
3	22.4	6.6		6.4				Each beaker fed 1.0 ml
9	22.3	6.0		6.5				YTC suspension
21	22.2	6.0		~~6.0~~ 6.7	LPS @ 11-22-10			Initials: GJL
30	22.6	6.6		6.6				
32	22.0	6.5		6.6				
38	22.0	6.8		6.6				
42	22.0	6.7		6.5				
48	22.0	6.6		6.6				
70	22.8	6.3		6.4				
76	22.4	7.0		6.6				
95	22.8	7.0		6.6				
99	22.4	6.9		6.6				
101	22.4	6.8		6.5				
103	22.2	6.4		6.7				
109	22.2	6.2		6.6				
112	22.2	6.7		6.7				
124	22.3	6.5		6.4				
133	22.9	6.8		6.8				
139	22.9	6.5		6.8				
146	22.5	6.6		6.7				
154	22.9	6.8		6.7				
157	22.3	6.6		6.5				
181	22.2	6.4		6.7				
186	22.4	6.6		6.7				
								Water changed in all
								beakers.
								Time: 0615
								Initials: GJL
								Water changed in all
								beakers.
								Time: 1710
								Initials: KK

*Water quality measurements to be taken.

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-1 Client Anchor QEA Investigator

DAILY RECORD SHEET

Day 28 (11/23/10) YP

Beaker No.	Temp.* (deg.C)	DO* (ppm)	Cond.* (umhos/cm)	pH*	Hardness* (mg/L)	Alkalinity* (mg/L	NH3* (ppm)	Comments
3	23.0	7.2	135	6.7	34	30		Each beaker fed 1.0 ml
9	22.9	6.3	137	6.6	34	30		YTC suspension
21	22.4	6.7	136	6.8	34	20		Initials: —
30	22.8	7.3	136	6.9	34	20		
32	22.1	7.1	132	6.8	34	30		
38	~~21.9~~ 22.4	7.3	132	6.9	34	30		
42	22.0	7.1	132	6.7	34	30		
48	22.1	7.1	130	6.9	34	20		
70	22.5	6.9	133	6.7	34	20		
76	22.1	7.3	132	6.9	34	20		
95	22.4	7.3	131	6.9	34	20		
99	22.0	7.3	130	7.0	34	20		
101	22.0	7.1	129	6.9	34	20		
103	22.0	7.3	128	7.0	34	30		
109	22.2	6.9	128	6.9	34	20		
112	22.0	7.3	128	7.2	34	30		
124	22.0	7.3	130	7.1	34	30		
133	22.6	7.3	130	7.1	34	30		
139	22.6	7.1	131	7.1	34	30		
146	22.2	7.1	127	7.0	34	30		
154	22.5	7.1	128	7.0	34	30		
157	22.0	7.0	124	6.8	34	30		
181	22.1	7.1	128	7.1	34	30		
186	22.0	7.1	127	6.9	34	30		
								Water changed in all
								beakers.
								Time: 0610
								Initials: GJ
								Water changed in all
								beakers.
								Time: —
								Initials: —

*Water quality measurements to be taken.

Test No. 814-1 Client Anchor QEA Investigator

DAY 28 TEST TERMINATION SHEET

Beaker No.	Number of survivors	Initials
1	7	GJL
2	9	GJL
3	10	GTB
4	9	GJL
5	9	GJL
6	10	GTB
7	10	GTB
8	9	GJL
9	10	GTB
10	10	GJL
11	10	GD
12	8	GD
13	10	GJL
14	7	GJL
15	8	GJL
16	10	GJL
17	10	GTB
18	10	GTB
19	9	GJL
20	10	GJL
21	GJL 11-23-10 9	GJL
22	10	GTB
23	9	GD
24	9	GJL
25	10	GJL
26	9	GTB
27	10	GD
28	10	GJL
29	9	GJL
30	7	GJL
31	10	GTB
32	9	GJL
33	9	GTB
34	8	GJL
35	10	GJL
36	9	GTB
37	9	GTB
38	10	GJL
39	10	GJL
40	10	GJL
41	7	GTB
42	10	GTB
43	8	GD
44	10	GJL
45	9	GJL

Beaker No.	Number of survivors	Initials
46	10	GTB
47	10	GTB
48	8	GTB
49	7	GTB
50	10	GTB
51	10	GJL
52	10	GJL
53	9	GTB
54	10	GTB
55	9	GJL
56	8	GJL
57	10	GTB
58	10	GTB
59	10	GJL
60	10	GJL
61	10	GTB
62	10	GTB
63	8	GJL
64	9	GJL
65	9	GJL
66	10	GJL
67	10	GJL
68	10	GJL
69	10	GTB
70	7	GTB
71	10	GJL
72	7	GJL
73	10	GTB
74	9	GTB
75	8	GJL
76	10	GJL
77	8	GTB
78	9	GTB
79	8	GJL
80	10	GJL
81	9	GTB
82	10	GTB
83	9	GJL
84	10	GJL
85	10	GTB
86	10	GTB
87	9	GJL
88	9	GJL
89	10	GTB
90	7	GD

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-1 Client Anchor QEA Investigator

DAY 28 TEST TERMINATION SHEET

Beaker No.	Number of survivors	Initials
91	10	GJL
92	10	GJL
93	9	GBS
94	10	GBS
95	9	GJL
96	10	GJL
97	8	GJL
98	9	GJL
99	8	GBS
100	7	GBS
101	10	GBS
102	10	GBS
103	10	GJL
104	10	GJL
105	9	GBS
106	10	GBS
107	10	GJL
108	10	GJL
109	9	GJL
110	10	GJL
111	7	GBS
112	9	GBS
113	8	GJL
114	10	GJL
115	10	GBS
116	8	GBS
117	8	GJL
118	9	GJL
119	10	GJL
120	9	GJL
121	10	GBS
122	10	GBS
123	10	GBS
124	9	GBS
125	10	GJL
126	8	GJL
127	8	GBS
128	10	GBS
129	9	GJL
130	10	GJL
131	9	GJL
132	9	GJL
133	10	GBS
134	9	GBS
135	9	GJL

Beaker No.	Number of survivors	Initials
136	10	GJL
137	9	GBS
138	10	GBS
139	9	GJL
140	8	GJL
141	9	GBS
142	9	GBS
143	10	GJL
144	8	GJL
145	9	GJL
146	10	GJL
147	10	GBS
148	6	GBS
149	10	GJL
150	9	GJL
151	9	GBS
152	10	GBS
153	10	GBS
154	9	GBS
155	10	GBS
156	10	GBS
157	10	GBS
158	10	GBS
159	9	GBS
160	10	GBS
161	10	GBS
162	10	GBS
163	8	GJL
164	8	GJL
165	10	GBS
166	9	GBS
167	8	GBS
168	6	GBS
169	10	GJL
170	10	GJL
171	10	GJL
172	10	GJL
173	10	GBS
174	5	GBS
175	9	GJL
176	10	GJL
177	8	GBS
178	9	GBS
179	9	GJL
180	10	GJL

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-1 Client Anchor QEA Investigator

DAY 28 TEST TERMINATION SHEET

Beaker No.	Number of survivors	Initials
181	9	BB
182	9	BB
183	9	GJL
184	10	GJL
185	9	GJL
186	10	GJL
187	8	BB
188	10	BB
189	10	GJL
190	10	GJL
191	9	GJL
192	10	GJL
193		
194		
195		
196		
197		
198		
199		
200		
201		
202		
203		
204		
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224		
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Beaker No.	Number of survivors	Initials
226		
227		
228		
229		
230		
231		
232		
233		
234		
235		
236		
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240		
241		
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Test No. 814-1 Client Anchor QEA Investigator

ZERO-TIME WEIGHING DATA SHEET

Tare: Date 10-20-10 Oven temp (C.) 63 Drying time (hr.) 24 Initials JRF
Standard Weights: 10 mg: 10.004 100mg: 100.016

Final: Date 10-28-10 Oven temp (C.) 63 Drying time (hr.) 24 Initials GJL
Standard Weights: 10 mg: 10.008 100mg: 100.016

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	36.364	36.830	10	
2	37.821	38.344	10	
3	39.890	40.486	10	
4	39.359	39.929	10	
5	38.136	38.696	10	

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-HA4c

HYALELLA AZTECA 28-DAY SOLID PHASE SEDIMENT TEST

Test No. 814-1 Client Anchor QEA Investigator

WEIGHING DATA SHEET

Tare:	Date 11-1-10	Oven temp (C.) 63	Drying time (hr.) 24	Initials JRF
	Standard Weights:	10 mg: 10.008	100mg: 100.017	
Final #1:	Date 11-24-10	Oven temp (C.) 61	Drying time (hr.) 24	Initials JRF
	Standard Weights:	10 mg: 10.008	100mg: 100.012	
Final #2:	Date 11-26-10	Oven temp (C.) 62	Drying time (hr.) 24	Initials GJ
	Standard Weights:	10 mg: 10.005	100mg: 100.014	

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	36.766	37.804	37.777	7	LPS	
2	2	38 ~~40.221~~ 38.405	40.055	40.020	9	LPS	
3	3	40.221	41.827	41.796	10	LPS	
4	4	41.533	42.960	42.932	9	LPS	
5	5	42.850	44.438	44.412	9	LPS	
6	6	39.516	41.006	40.979	10	LPS	
7	7	36.550	38.351	38.326	10	LPS	
8	8	41.183	42.562	42.550	9	LPS	
9	9	38.808	40.188	40.155	10	LPS	
10	10	37.647	39.392	39.356	10	LPS	
11	11	39.488	40.953	40.923	10	LPS	
12	12	41.613	42.844	42.826	8	LPS	
13	13	37.803	39.249	39.229	10	LPS	
14	14	33.345	34.580	34.567	7	LPS	
15	15	38.493	39.777	39.765	8	LPS	
16	16	39.295	40.909	40.891	10	LPS	
17	17	39.772	41.035	41.023	10	LPS	
18	18	41.009	42.292	42.281	10	LPS	
19	19	40.048	41.442	41.431	9	LPS	
20	20	37.923	39.248	39.244	10	LPS	
21	21	38.205	39.996	39.984	9	LPS	
22	22	38.652	40.962	40.945	10	LPS	
23	23	36.550	38.096	38.092	9	LPS	
24	24	37.790	39.364	39.354	9	LPS	
25	25	38.612	40.081	40.062	10	LPS	
26	26	38.135	39.983	39.952	9	LPS	
27	27	41.676	43.260	43.239	10	LPS	
28	28	39.750	41.099	41.086	10	LPS	
29	29	35.464	36.828	36.818	9	LPS	
30	30	38.141	39.251	39.244	7	LPS	
31	31	37.374	38.797	38.782	10	LPS	
32	32	33.943	35.340	35.331	9	LPS	
33	33	37.103	38.413	38.392	9	YI	

Test No. 814-1 Client Anchor QEA 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	35.850	37.242	37.214	8	YV	
35	35	40.648	42.198	42.173	10	YV	
36	36	37.741	39.153	39.129	9	YV	
37	37	37.289	38.671	38.645	9	YV	
38	38	36.427	37.855	37.824	10	YV	
39	39	39.049	40.514	40.486	10	YV	
40	40	38.170	39.665	39.639	10	YV	
41	41	38.187	39.371	39.352	7	YV	
42	42	37.285	38.411	38.399	10	YV	
43	43	37.859	39.183	39.164	8	YV	
44	44	36.546	37.949	37.932	10	YV	
45	45	39.271	40.761	40.744	~~10~~ 9	YV	
46	46	38.145	39.728	39.720	10	YV	
47	47	40.128	41.862	41.858	10	YV	
48	48	39.099	40.765	40.745	8	YV	
49	49	40.684	41.875	41.879	6	YV	
50	50	37.782	39.246	39.244	10	YV	
51	51	37.725	39.058	39.058	10	YV	
52	52	37.272	38.907	38.907	10	YV	
53	53	40.563	41.762	41.759	9	YV	
54	54	35.454	36.882	36.882	10	YV	
55	55	34.279	35.808	35.784	9	YV	
56	56	40.363	41.730	41.739	8	YV	
57	57	36.499	38.034	38.027	10	YV	
58	58	36.459	37.772	37.774	10	YV	
59	59	35.754	37.220	37.234	10	YV	
60	60	37.216	38.728	38.731	10	YV	
61	61	39.813	41.334	41.347	10	YV	
62	62	36.801	38.998	38.986	10	YV	
63	63	36.313	37.530	37.541	8	YV	
64	64	42.226	43.611	43.620	9	YV	
65	65	39.524	40.977	40.988	9	LPS	
66	66	37.625	39.213	39.217	10	LPS	
67	67	39.099	40.187	40.196	10	LPS	
68	68	37.506	38.931	38.938	10	LPS	
69	69	40.176	41.454	41.466	10	LPS	
70	70	38.658	39.919	39.932	7	LPS	
71	71	38.030	40.051	40.058	10	LPS	
72	72	41.378	42.750	42.762	7	LPS	
73	73	38.328	39.549	39.559	10	LPS	
74	74	39.848	41.058	41.070	9	LPS	
75	75	35.938	37.349	37.354	8	LPS	
76	76	38.364	39.900	39.906	10	LPS	

Test No. 814-1 Client Anchor QEA 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	36.080	37.292	37.298	8	UPS	
78	78	42.679	43.968	43.969	9	UPS	
79	79	37.903	39.198	39.198	8	UPS	
80	80	39.939	41.937	41.937	10	UPS	
81	81	39.789	40.756	40.754	9	UPS	
82	82	37.804	39.169	39.165	10	UPS	
83	83	38.263	39.593	39.588	9	UPS	
84	84	36.058	37.308	37.305	10	UPS	
85	85	35.533	36.721	36.718	10	UPS	
86	86	38.540	40.154	40.153	10	UPS	
87	87	38.096	39.562	39.561	9	UPS	
88	88	38.658	40.085	40.085	9	UPS	
89	89	39.822	41.350	41.355	10	UPS	
90	90	38.644	40.209	40.207	7	UPS	
91	91	38.176	39.485	39.485	10	UPS	
92	92	36.222	37.585	37.592	10	UPS	
93	93	37.542	38.989	38.963	9	YV	
94	94	36.429	37.633	37.616	10	YV	
95	95	38.226	39.273	39.255	9	YV	
96	96	38.209	40.258	40.234	10	YV	
97	97	34.313	35.620	35.603	8	YV	
98	98	38.428	39.810	39.792	9	YV	
99	99	37.593	39.119	39.081	8	YV	
100	100	43.416	44.806	44.775	7	YV	
101	101	38.639	39.997	39.979	10	YV	
102	102	36.750	38.822	38.782	10	YV	
103	103	38.941	40.478	40.454	10	YV	
104	104	34.712	36.274	36.256	10	YV	
105	105	36.498	37.736	37.725	9	YV	
106	106	39.353	40.776	40.761	10	YV	
107	107	38.007	39.795	39.773	10	YV	
108	108	35.895	37.285	37.262	10	YV	
109	109	37.293	38.734	38.715	9	YV	
110	110	36.815	38.457	38.437	10	YV	
111	111	38.210	40.106	40.086	7	UPS	
112	112	40.001	41.689	41.669	9	UPS	
113	113	39.409	41.584	41.552	8	UPS	
114	114	41.065	42.912	42.887	10	UPS	
115	115	36.012	37.793	37.776	10	UPS	
116	116	38.116	39.591	39.567	8	UPS	
117	117	37.245	38.940	38.917	8	YV	
118	118	38.188	40.316	40.297	9	YV	
119	119	39.531	40.964	40.941	10	YV	

Test No. 814-1 Client Anchor QEA 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	40.752	42.714	42.688	9	YP	
121	121	41.532	43.132	43.121	10	LPS	
122	122	36.906	38.626	38.597	10	LPS	
123	123	39.904	41.287	41.278	10	LPS	
124	124	35.521	37.106	37.094	9	LPS	
125	125	41.131	42.364	42.384	10	MER	
126	126	37.693	39.072	39.080	8	MER	
127	127	36.295	37.514	37.525	8	MER	
128	128	39.223	40.614	40.624	10	MER	
129	129	38.879	41.313	41.324	9	MER	
130	130	39.405	41.392	41.402	10	MER	
131	131	40.483	41.734	41.736	9	MER	
132	132	38.295	39.627	39.626	9	MER	
133	133	36.394	37.583	37.602	10	MER	
134	134	41.964	43.459	43.473	9	MER	
135	135	43.037	44.287	44.292	9	MER	
136	136	37.377	38.621	38.632	10	MER	
137	137	35.126	36.594	36.607	9	MER	
138	138	39.324	40.990	40.997	10	MER	
139	139	40.884	42.173	42.179	9	MER	
140	140	36.348	38.799	38.801	8	MER	
141	141	39.046	40.288	40.303	9	MER	
142	142	38.789	40.086	40.106	9	MER	
143	143	35.132	36.612	36.621	10	MER	
144	144	35.608	37.248	37.249	8	MER	
145	145	38.244	39.649	39.652	9	MER	
146	146	40.055	41.815	41.821	10	MER	
147	147	39.538	40.963	40.962	10	MER	
148	148	41.468	42.654	42.647	6	MER	
149	149	39.558	40.919	40.917	10	MER	
150	150	39.344	41.808	41.818	9	MER	
151	151	37.886	39.463	39.466	9	LPS	
152	152	35.442	36.883	36.886	10	LPS	
153	153	40.073	41.790	41.797	10	LPS	
154	154	36.638	38.143	38.143	9	LPS	
155	155	35.141	36.584	36.585	10	LPS	
156	156	39.668	41.027	41.023	10	LPS	
157	157	38.221	39.597	39.574	10	LPS	
158	158	39.519	41.377	41.356	~~9~~ 10	LPS	LPS ① 11-23-10
159	159	38.315	40.035	40.022	9	LPS	
160	160	39.509	40.956	40.939	10	LPS	
161	161	35.978	37.415	37.406	10	YP	
162	162	39.340	41.016	41.018	10	YP	

Test No. 814-1 Client Anchor QEA 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	42.898	43.973	43.944	8	YN	
164	164	39.925	41.233	41.215	8	YN	
165	165	40.667	42.104	42.096	10	YN	
166	166	38.549	40.174	40.157	9	YN	
167	167	38.733	39.943	39.941	8	YN	
168	168	39.258	41.197	41.188	6	YN	
169	169	43.190	44.980	44.972	10	YN	
170	170	39.274	40.851	40.844	10	YN	
171	171	39.344	40.728	40.715	10	LPS	
172	172	40.057	41.383	41.368	10	LPS	
173	173	36.405	37.908	37.878	10	LPS	
174	174	37.981	39.098	39.085	5	LPS	
175	175	36.980	38.471	38.467	9	LPS	
176	176	38.061	39.744	39.741	10	LPS	
177	177	39.703	41.695	41.692	8	LPS	
178	178	37.565	39.462	39.466	9	LPS	
179	179	38.492	39.755	39.764	9	LPS	
180	180	38.531	39.827	39.812	10	LPS	
181	181	37.741	39.128	39.113	9	LPS	
182	182	36.881	38.875	38.859	9	LPS	
183	183	38.622	40.283	40.268	9	LPS	
184	184	37.568	39.253	39.246	10	LPS	
185	185	39.956	41.485	41.481	9	LPS	
186	186	35.316	36.640	36.613	10	LPS	
187	187	39.761	41.465	41.461	8	LPS	
188	188	37.498	39.513	39.515	10	LPS	
189	189	35.903	37.589	37.596	10	LPS	
190	190	38.290	39.738	39.740	10	LPS	
191	191	39.380	41.162	41.166	9	LPS	
192	192	38.246	39.853	39.862	10	LPS	
193	193						
194	194						
195	195						
196	196						
197	197						
198	198						
199	199						
200	200						
201	201						
202	202						
203	203						
204	204						
205	205						

Chesapeake Cultures

P.O. Box 507 Hayes, VA 23072 (804)693-4046 (804)694-4704 fax
www.c-cultures.com
growfish@c-cultures.com

NAS

Shipment Information

Species Hyalella azteca Date 10/21/10

Age ~2-3 days on shipment 1-1.3 mm P.O. No. verbal

Quantity 2500+ Invoice No. 7007

Temperature 23.5°C Salinity — pH 7.95

Notes Rec'd 10-22-10 BA

Biologist SR

Please inspect shipment and report any problem immediately

TEST DATA ANALYSIS RECORDS

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 biomass=DRY WT-TARE WT
WT=average individual biomass=TWT/WT COUNT

INITIAL WEIGHT				
pan #	tare wt (mg)	final wt (mg)	wt count	avg. wt/ organism
1	36.364	36.830	10	0.047
2	37.821	38.344	10	0.052
3	39.890	40.486	10	0.060
4	39.359	39.929	10	0.057
5	38.136	38.696	10	0.056
			Mean	0.054
			SD	0.005

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
1	7	3338G	Control	1		10	10	0	100.0	0.0	36.550	10	38.326	1.78	0.18						
2	80	3338G	Control	2		10	10	0	100.0	0.0	39.939	10	41.937	2.00	0.20						
3	96	3338G	Control	3		10	10	0	100.0	0.0	38.209	10	40.234	2.03	0.20						
4	188	3338G	Control	4		10	10	0	100.0	0.0	37.498	10	39.515	2.02	0.20						
5	22	3338G	Control	5		10	10	0	100.0	0.0	38.652	10	40.945	2.29	0.23	Mean	9.5	0.5	95.0	5.0	0.20
6	2	3338G	Control	6		10	9	1	90.0	10.0	38.405	9	40.020	1.62	0.18	SD	0.8	0.8	7.6	7.6	0.02
7	177	3338G	Control	7		10	8	2	80.0	20.0	39.703	8	41.692	1.99	0.25	n	8	8	8	8	8
8	21	3338G	Control	8	wq replicate	10	9	1	90.0	10.0	38.205	9	39.984	1.78	0.20						
9	178	3342G	DGS-01SG-101014	1		10	9	1	90.0	10.0	37.565	9	39.466	1.90	0.21						
10	71	3342G	DGS-01SG-101014	2		10	10	0	100.0	0.0	38.030	10	40.058	2.03	0.20						
11	49	3342G	DGS-01SG-101014	3		10	7	3	70.0	30.0	40.684	6	41.879	1.20	0.20						
12	182	3342G	DGS-01SG-101014	4		10	9	1	90.0	10.0	36.881	9	38.859	1.98	0.22						
13	130	3342G	DGS-01SG-101014	5		10	10	0	100.0	0.0	39.405	10	41.402	2.00	0.20	Mean	8.9	1.1	88.8	11.3	0.21
14	102	3342G	DGS-01SG-101014	6		10	10	0	100.0	0.0	36.750	10	38.782	2.03	0.20	SD	1.1	1.1	11.3	11.3	0.01
15	187	3342G	DGS-01SG-101014	7		10	8	2	80.0	20.0	39.761	8	41.461	1.70	0.21	n	8	8	8	8	8
16	48	3342G	DGS-01SG-101014	8	wq replicate	10	8	2	80.0	20.0	39.099	8	40.745	1.65	0.21						
17	132	3343G	DGS-02SG-101014	1		10	9	1	90.0	10.0	38.295	9	39.626	1.33	0.15						
18	27	3343G	DGS-02SG-101014	2		10	10	0	100.0	0.0	41.676	10	43.239	1.56	0.16						
19	34	3343G	DGS-02SG-101014	3		10	8	2	80.0	20.0	35.850	8	37.214	1.36	0.17						
20	156	3343G	DGS-02SG-101014	4		10	10	0	100.0	0.0	39.668	10	41.023	1.36	0.14						
21	108	3343G	DGS-02SG-101014	5		10	10	0	100.0	0.0	35.895	10	37.262	1.37	0.14	Mean	9.4	0.6	93.8	6.3	0.15
22	44	3343G	DGS-02SG-101014	6		10	10	0	100.0	0.0	36.546	10	37.932	1.39	0.14	SD	0.7	0.7	7.4	7.4	0.01
23	105	3343G	DGS-02SG-101014	7		10	9	1	90.0	10.0	36.498	9	37.725	1.23	0.14	n	8	8	8	8	8
24	181	3343G	DGS-02SG-101014	8	wq replicate	10	9	1	90.0	10.0	37.741	9	39.113	1.37	0.15						
25	116	3344G	DGS-04SG-101013	1		10	8	2	80.0	20.0	38.116	8	39.567	1.45	0.18						
26	172	3344G	DGS-04SG-101013	2		10	10	0	100.0	0.0	40.057	10	41.368	1.31	0.13						
27	53	3344G	DGS-04SG-101013	3		10	9	1	90.0	10.0	40.563	9	41.759	1.20	0.13						
28	20	3344G	DGS-04SG-101013	4		10	10	0	100.0	0.0	37.923	10	39.244	1.32	0.13						
29	82	3344G	DGS-04SG-101013	5		10	10	0	100.0	0.0	37.804	10	39.165	1.36	0.14	Mean	9.1	0.9	91.3	8.8	0.18
30	128	3344G	DGS-04SG-101013	6		10	10	0	100.0	0.0	39.223	10	40.624	1.40	0.14	SD	1.1	1.1	11.3	11.3	0.12
31	98	3344G	DGS-04SG-101013	7		10	9	1	90.0	10.0	38.428	9	39.792	1.36	0.15	n	8	8	8	8	8
32	70	3344G	DGS-04SG-101013	8	wq replicate	10	7	3	70.0	30.0	36.658	7	39.932	3.27	0.47						

Test Number: P814-1

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	61	3345G	DGS-05SG-101014	1		10	10	0	100.0	0.0	39.813	10	41.347	1.53	0.15						
34	5	3345G	DGS-05SG-101014	2		10	9	1	90.0	10.0	42.850	9	44.412	1.56	0.17						
35	120	3345G	DGS-05SG-101014	3		10	9	1	90.0	10.0	40.752	9	42.688	1.94	0.22						
36	129	3345G	DGS-05SG-101014	4		10	9	1	90.0	10.0	38.879	9	41.324	2.45	0.27						
37	140	3345G	DGS-05SG-101014	5		10	8	2	80.0	20.0	36.348	8	38.801	2.45	0.31	Mean	9.1	0.9	91.3	8.8	0.21
38	169	3345G	DGS-05SG-101014	6		10	10	0	100.0	0.0	43.190	10	44.972	1.78	0.18	SD	0.8	0.8	8.3	8.3	0.06
39	144	3345G	DGS-05SG-101014	7		10	8	2	80.0	20.0	35.608	8	37.249	1.64	0.21	n	8	8	8	8	8
40	3	3345G	DGS-05SG-101014	8	wq replicate	10	10	0	100.0	0.0	40.221	10	41.796	1.58	0.16						
41	166	3346G	DGS-06SG-101014	1		10	9	1	90.0	10.0	38.549	9	40.157	1.61	0.18						
42	117	3346G	DGS-06SG-101014	2		10	8	2	80.0	20.0	37.245	8	38.917	1.67	0.21						
43	173	3346G	DGS-06SG-101014	3		10	10	0	100.0	0.0	36.405	10	37.878	1.47	0.15						
44	190	3346G	DGS-06SG-101014	4		10	10	0	100.0	0.0	38.290	10	39.740	1.45	0.15						
45	189	3346G	DGS-06SG-101014	5		10	10	0	100.0	0.0	35.903	10	37.596	1.69	0.17	Mean	9.3	0.8	92.5	7.5	0.17
46	23	3346G	DGS-06SG-101014	6		10	9	1	90.0	10.0	36.550	9	38.092	1.54	0.17	SD	0.7	0.7	7.1	7.1	0.02
47	26	3346G	DGS-06SG-101014	7		10	9	1	90.0	10.0	38.135	9	39.952	1.82	0.20	n	8	8	8	8	8
48	109	3346G	DGS-06SG-101014	8	wq replicate	10	9	1	90.0	10.0	37.293	9	38.715	1.42	0.16						
49	87	3347G	DGS-08SG-101013	1		10	9	1	90.0	10.0	38.096	9	39.561	1.47	0.16						
50	121	3347G	DGS-08SG-101013	2		10	10	0	100.0	0.0	41.532	10	43.121	1.59	0.16						
51	113	3347G	DGS-08SG-101013	3		10	8	2	80.0	20.0	39.409	8	41.552	2.14	0.27						
52	191	3347G	DGS-08SG-101013	4		10	9	1	90.0	10.0	39.380	9	41.166	1.79	0.20						
53	165	3347G	DGS-08SG-101013	5		10	10	0	100.0	0.0	40.667	10	42.096	1.43	0.14	Mean	8.9	1.1	88.8	11.3	0.20
54	150	3347G	DGS-08SG-101013	6		10	9	1	90.0	10.0	39.344	9	41.818	2.47	0.27	SD	1.0	1.0	9.9	9.9	0.05
55	14	3347G	DGS-08SG-101013	7		10	7	3	70.0	30.0	33.345	7	34.567	1.22	0.17	n	8	8	8	8	8
56	112	3347G	DGS-08SG-101013	8	wq replicate	10	9	1	90.0	10.0	40.001	9	41.669	1.67	0.19						
57	97	3348G	DGS-09SG-101013	1		10	8	2	80.0	20.0	34.313	8	35.603	1.29	0.16						
58	6	3348G	DGS-09SG-101013	2		10	10	0	100.0	0.0	39.516	10	40.979	1.46	0.15						
59	8	3348G	DGS-09SG-101013	3		10	9	1	90.0	10.0	41.183	9	42.550	1.37	0.15						
60	115	3348G	DGS-09SG-101013	4		10	10	0	100.0	0.0	36.012	10	37.776	1.76	0.18						
61	55	3348G	DGS-09SG-101013	5		10	9	1	90.0	10.0	34.279	9	35.784	1.51	0.17	Mean	9.0	1.0	90.0	10.0	0.16
62	148	3348G	DGS-09SG-101013	6		10	6	4	60.0	40.0	41.468	6	42.647	1.18	0.20	SD	1.4	1.4	14.1	14.1	0.02
63	25	3348G	DGS-09SG-101013	7		10	10	0	100.0	0.0	38.612	10	40.062	1.45	0.15	n	8	8	8	8	8
64	186	3348G	DGS-09SG-101013	8	wq replicate	10	10	0	100.0	0.0	35.316	10	36.613	1.30	0.13						
65	4	3349G	DGS-12SG-101013	1		10	9	1	90.0	10.0	41.533	9	42.932	1.40	0.16						
66	106	3349G	DGS-12SG-101013	2		10	10	0	100.0	0.0	39.353	10	40.761	1.41	0.14						
67	85	3349G	DGS-12SG-101013	3		10	10	0	100.0	0.0	35.533	10	36.718	1.19	0.12						
68	29	3349G	DGS-12SG-101013	4		10	9	1	90.0	10.0	35.464	9	36.818	1.35	0.15						
69	93	3349G	DGS-12SG-101013	5		10	9	1	90.0	10.0	37.542	9	38.963	1.42	0.16	Mean	9.3	0.8	92.5	7.5	0.14
70	125	3349G	DGS-12SG-101013	6		10	10	0	100.0	0.0	41.131	10	42.364	1.25	0.13	SD	1.0	1.0	10.4	10.4	0.01
71	54	3349G	DGS-12SG-101013	7		10	10	0	100.0	0.0	35.454	10	36.882	1.43	0.14	n	8	8	8	8	8
72	30	3349G	DGS-12SG-101013	8	wq replicate	10	7	3	70.0	30.0	38.141	7	39.244	1.10	0.16						
73	16	3350G	DGS-13SG-101013	1		10	10	0	100.0	0.0	39.295	10	40.891	1.60	0.16						
74	39	3350G	DGS-13SG-101013	2		10	10	0	100.0	0.0	39.049	10	40.486	1.44	0.14						
75	138	3350G	DGS-13SG-101013	3		10	10	0	100.0	0.0	39.324	10	40.997	1.67	0.17						
76	46	3350G	DGS-13SG-101013	4		10	10	0	100.0	0.0	38.145	10	39.720	1.58	0.16						
77	179	3350G	DGS-13SG-101013	5		10	9	1	90.0	10.0	38.492	9	39.764	1.27	0.14	Mean	9.8	0.3	97.5	2.5	0.16
78	142	3350G	DGS-13SG-101013	6		10	9	1	90.0	10.0	38.789	9	40.106	1.32	0.15	SD	0.5	0.5	4.6	4.6	0.01
79	162	3350G	DGS-13SG-101013	7		10	10	0	100.0	0.0	39.340	10	41.018	1.68	0.17	n	8	8	8	8	8
80	146	3350G	DGS-13SG-101013	8	wq replicate	10	10	0	100.0	0.0	40.055	10	41.821	1.77	0.18						

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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
81	152	3351G	DGS-16SG-101013	1		10	10	0	100.0	0.0	35.442	10	36.886	1.44	0.14						
82	92	3351G	DGS-16SG-101013	2		10	10	0	100.0	0.0	36.222	10	37.592	1.37	0.14						
83	65	3351G	DGS-16SG-101013	3		10	9	1	90.0	10.0	39.524	9	40.988	1.46	0.16						
84	86	3351G	DGS-16SG-101013	4		10	10	0	100.0	0.0	38.540	10	40.153	1.61	0.16						
85	89	3351G	DGS-16SG-101013	5		10	10	0	100.0	0.0	39.822	10	41.355	1.53	0.15	Mean	9.4	0.6	93.8	6.3	0.15
86	167	3351G	DGS-16SG-101013	6		10	8	2	80.0	20.0	38.733	8	39.941	1.21	0.15	SD	0.7	0.7	7.4	7.4	0.02
87	33	3351G	DGS-16SG-101013	7		10	9	1	90.0	10.0	37.103	9	38.392	1.29	0.14	n	8	8	8	8	8
88	95	3351G	DGS-16SG-101013	8	wq replicate	10	9	1	90.0	10.0	38.226	9	39.255	1.03	0.11						
89	184	3352G	DGS-17SG-101013	1		10	10	0	100.0	0.0	37.568	10	39.246	1.68	0.17						
90	13	3352G	DGS-17SG-101013	2		10	10	0	100.0	0.0	37.603	10	39.229	1.43	0.14						
91	104	3352G	DGS-17SG-101013	3		10	10	0	100.0	0.0	34.712	10	36.256	1.54	0.15						
92	107	3352G	DGS-17SG-101013	4		10	10	0	100.0	0.0	38.007	10	39.773	1.77	0.18						
93	37	3352G	DGS-17SG-101013	5		10	9	1	90.0	10.0	37.289	9	38.645	1.36	0.15	Mean	9.5	0.5	95.0	5.0	0.17
94	90	3352G	DGS-17SG-101013	6		10	7	3	70.0	30.0	38.644	7	40.207	1.56	0.22	SD	1.1	1.1	10.7	10.7	0.03
95	153	3352G	DGS-17SG-101013	7		10	10	0	100.0	0.0	40.073	10	41.797	1.72	0.17	n	8	8	8	8	8
96	76	3352G	DGS-17SG-101013	8	wq replicate	10	10	0	100.0	0.0	38.364	10	39.906	1.54	0.15						
97	160	3353G	DGS-20SG-101013	1		10	10	0	100.0	0.0	39.509	10	40.939	1.43	0.14						
98	176	3353G	DGS-20SG-101013	2		10	10	0	100.0	0.0	38.061	10	39.741	1.68	0.17						
99	47	3353G	DGS-20SG-101013	3		10	10	0	100.0	0.0	40.128	10	41.850	1.72	0.17						
100	134	3353G	DGS-20SG-101013	4		10	9	1	90.0	10.0	41.964	9	43.473	1.51	0.17						
101	137	3353G	DGS-20SG-101013	5		10	9	1	90.0	10.0	35.126	9	36.607	1.48	0.16	Mean	9.6	0.4	96.3	3.8	0.17
102	158	3353G	DGS-20SG-101013	6		10	10	0	100.0	0.0	39.519	10	41.356	1.84	0.18	SD	0.5	0.5	5.2	5.2	0.01
103	52	3353G	DGS-20SG-101013	7		10	10	0	100.0	0.0	37.272	10	38.907	1.64	0.16	n	8	8	8	8	8
104	124	3353G	DGS-20SG-101013	8	wq replicate	10	9	1	90.0	10.0	35.521	9	37.094	1.57	0.17						
105	17	3354G	DGS-21SG-101013	1		10	10	0	100.0	0.0	39.772	10	41.023	1.25	0.13						
106	63	3354G	DGS-21SG-101013	2		10	8	2	80.0	20.0	36.313	8	37.541	1.23	0.15						
107	60	3354G	DGS-21SG-101013	3		10	10	0	100.0	0.0	37.216	10	38.731	1.52	0.15						
108	119	3354G	DGS-21SG-101013	4		10	10	0	100.0	0.0	39.531	10	40.941	1.41	0.14						
109	28	3354G	DGS-21SG-101013	5		10	10	0	100.0	0.0	39.750	10	41.086	1.34	0.13	Mean	9.6	0.4	96.3	3.8	0.14
110	192	3354G	DGS-21SG-101013	6		10	10	0	100.0	0.0	38.246	10	39.862	1.62	0.16	SD	0.7	0.7	7.4	7.4	0.02
111	135	3354G	DGS-21SG-101013	7		10	9	1	90.0	10.0	43.037	9	44.292	1.26	0.14	n	8	8	8	8	8
112	42	3354G	DGS-21SG-101013	8	wq replicate	10	10	0	100.0	0.0	37.285	10	38.399	1.11	0.11						
113	59	3355G	DGS-25SG-101013	1		10	10	0	100.0	0.0	35.754	10	37.234	1.48	0.15						
114	43	3355G	DGS-25SG-101013	2		10	8	2	80.0	20.0	37.859	8	39.164	1.31	0.16						
115	174	3355G	DGS-25SG-101013	3		10	5	5	50.0	50.0	37.981	5	39.085	1.10	0.22						
116	45	3355G	DGS-25SG-101013	4		10	9	1	90.0	10.0	39.271	9	40.744	1.47	0.16						
117	67	3355G	DGS-25SG-101013	5		10	10	0	100.0	0.0	39.099	10	40.196	1.10	0.11	Mean	9.0	1.0	90.0	10.0	0.15
118	18	3355G	DGS-25SG-101013	6		10	10	0	100.0	0.0	41.009	10	42.281	1.27	0.13	SD	1.8	1.8	17.7	17.7	0.03
119	40	3355G	DGS-25SG-101013	7		10	10	0	100.0	0.0	38.170	10	39.639	1.47	0.15	n	8	8	8	8	8
120	103	3355G	DGS-25SG-101013	8	wq replicate	10	10	0	100.0	0.0	38.941	10	40.454	1.51	0.15						
121	147	3356G	DGS-26SG-101013	1		10	10	0	100.0	0.0	39.538	10	40.962	1.42	0.14						
122	151	3356G	DGS-26SG-101013	2		10	9	1	90.0	10.0	37.886	9	39.466	1.58	0.18						
123	36	3356G	DGS-26SG-101013	3		10	9	1	90.0	10.0	37.741	9	39.129	1.39	0.15						
124	31	3356G	DGS-26SG-101013	4		10	10	0	100.0	0.0	37.374	10	38.782	1.41	0.14						
125	143	3356G	DGS-26SG-101013	5		10	10	0	100.0	0.0	35.132	10	36.621	1.49	0.15	Mean	9.8	0.3	97.5	2.5	0.15
126	155	3356G	DGS-26SG-101013	6		10	10	0	100.0	0.0	35.141	10	36.585	1.44	0.14	SD	0.5	0.5	4.6	4.6	0.01
127	58	3356G	DGS-26SG-101013	7		10	10	0	100.0	0.0	36.459	10	37.774	1.32	0.13	n	8	8	8	8	8
128	38	3356G	DGS-26SG-101013	8	wq replicate	10	10	0	100.0	0.0	36.427	10	37.824	1.40	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
129	75	3357G	DGS-30SG-101012	1		10	8	2	80.0	20.0	35.938	8	37.354	1.42	0.18						
130	41	3357G	DGS-30SG-101012	2		10	7	3	70.0	30.0	38.187	7	39.352	1.17	0.17						
131	94	3357G	DGS-30SG-101012	3		10	10	0	100.0	0.0	36.429	10	37.616	1.19	0.12						
132	110	3357G	DGS-30SG-101012	4		10	10	0	100.0	0.0	36.815	10	38.437	1.62	0.16						
133	131	3357G	DGS-30SG-101012	5		10	9	1	90.0	10.0	40.483	9	41.736	1.25	0.14	Mean	8.8	1.3	87.5	12.5	0.15
134	164	3357G	DGS-30SG-101012	6		10	8	2	80.0	20.0	39.925	8	41.215	1.29	0.16	SD	1.2	1.2	11.6	11.6	0.02
135	84	3357G	DGS-30SG-101012	7		10	10	0	100.0	0.0	36.058	10	37.305	1.25	0.12	n	8	8	8	8	8
136	99	3357G	DGS-30SG-101012	8	wq replicate	10	8	2	80.0	20.0	37.593	8	39.081	1.49	0.19						
137	81	3358G	DGS-31SG-101012	1		10	9	1	90.0	10.0	39.789	9	40.754	0.96	0.11						
138	149	3358G	DGS-31SG-101012	2		10	10	0	100.0	0.0	39.558	10	40.917	1.36	0.14						
139	62	3358G	DGS-31SG-101012	3		10	10	0	100.0	0.0	36.801	10	38.986	2.19	0.22						
140	127	3358G	DGS-31SG-101012	4		10	8	2	80.0	20.0	36.295	8	37.525	1.23	0.15						
141	180	3358G	DGS-31SG-101012	5		10	10	0	100.0	0.0	38.531	10	39.812	1.28	0.13	Mean	9.5	0.5	95.0	5.0	0.15
142	123	3358G	DGS-31SG-101012	6		10	10	0	100.0	0.0	39.904	10	41.278	1.37	0.14	SD	0.8	0.8	7.6	7.6	0.03
143	64	3358G	DGS-31SG-101012	7		10	9	1	90.0	10.0	42.226	9	43.620	1.39	0.15	n	8	8	8	8	8
144	101	3358G	DGS-31SG-101012	8	wq replicate	10	10	0	100.0	0.0	38.639	10	39.979	1.34	0.13						
145	161	3359G	DGS-33SG-101012	1		10	10	0	100.0	0.0	35.978	10	37.406	1.43	0.14						
146	88	3359G	DGS-33SG-101012	2		10	9	1	90.0	10.0	38.658	9	40.085	1.43	0.16						
147	11	3359G	DGS-33SG-101012	3		10	10	0	100.0	0.0	39.488	10	40.923	1.44	0.14						
148	68	3359G	DGS-33SG-101012	4		10	10	0	100.0	0.0	37.506	10	38.938	1.43	0.14						
149	136	3359G	DGS-33SG-101012	5		10	10	0	100.0	0.0	37.377	10	38.632	1.26	0.13	Mean	9.8	0.3	97.5	2.5	0.14
150	35	3359G	DGS-33SG-101012	6		10	10	0	100.0	0.0	40.648	10	42.173	1.53	0.15	SD	0.5	0.5	4.6	4.6	0.01
151	145	3359G	DGS-33SG-101012	7		10	9	1	90.0	10.0	38.244	9	39.652	1.41	0.16	n	8	8	8	8	8
152	133	3359G	DGS-33SG-101012	8	wq replicate	10	10	0	100.0	0.0	36.394	10	37.602	1.21	0.12						
153	69	3360G	DGS-34SG-101012	1		10	10	0	100.0	0.0	40.176	10	41.466	1.29	0.13						
154	185	3360G	DGS-34SG-101012	2		10	9	1	90.0	10.0	39.956	9	41.481	1.53	0.17						
155	19	3360G	DGS-34SG-101012	3		10	9	1	90.0	10.0	40.048	9	41.431	1.38	0.15						
156	163	3360G	DGS-34SG-101012	4		10	8	2	80.0	20.0	42.898	8	43.944	1.05	0.13						
157	56	3360G	DGS-34SG-101012	5		10	8	2	80.0	20.0	40.363	8	41.739	1.38	0.17	Mean	8.9	1.1	88.8	11.3	0.15
158	91	3360G	DGS-34SG-101012	6		10	10	0	100.0	0.0	38.176	10	39.485	1.31	0.13	SD	0.8	0.8	8.3	8.3	0.02
159	126	3360G	DGS-34SG-101012	7		10	8	2	80.0	20.0	37.693	8	39.080	1.39	0.17	n	8	8	8	8	8
160	154	3360G	DGS-34SG-101012	8	wq replicate	10	9	1	90.0	10.0	36.638	9	38.143	1.51	0.17						
161	122	3361G	DGS-35SG-101012	1		10	10	0	100.0	0.0	36.906	10	38.597	1.69	0.17						
162	12	3361G	DGS-35SG-101012	2		10	8	2	80.0	20.0	41.613	8	42.826	1.21	0.15						
163	1	3361G	DGS-35SG-101012	3		10	7	3	70.0	30.0	36.766	7	37.777	1.01	0.14						
164	72	3361G	DGS-35SG-101012	4		10	7	3	70.0	30.0	41.378	7	42.762	1.38	0.20						
165	168	3361G	DGS-35SG-101012	5		10	6	4	60.0	40.0	39.258	6	41.188	1.93	0.32	Mean	8.3	1.8	82.5	17.5	0.19
166	118	3361G	DGS-35SG-101012	6		10	9	1	90.0	10.0	38.188	9	40.297	2.11	0.23	SD	1.5	1.5	14.9	14.9	0.06
167	74	3361G	DGS-35SG-101012	7		10	9	1	90.0	10.0	39.848	9	41.070	1.22	0.14	n	8	8	8	8	8
168	157	3361G	DGS-35SG-101012	8	wq replicate	10	10	0	100.0	0.0	38.221	10	39.574	1.35	0.14						
169	100	3362G	U2C-2-101014	1		10	7	3	70.0	30.0	43.416	7	44.775	1.36	0.19						
170	159	3362G	U2C-2-101014	2		10	9	1	90.0	10.0	38.315	9	40.022	1.71	0.19						
171	171	3362G	U2C-2-101014	3		10	10	0	100.0	0.0	39.344	10	40.715	1.37	0.14						
172	15	3362G	U2C-2-101014	4		10	8	2	80.0	20.0	38.493	8	39.765	1.27	0.16						
173	114	3362G	U2C-2-101014	5		10	10	0	100.0	0.0	41.065	10	42.887	1.82	0.18	Mean	8.8	1.3	87.5	12.5	0.17
174	79	3362G	U2C-2-101014	6		10	8	2	80.0	20.0	37.903	8	39.198	1.30	0.16	SD	1.0	1.0	10.4	10.4	0.02
175	183	3362G	U2C-2-101014	7		10	9	1	90.0	10.0	38.622	9	40.268	1.65	0.18	n	8	8	8	8	8
176	139	3362G	U2C-2-101014	8	wq replicate	10	9	1	90.0	10.0	40.884	9	42.179	1.30	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
177	83	3363G	U4Q-1-101014	1		10	9	1	90.0	10.0	38.263	9	39.588	1.33	0.15						
178	66	3363G	U4Q-1-101014	2		10	10	0	100.0	0.0	37.625	10	39.217	1.59	0.16						
179	111	3363G	U4Q-1-101014	3		10	7	3	70.0	30.0	38.210	7	40.086	1.88	0.27						
180	175	3363G	U4Q-1-101014	4		10	9	1	90.0	10.0	36.980	9	38.467	1.49	0.17						
181	78	3363G	U4Q-1-101014	5		10	9	1	90.0	10.0	42.679	9	43.969	1.29	0.14	Mean	9.3	0.8	92.5	7.5	0.17
182	50	3363G	U4Q-1-101014	6		10	10	0	100.0	0.0	37.782	10	39.244	1.46	0.15	SD	1.0	1.0	10.4	10.4	0.04
183	170	3363G	U4Q-1-101014	7		10	10	0	100.0	0.0	39.274	10	40.844	1.57	0.16	n	8	8	8	8	8
184	9	3363G	U4Q-1-101014	8	wq replicate	10	10	0	100.0	0.0	38.808	10	40.155	1.35	0.13						
185	51	3364G	U4Q-2-101014	1		10	10	0	100.0	0.0	37.725	10	39.058	1.33	0.13						
186	57	3364G	U4Q-2-101014	2		10	10	0	100.0	0.0	36.499	10	38.027	1.53	0.15						
187	73	3364G	U4Q-2-101014	3		10	10	0	100.0	0.0	38.328	10	39.559	1.23	0.12						
188	24	3364G	U4Q-2-101014	4		10	9	1	90.0	10.0	37.790	9	39.354	1.56	0.17						
189	77	3364G	U4Q-2-101014	5		10	8	2	80.0	20.0	36.080	8	37.298	1.22	0.15	Mean	9.4	0.6	93.8	6.3	0.15
190	10	3364G	U4Q-2-101014	6		10	10	0	100.0	0.0	37.647	10	39.356	1.71	0.17	SD	0.7	0.7	7.4	7.4	0.02
191	141	3364G	U4Q-2-101014	7		10	9	1	90.0	10.0	39.046	9	40.303	1.26	0.14	n	8	8	8	8	8
192	32	3364G	U4Q-2-101014	8	wq replicate	10	9	1	90.0	10.0	33.943	9	35.331	1.39	0.15						

Note: beaker #49, one animal was lost or damaged in transfer to weighing pan

Test Number: P814-1

Freshwater Sediment Test
28-Day Hyalella azteca

Data entry verified against laboratory bench sheets 11-29-10 JRF

Water Quality Data

BKR	NAS SMPL	CLIENT DESCRIP	Interstitial water pH	Interstitial water NH3
	3338G	Control	6.2	2.4
	3342G	DGS-01SG-101014	6.5	4.9
	3343G	DGS-02SG-101014	6.7	8.8
	3344G	DGS-04SG-101013	6.8	21.2
	3345G	DGS-05SG-101014	6.9	1.9
	3346G	DGS-06SG-101014	6.7	8.5
	3347G	DGS-08SG-101013	6.9	2.6
	3348G	DGS-09SG-101013	6.8	6.2
	3349G	DGS-12SG-101013	6.8	4.1
	3350G	DGS-13SG-101013	6.8	7.1
	3351G	DGS-16SG-101013	7.0	3.4
	3352G	DGS-17SG-101013	7.2	3.9
	3353G	DGS-20SG-101013	7.2	>0.5
	3354G	DGS-21SG-101013	7.2	7.6
	3355G	DGS-25SG-101013	7.1	1.6
	3356G	DGS-26SG-101013	6.7	5.4
	3357G	DGS-30SG-101012	6.8	2.9
	3358G	DGS-31SG-101012	6.8	5.3
	3359G	DGS-33SG-101012	6.9	2.9
	3360G	DGS-34SG-101012	6.7	8.1
	3361G	DGS-35SG-101012	6.6	15.0
	3362G	U2C-2-101014	6.8	1.7
	3363G	U4Q-1-101014	6.7	4.9
	3364G	U4Q-2-101014	6.7	3.7

BKR	NAS SMPL	CLIENT DESCRIP	REPL	DAY	Overlying water TEMP	DO	COND	pH	NH3	HARD	ALK
3	3345G	DGS-05SG-101014	8	0	23.0	7.1	129	7.1	0.1	34	30
9	3363G	U4Q-1-101014	8	0	22.8	6.6	125	6.9	0.6	43	40
21	3338G	Control	8	0	22.7	5.8	228	6.8	0.3	43	30
30	3349G	DGS-12SG-101013	8	0	22.9	7.1	132	6.9	0.3	34	30
32	3364G	U4Q-2-101014	8	0	22.7	6.1	120	6.8	0.5	43	30
38	3356G	DGS-26SG-101013	8	0	22.5	6.9	131	6.8	0.4	51	40
42	3354G	DGS-21SG-101013	8	0	22.4	6.9	130	6.8	0.7	43	40
48	3342G	DGS-01SG-101014	8	0	22.3	6.8	134	6.8	0.6	51	40
70	3344G	DGS-04SG-101013	8	0	22.6	7.3	137	6.9	1.7	43	40
76	3352G	DGS-17SG-101013	8	0	22.5	7.3	138	7.1	0.4	43	40
95	3351G	DGS-16SG-101013	8	0	22.6	7.3	132	7.1	0.3	43	30
99	3357G	DGS-30SG-101012	8	0	22.4	7.1	133	6.9	0.3	43	30
101	3358G	DGS-31SG-101012	8	0	22.4	7.2	135	6.9	0.5	43	40
103	3355G	DGS-25SG-101013	8	0	22.3	7.0	142	7.0	0.2	43	40
109	3346G	DGS-06SG-101014	8	0	22.3	7.1	130	7.0	0.7	43	30
112	3347G	DGS-08SG-101013	8	0	22.2	7.3	130	7.1	0.2	34	30
124	3353G	DGS-20SG-101013	8	0	22.3	7.3	136	7.1	<0.1	51	30
133	3359G	DGS-33SG-101012	8	0	22.5	6.8	130	7.0	0.3	34	30
139	3362G	U2C-2-101014	8	0	22.7	7.4	122	7.0	<0.1	34	30
146	3350G	DGS-13SG-101013	8	0	22.5	7.3	133	7.0	0.5	43	40
154	3360G	DGS-34SG-101012	8	0	22.7	7.2	133	6.9	0.7	43	40
157	3361G	DGS-35SG-101012	8	0	22.4	7.3	136	7.0	1.2	34	30
181	3343G	DGS-02SG-101014	8	0	22.4	7.2	129	7.0	0.7	43	40
186	3348G	DGS-09SG-101013	8	0	22.4	7.3	129	7.0	0.6	34	30
3	3345G	DGS-05SG-101014	8	1	23.2	7.0	137	7.0			
9	3363G	U4Q-1-101014	8	1	23.1	6.8	139	6.8			
21	3338G	Control	8	1	23.2	6.9	200	6.8			
30	3349G	DGS-12SG-101013	8	1	23.5	7.0	139	6.6			
32	3364G	U4Q-2-101014	8	1	23.2	7.0	135	6.7			
38	3356G	DGS-26SG-101013	8	1	23.2	6.7	139	6.7			

42	3354G	DGS-21SG-101013	8	1	23.1	6.9	139	6.7
48	3342G	DGS-01SG-101014	8	1	23.0	7.1	139	6.6
70	3344G	DGS-04SG-101013	8	1	23.4	7.0	146	6.6
76	3352G	DGS-17SG-101013	8	1	23.2	7.0	142	6.8
95	3351G	DGS-16SG-101013	8	1	23.4	7.0	139	6.9
99	3357G	DGS-30SG-101012	8	1	23.2	7.2	139	6.8
101	3358G	DGS-31SG-101012	8	1	23.2	7.0	141	6.7
103	3355G	DGS-25SG-101013	8	1	23.2	7.1	144	6.7
109	3346G	DGS-06SG-101014	8	1	23.1	7.1	139	6.6
112	3347G	DGS-08SG-101013	8	1	23.1	7.0	136	6.6
124	3353G	DGS-20SG-101013	8	1	23.1	7.2	139	6.7
133	3359G	DGS-33SG-101012	8	1	23.4	7.2	138	6.9
139	3362G	U2C-2-101014	8	1	23.4	7.2	139	6.8
146	3350G	DGS-13SG-101013	8	1	23.3	7.0	136	6.8
154	3360G	DGS-34SG-101012	8	1	23.3	7.1	140	6.6
157	3361G	DGS-35SG-101012	8	1	23.4	6.9	137	6.7
181	3343G	DGS-02SG-101014	8	1	23.2	7.0	139	6.7
186	3348G	DGS-09SG-101013	8	1	23.2	7.2	137	6.8
3	3345G	DGS-05SG-101014	8	2	23.0			
9	3363G	U4Q-1-101014	8	2	23.1			
21	3338G	Control	8	2	23.1			
30	3349G	DGS-12SG-101013	8	2	23.2			
32	3364G	U4Q-2-101014	8	2	23.0			
38	3356G	DGS-26SG-101013	8	2	23.0			
42	3354G	DGS-21SG-101013	8	2	23.0			
48	3342G	DGS-01SG-101014	8	2	22.9			
70	3344G	DGS-04SG-101013	8	2	23.2			
76	3352G	DGS-17SG-101013	8	2	23.1			
95	3351G	DGS-16SG-101013	8	2	23.2			
99	3357G	DGS-30SG-101012	8	2	23.1			
101	3358G	DGS-31SG-101012	8	2	23.1			
103	3355G	DGS-25SG-101013	8	2	23.0			
109	3346G	DGS-06SG-101014	8	2	23.0			
112	3347G	DGS-08SG-101013	8	2	23.0			
124	3353G	DGS-20SG-101013	8	2	23.0			
133	3359G	DGS-33SG-101012	8	2	23.2			
139	3362G	U2C-2-101014	8	2	23.2			
146	3350G	DGS-13SG-101013	8	2	23.2			
154	3360G	DGS-34SG-101012	8	2	23.3			
157	3361G	DGS-35SG-101012	8	2	23.1			
181	3343G	DGS-02SG-101014	8	2	23.0			
186	3348G	DGS-09SG-101013	8	2	23.1			
3	3345G	DGS-05SG-101014	8	3	23.0	6.8		7.2
9	3363G	U4Q-1-101014	8	3	23.0	6.6		7.1
21	3338G	Control	8	3	23.1	6.9		7.0
30	3349G	DGS-12SG-101013	8	3	23.3	6.9		7.1
32	3364G	U4Q-2-101014	8	3	23.1	7.0		7.1
38	3356G	DGS-26SG-101013	8	3	23.0	6.8		7.1
42	3354G	DGS-21SG-101013	8	3	23.0	6.8		7.1
48	3342G	DGS-01SG-101014	8	3	22.9	6.6		7.0
70	3344G	DGS-04SG-101013	8	3	23.2	6.7		7.1
76	3352G	DGS-17SG-101013	8	3	23.1	6.9		7.2
95	3351G	DGS-16SG-101013	8	3	23.2	6.8		7.1
99	3357G	DGS-30SG-101012	8	3	23.1	6.8		7.1
101	3358G	DGS-31SG-101012	8	3	23.1	6.6		7.1
103	3355G	DGS-25SG-101013	8	3	23.0	6.8		7.2
109	3346G	DGS-06SG-101014	8	3	22.9	6.6		7.1
112	3347G	DGS-08SG-101013	8	3	23.0	7.0		7.2
124	3353G	DGS-20SG-101013	8	3	23.0	6.9		7.2
133	3359G	DGS-33SG-101012	8	3	23.2	6.9		7.1

139	3362G	U2C-2-101014	8	3	23.2	6.9		7.1
146	3350G	DGS-13SG-101013	8	3	23.2	6.9		7.1
154	3360G	DGS-34SG-101012	8	3	23.3	6.9		7.0
157	3361G	DGS-35SG-101012	8	3	23.1	6.7		7.0
181	3343G	DGS-02SG-101014	8	3	23.0	6.8		7.1
186	3348G	DGS-09SG-101013	8	3	23.2	6.8		7.1
3	3345G	DGS-05SG-101014	8	4	23.6			
9	3363G	U4Q-1-101014	8	4	23.6			
21	3338G	Control	8	4	23.7			
30	3349G	DGS-12SG-101013	8	4	23.6			
32	3364G	U4Q-2-101014	8	4	23.5			
38	3356G	DGS-26SG-101013	8	4	23.5			
42	3354G	DGS-21SG-101013	8	4	23.5			
48	3342G	DGS-01SG-101014	8	4	23.6			
70	3344G	DGS-04SG-101013	8	4	23.4			
76	3352G	DGS-17SG-101013	8	4	23.6			
95	3351G	DGS-16SG-101013	8	4	23.6			
99	3357G	DGS-30SG-101012	8	4	23.4			
101	3358G	DGS-31SG-101012	8	4	23.4			
103	3355G	DGS-25SG-101013	8	4	23.5			
109	3346G	DGS-06SG-101014	8	4	23.6			
112	3347G	DGS-08SG-101013	8	4	23.6			
124	3353G	DGS-20SG-101013	8	4	23.5			
133	3359G	DGS-33SG-101012	8	4	23.6			
139	3362G	U2C-2-101014	8	4	23.6			
146	3350G	DGS-13SG-101013	8	4	23.5			
154	3360G	DGS-34SG-101012	8	4	23.6			
157	3361G	DGS-35SG-101012	8	4	23.6			
181	3343G	DGS-02SG-101014	8	4	23.6			
186	3348G	DGS-09SG-101013	8	4	23.6			
3	3345G	DGS-05SG-101014	8	5	22.7			
9	3363G	U4Q-1-101014	8	5	22.9			
21	3338G	Control	8	5	22.9			
30	3349G	DGS-12SG-101013	8	5	23.0			
32	3364G	U4Q-2-101014	8	5	22.8			
38	3356G	DGS-26SG-101013	8	5	22.8			
42	3354G	DGS-21SG-101013	8	5	22.8			
48	3342G	DGS-01SG-101014	8	5	22.7			
70	3344G	DGS-04SG-101013	8	5	23.0			
76	3352G	DGS-17SG-101013	8	5	22.8			
95	3351G	DGS-16SG-101013	8	5	22.9			
99	3357G	DGS-30SG-101012	8	5	22.8			
101	3358G	DGS-31SG-101012	8	5	22.8			
103	3355G	DGS-25SG-101013	8	5	22.7			
109	3346G	DGS-06SG-101014	8	5	22.7			
112	3347G	DGS-08SG-101013	8	5	22.7			
124	3353G	DGS-20SG-101013	8	5	22.7			
133	3359G	DGS-33SG-101012	8	5	23.0			
139	3362G	U2C-2-101014	8	5	23.0			
146	3350G	DGS-13SG-101013	8	5	22.9			
154	3360G	DGS-34SG-101012	8	5	23.0			
157	3361G	DGS-35SG-101012	8	5	22.9			
181	3343G	DGS-02SG-101014	8	5	22.9			
186	3348G	DGS-09SG-101013	8	5	22.9			
3	3345G	DGS-05SG-101014	8	6	22.6	6.6		7.0
9	3363G	U4Q-1-101014	8	6	22.7	6.9		7.0
21	3338G	Control	8	6	22.7	6.3		7.0
30	3349G	DGS-12SG-101013	8	6	23.0	6.7		7.0
32	3364G	U4Q-2-101014	8	6	22.7	6.7		7.0
38	3356G	DGS-26SG-101013	8	6	22.7	6.5		7.0

42	3354G	DGS-21SG-101013	8	6	22.6	6.3		7.0
48	3342G	DGS-01SG-101014	8	6	22.6	6.5		7.0
70	3344G	DGS-04SG-101013	8	6	22.9	6.3		6.9
76	3352G	DGS-17SG-101013	8	6	22.7	6.5		7.0
95	3351G	DGS-16SG-101013	8	6	22.9	6.7		7.0
99	3357G	DGS-30SG-101012	8	6	22.7	6.7		7.0
101	3358G	DGS-31SG-101012	8	6	22.7	6.4		7.0
103	3355G	DGS-25SG-101013	8	6	22.6	6.6		7.0
109	3346G	DGS-06SG-101014	8	6	22.5	6.3		7.0
112	3347G	DGS-08SG-101013	8	6	22.6	6.5		7.0
124	3353G	DGS-20SG-101013	8	6	22.6	6.6		7.1
133	3359G	DGS-33SG-101012	8	6	22.9	6.5		7.0
139	3362G	U2C-2-101014	8	6	22.9	6.3		7.0
146	3350G	DGS-13SG-101013	8	6	22.8	6.1		6.9
154	3360G	DGS-34SG-101012	8	6	22.9	6.4		7.0
157	3361G	DGS-35SG-101012	8	6	22.7	6.3		6.9
181	3343G	DGS-02SG-101014	8	6	22.6	6.1		7.0
186	3348G	DGS-09SG-101013	8	7	22.7	6.5		7.0
3	3345G	DGS-05SG-101014	8	7	22.6			
9	3363G	U4Q-1-101014	8	7	22.6			
21	3338G	Control	8	7	22.6			
30	3349G	DGS-12SG-101013	8	7	22.8			
32	3364G	U4Q-2-101014	8	7	22.5			
38	3356G	DGS-26SG-101013	8	7	22.5			
42	3354G	DGS-21SG-101013	8	7	22.5			
48	3342G	DGS-01SG-101014	8	7	22.4			
70	3344G	DGS-04SG-101013	8	7	22.7			
76	3352G	DGS-17SG-101013	8	7	22.6			
95	3351G	DGS-16SG-101013	8	7	22.7			
99	3357G	DGS-30SG-101012	8	7	22.6			
101	3358G	DGS-31SG-101012	8	7	22.6			
103	3355G	DGS-25SG-101013	8	7	22.5			
109	3346G	DGS-06SG-101014	8	7	22.4			
112	3347G	DGS-08SG-101013	8	7	22.5			
124	3353G	DGS-20SG-101013	8	7	22.5			
133	3359G	DGS-33SG-101012	8	7	22.8			
139	3362G	U2C-2-101014	8	7	22.7			
146	3350G	DGS-13SG-101013	8	7	22.6			
154	3360G	DGS-34SG-101012	8	7	22.8			
157	3361G	DGS-35SG-101012	8	7	22.6			
181	3343G	DGS-02SG-101014	8	7	22.6			
186	3348G	DGS-09SG-101013	8	7	22.6			
3	3345G	DGS-05SG-101014	8	8	23.5	6.3	127	7.0
9	3363G	U4Q-1-101014	8	8	23.3	6.5	127	6.9
21	3338G	Control	8	8	23.2	6.4	143	7.0
30	3349G	DGS-12SG-101013	8	8	23.5	6.2	127	6.9
32	3364G	U4Q-2-101014	8	8	23.2	6.4	126	6.9
38	3356G	DGS-26SG-101013	8	8	23.1	6.3	127	7.0
42	3354G	DGS-21SG-101013	8	8	23.0	6.4	126	7.0
48	3342G	DGS-01SG-101014	8	8	22.9	6.0	127	6.9
70	3344G	DGS-04SG-101013	8	8	23.2	5.9	130	6.8
76	3352G	DGS-17SG-101013	8	8	23.2	6.4	128	7.0
95	3351G	DGS-16SG-101013	8	8	23.3	6.4	127	7.0
99	3357G	DGS-30SG-101012	8	8	23.2	6.3	127	6.9
101	3358G	DGS-31SG-101012	8	8	23.1	6.2	128	7.0
103	3355G	DGS-25SG-101013	8	8	23.0	6.2	129	7.0
109	3346G	DGS-06SG-101014	8	8	23.0	6.3	126	6.9
112	3347G	DGS-08SG-101013	8	8	23.0	6.5	125	7.0
124	3353G	DGS-20SG-101013	8	8	23.0	6.4	127	7.0
133	3359G	DGS-33SG-101012	8	8	23.3	6.3	126	7.0

139	3362G	U2C-2-101014	8	8	23.3	6.4	126	6.9
146	3350G	DGS-13SG-101013	8	8	23.2	6.2	125	6.9
154	3360G	DGS-34SG-101012	8	8	23.4	6.3	127	6.9
157	3361G	DGS-35SG-101012	8	8	23.1	6.2	126	6.8
181	3343G	DGS-02SG-101014	8	8	23.1	6.2	127	6.9
186	3348G	DGS-09SG-101013	8	8	23.2	6.3	128	7.0
3	3345G	DGS-05SG-101014	8	9	23.2			
9	3363G	U4Q-1-101014	8	9	23.2			
21	3338G	Control	8	9	23.1			
30	3349G	DGS-12SG-101013	8	9	23.4			
32	3364G	U4Q-2-101014	8	9	23.0			
38	3356G	DGS-26SG-101013	8	9	23.0			
42	3354G	DGS-21SG-101013	8	9	22.9			
48	3342G	DGS-01SG-101014	8	9	22.9			
70	3344G	DGS-04SG-101013	8	9	23.3			
76	3352G	DGS-17SG-101013	8	9	23.1			
95	3351G	DGS-16SG-101013	8	9	23.3			
99	3357G	DGS-30SG-101012	8	9	23.0			
101	3358G	DGS-31SG-101012	8	9	23.1			
103	3355G	DGS-25SG-101013	8	9	22.9			
109	3346G	DGS-06SG-101014	8	9	22.9			
112	3347G	DGS-08SG-101013	8	9	22.9			
124	3353G	DGS-20SG-101013	8	9	23.0			
133	3359G	DGS-33SG-101012	8	9	23.3			
139	3362G	U2C-2-101014	8	9	23.3			
146	3350G	DGS-13SG-101013	8	9	23.1			
154	3360G	DGS-34SG-101012	8	9	23.3			
157	3361G	DGS-35SG-101012	8	9	23.0			
181	3343G	DGS-02SG-101014	8	9	23.0			
186	3348G	DGS-09SG-101013	8	9	23.1			
3	3345G	DGS-05SG-101014	8	10	23.4	6.8		7.0
9	3363G	U4Q-1-101014	8	10	23.0	6.9		7.0
21	3338G	Control	8	10	23.0	6.8		7.0
30	3349G	DGS-12SG-101013	8	10	23.3	7.0		6.9
32	3364G	U4Q-2-101014	8	10	22.9	7.0		6.9
38	3356G	DGS-26SG-101013	8	10	22.9	6.8		7.0
42	3354G	DGS-21SG-101013	8	10	22.8	6.9		7.1
48	3342G	DGS-01SG-101014	8	10	22.8	6.6		7.1
70	3344G	DGS-04SG-101013	8	10	23.1	6.4		6.8
76	3352G	DGS-17SG-101013	8	10	22.9	6.8		7.1
95	3351G	DGS-16SG-101013	8	10	23.2	6.8		6.9
99	3357G	DGS-30SG-101012	8	10	23.0	6.8		6.9
101	3358G	DGS-31SG-101012	8	10	23.0	6.7		7.0
103	3355G	DGS-25SG-101013	8	10	22.8	6.8		7.1
109	3346G	DGS-06SG-101014	8	10	22.8	6.6		7.0
112	3347G	DGS-08SG-101013	8	10	22.9	6.9		7.0
124	3353G	DGS-20SG-101013	8	10	22.9	6.6		7.0
133	3359G	DGS-33SG-101012	8	10	23.3	6.8		6.9
139	3362G	U2C-2-101014	8	10	23.3	6.6		6.9
146	3350G	DGS-13SG-101013	8	10	23.1	6.4		6.9
154	3360G	DGS-34SG-101012	8	10	23.2	6.5		6.7
157	3361G	DGS-35SG-101012	8	10	22.9	6.2		6.8
181	3343G	DGS-02SG-101014	8	10	22.9	6.5		7.0
186	3348G	DGS-09SG-101013	8	10	23.0	6.3		7.0
3	3345G	DGS-05SG-101014	8	11	22.9			
9	3363G	U4Q-1-101014	8	11	22.9			
21	3338G	Control	8	11	22.7			
30	3349G	DGS-12SG-101013	8	11	23.0			
32	3364G	U4Q-2-101014	8	11	22.8			
38	3356G	DGS-26SG-101013	8	11	22.7			

42	3354G	DGS-21SG-101013	8	11	22.7		
48	3342G	DGS-01SG-101014	8	11	22.7		
70	3344G	DGS-04SG-101013	8	11	23.0		
76	3352G	DGS-17SG-101013	8	11	22.8		
95	3351G	DGS-16SG-101013	8	11	22.9		
99	3357G	DGS-30SG-101012	8	11	23.0		
101	3358G	DGS-31SG-101012	8	11	22.8		
103	3355G	DGS-25SG-101013	8	11	22.8		
109	3346G	DGS-06SG-101014	8	11	22.9		
112	3347G	DGS-08SG-101013	8	11	22.8		
124	3353G	DGS-20SG-101013	8	11	22.9		
133	3359G	DGS-33SG-101012	8	11	22.9		
139	3362G	U2C-2-101014	8	11	23.0		
146	3350G	DGS-13SG-101013	8	11	22.8		
154	3360G	DGS-34SG-101012	8	11	22.9		
157	3361G	DGS-35SG-101012	8	11	22.8		
181	3343G	DGS-02SG-101014	8	11	22.7		
186	3348G	DGS-09SG-101013	8	11	22.8		
3	3345G	DGS-05SG-101014	8	12	22.5		
9	3363G	U4Q-1-101014	8	12	22.5		
21	3338G	Control	8	12	22.4		
30	3349G	DGS-12SG-101013	8	12	22.6		
32	3364G	U4Q-2-101014	8	12	22.4		
38	3356G	DGS-26SG-101013	8	12	22.4		
42	3354G	DGS-21SG-101013	8	12	22.4		
48	3342G	DGS-01SG-101014	8	12	22.3		
70	3344G	DGS-04SG-101013	8	12	22.4		
76	3352G	DGS-17SG-101013	8	12	22.4		
95	3351G	DGS-16SG-101013	8	12	22.5		
99	3357G	DGS-30SG-101012	8	12	22.4		
101	3358G	DGS-31SG-101012	8	12	22.5		
103	3355G	DGS-25SG-101013	8	12	22.4		
109	3346G	DGS-06SG-101014	8	12	22.4		
112	3347G	DGS-08SG-101013	8	12	22.4		
124	3353G	DGS-20SG-101013	8	12	22.4		
133	3359G	DGS-33SG-101012	8	12	22.5		
139	3362G	U2C-2-101014	8	12	22.5		
146	3350G	DGS-13SG-101013	8	12	22.5		
154	3360G	DGS-34SG-101012	8	12	22.4		
157	3361G	DGS-35SG-101012	8	12	22.3		
181	3343G	DGS-02SG-101014	8	12	22.3		
186	3348G	DGS-09SG-101013	8	12	22.4		
3	3345G	DGS-05SG-101014	8	13	22.1	7.7	7.0
9	3363G	U4Q-1-101014	8	13	22.0	7.5	7.1
21	3338G	Control	8	13	22.0	7.3	7.0
30	3349G	DGS-12SG-101013	8	13	22.1	7.7	7.1
32	3364G	U4Q-2-101014	8	13	22.1	7.7	7.0
38	3356G	DGS-26SG-101013	8	13	22.0	7.6	7.2
42	3354G	DGS-21SG-101013	8	13	22.0	7.7	7.2
48	3342G	DGS-01SG-101014	8	13	21.9	7.3	7.3
70	3344G	DGS-04SG-101013	8	13	22.4	7.3	6.9
76	3352G	DGS-17SG-101013	8	13	22.2	7.7	7.2
95	3351G	DGS-16SG-101013	8	13	22.4	7.8	7.1
99	3357G	DGS-30SG-101012	8	13	22.2	7.7	7.1
101	3358G	DGS-31SG-101012	8	13	22.2	7.7	7.1
103	3355G	DGS-25SG-101013	8	13	22.0	7.7	7.2
109	3346G	DGS-06SG-101014	8	13	22.0	7.6	7.2
112	3347G	DGS-08SG-101013	8	13	22.0	7.7	7.1
124	3353G	DGS-20SG-101013	8	13	22.0	7.7	7.2
133	3359G	DGS-33SG-101012	8	13	22.4	7.8	7.2

139	3362G	U2C-2-101014	8	13	22.4	7.7		7.2
146	3350G	DGS-13SG-101013	8	13	22.3	7.7		7.1
154	3360G	DGS-34SG-101012	8	13	22.4	7.5		7.1
157	3361G	DGS-35SG-101012	8	13	22.1	7.1		6.9
181	3343G	DGS-02SG-101014	8	13	22.1	7.5		7.1
186	3348G	DGS-09SG-101013	8	13	22.2	7.5		7.1
3	3345G	DGS-05SG-101014	8	14	22.6			
9	3363G	U4Q-1-101014	8	14	22.6			
21	3338G	Control	8	14	22.5			
30	3349G	DGS-12SG-101013	8	14	22.8			
32	3364G	U4Q-2-101014	8	14	22.5			
38	3356G	DGS-26SG-101013	8	14	22.5			
42	3354G	DGS-21SG-101013	8	14	22.5			
48	3342G	DGS-01SG-101014	8	14	22.5			
70	3344G	DGS-04SG-101013	8	14	22.6			
76	3352G	DGS-17SG-101013	8	14	22.6			
95	3351G	DGS-16SG-101013	8	14	22.7			
99	3357G	DGS-30SG-101012	8	14	22.6			
101	3358G	DGS-31SG-101012	8	14	22.5			
103	3355G	DGS-25SG-101013	8	14	22.5			
109	3346G	DGS-06SG-101014	8	14	22.5			
112	3347G	DGS-08SG-101013	8	14	22.6			
124	3353G	DGS-20SG-101013	8	14	22.5			
133	3359G	DGS-33SG-101012	8	14	22.7			
139	3362G	U2C-2-101014	8	14	22.7			
146	3350G	DGS-13SG-101013	8	14	22.6			
154	3360G	DGS-34SG-101012	8	14	22.7			
157	3361G	DGS-35SG-101012	8	14	22.4			
181	3343G	DGS-02SG-101014	8	14	22.4			
186	3348G	DGS-09SG-101013	8	14	22.5			
3	3345G	DGS-05SG-101014	8	15	22.7	6.6	130	6.7
9	3363G	U4Q-1-101014	8	15	22.6	6.8	136	6.9
21	3338G	Control	8	15	22.5	6.7	134	6.8
30	3349G	DGS-12SG-101013	8	15	22.8	6.1	133	6.6
32	3364G	U4Q-2-101014	8	15	22.4	6.7	128	6.6
38	3356G	DGS-26SG-101013	8	15	22.3	6.5	126	6.8
42	3354G	DGS-21SG-101013	8	15	22.2	6.4	128	6.9
48	3342G	DGS-01SG-101014	8	15	22.2	6.1	128	7.1
70	3344G	DGS-04SG-101013	8	15	22.7	6.2	127	6.6
76	3352G	DGS-17SG-101013	8	15	22.5	6.6	131	7.0
95	3351G	DGS-16SG-101013	8	15	22.7	6.3	123	6.8
99	3357G	DGS-30SG-101012	8	15	22.4	6.5	126	6.7
101	3358G	DGS-31SG-101012	8	15	22.5	6.6	122	6.7
103	3355G	DGS-25SG-101013	8	15	22.3	6.4	128	7.0
109	3346G	DGS-06SG-101014	8	15	22.3	6.6	126	7.0
112	3347G	DGS-08SG-101013	8	15	22.3	6.9	122	6.8
124	3353G	DGS-20SG-101013	8	15	22.4	7.0	127	7.0
133	3359G	DGS-33SG-101012	8	15	23.0	6.8	123	6.8
139	3362G	U2C-2-101014	8	15	23.0	6.7	125	6.8
146	3350G	DGS-13SG-101013	8	15	22.7	6.5	122	6.8
154	3360G	DGS-34SG-101012	8	15	23.0	6.6	125	6.9
157	3361G	DGS-35SG-101012	8	15	22.5	6.1	119	6.6
181	3343G	DGS-02SG-101014	8	15	22.4	6.2	125	6.9
186	3348G	DGS-09SG-101013	8	15	22.5	6.6	124	6.9
3	3345G	DGS-05SG-101014	8	16	22.7			
9	3363G	U4Q-1-101014	8	16	22.6			
21	3338G	Control	8	16	22.6			
30	3349G	DGS-12SG-101013	8	16	22.8			
32	3364G	U4Q-2-101014	8	16	22.5			
38	3356G	DGS-26SG-101013	8	16	22.4			

42	3354G	DGS-21SG-101013	8	16	22.3		
48	3342G	DGS-01SG-101014	8	16	22.3		
70	3344G	DGS-04SG-101013	8	16	22.7		
76	3352G	DGS-17SG-101013	8	16	22.5		
95	3351G	DGS-16SG-101013	8	16	22.7		
99	3357G	DGS-30SG-101012	8	16	22.5		
101	3358G	DGS-31SG-101012	8	16	22.5		
103	3355G	DGS-25SG-101012	8	16	22.3		
109	3346G	DGS-06SG-101014	8	16	22.3		
112	3347G	DGS-08SG-101013	8	16	22.4		
124	3353G	DGS-20SG-101013	8	16	22.4		
133	3359G	DGS-33SG-101012	8	16	22.7		
139	3362G	U2C-2-101014	8	16	22.7		
146	3350G	DGS-13SG-101013	8	16	22.5		
154	3360G	DGS-34SG-101012	8	16	22.7		
157	3361G	DGS-35SG-101012	8	16	22.4		
181	3343G	DGS-02SG-101014	8	16	22.4		
186	3348G	DGS-09SG-101013	8	16	22.5		
3	3345G	DGS-05SG-101014	8	17	22.3	6.7	7.1
9	3363G	U4Q-1-101014	8	17	22.3	6.4	7.2
21	3338G	Control	8	17	22.4	6.1	7.2
30	3349G	DGS-12SG-101013	8	17	22.7	6.4	7.0
32	3364G	U4Q-2-101014	8	17	22.3	6.7	7.0
38	3356G	DGS-26SG-101013	8	17	22.2	6.4	7.0
42	3354G	DGS-21SG-101013	8	17	22.2	6.3	6.9
48	3342G	DGS-01SG-101014	8	17	22.2	6.0	7.1
70	3344G	DGS-04SG-101013	8	17	22.5	6.0	6.8
76	3352G	DGS-17SG-101013	8	17	22.4	6.6	7.1
95	3351G	DGS-16SG-101013	8	17	22.6	6.4	6.9
99	3357G	DGS-30SG-101012	8	17	22.3	6.5	6.9
101	3358G	DGS-31SG-101012	8	17	22.4	6.3	6.8
103	3355G	DGS-25SG-101012	8	17	22.2	6.4	7.0
109	3346G	DGS-06SG-101014	8	17	22.2	6.1	7.0
112	3347G	DGS-08SG-101013	8	17	22.2	6.4	6.9
124	3353G	DGS-20SG-101013	8	17	22.3	6.7	7.1
133	3359G	DGS-33SG-101012	8	17	22.6	6.7	7.0
139	3362G	U2C-2-101014	8	17	22.6	6.5	7.0
146	3350G	DGS-13SG-101013	8	17	22.4	6.4	6.9
154	3360G	DGS-34SG-101012	8	17	22.6	6.4	6.9
157	3361G	DGS-35SG-101012	8	17	22.3	6.2	6.8
181	3343G	DGS-02SG-101014	8	17	22.2	6.3	7.0
186	3348G	DGS-09SG-101013	8	17	22.3	6.5	7.0
3	3345G	DGS-05SG-101014	8	18	22.6		
9	3363G	U4Q-1-101014	8	18	22.6		
21	3338G	Control	8	18	22.6		
30	3349G	DGS-12SG-101013	8	18	22.8		
32	3364G	U4Q-2-101014	8	18	22.6		
38	3356G	DGS-26SG-101013	8	18	22.5		
42	3354G	DGS-21SG-101013	8	18	22.4		
48	3342G	DGS-01SG-101014	8	18	22.2		
70	3344G	DGS-04SG-101013	8	18	22.7		
76	3352G	DGS-17SG-101013	8	18	22.6		
95	3351G	DGS-16SG-101013	8	18	22.7		
99	3357G	DGS-30SG-101012	8	18	22.8		
101	3358G	DGS-31SG-101012	8	18	22.4		
103	3355G	DGS-25SG-101012	8	18	22.4		
109	3346G	DGS-06SG-101014	8	18	22.3		
112	3347G	DGS-08SG-101013	8	18	22.4		
124	3353G	DGS-20SG-101013	8	18	22.4		
133	3359G	DGS-33SG-101012	8	18	22.8		

139	3362G	U2C-2-101014	8	18	22.7		
146	3350G	DGS-13SG-101013	8	18	22.8		
154	3360G	DGS-34SG-101012	8	18	22.7		
157	3361G	DGS-35SG-101012	8	18	22.5		
181	3343G	DGS-02SG-101014	8	18	22.5		
186	3348G	DGS-09SG-101013	8	18	22.5		
3	3345G	DGS-05SG-101014	8	19	22.6		
9	3363G	U4Q-1-101014	8	19	22.6		
21	3338G	Control	8	19	22.6		
30	3349G	DGS-12SG-101013	8	19	22.8		
32	3364G	U4Q-2-101014	8	19	22.6		
38	3356G	DGS-26SG-101013	8	19	22.5		
42	3354G	DGS-21SG-101013	8	19	22.5		
48	3342G	DGS-01SG-101014	8	19	22.5		
70	3344G	DGS-04SG-101013	8	19	22.7		
76	3352G	DGS-17SG-101013	8	19	22.7		
95	3351G	DGS-16SG-101013	8	19	22.8		
99	3357G	DGS-30SG-101012	8	19	22.6		
101	3358G	DGS-31SG-101012	8	19	22.7		
103	3355G	DGS-25SG-101013	8	19	22.6		
109	3346G	DGS-06SG-101014	8	19	22.5		
112	3347G	DGS-08SG-101013	8	19	22.6		
124	3353G	DGS-20SG-101013	8	19	22.6		
133	3359G	DGS-33SG-101012	8	19	22.7		
139	3362G	U2C-2-101014	8	19	22.8		
146	3350G	DGS-13SG-101013	8	19	22.7		
154	3360G	DGS-34SG-101012	8	19	22.8		
157	3361G	DGS-35SG-101012	8	19	22.6		
181	3343G	DGS-02SG-101014	8	19	22.5		
186	3348G	DGS-09SG-101013	8	19	22.6		
3	3345G	DGS-05SG-101014	8	20	23.1	6.4	6.8
9	3363G	U4Q-1-101014	8	20	22.9	5.6	6.7
21	3338G	Control	8	20	22.8	5.1	6.7
30	3349G	DGS-12SG-101013	8	20	23.1	6.2	6.8
32	3364G	U4Q-2-101014	8	20	22.7	6.6	6.7
38	3356G	DGS-26SG-101013	8	20	22.7	6.5	6.9
42	3354G	DGS-21SG-101013	8	20	22.6	6.4	6.8
48	3342G	DGS-01SG-101014	8	20	22.5	5.8	6.8
70	3344G	DGS-04SG-101013	8	20	22.9	6.2	6.7
76	3352G	DGS-17SG-101013	8	20	22.8	6.4	6.9
95	3351G	DGS-16SG-101013	8	20	22.9	6.6	6.8
99	3357G	DGS-30SG-101012	8	20	22.7	6.8	6.8
101	3358G	DGS-31SG-101012	8	20	22.8	6.5	6.7
103	3355G	DGS-25SG-101013	8	20	22.6	6.1	6.9
109	3346G	DGS-06SG-101014	8	20	22.7	6.3	6.9
112	3347G	DGS-08SG-101013	8	20	22.7	6.4	6.8
124	3353G	DGS-20SG-101013	8	20	22.7	6.5	7.2
133	3359G	DGS-33SG-101012	8	20	23.0	6.7	6.9
139	3362G	U2C-2-101014	8	20	23.0	6.7	6.9
146	3350G	DGS-13SG-101013	8	20	22.9	6.6	6.8
154	3360G	DGS-34SG-101012	8	20	23.0	6.6	6.8
157	3361G	DGS-35SG-101012	8	20	22.7	6.2	6.6
181	3343G	DGS-02SG-101014	8	20	22.6	6.2	6.8
186	3348G	DGS-09SG-101013	8	20	22.5	6.5	6.9
3	3345G	DGS-05SG-101014	8	21	22.9		
9	3363G	U4Q-1-101014	8	21	22.7		
21	3338G	Control	8	21	22.7		
30	3349G	DGS-12SG-101013	8	21	22.8		
32	3364G	U4Q-2-101014	8	21	22.6		
38	3356G	DGS-26SG-101013	8	21	22.5		

42	3354G	DGS-21SG-101013	8	21	22.4			
48	3342G	DGS-01SG-101014	8	21	22.4			
70	3344G	DGS-04SG-101013	8	21	22.7			
76	3352G	DGS-17SG-101013	8	21	22.6			
95	3351G	DGS-16SG-101013	8	21	22.8			
99	3357G	DGS-30SG-101012	8	21	22.6			
101	3358G	DGS-31SG-101012	8	21	22.6			
103	3355G	DGS-25SG-101013	8	21	22.5			
109	3346G	DGS-06SG-101014	8	21	22.5			
112	3347G	DGS-08SG-101013	8	21	22.5			
124	3353G	DGS-20SG-101013	8	21	22.5			
133	3359G	DGS-33SG-101012	8	21	22.8			
139	3362G	U2C-2-101014	8	21	22.8			
146	3350G	DGS-13SG-101013	8	21	22.7			
154	3360G	DGS-34SG-101012	8	21	22.8			
157	3361G	DGS-35SG-101012	8	21	22.5			
181	3343G	DGS-02SG-101014	8	21	22.5			
186	3348G	DGS-09SG-101013	8	21	22.7			
3	3345G	DGS-05SG-101014	8	22	22.8	6.5	141	6.8
9	3363G	U4Q-1-101014	8	22	22.7	6.0	143	6.8
21	3338G	Control	8	22	22.7	5.2	150	6.9
30	3349G	DGS-12SG-101013	8	22	22.9	6.3	140	6.9
32	3364G	U4Q-2-101014	8	22	22.7	6.6	137	6.8
38	3356G	DGS-26SG-101013	8	22	22.6	6.3	139	6.9
42	3354G	DGS-21SG-101013	8	22	22.5	6.1	137	6.8
48	3342G	DGS-01SG-101014	8	22	22.5	6.1	136	6.8
70	3344G	DGS-04SG-101013	8	22	22.9	5.9	136	6.7
76	3352G	DGS-17SG-101013	8	22	22.8	6.3	137	7.0
95	3351G	DGS-16SG-101013	8	22	22.9	6.4	135	6.9
99	3357G	DGS-30SG-101012	8	22	22.7	6.5	135	6.9
101	3358G	DGS-31SG-101012	8	22	22.7	6.1	134	6.8
103	3355G	DGS-25SG-101013	8	22	22.6	6.2	137	6.9
109	3346G	DGS-06SG-101014	8	22	22.5	6.0	136	7.0
112	3347G	DGS-08SG-101013	8	22	22.5	6.3	134	6.9
124	3353G	DGS-20SG-101013	8	22	22.7	6.2	140	7.3
133	3359G	DGS-33SG-101012	8	22	23.0	6.4	136	7.0
139	3362G	U2C-2-101014	8	22	23.0	6.1	137	7.0
146	3350G	DGS-13SG-101013	8	22	22.8	6.0	136	6.9
154	3360G	DGS-34SG-101012	8	22	23.0	6.2	133	6.8
157	3361G	DGS-35SG-101012	8	22	22.7	5.8	130	6.7
181	3343G	DGS-02SG-101014	8	22	22.6	5.8	135	6.8
186	3348G	DGS-09SG-101013	8	22	22.7	6.2	133	6.8
3	3345G	DGS-05SG-101014	8	23	22.7			
9	3363G	U4Q-1-101014	8	23	22.5			
21	3338G	Control	8	23	22.5			
30	3349G	DGS-12SG-101013	8	23	22.7			
32	3364G	U4Q-2-101014	8	23	22.4			
38	3356G	DGS-26SG-101013	8	23	22.3			
42	3354G	DGS-21SG-101013	8	23	22.2			
48	3342G	DGS-01SG-101014	8	23	22.2			
70	3344G	DGS-04SG-101013	8	23	22.6			
76	3352G	DGS-17SG-101013	8	23	22.5			
95	3351G	DGS-16SG-101013	8	23	22.7			
99	3357G	DGS-30SG-101012	8	23	22.4			
101	3358G	DGS-31SG-101012	8	23	22.5			
103	3355G	DGS-25SG-101013	8	23	22.3			
109	3346G	DGS-06SG-101014	8	23	22.3			
112	3347G	DGS-08SG-101013	8	23	22.3			
124	3353G	DGS-20SG-101013	8	23	22.4			
133	3359G	DGS-33SG-101012	8	23	22.7			

139	3362G	U2C-2-101014	8	23	22.7								
146	3350G	DGS-13SG-101013	8	23	22.5								
154	3360G	DGS-34SG-101012	8	23	22.7								
157	3361G	DGS-35SG-101012	8	23	22.3								
181	3343G	DGS-02SG-101014	8	23	22.3								
186	3348G	DGS-09SG-101013	8	23	22.4								
3	3345G	DGS-05SG-101014	8	24	22.7	6.8		6.8					
9	3363G	U4Q-1-101014	8	24	22.5	6.3		6.8					
21	3338G	Control	8	24	22.5	6.1		7.0					
30	3349G	DGS-12SG-101013	8	24	22.8	6.6		7.0					
32	3364G	U4Q-2-101014	8	24	22.5	6.8		6.8					
38	3356G	DGS-26SG-101013	8	24	22.3	6.5		6.9					
42	3354G	DGS-21SG-101013	8	24	22.3	6.5		6.9					
48	3342G	DGS-01SG-101014	8	24	22.2	6.3		6.8					
70	3344G	DGS-04SG-101013	8	24	22.6	6.3		6.8					
76	3352G	DGS-17SG-101013	8	24	22.5	6.8		6.9					
95	3351G	DGS-16SG-101013	8	24	22.7	6.6		6.9					
99	3357G	DGS-30SG-101012	8	24	22.4	6.7		6.9					
101	3358G	DGS-31SG-101012	8	24	22.4	6.5		6.8					
103	3355G	DGS-25SG-101012	8	24	22.3	6.5		6.9					
109	3346G	DGS-06SG-101014	8	24	22.3	6.2		7.0					
112	3347G	DGS-08SG-101013	8	24	22.3	6.6		7.0					
124	3353G	DGS-20SG-101013	8	24	22.3	6.6		7.2					
133	3359G	DGS-33SG-101012	8	24	22.7	7.0		7.2					
139	3362G	U2C-2-101014	8	24	22.8	6.9		7.1					
146	3350G	DGS-13SG-101013	8	24	22.6	6.9		7.1					
154	3360G	DGS-34SG-101012	8	24	22.8	7.0		6.9					
157	3361G	DGS-35SG-101012	8	24	22.5	6.8		6.8					
181	3343G	DGS-02SG-101014	8	24	22.4	6.3		6.9					
186	3348G	DGS-09SG-101013	8	24	22.4	6.4		6.9					
3	3345G	DGS-05SG-101014	8	25	22.7								
9	3363G	U4Q-1-101014	8	25	22.6								
21	3338G	Control	8	25	22.4								
30	3349G	DGS-12SG-101013	8	25	22.7								
32	3364G	U4Q-2-101014	8	25	22.3								
38	3356G	DGS-26SG-101013	8	25	22.3								
42	3354G	DGS-21SG-101013	8	25	22.2								
48	3342G	DGS-01SG-101014	8	25	22.2								
70	3344G	DGS-04SG-101013	8	25	22.6								
76	3352G	DGS-17SG-101013	8	25	22.4								
95	3351G	DGS-16SG-101013	8	25	22.7								
99	3357G	DGS-30SG-101012	8	25	22.4								
101	3358G	DGS-31SG-101012	8	25	22.4								
103	3355G	DGS-25SG-101012	8	25	22.4								
109	3346G	DGS-06SG-101014	8	25	22.4								
112	3347G	DGS-08SG-101013	8	25	22.3								
124	3353G	DGS-20SG-101013	8	25	22.4								
133	3359G	DGS-33SG-101012	8	25	22.6								
139	3362G	U2C-2-101014	8	25	22.7								
146	3350G	DGS-13SG-101013	8	25	22.5								
154	3360G	DGS-34SG-101012	8	25	22.6								
157	3361G	DGS-35SG-101012	8	25	22.3								
181	3343G	DGS-02SG-101014	8	25	22.2								
186	3348G	DGS-09SG-101013	8	25	22.3								
3	3345G	DGS-05SG-101014	8	26	22.3								
9	3363G	U4Q-1-101014	8	26	22.3								
21	3338G	Control	8	26	22.2								
30	3349G	DGS-12SG-101013	8	26	22.5								
32	3364G	U4Q-2-101014	8	26	22.1								
38	3356G	DGS-26SG-101013	8	26	22.1								

42	3354G	DGS-21SG-101013	8	26	22.0						
48	3342G	DGS-01SG-101014	8	26	22.1						
70	3344G	DGS-04SG-101013	8	26	22.4						
76	3352G	DGS-17SG-101013	8	26	22.3						
95	3351G	DGS-16SG-101013	8	26	22.5						
99	3357G	DGS-30SG-101012	8	26	22.2						
101	3358G	DGS-31SG-101012	8	26	22.3						
103	3355G	DGS-25SG-101012	8	26	22.1						
109	3346G	DGS-06SG-101014	8	26	22.0						
112	3347G	DGS-08SG-101013	8	26	22.1						
124	3353G	DGS-20SG-101013	8	26	22.2						
133	3359G	DGS-33SG-101012	8	26	22.5						
139	3362G	U2C-2-101014	8	26	22.5						
146	3350G	DGS-13SG-101013	8	26	22.4						
154	3360G	DGS-34SG-101012	8	26	22.5						
157	3361G	DGS-35SG-101012	8	26	22.1						
181	3343G	DGS-02SG-101014	8	26	22.0						
186	3348G	DGS-09SG-101013	8	26	22.1						
3	3345G	DGS-05SG-101014	8	27	22.4	6.6		6.4			
9	3363G	U4Q-1-101014	8	27	22.3	6.0		6.5			
21	3338G	Control	8	27	22.2	6.0		6.7			
30	3349G	DGS-12SG-101013	8	27	22.6	6.6		6.6			
32	3364G	U4Q-2-101014	8	27	22.0	6.5		6.6			
38	3356G	DGS-26SG-101013	8	27	22.0	6.8		6.6			
42	3354G	DGS-21SG-101013	8	27	22.0	6.7		6.5			
48	3342G	DGS-01SG-101014	8	27	22.0	6.6		6.6			
70	3344G	DGS-04SG-101013	8	27	22.8	6.3		6.4			
76	3352G	DGS-17SG-101013	8	27	22.4	7.0		6.6			
95	3351G	DGS-16SG-101013	8	27	22.8	7.0		6.6			
99	3357G	DGS-30SG-101012	8	27	22.4	6.9		6.6			
101	3358G	DGS-31SG-101012	8	27	22.4	6.8		6.5			
103	3355G	DGS-25SG-101012	8	27	22.2	6.4		6.7			
109	3346G	DGS-06SG-101014	8	27	22.2	6.2		6.6			
112	3347G	DGS-08SG-101013	8	27	22.2	6.7		6.7			
124	3353G	DGS-20SG-101013	8	27	22.3	6.5		6.9			
133	3359G	DGS-33SG-101012	8	27	22.9	6.8		6.8			
139	3362G	U2C-2-101014	8	27	22.9	6.5		6.8			
146	3350G	DGS-13SG-101013	8	27	22.5	6.6		6.7			
154	3360G	DGS-34SG-101012	8	27	22.9	6.8		6.7			
157	3361G	DGS-35SG-101012	8	27	22.3	6.6		6.5			
181	3343G	DGS-02SG-101014	8	27	22.2	6.4		6.7			
186	3348G	DGS-09SG-101013	8	27	22.4	6.6		6.7			
3	3345G	DGS-05SG-101014	8	28	23.0	7.2	135	6.7	<0.1	34	30
9	3363G	U4Q-1-101014	8	28	22.9	6.3	137	6.6	<0.1	34	30
21	3338G	Control	8	28	22.4	6.7	136	6.8	<0.1	34	20
30	3349G	DGS-12SG-101013	8	28	22.8	7.3	136	6.9	<0.1	34	20
32	3364G	U4Q-2-101014	8	28	22.1	7.1	132	6.8	<0.1	34	30
38	3356G	DGS-26SG-101013	8	28	22.4	7.3	132	6.9	<0.1	34	30
42	3354G	DGS-21SG-101013	8	28	22.0	7.1	132	6.7	<0.1	34	30
48	3342G	DGS-01SG-101014	8	28	22.1	7.1	130	6.9	<0.1	34	20
70	3344G	DGS-04SG-101013	8	28	22.5	6.9	133	6.7	<0.1	34	20
76	3352G	DGS-17SG-101013	8	28	22.1	7.3	132	6.9	<0.1	34	20
95	3351G	DGS-16SG-101013	8	28	22.4	7.3	131	6.9	<0.1	34	20
99	3357G	DGS-30SG-101012	8	28	22.0	7.3	130	7.0	<0.1	34	20
101	3358G	DGS-31SG-101012	8	28	22.0	7.1	129	6.9	0.1	34	20
103	3355G	DGS-25SG-101012	8	28	22.0	7.3	128	7.0	<0.1	34	30
109	3346G	DGS-06SG-101014	8	28	22.2	6.9	128	6.9	<0.1	34	20
112	3347G	DGS-08SG-101013	8	28	22.0	7.3	128	7.2	<0.1	34	30
124	3353G	DGS-20SG-101013	8	28	22.0	7.3	130	7.1	<0.1	34	30
133	3359G	DGS-33SG-101012	8	28	22.6	7.3	130	7.1	<0.1	34	30

Freshwater Sediment Test
28-Day Hyalella azteca

139	3362G	U2C-2-101014	8	28	22.6	7.1	131	7.1	<0.1	34	30			
146	3350G	DGS-13SG-101013	8	28	22.2	7.1	127	7.0	<0.1	34	30			
154	3360G	DGS-34SG-101012	8	28	22.5	7.1	128	7.0	<0.1	34	30			
157	3361G	DGS-35SG-101012	8	28	22.0	7.0	124	6.8	<0.1	34	30			
181	3343G	DGS-02SG-101014	8	28	22.1	7.1	128	7.1	<0.1	34	20			
186	3348G	DGS-09SG-101013	8	28	22.0	7.1	127	6.9	<0.1	34	30			
				Mean	22.7	6.7	133	6.9	—	38	30		6.8	—
				SD	0.4	0.4	11	0.2	—	5	7		0.2	—
				n	696	336	144	336	48	48	48		24	24
				Min	21.9	5.1	119	6.4	<0.1	34	20		6.2	<0.5
				Max	23.7	7.8	228	7.3	1.7	51	40		7.2	21.2

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.	-----	0.093	1.00		
	3.0 mg/L NH_3-N Std.	-----	0.310	3.00		
	6.0 mg/L NH_3-N Std.	-----	0.605	6.00		
	10.0 mg/L NH_3-N Std.	-----	1.050	10.00		
	3.0 mg/L spike	-----	0.315	3.03		
	3.0 mg/L spike dupl.	-----	0.311	3.00		
	5.0 mg/L 2nd source		0.525	5.06		
1.	3338G	5	0.049	2.36		
2.	3342G	5	0.101	4.86		
3.	3343G	5	0.182	8.76		
4.	3344G	5	0.440	21.19		
5.	3345G	5	0.040	1.93		
6.	3346G	5	0.176	8.48		
7.	3347G	5	0.054	2.60		
8.	3348G	5	0.128	6.16		
9.	3349G	5	0.085	4.09		
10.	3350G	5	0.148	7.13		
11.	3351G	5	0.071	3.42		
12.	3352G	5	0.080	3.85		
13.	3353G	5	0.010	ND		
14.	3354G	5	0.158	7.61		
15.	3355G	5	0.034	1.64		
16.	3356G	5	0.112	5.39		
17.	3357G	5	0.060	2.89		
18.	3358G	5	0.110	5.30		
19.	3359G	5	0.060	2.89		
20.	3360G	5	0.168	8.09		
21.	3361G	5	0.311	14.98		
22.	3362G	5	0.036	1.73		
23.	3363G	5	0.102	4.91		
24.	3364G	5	0.077	3.71		
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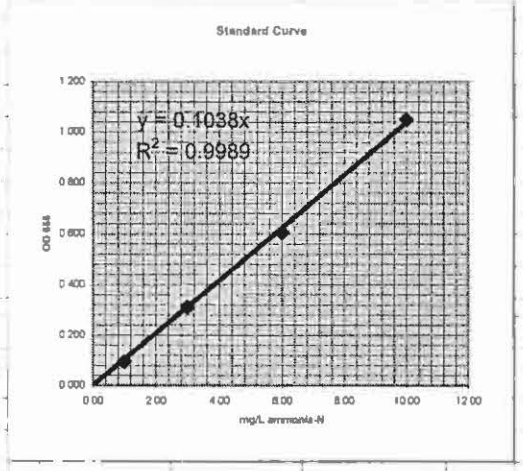

Reporting limit (mg/L) =	0.5
Recovery (%) =	100.5
Precision (RPD) =	1.28
2nd source (%) =	101.1
Sample volume (ml):	0.10
Dilution factor	5

Sample Set Description:

Proj.No.: 814
Test Day:
Species:

Sediment porewaters

Analyst: RSC
Date analysed: 10/22/2010

Total Ammonia-N in Sediment Pore Water: Computation Worksheet
Salicylate Method (SOP #5492)

Result

	Sample description	Dilution factor	OD655	NH_3-N (mg/L)	pH	Salinity (ppt)
	Blank	-----	-----	-----		
	1.0 mg/L NH_3-N Std.	-----	.093	1.00		
	3.0 mg/L NH_3-N Std.	-----	.310	3.00		
	6.0 mg/L NH_3-N Std.	-----	.605	6.00		
	10.0 mg/L NH_3-N Std.	-----	1.05	10.00		
	3.0 mg/L spike	-----	.315			
	3.0 mg/L spike dupl.	-----	.311			
	5.0 mg/L 2nd source		.525			
1.	3338G	5	.049		6.2	
2.	3342G	5	.101		6.5	
3.	3343G	5	.182		6.7	
4.	3344G	5	.440		6.8	
5.	3345G	5	.040		6.9	
6.	3346G	5	.176		6.7	
7.	3347G	5	.054		6.9	
8.	3348G	5	.128		6.8	
9.	3349G	5	.085		6.8	
10.	3350G	5	.148		6.8	
11.	3351G	5	.071		7.0	
12.	3352G	5	.080		7.2	
13.	3353G	5	.010		7.2	
14.	3354G	5	.158		7.2	
15.	3355G	5	.024		7.1	
16.	3356G	5	.112		6.7	
17.	3357G	5	.060		6.8	
18.	3358G	5	.110		6.8	
19.	3359G	5	.060		6.9	
20.	3360G	5	.188		6.7	
21.	3361G	5	.311		6.6	
22.	3362G	5	.036		6.8	
23.	3363G	5	.102		6.7	
24.	3364G	5	.077		6.7	
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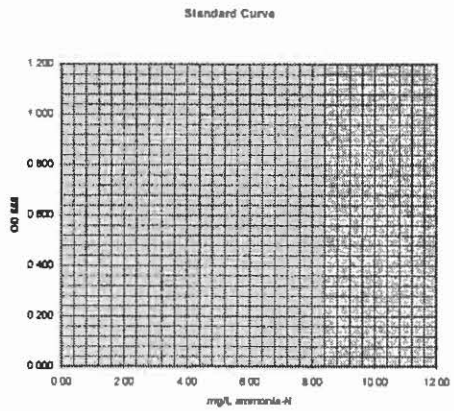


Reporting limit (mg/L) =	0.5
Recovery (%) =	#VALUE!
Precision (RPD) =	#VALUE!
2nd source (%) =	#VALUE!
Sample volume (ml):	0.10
Dilution factor	5

Sample Set Description:

Proj.No.: 814
Test Day:
Species:

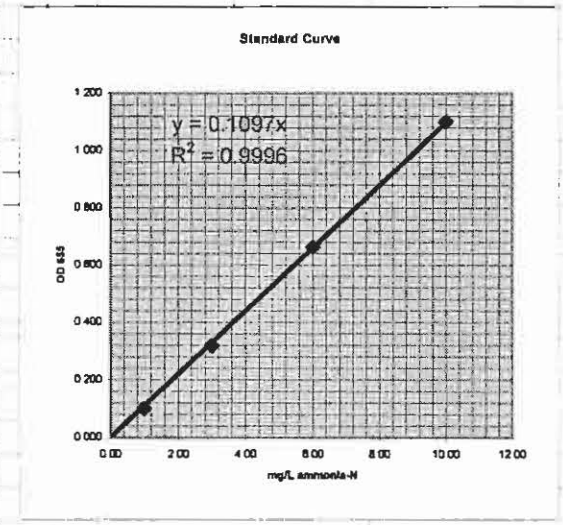
Sediment porewaters

Analyst: RSC
Date analysed: 10/22/2010

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.	-----	0.100	1.00
	3.0 mg/L NH_3-N Std.	-----	0.318	3.00
	6.0 mg/L NH_3-N Std.	-----	0.661	6.00
	10.0 mg/L NH_3-N Std.	-----	1.100	10.00
	3.0 mg/L spike	-----	0.329	3.00
	3.0 mg/L spike dupl.	-----	0.334	3.04
	5.0 mg/L 2nd source	-----	0.557	5.08
1.	3	1	0.011	0.10
2.	9	1	0.060	0.55
3.	21	1	0.032	0.29
4.	30	1	0.031	0.28
5.	32	1	0.058	0.53
6.	38	1	0.047	0.43
7.	42	1	0.077	0.70
8.	48	1	0.061	0.56
9.	70	1	0.189	1.72
10.	76	1	0.038	0.35
11.	95	1	0.028	0.26
12.	99	1	0.030	0.27
13.	101	1	0.053	0.48
14.	103	1	0.021	0.19
15.	109	1	0.076	0.69
16.	112	1	0.021	0.19
17.	124	1	0.009	ND
18.	133	1	0.032	0.29
19.	139	1	0.010	ND
20.	146	1	0.049	0.45
21.	154	1	0.073	0.67
22.	157	1	0.129	1.18
23.	181	1	0.080	0.73
24.	186	1	0.069	0.63
25.				
26.				
27.				
28.				
29.				
30.				
31.				
32.				
33.				
34.				
35.				
36.				



Reporting limit (mg/L) =	0.1
Recovery (%) =	100.7
Precision (RPD) =	-1.51
2nd source (%) =	101.5
Sample volume (ml):	0.50
Dilution factor	1

Sample Set Description:

Test No.: 814-1
Test Day: 0 (10-26-10)
Species: *Hyalella*

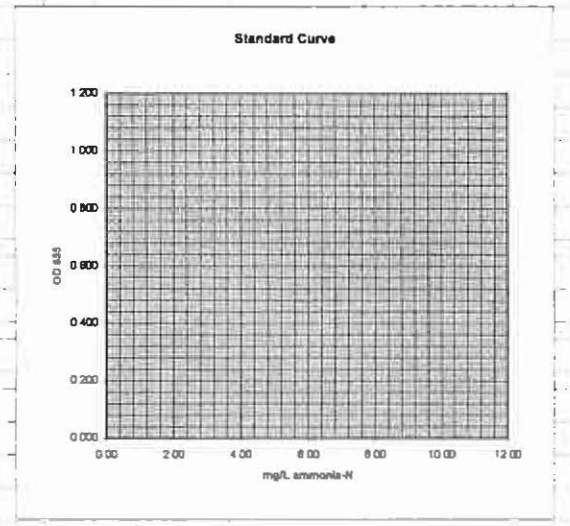
Overlying water

Analyst: RSC
Date analysed: 11/23/2010

Total Ammonia-N in Water: Computation Worksheet
Salicylate Method (SOP #5492)

Result

	Sample description	Dilution factor	OD655	NH3-N (mg/L)
	Blank	-----	-----	-----
	1.0 mg/L NH3-N Std.	-----	.100	1.00
	3.0 mg/L NH3-N Std.	-----	.718	3.00
	6.0 mg/L NH3-N Std.	-----	.661	6.00
	10.0 mg/L NH3-N Std.	-----	1.1	10.00
	3.0 mg/L spike	-----	.329	
	3.0 mg/L spike dupl.	-----	.334	
	5.0 mg/L 2nd source	-----	.557	
1.	3	1	.021	
2.	9	1	.060	
3.	21	1	.032	
4.	30	1	.031	
5.	32	1	.058	
6.	38	1	.047	
7.	42	1	.077	
8.	48	1	.061	
9.	70	1	.189	
10.	76	1	.038	
11.	95	1	.028	
12.	99	1	.030	
13.	101	1	.053	
14.	103	1	.021	
15.	109	1	.076	
16.	112	1	.021	
17.	124	1	.009	
18.	133	1	.032	
19.	139	1	.010	
20.	146	1	.049	
21.	154	1	.073	
22.	157	1	.129	
23.	181	1	.080	
24.	186	1	.069	
25.				
26.				
27.				
28.				
29.				
30.				
31.				
32.				
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.: 814-1
Test Day: 0 (10-26-10)
Species: *Hyalella*

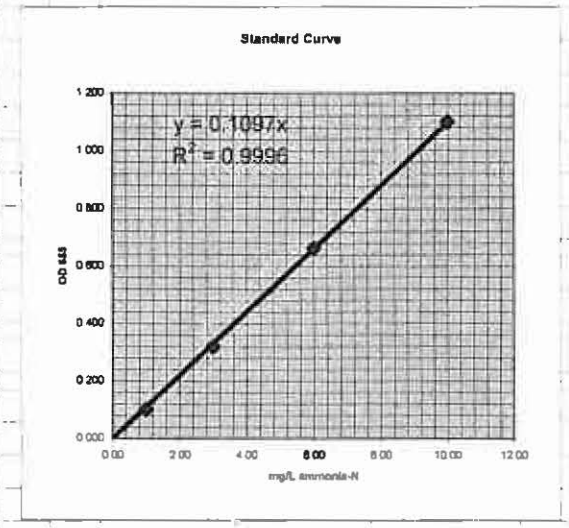
Overlying water

Analyst: RSC
Date analysed: 11/23/2010

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.	----	0.100	1.00
	3.0 mg/L NH_3-N Std.	-----	0.318	3.00
	6.0 mg/L NH_3-N Std.	-----	0.661	6.00
	10.0 mg/L NH_3-N Std.	-----	1.100	10.00
	3.0 mg/L spike	-----	0.329	3.00
	3.0 mg/L spike dupl.	-----	0.334	3.04
	5.0 mg/L 2nd source	-----	0.557	5.08
1.	3	1	0.000	ND
2.	9	1	0.000	ND
3.	21	1	0.008	ND
4.	30	1	0.000	ND
5.	32	1	0.001	ND
6.	38	1	0.000	ND
7.	42	1	0.000	ND
8.	48	1	0.000	ND
9.	70	1	0.005	ND
10.	76	1	0.000	ND
11.	95	1	0.005	ND
12.	99	1	0.000	ND
13.	101	1	0.011	0.10
14.	103	1	0.000	ND
15.	109	1	0.000	ND
16.	112	1	0.000	ND
17.	124	1	0.000	ND
18.	133	1	0.000	ND
19.	139	1	0.000	ND
20.	146	1	0.000	ND
21.	154	1	0.000	ND
22.	157	1	0.000	ND
23.	181	1	0.000	ND
24.	186	1	0.000	ND
25.				
26.				
27.				
28.				
29.				
30.				
31.				
32.				
33.				
34.				
35.				
36.				



Reporting limit (mg/L) =	0.1
Recovery (%) =	100.7
Precision (RPD) =	-1.51
2nd source (%) =	101.5
Sample volume (ml):	0.50
Dilution factor	1

Sample Set Description:

Test No.: 814-1
Test Day: 28 (11-23-10)
Species: *Hyalella*

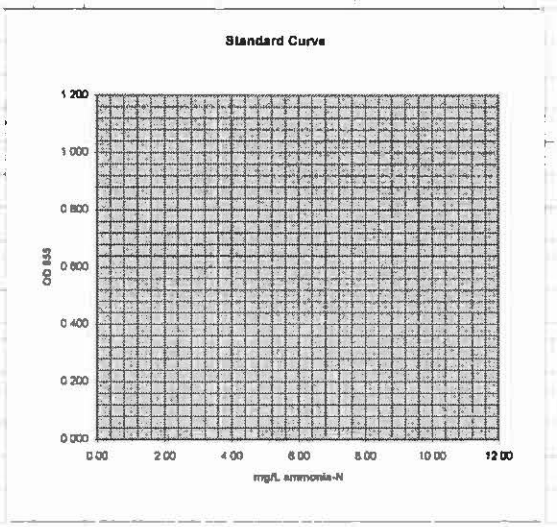
Overlying water

Analyst: RSC
Date analysed: 11/23/2010

Total Ammonia-N in Water: Computation Worksheet
Salicylate Method (SOP #5492)

Result

	Sample description	Dilution factor	OD655	NH3-N (mg/L)
	Blank	-----	-----	-----
	1.0 mg/L NH3-N Std.	-----	.100	1.00
	3.0 mg/L NH3-N Std.	-----	.318	3.00
	6.0 mg/L NH3-N Std.	-----	.661	6.00
	10.0 mg/L NH3-N Std.	-----	1.1	10.00
	3.0 mg/L spike	-----	.329	
	3.0 mg/L spike dupl.	-----	.334	
	5.0 mg/L 2nd source	-----	.557	
1.	3	1	.000	
2.	9	1	.000	
3.	21	1	.008	
4.	30	1	.000	
5.	32	1	.001	
6.	38	1	.000	
7.	42	1	.000	
8.	48	1	.000	
9.	70	1	.005	
10.	76	1	.000	
11.	95	1	.005	
12.	99	1	.000	
13.	101	1	.011	
14.	103	1	.000	
15.	109	1	.000	
16.	112	1	.000	
17.	124	1	.000	
18.	133	1	.000	
19.	139	1	.000	
20.	146	1	.000	
21.	154	1	.000	
22.	157	1	.000	
23.	181	1	.000	
24.	186	1	.000	
25.				
26.				
27.				
28.				
29.				
30.				
31.				
32.				
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.: 814-1
Test Day: 28 (11-23-10)
Species: *Hyalella*

Overlying water

Analyst: RSC
Date analysed: 11/23/2010

CHAIN-OF-CUSTODY RECORDS

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number:

Date: 10/15/10
Project Name: Gasco Data Gaps
Project Number: 000029-02
Project Manager: Ryan Barth
Phone Number: 206.903.3334
Shipment Method:

ANCHOR QEA

Line	Field Sample ID	Collection Date/Time	Matrix	No. of Containers	Bioassay	Test Parameters	Comments/Preservation
1	DGS-04SG-101013	10/13/10 1616	SED	1	X	NAS #3344G	
2	DGS-02SG-101014	10/14/10 0829		1	X	#3343G	
3	DGS-01SG-101014	1018		1	X	#3342G	
4	DGS-05SG-101014	1102		1	X	#3345G	
5	DGS-06SG-101014	1146		1	X	#3346G	
6	U2C-2-101014	1350		1	X	#3362G	Reference Samples
7	U4Q-2-101014	1446		1	X	#3364G	
8	U4Q-1-101014	1524		1	X	#3363G	
9							
10							
11							
12							
13							
14							
15							

10/15/10 DP

Notes:

PAGE 71 OF 73

Relinquished By:	Company: Anchor QEA, LLC
Delaney Peterson	10/15/10 0900
Signature/Printed Name	Date/Time

Received By:	Company: YL #756
YARED LISANEWORK	10/15/10 9:00AM
Signature/Printed Name	Date/Time

Relinquished By:	Company: YL #756
YARED LISANEWORK	10/15/10 12:16PM
Signature/Printed Name	Date/Time

Received By:	Company: NAS
GERALD IRISSARRI	10-15-10 1215
Signature/Printed Name	Date/Time

Distribution: A copy will be made for the laboratory and client. The Project file will retain the original.

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number:

Date: 10/15/10
Project Name: Gasco Data Gaps
Project Number: 000029-02
Project Manager: Ryan Barth
Phone Number: 206.903.3334
Shipment Method:

ANCHOR QEA

Line	Field Sample ID	Collection Date/Time	Matrix	No. of Containers	Test Parameters: Bioassay																			Comments/Preservation
1	DGS-30SG-101012	10/12/10 1002	Sed	1	X																	NAS		#3357G
2	DGS-33SG-101012	1110		1	X																			#3359G
3	DGS-34SG-101012	1243		1	X																			#3360G
4	DGS-35SG-101012	1335		1	X																			#3361G
5	DGS-31SG-101012	1457		1	X																			#3358G
6	DGS-25SG-101012	1611		1	X																			#3355G
7	DGS-26SG-101013	10/13/10 0856		1	X																			#3356G
8	DGS-20SG-101013	0937		1	X																			#3353G
9	DGS-21SG-101013	1019		1	X																			#3354G
10	DGS-16SG-101013	1112		1	X																			#3351G
11	DGS-17SG-101013	1230		1	X																			#3352G
12	DGS-12SG-101013	1316		1	X																			#3349G
13	DGS-08SG-101013	1356		1	X																			#3347G
14	DGS-13SG-101013	1440		1	X																			#3350G
15	DGS-09SG-101013	1518		1	X																			#3348G

Notes:

PAGE 72 OF 73

Relinquished By:	Company: Anchor QEA, LLC
Delaney Peterson	10/15/10 0845
Signature/Printed Name	Date/Time

Received By:	Company: YL #756
YARED LISANEWORK	10/15/10 9:10AM
Signature/Printed Name	Date/Time

Relinquished By:	Company: YL #756
YARED LISANEWORK	10/15/10 12:16PM
Signature/Printed Name	Date/Time

Received By:	Company: NAS
GERALD IRISSARRI	10-15-10 1215
Signature/Printed Name	Date/Time

Distribution: A copy will be made for the laboratory and client. The Project file will retain the original

Cooler Temp. (°C)	Samples in cooler
3.0	04, U4Q-1 reference
1.5	30, 33, 34
1.0	08, 09, 13
1.0	25, 31, 35
1.0	U4Q-2 reference, U2C-2 reference
1.5	21, 20, 26
1.0	12, 16, 17
1.5	02, 05, 06, 10

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. 999-2805 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. GA Buhler 2. _____

3. _____ 4. _____

Test Beginning: 10-26-10 0915 Test Ending: 10-30-10 1000

TEST MATERIAL

Description: Potassium Chloride Crystals - Lot No.: FISHER 073280

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: 10-15-10

Water Quality: Cond. (umhos/cm): 305 Salinity (ppt) _____ pH 7.9

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	0.063	0.125	1	0.25	∅	0.5				
A	0.25	∅	0.5	0.063	0.125	1				

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

Revised 12-5-01

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-_____

ACUTE TOXICITY TEST (ALL SPECIES)

Test No. 999-2805 Client QC Test Investigator _____

TEST ORGANISMS

Species: *Hyalella azteca* Age: 7-8 DAYS Size: _____

Source: Chesapeake Cultures, Hayes, VA Date received: 10-22-10

Acclimation Data:

Date	Temp. (deg.C)	pH	Cond. umhos/cm	DO (mg/L)	Hardness (mg/L)	Alkalinity (mg/L)	Feeding Amount	Feeding description	Water changes
10-22-10	19.8	7.3	442	>15.0	171	180	10mL/PAN	YTC	1/2 WATER REPLACED W/ DILUTION WATER
10-23-10	22.3	8.1	320	8.3	120	110	"	"	"
10-24-10	22.5	7.7	227	7.9	86	80	"	"	"
10-25-10	22.2	6.9	212	8.2	68	60	"	"	"
10-26-10	22.0	7.2	179	9.3	60	40	"	"	—
Mean	21.8	7.4	276	9.5	101	94			
S.D.	1.1	0.5	107	3.1	45	55			
(N)	5	5	5	5	5	5			

Photoperiod during acclimation: 16:8, L:D

TEST PROCEDURES AND CONDITIONS

Test concentrations (50% series recommended): 1, 0.5, 0.25, 0.125, 0.063 0 g/L

Test chamber: 250 ml glass beakers Test volume: 100 ml

Replicates/treatment: 2 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:

Working stock: Dissolve 0.5g KCl crystals in dilution water and dilute to 500 mL.
Final conc.: 1.0 g/L.

Test concentration (g/L)	KCl working stock (ml/200ml)	Dilution water
1	200	Brought up to final volume of 200 ml with dilution water and distributed evenly between two replicates
0.5	100	
0.25	50	
0.125	25	
0.063	12.5	
0	0	

10-26-10 bsl

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-_____

ACUTE TOXICITY TEST (ALL SPECIES)

Test No. 999-2805 Client QC Test

DAILY RECORD SHEET

Day 0 (10 /26/10) GJL

Conc. (g/L)	Temp. (deg.C)	pH	Cond. (umhos/cm)	DO (ppm)	Hardness (mg/L)	Alkalinity (mg/L)	Survivors A	Survivors B
1. 1	23.5	8.0	1871	8.0	86	70	10	10
2. 0.5	23.6	7.9	1082	8.1			10	10
3. 0.25	23.6	7.9	677	8.0			10	10
4. 0.125	23.6	7.9	483	8.0			10	10
5. 0.063	23.6	7.9	379	8.0			10	10
6. 0	23.6	7.8	264	8.0	86	70	10	10

All animals fed 0.5 ml YTC suspension. Initials: GJL

Day 1 (10/27/10) GJL

Conc. (g/L)	Temp. (deg.C)	pH	Cond. (umhos/cm)	DO (ppm)	Hardness (mg/L)	Alkalinity (mg/L)	Survivors A	Survivors B
1. 1	23.3	8.1	2020	8.1			0(10D)	0(10D)
2. 0.5	23.4	8.0	1209	7.9			10	8(2D)
3. 0.25	23.4	7.9	745	7.9			10	10
4. 0.125	23.5	7.9	537	7.8			10	10
5. 0.063	23.5	7.9	421	7.7			10	10
6. 0	23.4	7.9	305	7.9			10	10

Day 2 (10 / 28/10) YN/GJL

Conc. (g/L)	Temp. (deg.C)	pH	Cond. (umhos/cm)	DO (ppm)	Hardness (mg/L)	Alkalinity (mg/L)	Survivors A	Survivors B
1. 1	—	—	—	—			∅	∅
2. 0.5	23.8	7.8	1239	7.3			5(5D)	4(4D)
3. 0.25	24.0	7.8	768	7.3			10	10 ~~9(1D)~~ GJL
4. 0.125	23.9	7.8	560	7.4			10	10
5. 0.063	23.9	7.8	436	7.3			10	9(1D)
6. 0	23.8	7.8	316	7.3			10	10

All animals fed 0.5 ml YTC suspension. Initials: GJL

Day 3 (10 /29/10) GJL

Conc. (g/L)	Temp. (deg.C)	pH	Cond. (umhos/cm)	DO (ppm)	Hardness (mg/L)	Alkalinity (mg/L)	Survivors A	Survivors B
1. 1	—	—	—	—			∅	∅
2. 0.5	23.9	7.8	1229	7.3			4(1D)	3(1D)
3. 0.25	24.0	7.8	751	7.2			10	10
4. 0.125	23.9	7.8	555	7.3			10	10
5. 0.063	23.8	7.8	423	7.4			10	9
6. 0	23.7	7.7	299	7.4			10	10

Day 4 (10 /30/10) GJL

Conc. (g/L)	Temp. (deg.C)	pH	Cond. (umhos/cm)	DO (ppm)	Hardness (mg/L)	Alkalinity (mg/L)	Survivors A	Survivors B
1. 1	—	—	—	—	—	—	0	0
2. 0.5	23.9	7.9	1296	7.2			4	1(2D)
3. 0.25	24.0	7.9	776	7.3			10	9(1D)
4. 0.125	23.9	7.8	578	7.3			10	10
5. 0.063	23.9	7.9	436	7.3			10	9
6. 0	24.0	7.9	314	7.4	86	80	10	10
Mean	23.7	7.9		7.6	86	73		
SD	0.2	0.1		0.3	0.0	6		
n	27	27		27	3	3		

Revised 12-5-01

Chesapeake Cultures

P.O. Box 507 Hayes, VA 23072 (804)693-4046 (804)694-4704 fax
www.c-cultures.com
growfish@c-cultures.com

NAS

Shipment Information

Species Hyalella azteca Date 10/21/10

Age ~2-3 days on shipment 1-1.3 mm P.O. No. verbal

Quantity 2500+ Invoice No. 7007

Temperature 23.5°C Salinity — pH 7.95

Notes Rec'd 10-22-10 BT

Biologist SR

Please inspect shipment and report any problem immediately

Acute 96-hr Toxicity Test-96 Hr Survival

Start Date:	10/26/2010 09:15	Test ID:	999-2805	Sample ID:	REF-Ref Toxicant
End Date:	10/30/2010 10:00	Lab ID:	ORNAS-Northwestern Aquati	Sample Type:	KCL-Potassium chloride
Sample Date:		Protocol:	EPAF 91-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:					

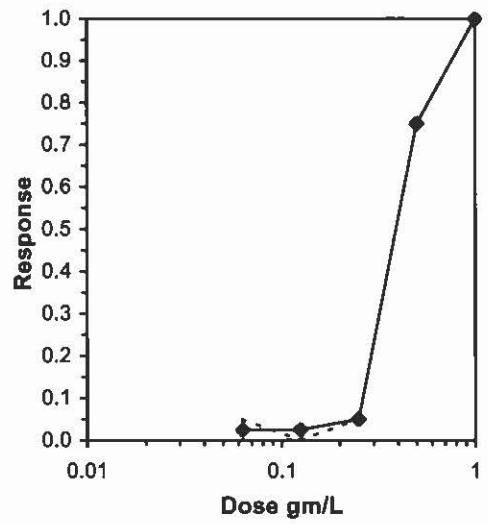
Conc-gm/L	1	2
D-Control	1.0000	1.0000
0.063	1.0000	0.9000
0.125	1.0000	1.0000
0.25	1.0000	0.9000
0.5	0.4000	0.1000
1	0.0000	0.0000

			Transform: Arcsin Square Root					Number	Total
Conc-gm/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
0.063	0.9500	0.9500	1.3305	1.2490	1.4120	8.661	2	1	20
0.125	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	2	0	20
0.25	0.9500	0.9500	1.3305	1.2490	1.4120	8.661	2	1	20
0.5	0.2500	0.2500	0.5032	0.3218	0.6847	51.002	2	15	20
1	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%	0.4061	0.3492	0.4723
10.0%	0.4003	0.3414	0.4692
20.0%	0.3918	0.3335	0.4603
Auto-2.5%	0.4058	0.3459	0.4760

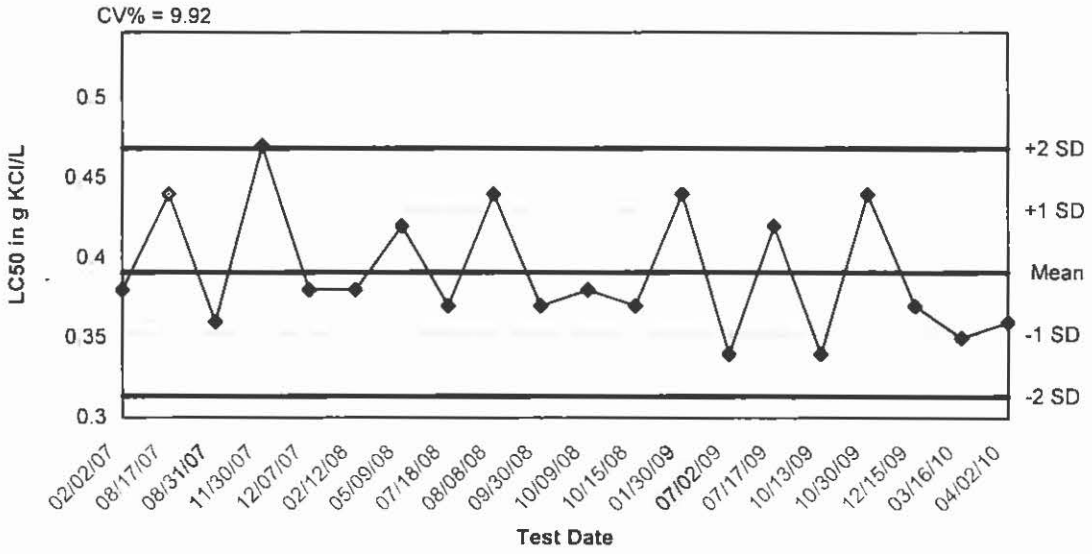


Test: AT-Acute 96-hr Toxicity Test	Test ID: 999-2805
Species: HA-Hyalella azteca	Protocol: EPAF 91-EPA Freshwater
Sample ID: REF-Ref Toxicant	Sample Type: KCL-Potassium chloride
Start Date: 10/26/2010 09:15 End Date: 10/30/2010 1(	Lab ID: ORNAS-Northwestern Aquatic Sciences

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	0.063	10	10	10	10	10	
	4	2	0.063	10	10	9	9	9	
	5	1	0.125	10	10	10	10	10	
	6	2	0.125	10	10	10	10	10	
	7	1	0.250	10	10	10	10	10	
	8	2	0.250	10	10	10	10	9	
	9	1	0.500	10	10	5	4	4	
	10	2	0.500	10	8	4	3	1	
	11	1	1.000	10	0	0	0	0	
	12	2	1.000	10	0	0	0	0	

Comments:

Amphipod, Hyalella azteca, acute reference toxicant test



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
02/02/07	0.3800	0.3910	0.3522	0.3134	0.4298	0.4686
08/17/07	0.4400	0.3910	0.3522	0.3134	0.4298	0.4686
08/31/07	0.3600	0.3910	0.3522	0.3134	0.4298	0.4686
11/30/07	0.4700	0.3910	0.3522	0.3134	0.4298	0.4686
12/07/07	0.3800	0.3910	0.3522	0.3134	0.4298	0.4686
02/12/08	0.3800	0.3910	0.3522	0.3134	0.4298	0.4686
05/09/08	0.4200	0.3910	0.3522	0.3134	0.4298	0.4686
07/18/08	0.3700	0.3910	0.3522	0.3134	0.4298	0.4686
08/08/08	0.4400	0.3910	0.3522	0.3134	0.4298	0.4686
09/30/08	0.3700	0.3910	0.3522	0.3134	0.4298	0.4686
10/09/08	0.3800	0.3910	0.3522	0.3134	0.4298	0.4686
10/15/08	0.3700	0.3910	0.3522	0.3134	0.4298	0.4686
01/30/09	0.4400	0.3910	0.3522	0.3134	0.4298	0.4686
07/02/09	0.3400	0.3910	0.3522	0.3134	0.4298	0.4686
07/17/09	0.4200	0.3910	0.3522	0.3134	0.4298	0.4686
10/13/09	0.3400	0.3910	0.3522	0.3134	0.4298	0.4686
10/30/09	0.4400	0.3910	0.3522	0.3134	0.4298	0.4686
12/15/09	0.3700	0.3910	0.3522	0.3134	0.4298	0.4686
03/16/10	0.3500	0.3910	0.3522	0.3134	0.4298	0.4686
04/02/10	0.3600	0.3910	0.3522	0.3134	0.4298	0.4686

GMR
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