STATEMENT OF QUALIFICATIONS, QUALITY ASSURANCE/QUALITY CONTROL MANUAL

Aquatic Bioassay
and Consulting Laboratories, Inc.
29 North Olive Street
Ventura, California 93001

(805) 643-5621

Revision #10
March 31, 2009

AQUATIC BIOASSAY AND CONSULTING, INC.
29 NORTH OLIVE STREET
VENTURA, CA 93001

QUALITY ASSURANCE MANUAL REVISION NUMBER: 10
QUALITY ASSURANCE MANUAL REVISION DATE: 3/31/09

Quality Assurance Manual Approval:

Approved by:

Name: Thomas Mikel
Title: President
Signature:
Date: 3/31/09

Concurrences:

Name: Scott C. Johnson
Title: Laboratory Director/Director, Aquatic Operations & Environmental Consulting
Signature:
Date: 3/31/09

Name: MichaelMachuzak
Title: Laboratory Manager/QC Officer
Signature:
Date: 3/31/09

TABLE OF CONTENTS

1. INTRODUCTION

2. COMPANY BACKGROUND AND EXPERIENCE

3. FACILITIES

3.1. LABORATORIES

3.2. TEMPERATURE AND LIGHT CONTROL

3.3. FRESH AND MARINE WATER SOURCES

3.4. TEST ORGANISMS: SOURCES, CULTURING AND HOLDING

3.5. DATA ANALYSIS CAPABILITIES

4. STAFF QUALIFICATIONS AND EXPERIENCE

4.1. DESCRIPTION OF STAFF RESPONSIBILITIES

4.2. EDUCATION AND EXPERIENCE OF KEY PERSONNEL

4.3. LABORATORY CERTIFICATIONS

5. TEST SPECIES UTILIZED FOR BIOASSAY TESTING

6. RECENT BIOASSAY CLIENTS

6.1. RELATED WORK EXPERIENCE

7. DATA QUALITY OBJECTIVES, ASSURANCE AND QUALITY CONTROL

7.1. CHAIN OF CUSTODY PROCEDURES, SAMPLE HANDLING, SAMPLE DISPOSAL

7.2. GOOD LABORATORY PRACTICES AND PERFORMANCE AUDITS

7.3. QUALITY ASSURANCE REPORTS AND REFERENCE TOXICANT TESTING AND QUALITY CONTROL CHARTS

7.4. INSTRUMENT CALIBRATION AND LOG-KEEPING TECHNIQUES

7.5. INTERLABORATORY DMR, AND SPLIT-SAMPLE TESTING

7.6. STANDARD OPERATING PROCEDURES

7.7. REPORTING

8. APPENDICES

8.1 EXAMPLES OF A COMPLETED BIOASSAY REPORTS

8.2. RESUMES OF KEY PERSONNEL

8.3. EXAMPLE OF A CHRONIC BIOASSAY WORKSHEET

8.4. DOHS LABORATORY CERTIFICATION

8.5. RECENT DMR & WP STUDY RESULTS

8.6. STANDARD OPERATING PROCEDURES

8.6.1. Hazardous Waste Toxicity Tests
8.6.2. Acute Effluent Toxicity Tests (EPA, 3rd Ed.)
8.6.3. Acute Effluent Toxicity Tests (EPA, 4th Ed.)
8.6.4. Acute Effluent Toxicity Tests (EPA, 5th Ed.)
8.6.5. Chronic Fathead Minnow Larvae Toxicity Test (EPA, 3rd Ed.)
8.6.6. Chronic Fathead Minnow Larvae Toxicity Test (EPA, 4th Ed.)
8.6.7. *Ceriodaphnia* Survival and Reproduction Toxicity Test (EPA, 3rd Ed.)
8.6.8. *Ceriodaphnia* Survival and Reproduction Toxicity Test (EPA, 4th Ed.)
8.6.9. *Selenastrum capricornutum* Toxicity Test (EPA, 3rd Ed.)
8.6.10. *Selenastrum capricornutum* Toxicity Test (EPA, 4th Ed.)
8.6.11. Chronic Silversides Minnow Toxicity Test
8.6.12. Red Abalone Toxicity Test
8.6.13. Giant Kelp Toxicity Test
8.6.14. Purple Sea Urchin Fertilization Toxicity Test
8.6.15. Purple Sea Urchin Larval Development Toxicity Test
8.6.16. Mysid Shrimp Sediment Toxicity Test
8.6.17. Chronic *Mysidopsis bahia* Shrimp Toxicity Test
8.6.18. Chronic *Holmesimysis costata* Shrimp Toxicity Test
8.6.19. Chronic Topsmelt Toxicity Test
8.6.20. Thermometer Calibration and Daily Temperature Monitoring
8.6.21. Total and Fecal Coliform Bacteriology (Multiple Tube Technique)
8.6.22. Inhibitory Residue Testing on Glassware and Plasticware
8.6.23. Sterility of Sampling Containers
8.6.24. Effectiveness of Sterilization in the Autoclave
8.6.25. Dissolved Oxygen, Modified Winkler and DO Probe
8.6.26. Biological Oxygen Demand (BOD)
8.6.27. *Hyalella azteca* 10 Day Sediment Survival Test

1. INTRODUCTION

Aquatic Bioassay's Biologists and Oceanographers have been performing Aquatic Bioassays and Marine Monitoring Surveys since 1971. We are fully equipped to perform all freshwater or marine, acute or chronic bioassays on hazardous wastes, wastewater, drilling fluids, or benthic sediments in compliance with NPDES, ASTM, USEPA/COE, or DOHS regulations. With over 130 bioassay clients in California and other states, we are one of the most successful bioassay laboratories on the West Coast.

The Aquatic Bioassay Team has a reputation for being able to accomplish projects after others have failed. In short, we will provide a bioassay or marine monitoring program that is cost effective, of the highest quality possible, and with a responsiveness that is totally unique to this company.

2. COMPANY BACKGROUND AND EXPERIENCE

From 1976, Thomas (Tim) Mikel served as Chief Biologist and subsequent Laboratory Director of CRL Environmental (formerly Jacobs Environmental). Immediately following the takeover of CRL Environmental by Enseco, Inc. in 1988, Mr. Mikel broke out on his own and formed Aquatic Bioassay and Consulting Laboratories, Inc.

Within less than a year, the Company had won a six-year receiving water monitoring program for the City of Oxnard, the largest municipal program in central California. This was followed almost immediately by long term monitoring projects for Chevron at Carpinteria and at Gaviota, and a current meter study for a Texaco offshore oil platform near Point Conception. Following the initiation of the Oxnard monitoring project, Mr. Mikel designed two acute and two chronic bioassay laboratories.

At the present time, Aquatic Bioassay performs acute and chronic, freshwater and marine bioassays for over 100 laboratories, municipalities, consultants, and industries throughout the state, and is one of the most highly regarded aquatic bioassay laboratories in California.

3. FACILITIES

3.1. LABORATORIES

Aquatic Bioassay occupies a 5000 square-foot building in Ventura, California. The facility is divided into three bioassay incubator rooms, a bioassay laboratory, a marine monitoring laboratory, and a video microscopy laboratory (Figure 3-1). A complete list of laboratory equipment is included in Table 3-1.

Marine Incubator Room. Aquatic bioassay supports three bioassay incubators maintained at 15, 20, and 25 deg C. The coldest room is used for conducting most marine acute and chronic bioassays and houses a 500 gallon seawater holding tank, 0.2 micron water filtration system, and three 50 gallon holding tanks for adult marine species. Tests include acute bioassays (crangon shrimp, speckled sanddabs, and three-spine sticklebacks), chronic bioassays (sea urchin fertilization, abalone development, and kelp spore germination and growth), and sediment and drill mud bioassays.

Acute Freshwater Incubator Room. The 20 deg C room is used for hazardous waste bioassays (DOHS, Title 22) and freshwater NPDES wastewater bioassays using adult fathead minnows.

Chronic Freshwater Incubator Room. The 25 deg C room is used for freshwater chronic bioassays, including the fathead minnow larval survival and growth test, the *Ceriodaphnia* survival and reproduction test, and the *Selenastrum* algae growth test. The marine silversides minnow survival and growth test is also conducted in this incubator.

Bioassay Laboratory. This laboratory houses instruments and supplies needed for measuring freshwater and marine chronic species. Equipment includes light tables, a Coulter Counter, analytical balances, water baths, drying ovens, and deionized water system with a final bank of water polishing cartridge.

Marine Monitoring Laboratory. The marine monitoring laboratory is designed for the evaluation of ocean water, sediments, and biota. Equipment includes glassware and instruments for measuring suspended solids, oil and grease, ammonia, turbidity, and coliform bacteria in marine waters; a series of brass screens and shaker device for the measurement of grain size in sediments; and microscopes, light tables, videos, and a complete taxononomic library for the identification of benthic and pelagic marine organisms.

Video Microscopy Laboratory. This laboratory is used for the counting and evaluation of most marine chronic bioassays. To reduce fatigue and improve accuracy, a bank of three inverted microscopes has been fitted with high resolution video cameras connected to video screens.

3.2. TEMPERATURE AND LIGHT CONTROL

Temperature control for both chronic and acute bioassay laboratories are conducted by forced-air heating and air conditioning units specially designed for laboratory purposes. The computerized thermostat adjusts the temperatures in these laboratories every two seconds. The lower temperatures for the marine species, however, required a more innovative approach. The marine incubator and holding area were thoroughly insulated and coverted into a walk-in refrigerator. A compressor on the roof of the building runs a refrigeration unit mounted in the room. This keeps the temperature range within less than one degree of 15 Centigrade. In order to keep this area dry, dehumidifiers are in operation at all times.

The light regime for all incubators and holding areas is 16 hours light and 8 hours dark at an intensity of 50 ± 5 microeinsteins.

3.3. FRESH AND MARINE WATER SOURCES

Two completely independent, large capacity deionizing units serve the laboratory. This redundancy assures that deionized water is always available. For chronic dilution waters, the deionized water is further refined to the equivalent of a Millipore Milli-Q System: two ion-exchange cartridges followed by carbon and organic clean-up cartridges.

Marine bioassay dilution water is either local coastal water or water collected in the open ocean near Anacapa Island. Seawater is collected into a plastic 500-gallon tank mounted on a trailer. Water is then transferred to our 500-gallon seawater storage tanks housed in our 15 deg C marine holding area. Before use, the water is pumped through activated carbon, 1 micron, 0.45 micron, and 0.20 micron filters.

3.4. TEST ORGANISMS: SOURCES, CULTURING AND HOLDING

Test organisms for aquatic bioassays are either collected locally or obtained from a licensed supplier. Purple sea urchins, and giant kelp are obtained from Proteus Sea Farms in Oxnard, California, Kim Siewers in Santa Cruz, California or Dave Gutoff in San Diego, California. Abalone spawners are obtained from the Cultured Abalone in Goleta, California or US Abalone in Davenport, California. Adult fathead minnows are obtained from Thomas Fish Company in Anderson, California. Other adult marine fish and invertebrates are obtained from various suppliers including, Brezina and Associates in Dillon Beach, California, Northwestern Aquatics in Oregon, and Aquatic Research Organisms in Hampton, NH. Fathead and silversides minnow larvae are obtained from Aquatic Research Organisms in Hampton, NH and *Ceriodaphnia* and *Selenastrum* populations are cultured in house.

For adult organisms 50, 65, and 100 gallon fiberglass tanks are utilized as holding aquaria. Freshwater holding water is made up from reagent grade chemicals in deionized water. Seawater holding water is made from either natural coastal water filtered through a 0.2 micron filter (see above) or standard sea salts dissolved in deionized water. Water is recirculated in each holding tank through a fiberglass filter, an activated carbon filter, and a gravel or crushed coral trickling filter specially designed for these holding tanks.

Holding waters and animal conditions are monitored daily. This includes monitoring of dissolved oxygen and temperature as well as indicating daily feeding and noting any behaviorial anomalies. In addition, the temperature of the shipping is recorded upon arrival to verify that the organisms are not subject to temperature changes of more than 3° C in a 12-hour period. Also, at a minimum of once per week, ammonia, salinity (for seawater), and temperature are checked in each holding tank. Also weekly, tanks are cleaned of detritus and 50% of the water is changed. Dead or unhealthy looking organisms are always removed immediately.

3.5. DATA ANALYSIS CAPABILITIES

Aquatic Bioassay is equipped with several IBM compatible personal and lap top computers. Programs include Excel, Word, ToxCalc, NCSS, IGODS and StatMost.

Aquatic Bioassay reports typically include a signed cover letter with the final results, error bar charts showing means and standard deviations for all concentrations, chemical analysis table, raw data table, and statistical data sheet. Example of completed freshwater and marine chronic bioassay reports are included in Appendix 9.1.

4. STAFF QUALIFICATIONS AND EXPERIENCE

4.1. DESCRIPTION OF STAFF RESPONSIBILITIES

In addition to staff biologists and technicians, three key members of the Aquatic Bioassay team are directly responsible for the bioassay program. Mr. Thomas (Tim) Mikel is the owner and president. Mr. Johnson serves as Laboratory Director, directly supervising all staff during the whole bioassay program. He remains in constant communication with the Laboratory Manager, Mr. Machuzak who also serves as the Laboratories' QA/QC Officer.

4.2. EDUCATION AND EXPERIENCE OF KEY PERSONNEL

Complete resumes of the five key team members are included as Appendix 9.2. The following bioparagraphs summarize their experience.

Mr. Thomas (Tim) Mikel is the owner and president of Aquatic Bioassay. His 20 years of experience have included Laboratory Directorships of CRL Environmental, Jacobs Laboratory, and the Santa Barbara Underseas Foundation. He has held Senior Marine Biologist positions for PJB Laboratories and the U.S. Department of the Interior. He designed the Ecological Restoration Project of Upper Newport Bay and was the Biological Coordinator of the Anacapa Island Underwater Nature Trail. Mr. Mikel has been Project Manager for scores of marine surveys in Central and Southern California. He is a frequent speaker for workshops in the field of environmental biology and has developed and published bioassay techniques being used in California today. He is biographed in Who's Who in America and American Men and Women in Science. He is the Chair of the Methods Committee of the Southern California Toxicity Assessment Group and is the Mollusk Bioassay Section Chair for the 20th Edition of *Standard Methods*. Mr. Mikel holds Bachelor's and Master's degrees in Marine Biology from Moss Landing Marine Laboratories and University of California, Santa Barbara, respectively.

Mr. Scott Johnson is the Director of Aquatic Bioassay and Project Manager for all Oceanographic and Aquatic Biology field projects. In addition, he is responsible for for all ocean and freshwater monitoring and laboratory operations, environmental assessments, toxicity reporting and environmental consulting. He is responsible for the NPDES marine monitoring programs for the largest municipal dischargers on the central California coast including the cities of Oxnard, Goleta, Santa Barbara, Avalon, and San Luis Obispo. Mr. Johnson was promoted from Water Biologist to Supervisor, then finally to Manager of the Biology Laboratories for the City of Los Angeles' Environmental Monitoring Division. He was responsible for all facets of the City's Santa Monica Bay and Los Angeles River NPDES monitoring programs including water quality, bacteriololgy, benthic ecology, toxicity testing, reporting and permit negotiations. Mr. Johnson was chairperson of the Southern California Toxicity Assessment Group Policy Committee for four years and has numerous scientific papers and presentations to his credit. Mr. Johnson holds both a Masters and Bachelors degrees in Biology (minor in Chemistry) from California State University, Long Beach.

Mr. Michael Machuzak is responsible for the coordination of all acute and chronic bioassays at *Aquatic Bioassay*. He was the Biological Director of Ab Lab, CRL Environmental, and Jacobs Laboratories and authored several original papers on marine bioassays and aquaculture. Mr. Machuzak is member of the *Field Sampling and Logistics Committee for the Southern California Bight Project-Bight 1998*. He received his technical education at Eastern Kentucky University and University of California, Santa Barbara.

Ms. Karin Wisenbaker conducts and supervises microbiological testing with IDEXX. Assists in report preparation, set-up and analysis, client interface and quality control. Ms. Wisenbaker holds a B.S. in Environmental Biology from California State University Northridge.

Ms. Beth Maturino conducts and supervises bioassay testing in our laboratory and is responsible for quality assurance and quality control (QA/QC). Ms. Maturino is a member of the *Microbiology Group* for the *Southern California Bight Project, Bight '98.*

Mr. Joe Freas responsible for chronic and acute, freshwater and marine bioassays. Assists in bioassay report preparation, set-up and analysis, client interface and quality control. Mr. Freas is also responsible for new toxicity testing method development and implemitation. Mr. Freas hold a B.S. in Biology from California State University Channel Islands.

4.3. LABORATORY CERTIFICATIONS

Aquatic Bioassay is certified by the Department of Health Services for Aquatic Toxicity Bioassays for Hazardous Waste and all NPDES bioassay methods. As well as microbiological testing of recreational waters. Our complete laboratory certification is included in Appendix 9.4. Aquatic Bioassay and Consulting, Inc. participates in the DMR-QA studies as well as annual WP studies.

5. TEST SPECIES UTILIZED FOR BIOASSAY TESTING

ORGANISM	TEST TYPE	REFERENCES
Freshwater Species		
Fathead minnows (*Pimephales promelas*)	Acute, Chronic	1,2,3,4,10,11, 16, 17
Rainbow trout (*Oncorhynchus mykiss*)	Acute	1,2,3,11, 16
Water fleas (*Ceriodaphnia,Daphnia spp.*)	Acute, Chronic	4,11, 16, 17
Green algae (*Selenastrum capricornutum*)	Chronic	4, 17
Estuarine/Marine Species		
Three-spine stickleback (*Gasterosteus aculeatus*)	Acute	1,2,3
Silversides minnow (*Menidia beryllina*)	Acute, Chronic	6,11, 16, 17
Topsmelt (*Atherinops affinis*)	Chronic	8
Atlantic mysid (*Mysidopsis bahia*)	Acute, Chronic	5,6,11,13, 16
Giant kelp (*Macrocystis pyrifera*)	Chronic	8
Red abalone (*Haliotus rufescens*)	Chronic	8
Sea urchins (*Strongylocentrotus spp.*)	Chronic	8
Sand dollar (*Dendraster excentricus*)	Chronic	8
Amphipod (*Eohaustorius spp.*)	Acute	15
Bivalves (*Mytilus, Tellina spp.*)	Acute, Chronic	5,8,9
Polychaetes (*Nephtys, Neanthes spp.*)	Acute, Chronic	5,14

1. APHA. *Standard Methods for the Examination of Water and Wastewater.* (Latest Edition).

2. USEPA. 1985. *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms.* (3rd Ed.) EPA/600/4-85/013.

3. Kopperdahl, F. 1976. *Guidelines for Performing Static Acute Bioassays for Municipal and Industrial Wastewaters.* Calif. Dept. Fish and Game.

4. USEPA. 1994. *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*. EPA-600/4-91/002.

5. USEPA and COE. 1991. *Evaluation of Dredged Material Proposed for Ocean Disposal.* EPA/503/8-91/001.

6. USEPA. 1988. *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms*. EPA-600/4-91/003.

7. Machuzak, M. and T. Mikel. 1987. Drilling fluid bioassays using Pacific Ocean mysid shrimp, *Acanthomysis sculpta*, a preliminary introduction. In: *Aquatic Toxicology and Hazard Assessment.* ASTM STP 971. Philadelphia. pp.447-53.

8. USEPA. 1995. *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms.* EPA/600/R-95/136.

9. ASTM. 1987. Standard Practice for conducting static acute toxicity tests with the larvae of four species of bivalve mollusks. E724-80. ASTM. Philadelphia.

10. Polisini, J.M. and R.G. Miller. 1988. Static acute bioassay procedures for hazardous waste samples. California Dept. of Fish and Game.

11. USEPA. 1993. *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms*. (4th Ed.). EPA/600/4-90/027F.

12. ASTM. 1990. Standard guide for conducting static 96-h toxicity tests with microalgae. E1218-90. ASTM. Philadelphia.

13. Fed. Reg. 1993. Federal Register. Vol.58, No.41, Appendix 2, pp. 12507-12.

14. USEPA. 1991. *Recommended Guidelines for Conducting Laboratory Bioassays on Puget Sound Sediments*. USEPA, Seattle.

15. ASTM. 1993. Guide for conducting 10-day static sediment toxicity tests with marine and estuarine amphipods. E1367-92. ASTM. Philadelphia.

16. USEPA. 2002. *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*. (5th ed). EPA-821-R-02-012.

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

6. RECENT BIOASSAY CLIENTS

Aquatic Bioassay Biologists have performed tens of thousands of bioassays since 1976 and currently conduct tests for 10 of the 12 Regional Water Quality Control Board Districts in California, making us one of the most experienced group of bioassay biologists in the State. Highlights of some of our work are described below:

Marine Acute and Chronic Bioassays. *Aquatic Bioassay* Biologists were the first commercial group of scientists to successfully perform the chronic abalone larval bioassay designed by the California Department of Fish and Game. Our testing organisms include mysid shrimp, silversides minnows, topsmelt, sea urchins, abalone, bivalves, kelp, and amphipods. *Aquatic Bioassay* has been conducting side-by-side multi-species studies for such groups as NRG Energy (three Southern California power plants), AERA, SWARS, Chevron, Pacific Operators Offshore, Orange County Sanitation Districts, San Luis Obispo County, Cities of Oxnard, Avalon, Pismo Beach, Monterey, Marina del Rey, Summerland, Carpinteria, Santa Barbara, San Elijo Joint Powers Authority, the Southern California Bight Projects, (Bight 98 and Bight 03), and the Central Coast Regional Water Quality Control Board.

Freshwater Acute and Chronic Bioassays. *Aquatic Bioassay* routinely conducts freshwater and marine chronic tests for Los Angeles County, Cities of Los Angeles, San Luis Obispo, Simi Valley, Thousand Oaks, Camarillo, Ojai, Ventura, Lompoc, Moorpark, Riverside, County of Orange Environmental Resources Division, Victor Valley, Santa Barbara, , Burbank, Beaumont, Yuba City, Valley Sanitation District, as well as Fallbrook Public Utilites, Encina Wastewater Authority. Test species include fathead minnows, green algae, rainbow trout, water fleas, and other daphnids.

Sediment and Drilling Fluid Bioassays. After conducting numerous suspended phase, solid phase, and bioaccumulation sediment bioassays, Aquatic Bioassay Biologists published the only procedure applicable for Pacific Ocean mysid shrimps (M.J. Machuzak and T.K. Mikel, *Drilling Fluid Bioassays Using Pacific Ocean Mysid Shrimp, Acanthomysis sculpta, a Preliminary Introduction* in *Aquatic Toxicity and Hazard Assessment,* 10th Vol. ASTM STP 971). Clients have included the Los Angeles Department of Water and Power, Southern California Bight Project, Larry Walker Associates, Calleguas Municipal Water District, Chevron, Exxon, Shell Oil, Torch Operations, the U.S. Navy, Burns and McDonnell, San Diego Harbor, County of Orange Environmental Resources Division, and the City of Oxnard.

6.1. RELATED WORK EXPERIENCE

PROJECTS

Our Laboratory Director has been conducting bioassays since 1976. Aquatic Bioassay has performed thousands of tests since 1988, making it one the most experienced bioassay laboratories in California. A list of clients is included in Table 6-1, and several projects are described below:

DynCorp. Dr. Robert Brent, 703-461-2401, Aquatic Bioassay participated in acute and chronic toxicity testing for the EPA for WET interlaboratory studies in 1998. Aquatic Bioassay was selected as one of nine laboratories nation wide to participate as an EPA sponsored laboratory.

Southern California Bight Project, (Bight 98, Bight 03 and Bight 08). Dr. Steve Weisberg, SCCWRP, 714-894-2222, During the summers of 1998, 2003 and 2008, Aquatic Bioassay conducted marine sediment bioassays on numerous samples from sites within the Southern California Bight.

NRG Energy. Mr. Alex Sanchez, 310-529-3280, Since 1995, Aquatic Bioassay has been conducting chronic and acute marine bioassays for Long Beach and El Segundo power stations.

Pacific Gas & Electric. Mr. Jim Kelly, 805-545-3194, In June of 1997 we began performing chronic toxicity bioassays for four PG&E power plants on effluent and influent water samples.

County of Orange Environmental Resources Division, Mr. Bruce Moore, 714-567-6373, Aquatic Bioassay conducts marine and freshwater acute and chronic toxicity tests for the County of Orange Environmental Resources Division.

Other long-term marine chronic programs include: Pacific Gas and Electric, City of Oxnard, City of San Luis Obispo, City of Avalon, City of Pismo Beach, City of Monterey, City of Santa Barbara, Montecito Sanitation District, Summerland, Chevron at Gaviota, Santa Ana Regional Water Quality Control Board, Phillips Petroleum at Santa Maria, and the Central Coast Regional Water Quality Control Board,

TABLE 6-1. COMPLETE LIST OF AQUATIC BIOASSAY CLIENTS.

Municipalities and Government

City of Avalon	Avalon, Ca.
Cen. Coast RWQCB	San Luis Obispo, Ca.
City of Camarillo	Camarillo, Ca.
City of Carpinteria	Carpinteria, Ca.
Elsinore Municipal	Lake Elsinore, Ca.
Las Virgenes Muni. Water Dist.	Calabasas, Ca.
City of Lompoc	Lompoc, Ca.
City of Los Angeles	Playa Del Rey, Ca.
County of Los Angeles	Whittier, Ca.
Marina Del Rey Harbor	Marina Del Rey, Ca.
Montecito Sanitary District	Montecito, Ca.
Moorpark San. Dist.	Moorpark, Ca.
Ojai Valley Sanitation Dist.	Ojai, Ca.
City of Oxnard	Oxnard, Ca.
City of Pismo Beach	Pismo Beach, Ca.
City of San Luis Obispo	San Luis Obispo, Ca.
City of Santa Barbara	Santa Barbara, Ca.
City of Santa Paula	Santa Paula, Ca.
City of Simi Valley	Simi Valley, Ca.
Summerland Sanitation District	Summerland, Ca.
South San Luis Obispo San. Dist.	Oceano, Ca.
City of Thousand Oaks	Thousand Oaks, Ca.
Valley Sanitation Dist.	Indio, Ca.
City of Ventura	Ventura, Ca.
Victor Valley Water Reclaim.	Victorville, Ca.
Yuba City San. Dist.	Yuba City, Ca.

Industries

American Fruit Processing	Pacoima, Ca.
Baxter Healthcare	McGaw Park, Il.
Chevron USA	Gaviota, Ca.
CMS Generating Station	Imperial, Ca.
Dexter Electronics	Industry, Ca.
NRG Energy	El Segundo, Ca.

Laboratories and Consultants

A&L Western Laboratories	Modesto, Ca.
Applied Environmental Tech.	Ventura, Ca.
American Environmental Testing	Los Angeles, Ca.
American Analytical	Chatsworth, Ca.
ANLAB	Sacramento, Ca.
Applied P & Ch Laboratory	Pomona, Ca.
Babcock Laboratories	Riverside, Ca.

BC Analytical	Anaheim, Ca.
Best Environmental	Garden Grove, Ca.
BSK Analytical	Fresno, Ca.
Cal Sciences	Garden Grove, Ca.
Creek Environmental	San Luis Obispo, Ca
Curtis and Thompkins	Berkeley, Ca.
Envirochem	Pomona, Ca.
FGL Environmental	Santa Paula, Ca.
FGL Environmental	Stockton, Ca.
Montgomery Laboratories	Pasadena, Ca.
Orange Coast Environmental	Tustin, Ca.
URS Consultants	San Francisco, Ca.
West Coast Environmental	Ventura, Ca.
West Coast Analytical	Santa Fe Springs, Ca.
Zymax Envirotechnology	San Luis Obispo, Ca.

7. DATA QUALITY OBJECTIVES, ASSURANCE AND QUALITY CONTROL

The management and staff of Aquatic Bioassay and Consulting are committed to providing services that are scientifically valid, legally defensible and of known precision and accuracy in order to meet or exceed the definitions and expectations of quality of our clients. To the extent possible, data are reported only if all quality control measures for a particular test are acceptable. In order to determine the validity of a test all acceptability criteria specified in the associated SOP must be met or the test is rejected as invalid. To that end the following procedures are followed to ensure these quality objectives are met.

7.1. CHAIN OF CUSTODY PROCEDURES, SAMPLE HANDLING AND SAMPLE DISPOSAL

An example of Aquatic Bioassay's chain of custody form is included in Figure 7-1. The chain of custody form is completed by the person collecting the effluent or other sample. Whenever the sample changes hands, the person relinquishing the sample, as well as the person receiving the sample, sign the chain of custody and record the date and time of the transferrence. The original chain of custody form remains with the sample until it is returned to the client with the final report.

Upon arrival to this laboratory, the temperature of each sample is recorded and each sample is given a separate sequential analytical number which is included on the sample container, the laboratory logbook, and laboratory work sheets. The samples are kept in chronological order as received in a designated cold storage area unless an aliquot is being removed for analysis. Samples that are to be tested under EPA testing proceedures must have the tests initiated within 36 hours of sample collection. Upon completion of testing, those samples that are deemed to be non-hazardous are disposed of via regular waste hauler. If samples are determined to be of a hazardous nature, the unused portion of sample is returned to the client. All effluent samples are discharged to municipal sewage. A log is kept near the door of the designated storage area, and any sample removal is documented with the analyst's initials and date and time of removal. Visitors to the laboratory must sign in and be escorted by a staff member. Storage and documentation areas are locked during evenings and weekends.

7.2. GOOD LABORATORY PRACTICES AND PERFORMANCE AUDITS

The performance of "good laboratory practices" are present in every aspect of Aquatic Bioassay's testing program. As the new chronic tests are being developed, Aquatic Bioassay scientists are constantly striving to determine what procedures will improve the accuracy and precision of these tests. In addition, Aquatic Bioassay and Consulting participates in all DMRQA studies, PT studies, and all voluntary performance based exercises available, annually at a minimum. These exercises provide the Aquatic Bioassay management with the information needed to assess the performance of the staff as well as the validity of the testing procedures employed in our laboratory.

All results from these studies are shared with all agencies we conduct testing for as well as all state and local regulatory agencies. More formal practices are listed below.

FIGURE 7.1. AQUATIC BIOASSAY CHAIN-OF-CUSTODY RECORD

CHAIN OF CUSTODY RECORD

Client:					Project Name/Number:		Analysis											
Address					Project Mgr.													
					P.O. #													
Phone Number:					Sampled By (signature)													
Date	Time	Comp.	Grab	Matrix	Sample ID	Volume/ Number												Comments
Relinquised By: (signature)						Date Time	Relinquised By: (signature)										Date Time	
Received By: (signature)						Date Time	Received By: (signature)										Date Time	
							Temperature upon receipt °C											

Aquatic Bioassay and Consulting Laboratories
29 N. Olive Street Ventura, CA 93001 Phone (805)643-5621 Fax (805)643-5621

Published Testing Procedures. Aquatic Bioassay adheres strictly to the published methodologies and does not deviate from them in order to make the testing easier or more profitable. Senior personnel are active members of Policy, QA/QC, and Methods Development committees of the Southern California Toxicity Assessment Group (SCTAG), where recommendations for modification are formally presented.

Choice of Chemicals. Aquatic Bioassay uses only reagent grade chemicals and the highest grade of sea salts available. As discussed above (Section 3.4.), dilution water is Type III grade or better, or for marine species, noncontaminated natural seawater collected far from shore and filtered through 0.2 micron filters.

Testing Chambers and Laboratory Glasssware. Whenever possible, testing chambers are of the disposable type (e.g. culture flasks for sea urchin and abalone larval tests). Otherwise, the highest quality glassware is prepared with strict adherence to published
cleaning procedures.

Standard Toxicants. During early methods development of marine chronic tests, we discovered low precision among laboratories with regard to the accurate chemical measurement of standard toxicants. Since we felt that this was a likely major source of
bioassay result variability among laboratories, we decided to contract with ERA Associates in Arvada, Colorado to prepare for us copper chloride and zinc sulfate stock solutions traceable to National Bureau of Standards solutions. Stock solutions are verified monthly for accuracy by an independent chemistry laboratory.

Instrument Calibration. All laboratory instruments are zeroed and calibrated before each use. Instruments and equipment are carefully maintained, and any deviations from normal response are brought to the attention the Laboratory Director (See Section
7.4. below).

7.3. REFERENCE TOXICANT TESTING AND QUALITY CONTROL CHARTS.

All bioassay reference toxicant results are recorded and mathematically reduced for inclusion in Quality Control (QC) Charts. Standard toxicant testing is performed with each batch of chronic tests and for each new population of adult acute animals. Following each test, the LC or EC50 is calculated and included with acceptability data on a QC Data Sheet (Table 7-1). Our QC Charts are constructed from the means and standard deviations of these data (Figure 7-2).

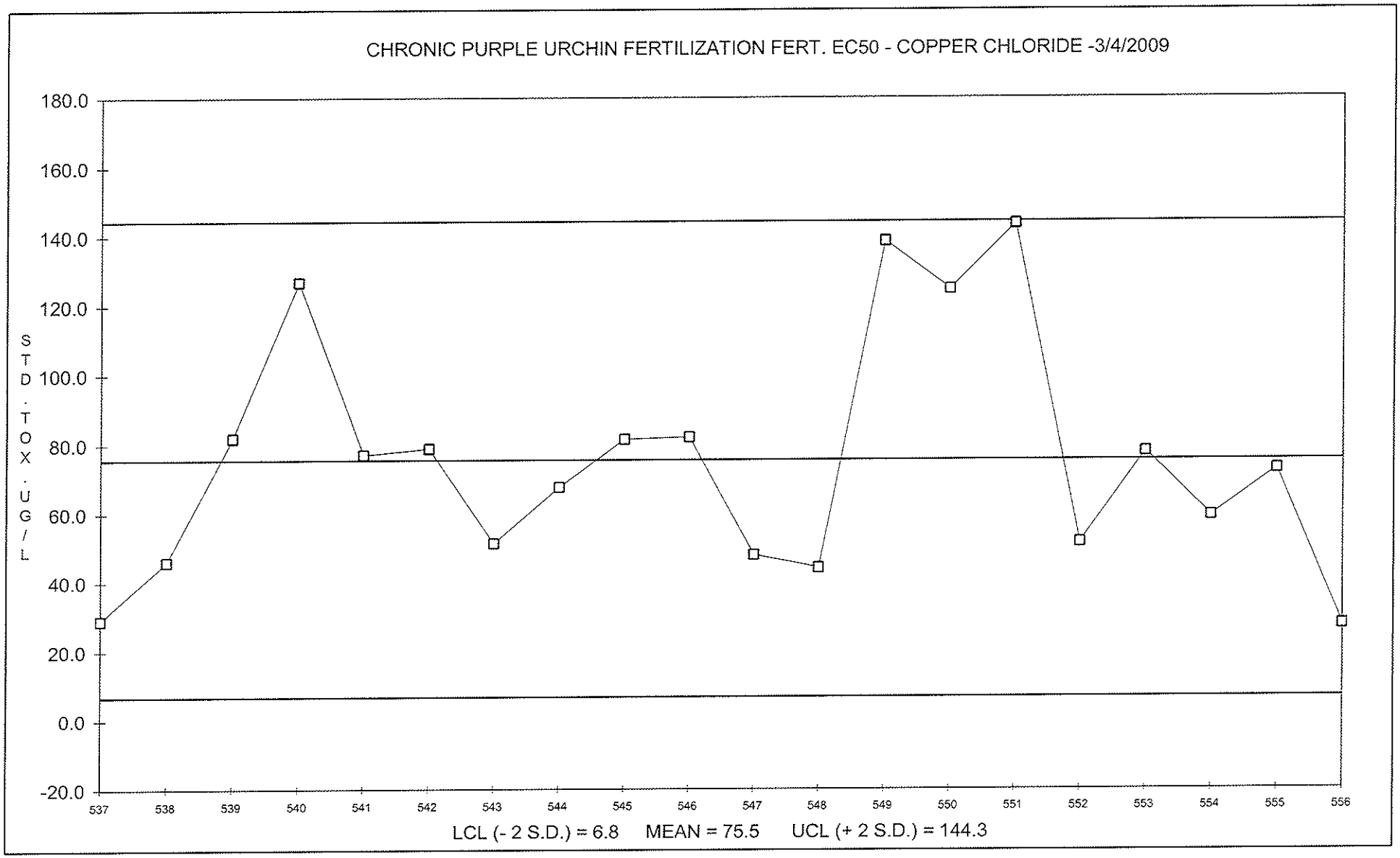
In general, new QC Charts are recalculated whenever a value approaches either the upper or lower control limit. The previous 19 acceptable data previous to this test are then included in the new chart. The current test's acceptability can then be determined. Only those tests which achieve all acceptability criteria and fall within the range of the control limits are included in subsequent control chart calculations.

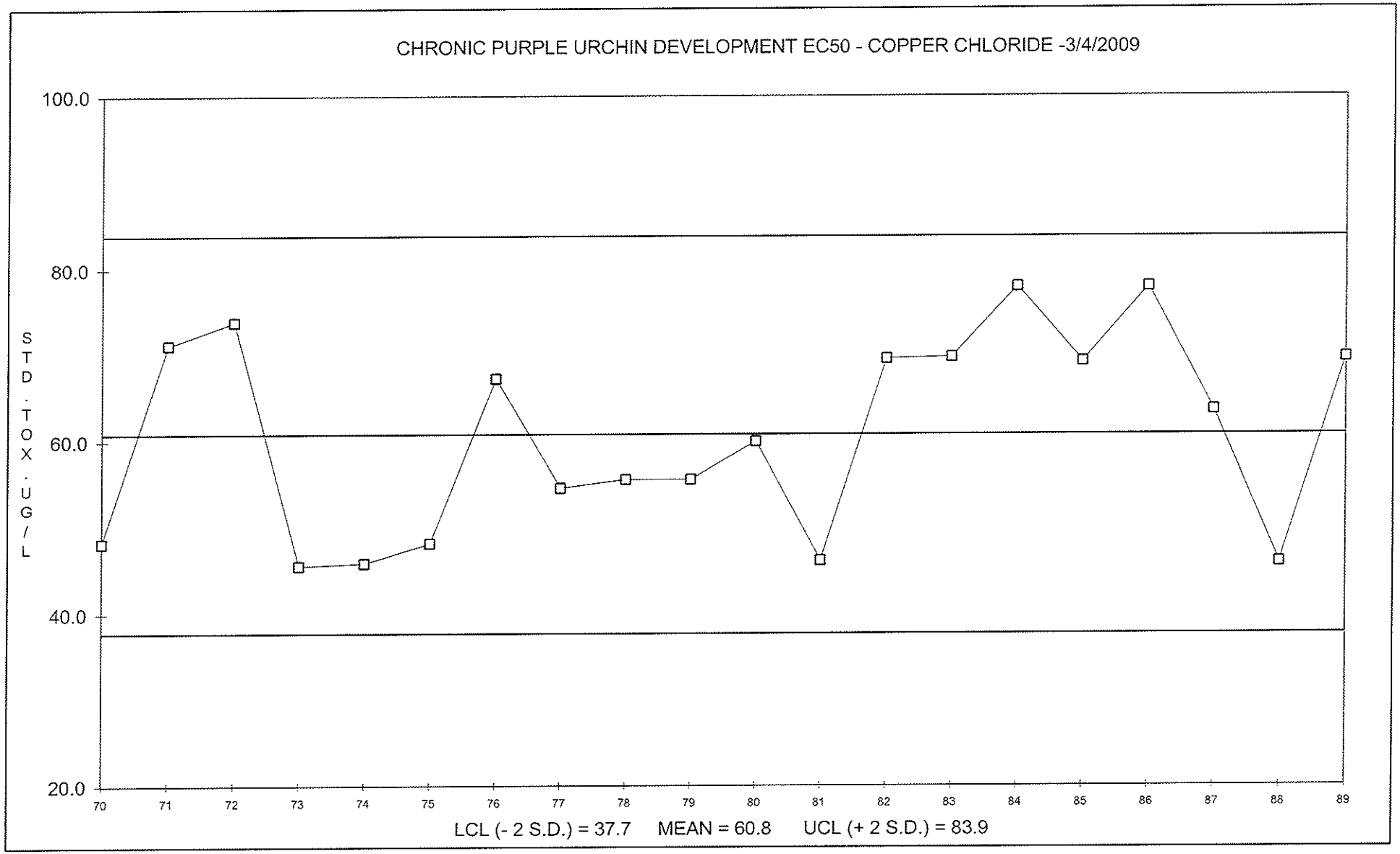
If a reference toxicant result falls outside of any acceptability requirement, all associated bioassays are reperformed. If the test is found to be acceptable, but the LC or EC50 is outside of the control limits, the QC Officer completes a Control Limit Exceedence Form (Table 7-2) which is brought to the attention of the Laboratory Director. The QC Officer, Laboratory Director, and analyst(s) then determine what the cause of the exceedance was and what will be the best corrective action. QC Charts are also used by the staff to follow seasonal, batch, annual or other temporal trends.

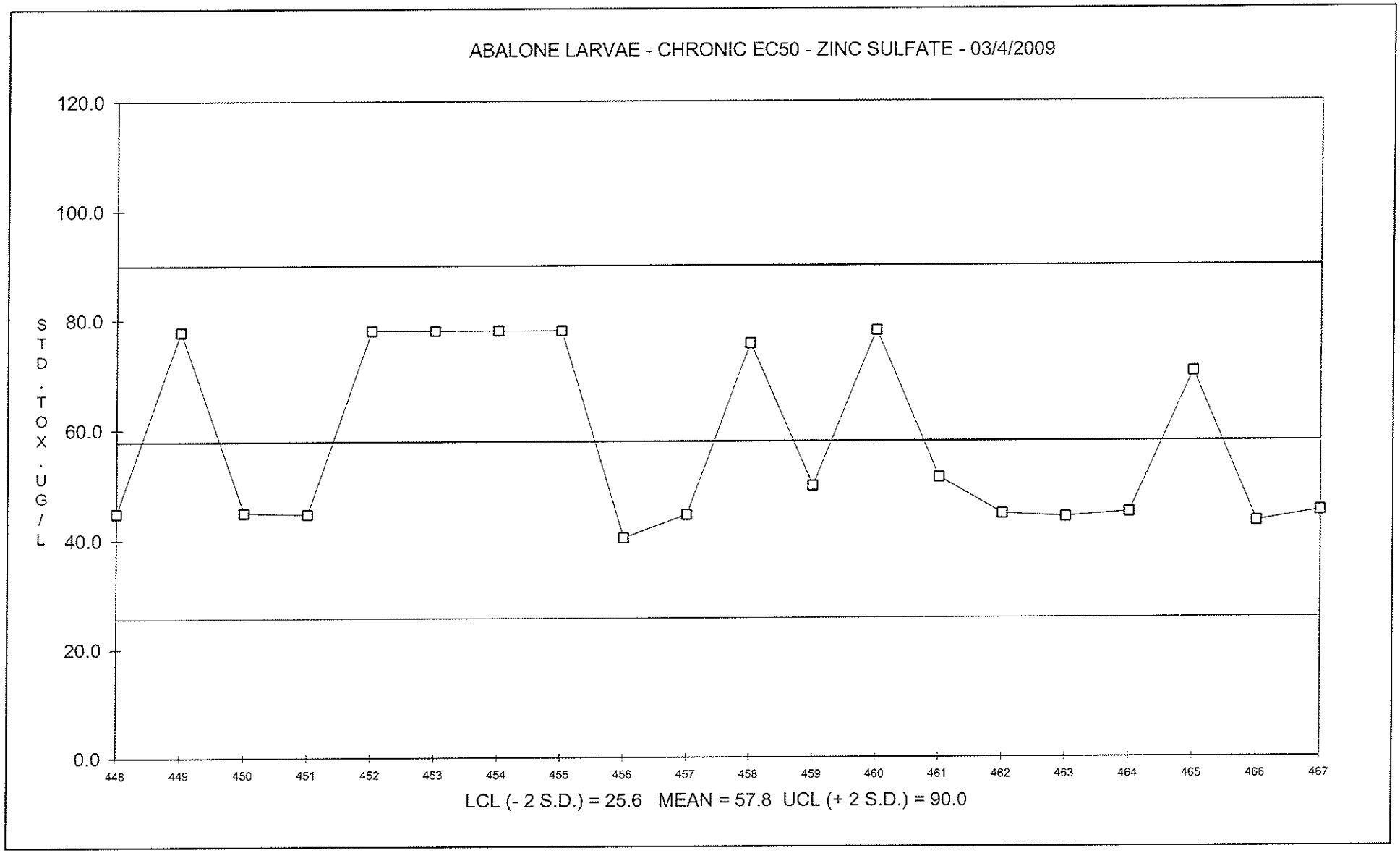
Table 7-1. HALIOTUS RUFESCENS QA/QC DATA SHEET
Standard Toxicant:

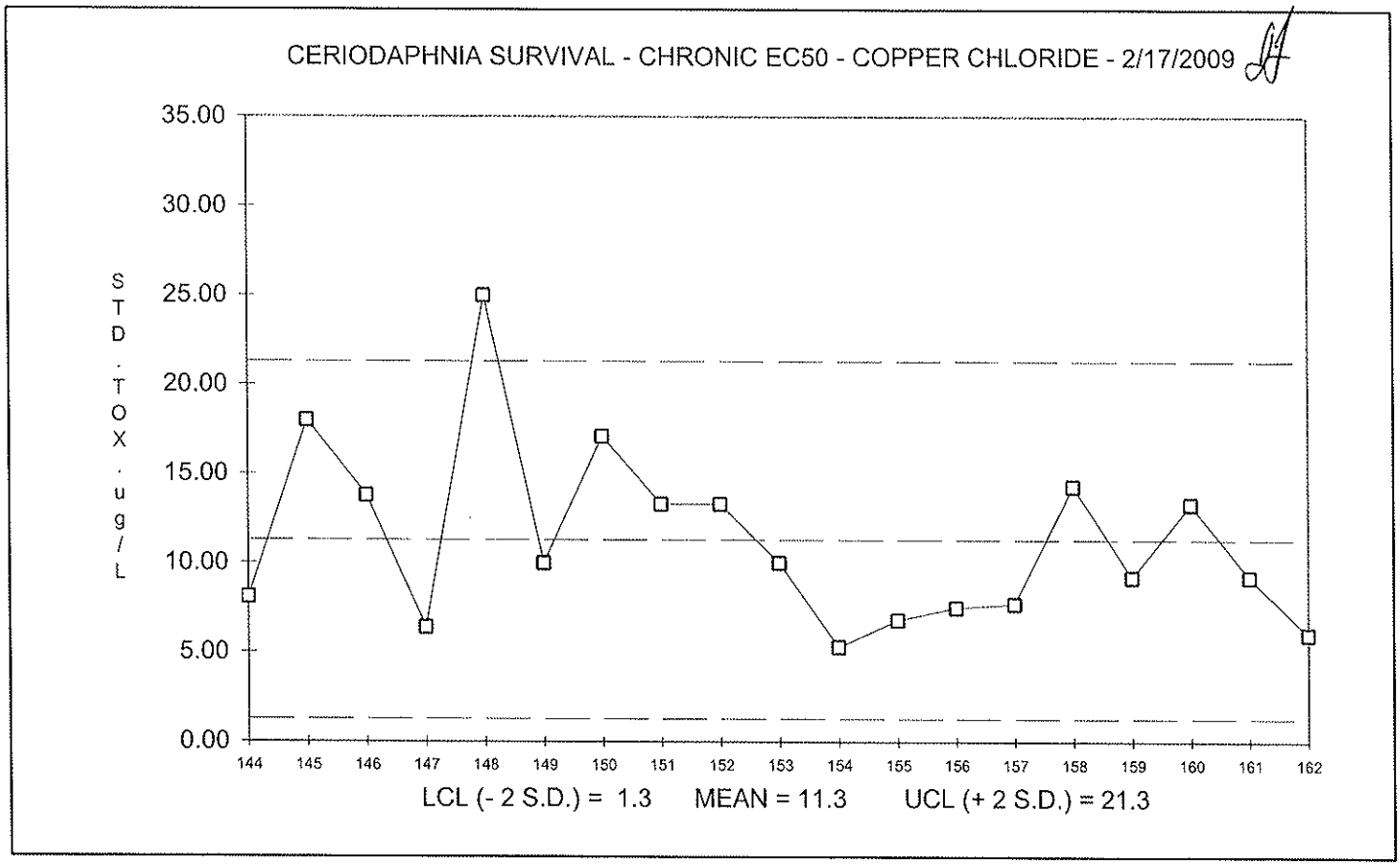
Date	Mean Control >= 90%	MS Within <= 100.0	NOEC < 56 ug/l	EC50

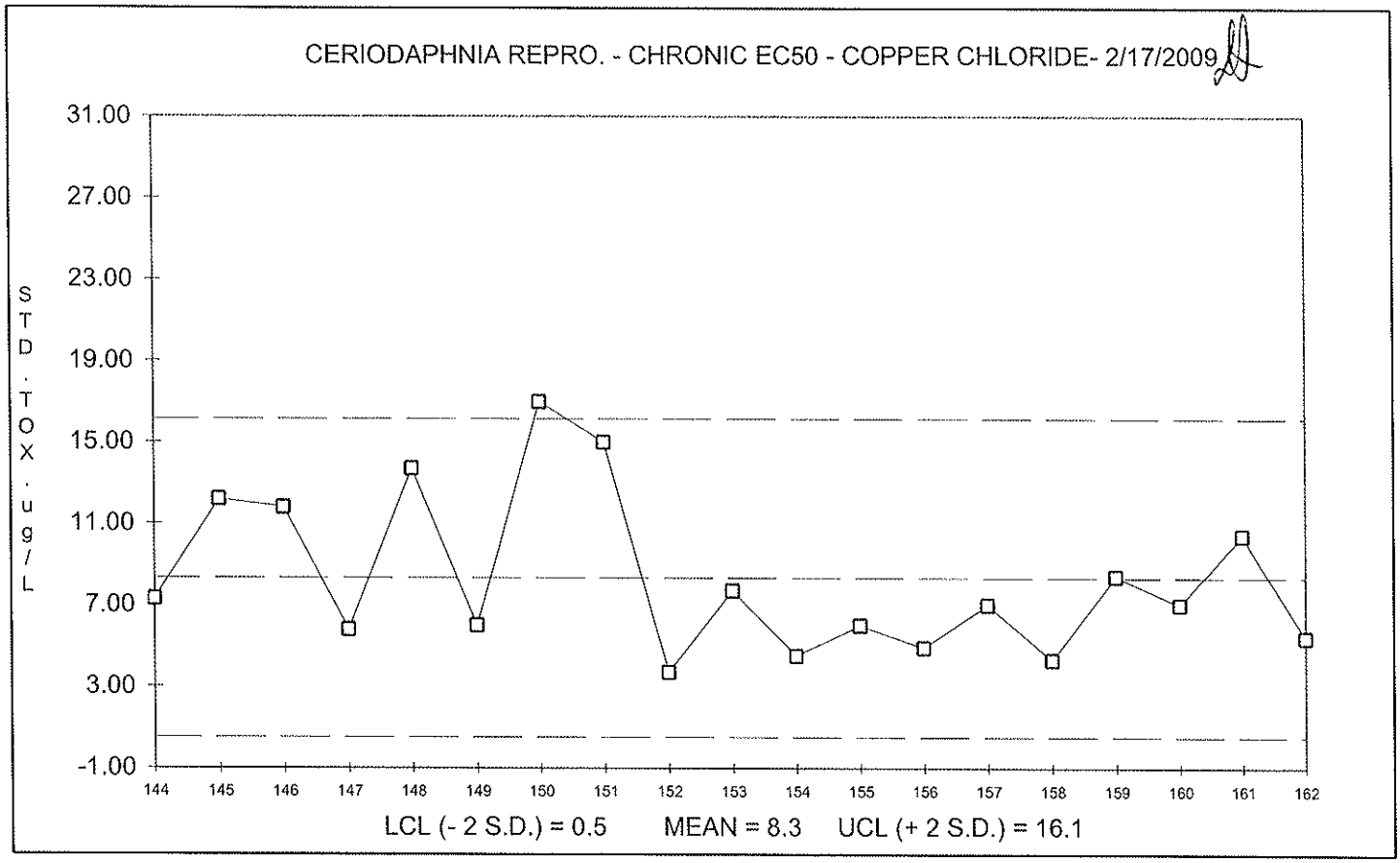
Notes:


CHRONIC PURPLE URCHIN FERTILIZATION FERT. EC50 - COPPER CHLORIDE -3/4/2009
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
-20.0
STD.TOX.UG/L
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
LCL (- 2 S.D.) = 6.8 MEAN = 75.5 UCL (+ 2 S.D.) = 144.3

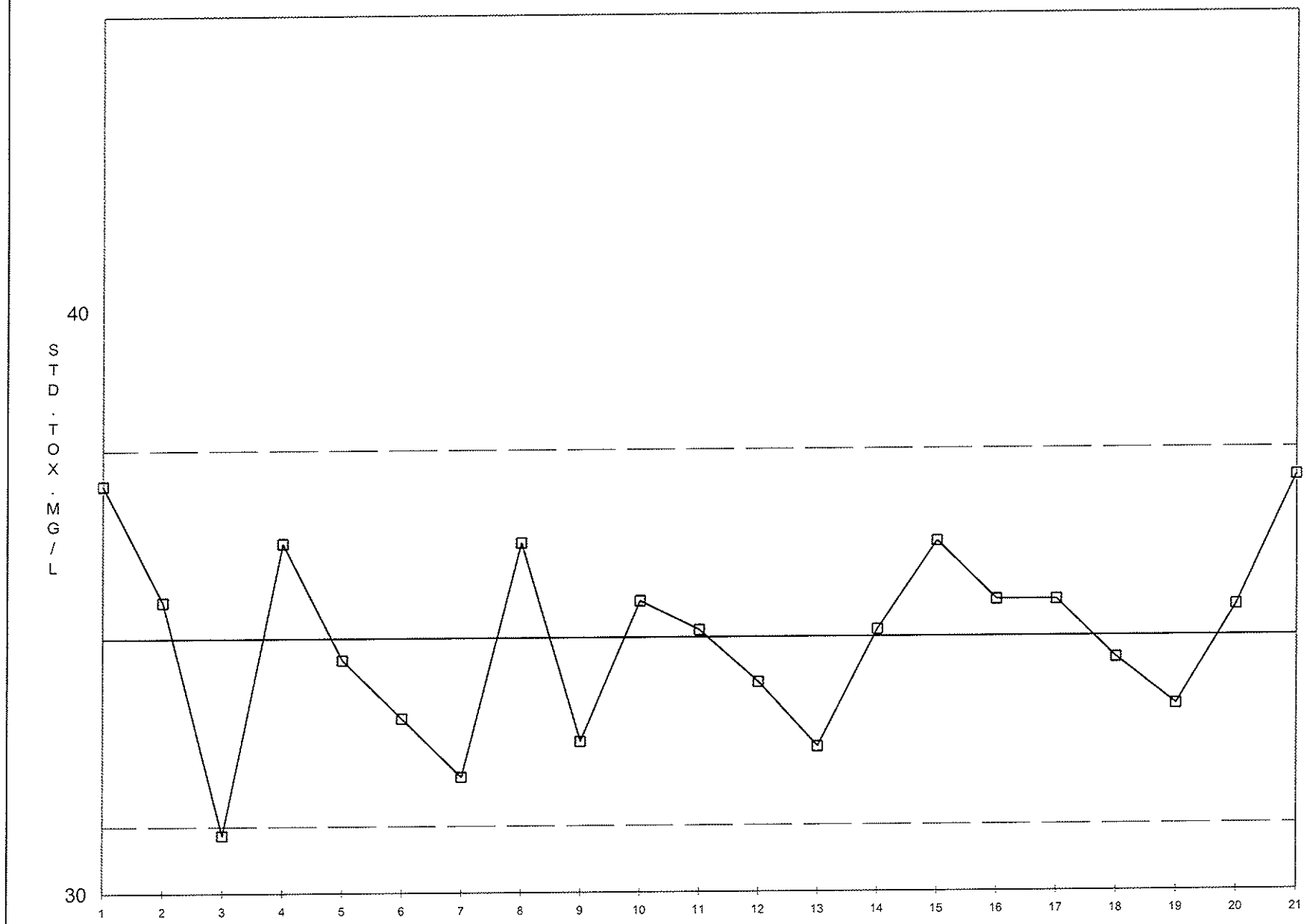

CHRONIC PURPLE URCHIN DEVELOPMENT EC50 - COPPER CHLORIDE -3/4/2009
100.0
80.0
60.0
40.0
20.0
STD.TOX.UG/L
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
LCL (- 2 S.D.) = 37.7
MEAN = 60.8
UCL (+ 2 S.D.) = 83.9


ABALONE LARVAE - CHRONIC EC50 - ZINC SULFATE - 03/4/2009
120.0
100.0
80.0
60.0
40.0
20.0
0.0
STD.TOX.UG/L
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
LCL (- 2 S.D.) = 25.6 MEAN = 57.8 UCL (+ 2 S.D.) = 90.0

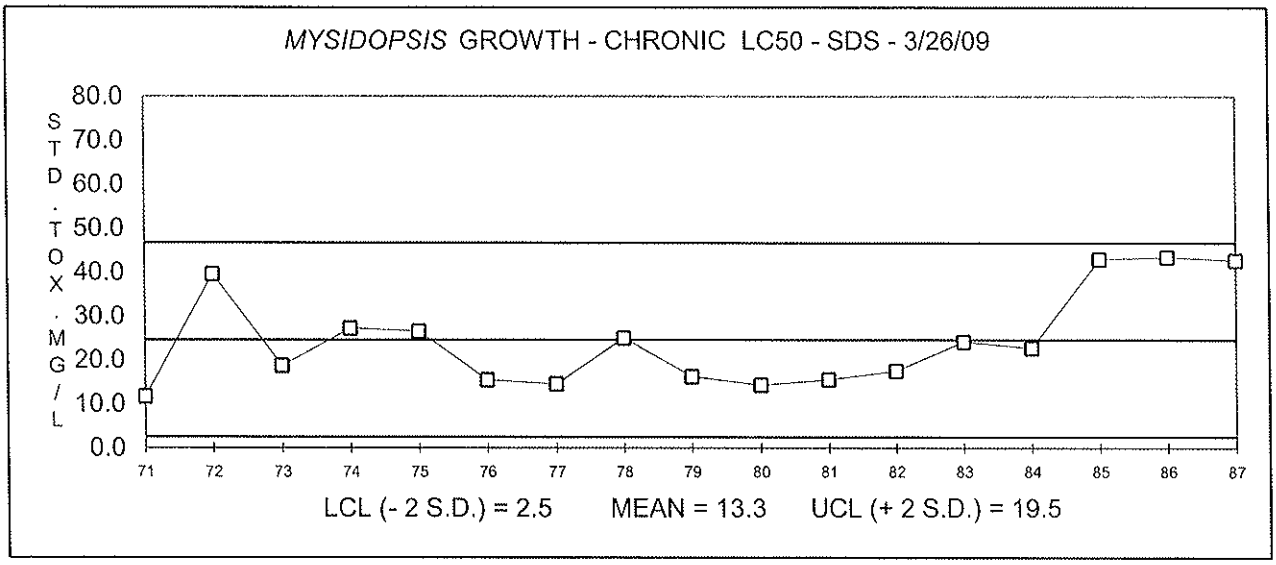

CERIODAPHNIA SURVIVAL - CHRONIC EC50 - COPPER CHLORIDE - 2/17/2009
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
STD-TOX-ug/L
144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162
LCL (- 2 S.D.) = 1.3 MEAN = 11.3 UCL (+ 2 S.D.) = 21.3

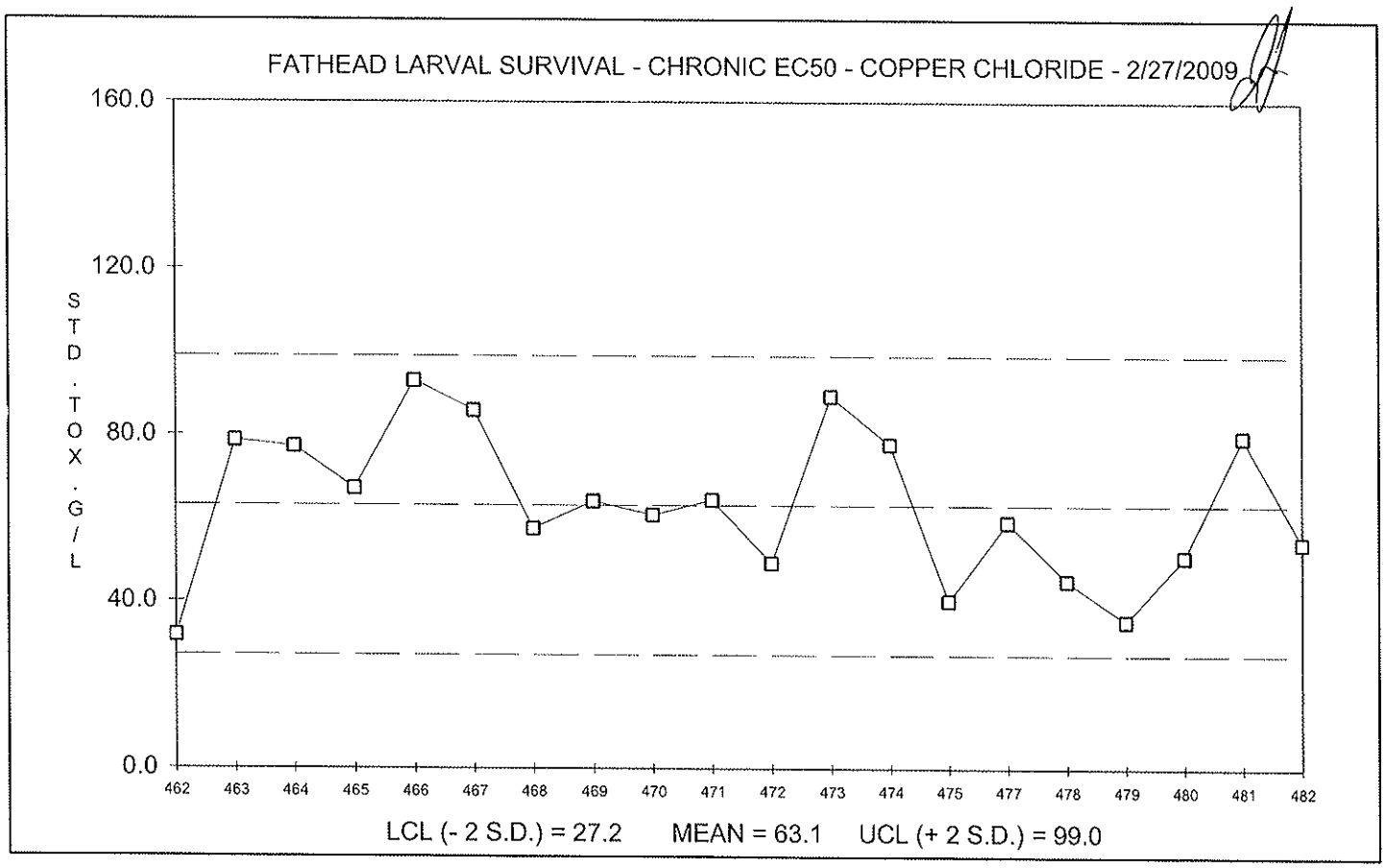

CERIODAPHNIA REPRO. - CHRONIC EC50 - COPPER CHLORIDE- 2/17/2009
31.00
27.00
23.00
19.00
15.00
11.00
7.00
3.00
-1.00
STD.TOX.ug/L
144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162
LCL (- 2 S.D.) = 0.5 MEAN = 8.3 UCL (+ 2 S.D.) = 16.1

MYSIDOPSIS SURVIVAL - CHRONIC LC50 - SDS - 3/5/2009

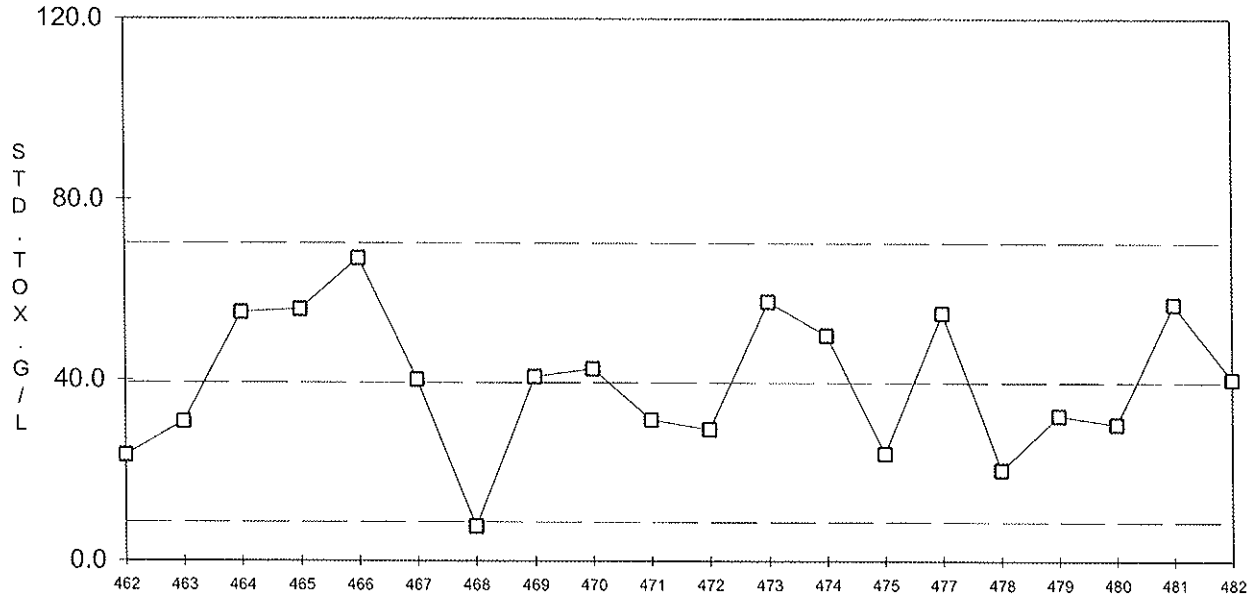


LCL (- 2 S.D.) = 31.2 MEAN = 34.4 UCL (+ 2 S.D.) = 37.6 CV = 0.29

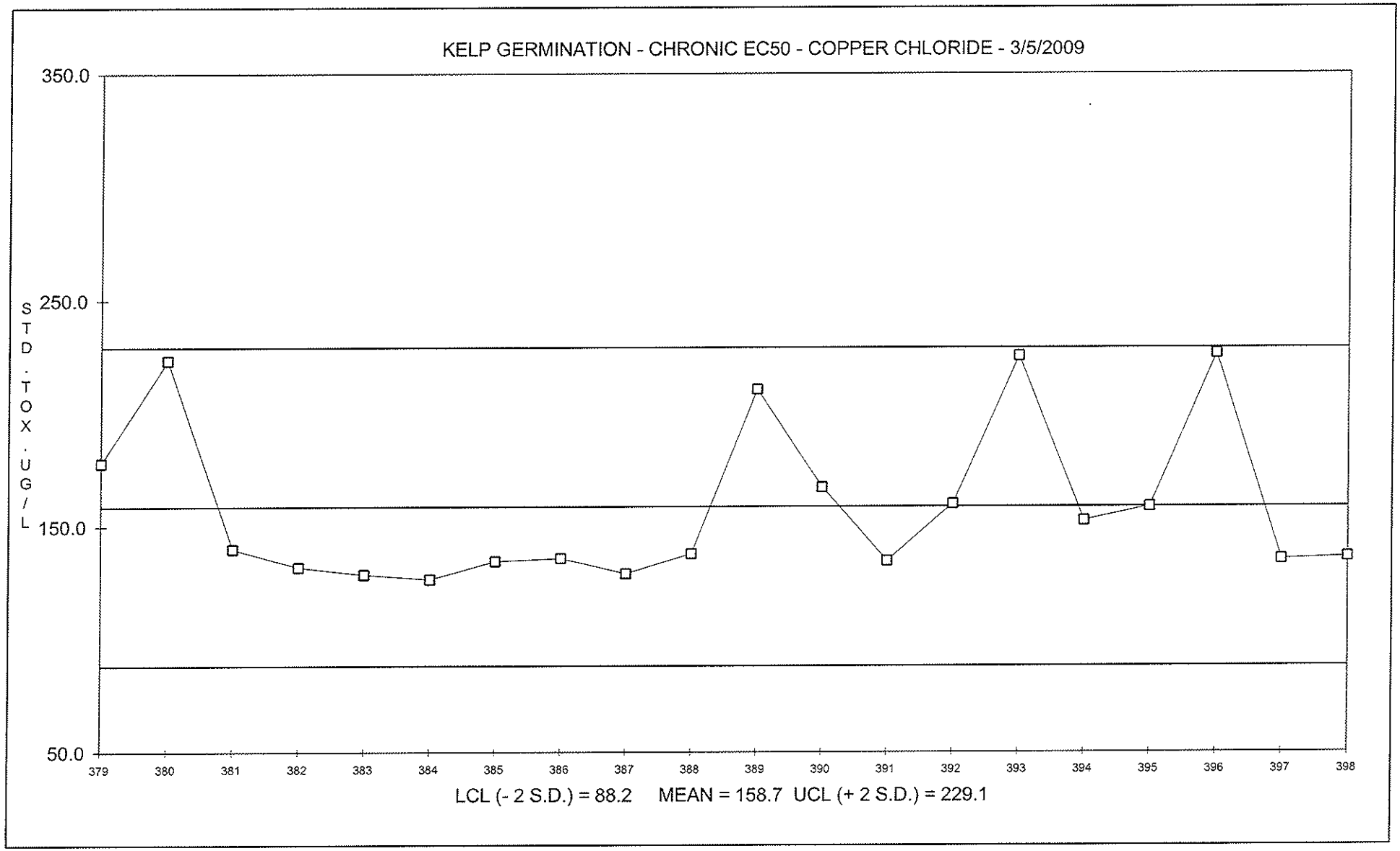

MYSIDOPSIS GROWTH - CHRONIC LC50 - SDS - 3/26/09
STD.TOX.MG/L
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
LCL (- 2 S.D.) = 2.5
MEAN = 13.3
UCL (+ 2 S.D.) = 19.5

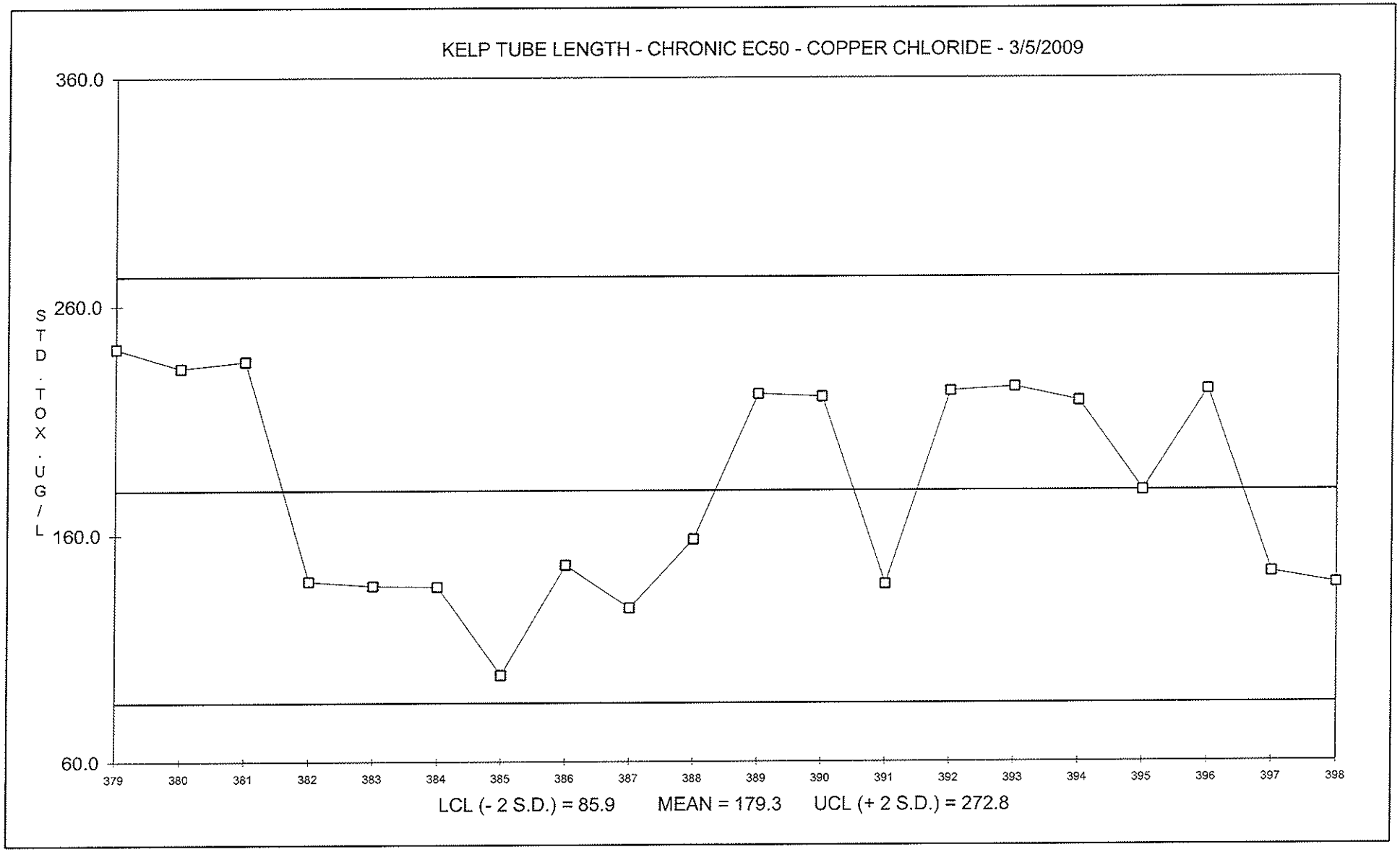

FATHEAD LARVAL SURVIVAL - CHRONIC EC50 - COPPER CHLORIDE - 2/27/2009
160.0
120.0
80.0
40.0
0.0
STD.TOX.G/L
462
463
464
465
466
467
468
469
470
471
472
473
474
475
477
478
479
480
481
482
LCL (- 2 S.D.) = 27.2
MEAN = 63.1
UCL (+ 2 S.D.) = 99.0

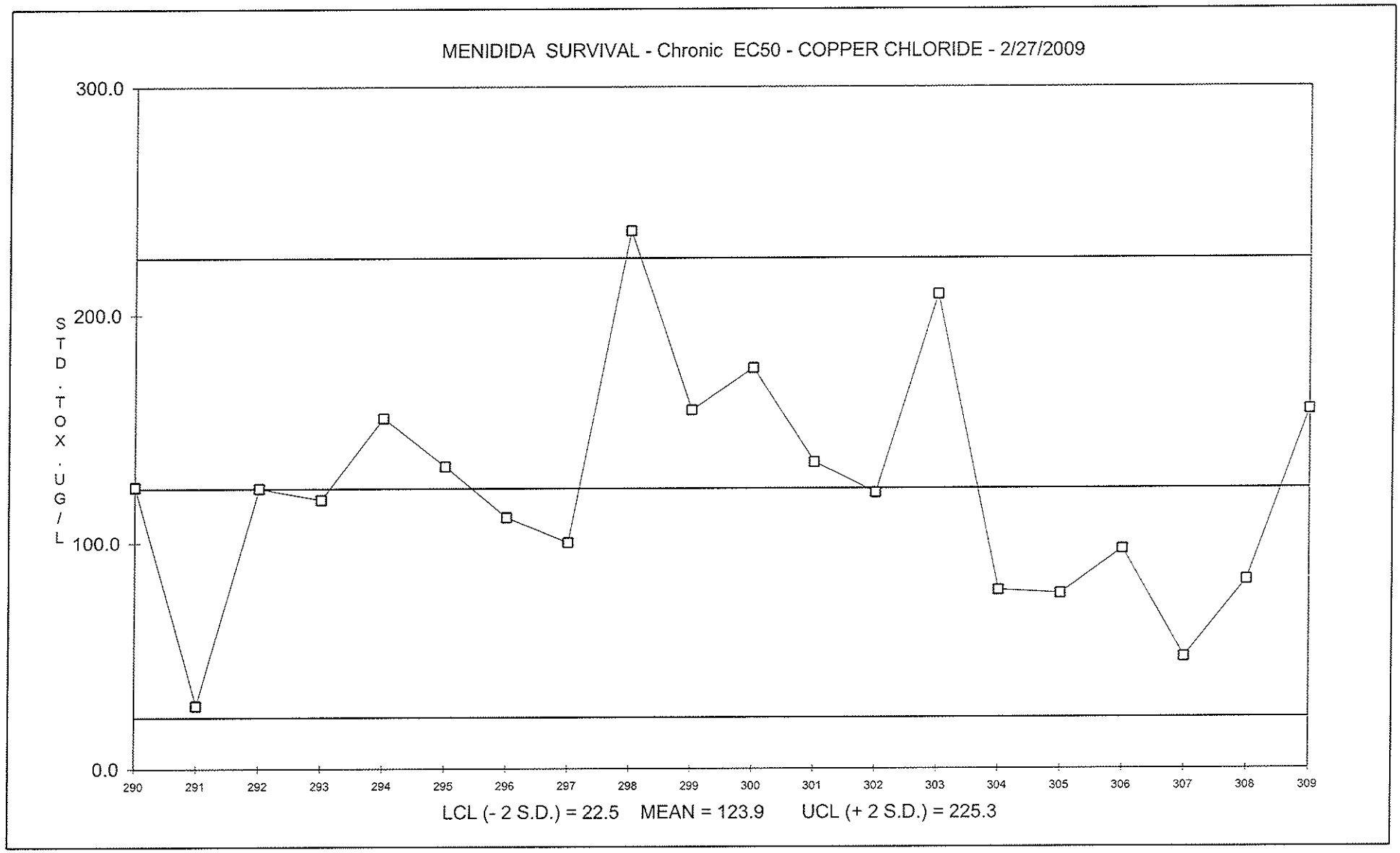
FATHEAD LARVAL GROWTH - CHRONIC EC50 - COPPER CHLORIDE - 2/27/2009

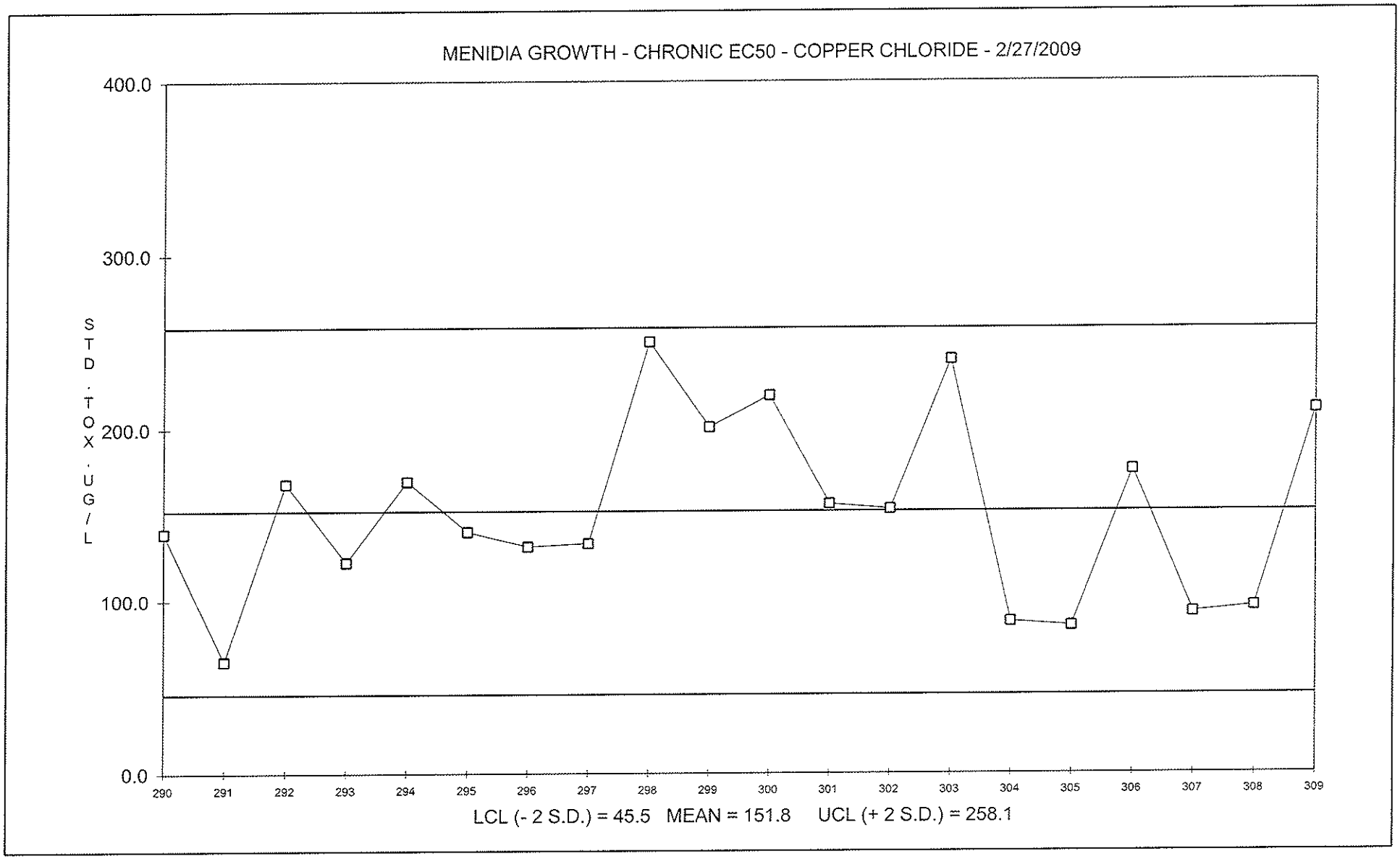


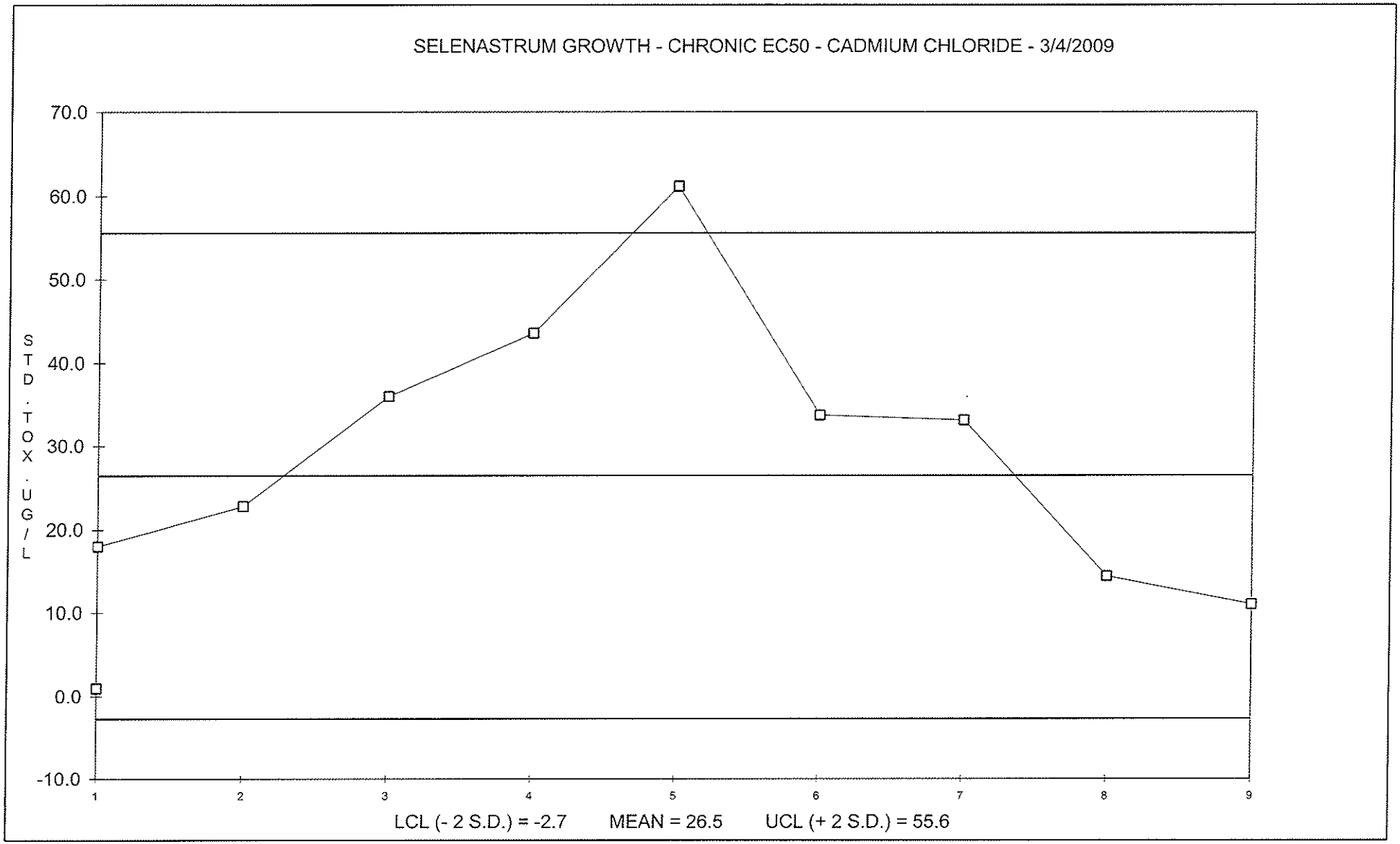
LCL (- 2 S.D.) = 8.5 MEAN = 39.4 UCL (+ 2 S.D.) = 70.3

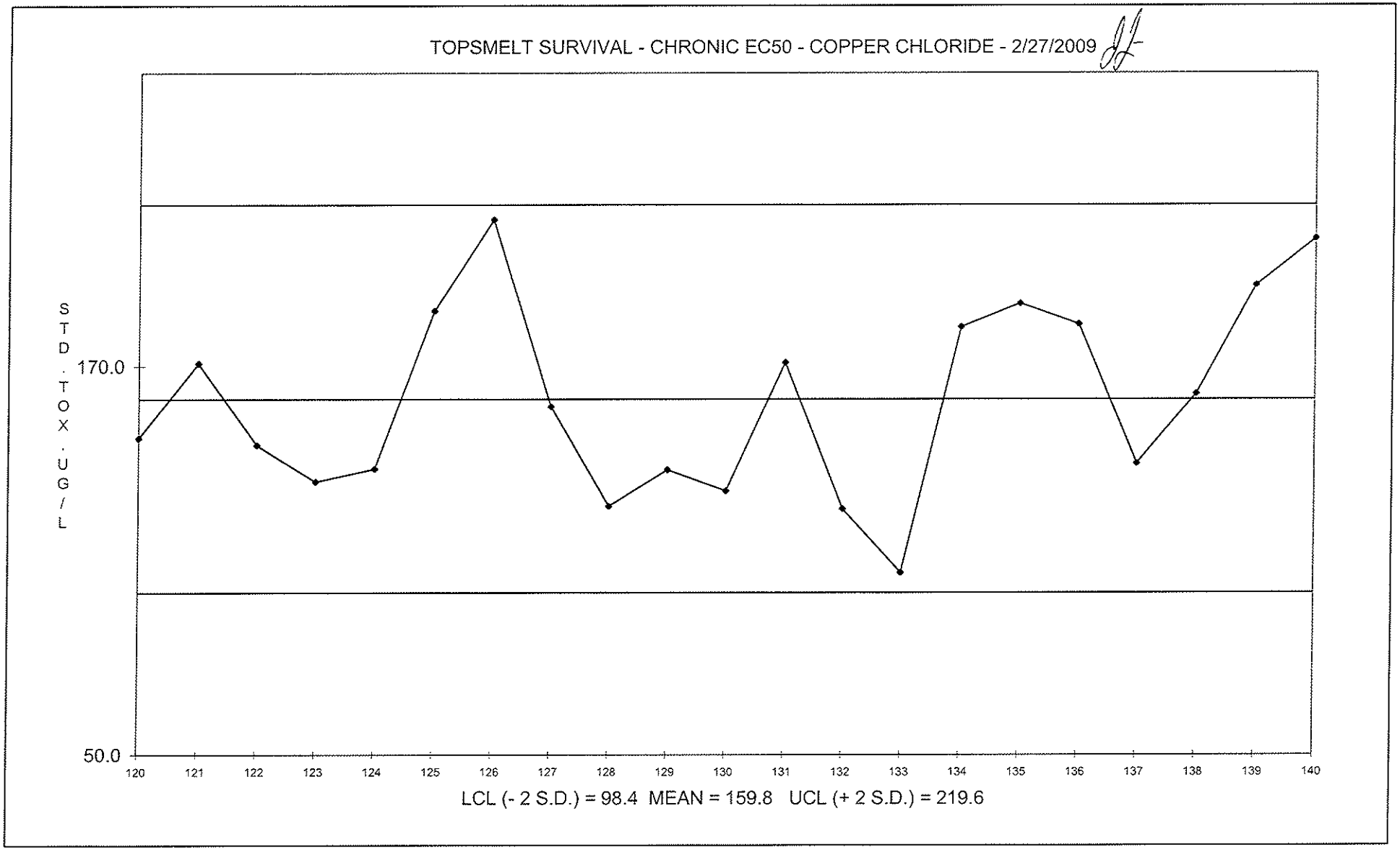

KELP GERMINATION - CHRONIC EC50 - COPPER CHLORIDE - 3/5/2009
350.0
250.0
150.0
50.0
STD.TOX.UG/L
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
LCL (- 2 S.D.) = 88.2 MEAN = 158.7 UCL (+ 2 S.D.) = 229.1

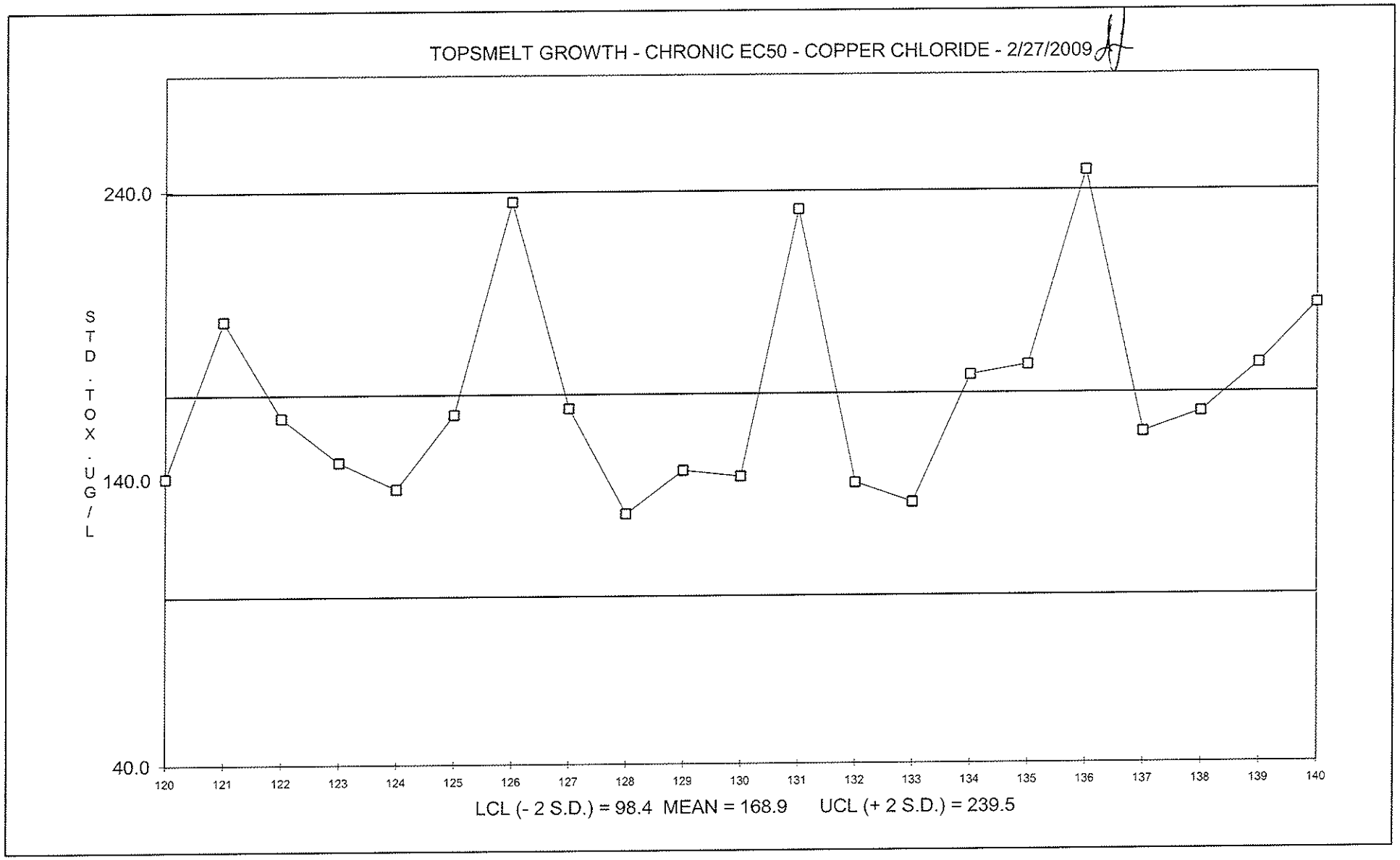

KELP TUBE LENGTH - CHRONIC EC50 - COPPER CHLORIDE - 3/5/2009
360.0
260.0
160.0
60.0
STD.TOX.UG/L
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
LCL (- 2 S.D.) = 85.9
MEAN = 179.3
UCL (+ 2 S.D.) = 272.8


MENIDIDA SURVIVAL - Chronic EC50 - COPPER CHLORIDE - 2/27/2009
300.0
200.0
100.0
0.0
STD.TOX.UG/L
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
LCL (- 2 S.D.) = 22.5 MEAN = 123.9 UCL (+ 2 S.D.) = 225.3


MENIDIA GROWTH - CHRONIC EC50 - COPPER CHLORIDE - 2/27/2009
400.0
300.0
200.0
100.0
0.0
STD-TOX-UG/L
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
LCL (- 2 S.D.) = 45.5 MEAN = 151.8 UCL (+ 2 S.D.) = 258.1


SELENASTRUM GROWTH - CHRONIC EC50 - CADMIUM CHLORIDE - 3/4/2009
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
-10.0
STD.TOX.UG/L
1
2
3
4
5
6
7
8
9
LCL (- 2 S.D.) = -2.7
MEAN = 26.5
UCL (+ 2 S.D.) = 55.6


TOPSMELT SURVIVAL - CHRONIC EC50 - COPPER CHLORIDE - 2/27/2009
STD.TOX.UG/L
170.0
50.0
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
LCL (- 2 S.D.) = 98.4 MEAN = 159.8 UCL (+ 2 S.D.) = 219.6


TOPSMELT GROWTH - CHRONIC EC50 - COPPER CHLORIDE - 2/27/2009
240.0
140.0
40.0
STD.TOX.UG/L
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
LCL (- 2 S.D.) = 98.4 MEAN = 168.9 UCL (+ 2 S.D.) = 239.5

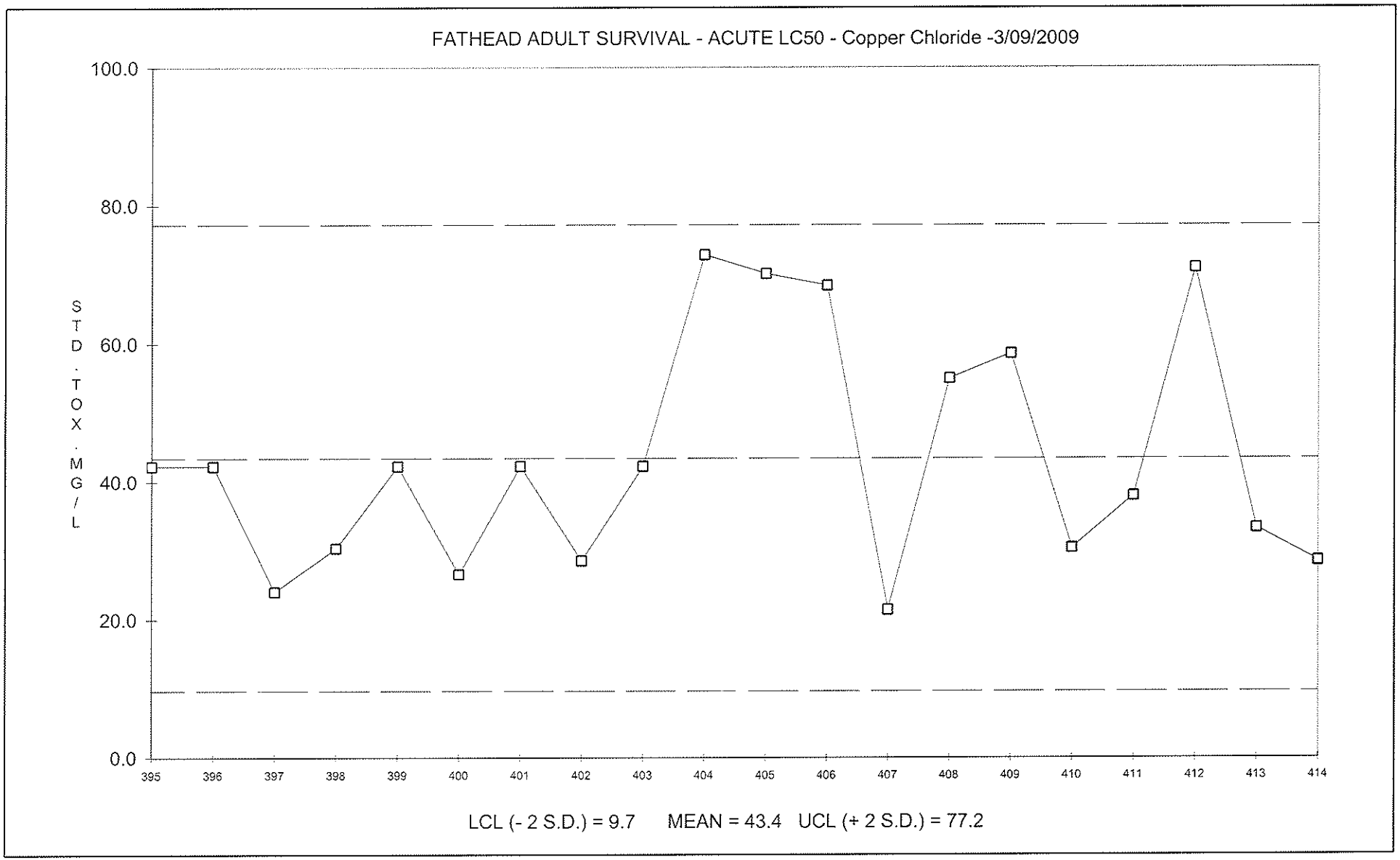
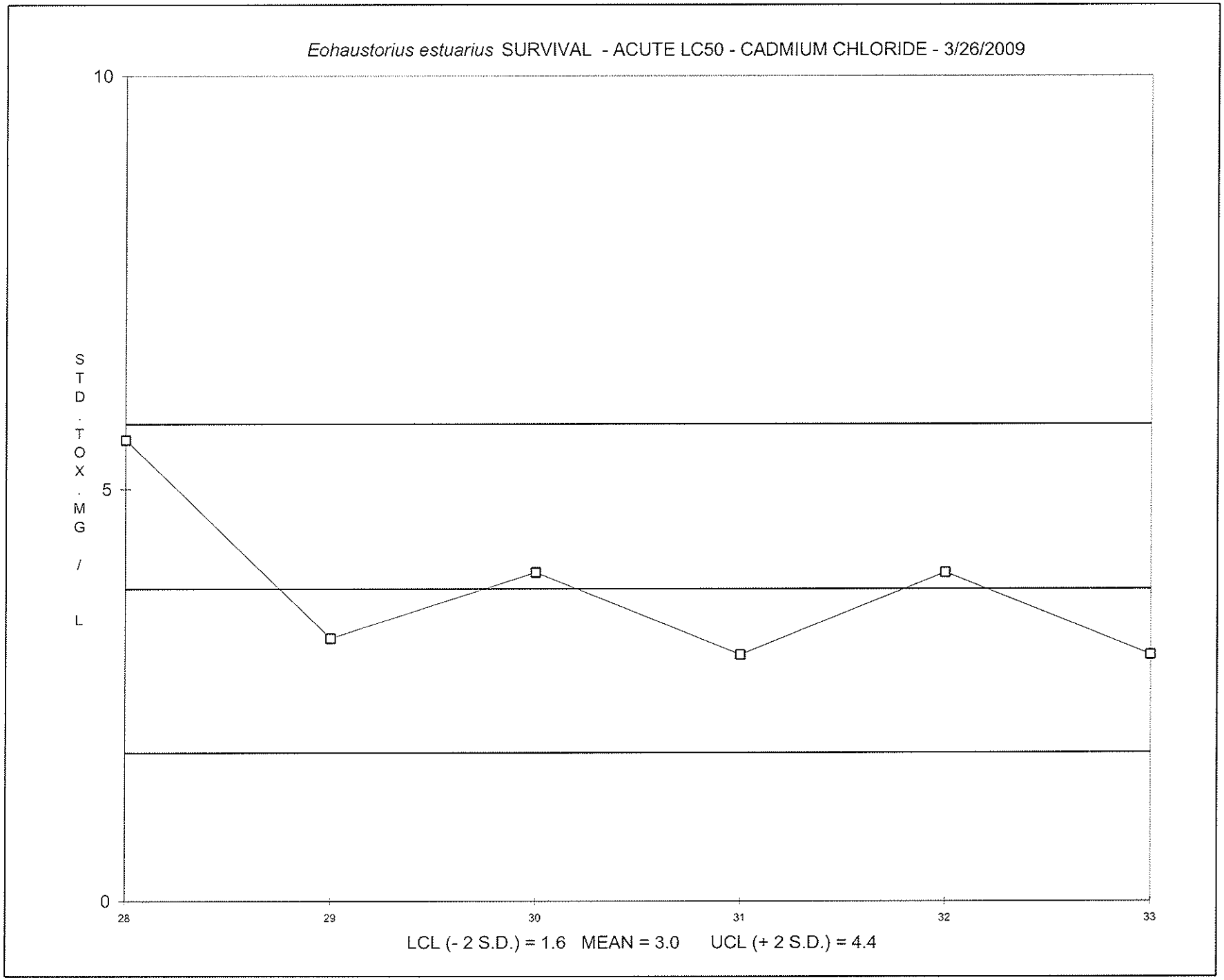

FATHEAD ADULT SURVIVAL - ACUTE LC50 - Copper Chloride -3/09/2009
100.0
80.0
60.0
40.0
20.0
0.0
STD.TOX.MG/L
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
LCL (- 2 S.D.) = 9.7
MEAN = 43.4
UCL (+ 2 S.D.) = 77.2

FIGURE 2-1. (CONTINUED).



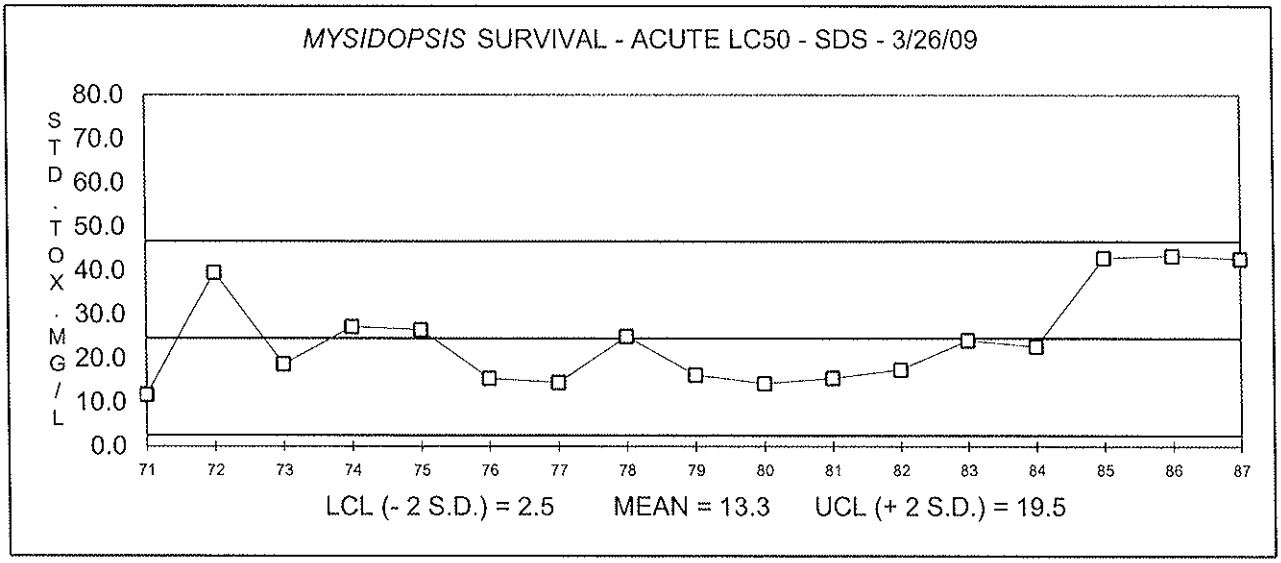

MYSIDOPSIS SURVIVAL - ACUTE LC50 - SDS - 3/26/09
STD. TOX. MG/L
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
LCL (- 2 S.D.) = 2.5
MEAN = 13.3
UCL (+ 2 S.D.) = 19.5

Table 7-2. CONTROL LIMIT EXCEEDENCE FORM

TEST _____ DATE _____

DESCRIBE OUT OF CONTROL INCIDENT _____

_____

_____

_____

DESCRIBE REASON FOR INCIDENT _____

_____

_____

_____

WHAT OTHER TESTS WERE AFFECTED? _____

_____

RECOMMENDATIONS _____

_____

_____

_____

Michael Machuzak, QC Officer Date

_____

Scott Johnson, Laboratory Director Date

7.4. INSTRUMENT CALIBRATION AND LOG-KEEPING TECHNIQUES

Holding water and animal conditions are monitored very closely. At a minimum of once per week, ammonia, salinity (for marine species). Temperature is checked in each holding tank daily. Also, a daily record of feeding, behavioural observations, and mortality are also maintained. Also weekly, tanks are cleaned of detritus and 50% of the water is changed. Dead or unhealthy looking organisms are always removed immediately.

Calibration, as defined at Aquatic Bioassay, involve those procedures that are performed routinely (daily or during every run of analysis) before any analyses are initiated (Table 7-4). Preventative maintenance involves those nonroutine procedures used to assure proper performance of laboratory equipment and instruments (Table 7-5). All calibration and maintenance procedures are dated, initialed, and recorded in a bound Laboratory Calibration Log.

7.5. INTERLABORATORY DMR AND SPLIT SAMPLE TESTING

Aquatic Bioassay is continuously involved in split sample and standard toxicant testing.

Aquatic Bioassay is an active member of the QA/QC Committee of the Southern California Toxicity Assessment Group (SCTAG).

Aquatic Bioassay is also involved in the annual DMR Studies for the EPA (see Appendix 9.4 for the most recent results) as well as the annual WP studies (see Appendix 9.4 for the most recent results).

7.6. STANDARD OPERATING PROCEDURES

Standard operating procedures for all requested bioassays are included in Appendix 9.5. Procedures are those specified in the published methods (See Table 5-1).

7.7. REPORTING

Data is acquistioned from laboratory bench sheets that test tecnicians have carefully prepared throughout the specific test by a senior technician. The bench sheets contain data that is specified in the EPA manuals and is also specified in each test SOP. The raw data is then entered into a computer to be analysed statistically by ToxCalc or SoftTox depending on the specific test. Once a data report is generated, it is inspected for completeness first by the technician preparing the report, secondly by the QC Officer and thirdly by the laboratory director. If the data report is correct and all acceptability criteria for the specific test have been met, it is signed by the Laboratory Director, copied and the original, with a wet signature, is dispatched to the client. A copy remains in our archives here at the laboratory.

If descrepancies are discovered at any of three levels of data examination, the Laboratory Director seeks the appropriate corrective action. This may include reanalysis of the data or a complete re-run of a particular toxicity test. After the corrective action has been carried out the same three tier examination of the final report takes place prior to releasing the data to the client.

Table 7-4. CALIBRATION PROCEDURES AND FREQUENCY.

PARAMETER	FREQUENCY	CALIBRATION PROCEDURE
Water System	Daily	Measure Conductivity and pH.
Thermometers	Monthly	Compare with N.B.S. standard.
Balances	With Each Use	Compare to Class S weights.
Oxygen Meter	Daily	Adjust zero, full scale, air calibration. Compare to Winkler titration.
Salinometer	Each use	Adjust redline. Compare to chloride titration standards.
Thermistors	Each use	Compare to N.B.S. traceable thermometers.
pH Meter	Daily	Calibrate to pH 7.0 and 4.0 or 10.0 buffers.
ISE Meter	Daily	Calibrate to standards curve.
Bioassay	Daily	Check temperature and Room continuous recorder.
Bioassay System	Daily	Check animal survival and water clarity.
Autoclave	Each run	Check spore tape and temperature.
Incubator	Daily	Check/adjust temperature.
Water Bath	Daily	Check/adjust temperature and water level.
Light Meter	Annually	Light meter is sent to manufacturer annually for factory calibration.

Table 7-5. PREVENTATIVE MAINTENANCE.

PARAMETER	FREQUENCY	MAINTENANCE	BY WHOM
Water System	As needed	Replace resin beds.	Mfgr.
Thermometers	As needed	Replace.	Staff
Balances	Annually	Service, calibrate.	Mfgr.
Oxygen Meter	As needed	Replace fill solution, membrane, batteries.	Staff
		Repair, service.	Mfgr.
Salinometer	As needed	Replate cond. probe. Replace batteries.	Staff
		Repair, service.	Mfgr.
Nephelometer	As needed	Cleaning, focusing, bulb replacement.	Staff
		Repair, service.	Mfgr.
Thermistors	As needed	Replace batteries.	Staff
		Repair, service.	Mfgr.
pH/ISE Meter	As needed	Clean probe.	Staff
		Repair, service.	Mfgr.
Bioassay	As needed	Change water. Clean tanks and filters.	Staff
Autoclave	Weekly	Clean outside and run with mild acid solution.	Staff
Incubator	As needed	Repair, service.	Mfgr.
Water Bath	As needed	Repair, service.	Mfgr.
Heating Oven	As needed	Repair, service.	Mfgr.

8. APPENDICES

8.1. EXAMPLES OF COMPLETED BIOASSAY REPORTS

AQUATIC BIOASSAY & CONSULTING
LABORATORIES, INC.

TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

February 20, 2009

Client
City of California
222 Any Rd.
Anytown, CA 93000

Dear Client:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms EPA-821-R-02-013.* Results were as follows:

CLIENT:	City of California
SAMPLE I.D.:	EFF
DATE RECEIVED:	7 Feb - 09
ABC LAB. NO.:	THO0209.017

CHRONIC FATHEAD LARVAE SURVIVAL & GROWTH BIOASSAY

SURVIVAL	NOEC	=	100.00 %
	TUc	=	1.00
	IC25	=	>100.00 %
	IC50	=	>100.00 %
GROWTH	NOEC	=	100.00 %
	TUc	=	1.00
	IC25	=	>100.00 %
	IC50	=	>100.00 %

Yours very truly,
Scott C. Johnson

Scott C. Johnson
Laboratory Director

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:	2/7/2009	Test ID:	XXX0209017	Sample ID:	CA0056294
End Date:	2/14/2009	Lab ID:	CAABC	Sample Type:	AMB1-Ambient water
Sample Date:	2/6/2009	Protocol:	EPA-821-R-02-013	Test Species:	PP-Pimephales promelas
Comments:	Eff				

Conc-%	1	2	3	4
N Control	1.0000	1.0000	1.0000	1.0000
32	0.9000	0.9000	1.0000	1.0000
42	0.9000	0.8000	0.9000	1.0000
56	0.9000	1.0000	0.9000	1.0000
75	1.0000	0.9000	1.0000	0.9000
100	1.0000	1.0000	1.0000	1.0000

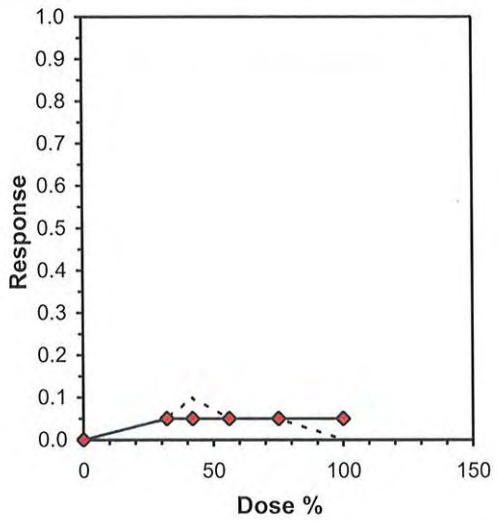
			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
N Control	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4			1.0000	1.0000
32	0.9500	0.9500	1.3305	1.2490	1.4120	7.072	4	14.00	10.00	0.9500	0.9500
42	0.9000	0.9000	1.2543	1.1071	1.4120	9.935	4	12.00	10.00	0.9500	0.9500
56	0.9500	0.9500	1.3305	1.2490	1.4120	7.072	4	14.00	10.00	0.9500	0.9500
75	0.9500	0.9500	1.3305	1.2490	1.4120	7.072	4	14.00	10.00	0.9500	0.9500
100	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4	18.00	10.00	0.9500	0.9500

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.91208	0.884	0.08565	-0.406
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs N Control				

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)	Skew
IC05	>100			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			



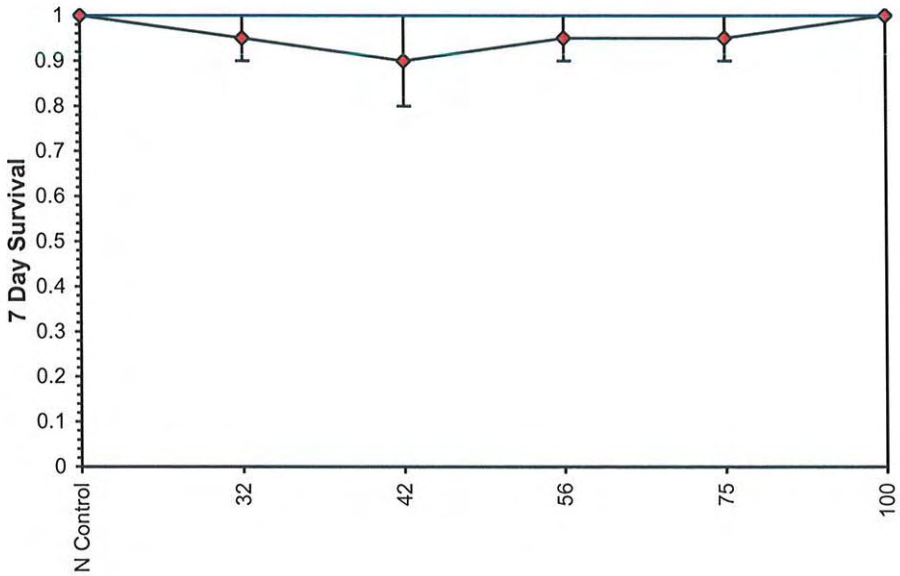
ToxCalc v5.0.23

Reviewed by:

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:	2/7/2009	Test ID:	XXX0209017	Sample ID:	CA0056294
End Date:	2/14/2009	Lab ID:	CAABC	Sample Type:	AMB1-Ambient water
Sample Date:	2/6/2009	Protocol:	EPA-821-R-02-013	Test Species:	PP-Pimephales promelas
Comments:	Eff				

Dose-Response Plot



ToxCalc v5.0.23

Reviewed by:

Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:	2/7/2009	Test ID:	XXX0209017	Sample ID:	CA0056294
End Date:	2/14/2009	Lab ID:	CAABC	Sample Type:	AMB1-Ambient water
Sample Date:	2/6/2009	Protocol:	EPA-821-R-02-013	Test Species:	PP-Pimephales promelas
Comments:	Eff				

Conc-%	1	2	3	4
N Control	0.4380	0.3850	0.4420	0.3980
32	0.3240	0.4220	0.5260	0.4070
42	0.3700	0.2640	0.3660	0.4420
56	0.3690	0.4780	0.4850	0.4630
75	0.3500	0.2990	0.3860	0.4270
100	0.3240	0.3880	0.3680	0.4630

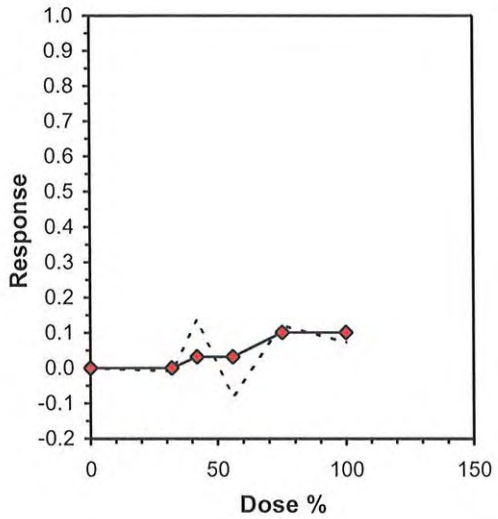
			Transform: Untransformed					1-Tailed			Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
N Control	0.4158	1.0000	0.4158	0.3850	0.4420	6.866	4				0.4178	1.0000
32	0.4198	1.0096	0.4198	0.3240	0.5260	19.753	4	-0.093	2.410	0.1038	0.4178	1.0000
42	0.3605	0.8671	0.3605	0.2640	0.4420	20.305	4	1.282	2.410	0.1038	0.4046	0.9686
56	0.4488	1.0794	0.4488	0.3690	0.4850	12.023	4	-0.766	2.410	0.1038	0.4046	0.9686
75	0.3655	0.8791	0.3655	0.2990	0.4270	14.873	4	1.166	2.410	0.1038	0.3756	0.8992
100	0.3858	0.9278	0.3858	0.3240	0.4630	15.042	4	0.696	2.410	0.1038	0.3756	0.8992

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.96733	0.884	-0.094	-0.2837
Bartlett's Test indicates equal variances (p = 0.71)	2.93199	15.0863		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test Treatments vs N Control	100	>100		1	0.10385	0.24978	0.00477	0.00371	0.31335	5, 18

Linear Interpolation (200 Resamples)

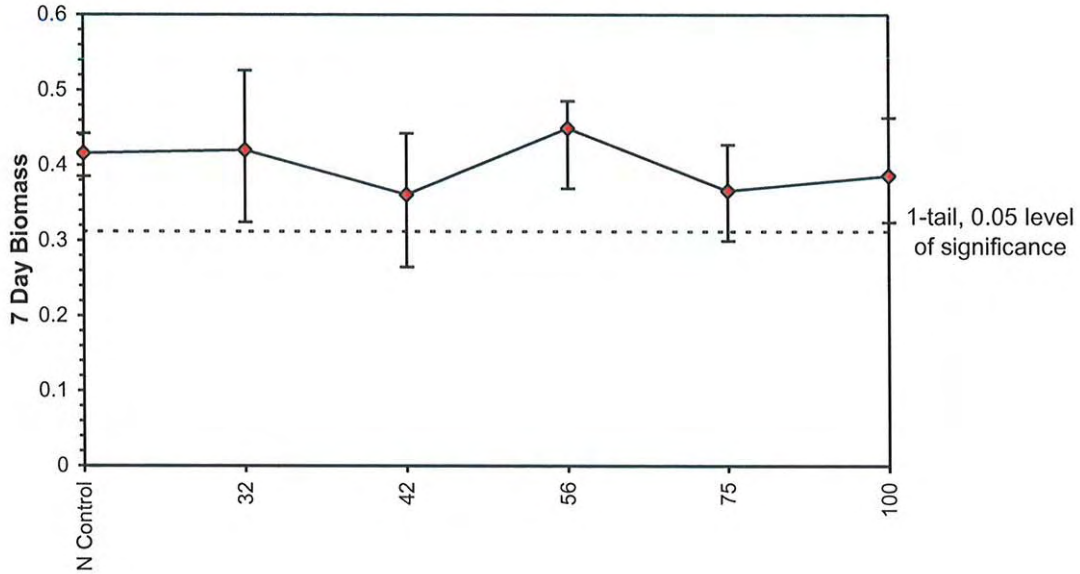
Point	%	SD	95% CL(Exp)	Skew
IC05	61.086			
IC10	74.771			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			



Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:	2/7/2009	Test ID:	XXX0209017	Sample ID:	CA0056294
End Date:	2/14/2009	Lab ID:	CAABC	Sample Type:	AMB1-Ambient water
Sample Date:	2/6/2009	Protocol:	EPA-821-R-02-013	Test Species:	PP-Pimephales promelas
Comments:	Eff				

Dose-Response Plot



Reviewed by:

Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:	2/7/2009	Test ID:	XXX0209017	Sample ID:	CA0056294
End Date:	2/14/2009	Lab ID:	CAABC	Sample Type:	AMB1-Ambient water
Sample Date:	2/6/2009	Protocol:	EPA-821-R-02-013	Test Species:	PP-Pimephales promelas
Comments:	Eff				

Auxiliary Data Summary

Conc-%	Parameter	Mean	Min	Max	SD	CV%	N
N Control	Temp C	24.30	24.00	24.90	0.32	2.33	8
32		24.60	24.00	25.20	0.54	2.99	8
42		24.64	24.00	25.20	0.55	3.00	8
56		24.69	24.00	25.30	0.59	3.10	8
75		24.76	24.00	25.50	0.65	3.26	8
100		24.85	24.00	25.60	0.73	3.44	8
N Control	pH	8.14	8.00	8.30	0.09	3.72	8
32		8.01	7.90	8.30	0.16	4.92	8
42		7.93	7.80	8.10	0.13	4.52	8
56		7.83	7.70	8.00	0.10	4.11	8
75		7.75	7.60	8.00	0.13	4.67	8
100		8.08	7.90	8.20	0.09	3.69	8
N Control	DO mg/L	7.63	6.70	7.90	0.42	8.47	8
32		7.79	5.90	9.10	0.89	12.13	8
42		7.44	5.90	8.30	0.83	12.25	8
56		7.75	7.50	8.30	0.27	6.74	8
75		7.61	5.70	9.30	1.52	16.19	8
100		7.65	5.70	8.80	0.89	12.35	8
N Control	Hardness mg/L	93.75	89.00	99.00	4.20	2.19	8
32		0.00	0.00	0.00	0.00		0
42		0.00	0.00	0.00	0.00		0
56		0.00	0.00	0.00	0.00		0
75		0.00	0.00	0.00	0.00		0
100		212.50	203.00	217.00	5.93	1.15	8
N Control	Alkalinity mg/L	305.00	286.00	344.00	17.07	1.35	8
32		562.38	465.00	766.00	98.15	1.76	8
42		545.38	519.00	588.00	25.07	0.92	8
56		626.38	603.00	642.00	15.92	0.64	8
75		739.88	719.00	755.00	13.17	0.49	8
100		898.75	886.00	919.00	13.22	0.40	8
N Control	Conductivity	62.38	60.00	65.00	2.07	2.30	8
32		0.00	0.00	0.00	0.00		0
42		0.00	0.00	0.00	0.00		0
56		0.00	0.00	0.00	0.00		0
75		0.00	0.00	0.00	0.00		0
100		144.25	141.00	146.00	2.19	1.03	8

AQUATIC
BIOASSAY &
CONSULTING
LABORATORIES, INC.

TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

March 31, 2009

Client
City of California
222 Any Rd.
Anytown, CA 93000

Dear Client:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms, EPA/R-95/136.* Results were as follows:

CLIENT:	City of California
SAMPLE I.D.:	Plant Final Effluent
DATE RECEIVED:	3 March - 09
ABC LAB. NO.:	XXX0309.074

CHRONIC SEA URCHIN FERTILIZATION BIOASSAY

NOEC	=	5.60 %
TUc	=	17.86
IC25	=	>5.60 %
IC50	=	>5.60 %

Yours very truly,

Scott C. Johnson

Scott C. Johnson
Laboratory Director

Sperm Cell Fertilization Test-Proportion Fertilized

Start Date:	3/3/2009	Test ID:	XXX0309074	Sample ID:	CA0048143
End Date:	3/3/2009	Lab ID:	CAABC	Sample Type:	EFF1-POTW
Sample Date:	3/3/2009	Protocol:	EPA600/R95/136, 1995	Test Species:	SP-Strongylocentrotus purpuratus
Comments:	Plant Final Effluent				

Conc-%	1	2	3	4
N Control	1.0000	1.0000	1.0000	1.0000
0.56	1.0000	1.0000	1.0000	1.0000
1	1.0000	1.0000	1.0000	1.0000
1.8	1.0000	0.9800	1.0000	1.0000
3.2	1.0000	1.0000	1.0000	1.0000
5.6	1.0000	1.0000	1.0000	1.0000

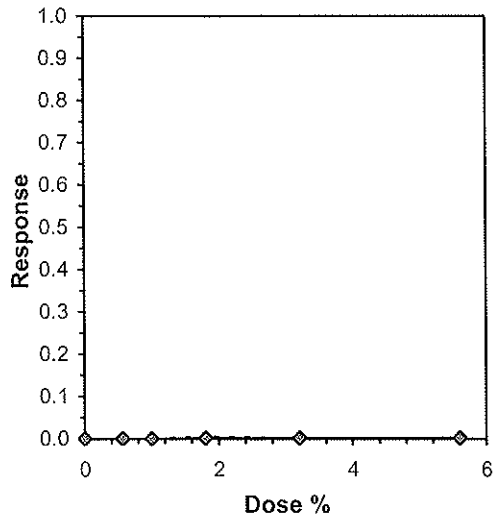
			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
N Control	1.0000	1.0000	1.5208	1.5208	1.5208	0.000	4			1.0000	1.0000
0.56	1.0000	1.0000	1.5208	1.5208	1.5208	0.000	4	18.00	10.00	1.0000	1.0000
1	1.0000	1.0000	1.5208	1.5208	1.5208	0.000	4	18.00	10.00	1.0000	1.0000
1.8	0.9950	0.9950	1.4978	1.4289	1.5208	3.067	4	16.00	10.00	0.9983	0.9983
3.2	1.0000	1.0000	1.5208	1.5208	1.5208	0.000	4	18.00	10.00	0.9983	0.9983
5.6	1.0000	1.0000	1.5208	1.5208	1.5208	0.000	4	18.00	10.00	0.9983	0.9983

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.46508	0.884	-3.0206	13.9892
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	5.6	>5.6		17.8571
Treatments vs N Control				

Linear Interpolation (200 Resamples)

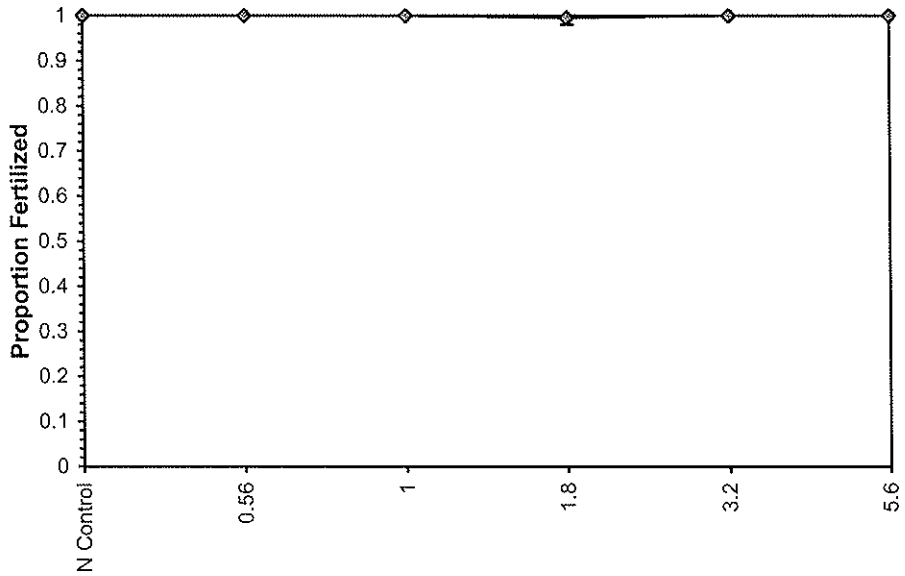
Point	%	SD	95% CL(Exp)	Skew
IC05	>5.6			
IC10	>5.6			
IC15	>5.6			
IC20	>5.6			
IC25	>5.6			
IC40	>5.6			
IC50	>5.6			



Sperm Cell Fertilization Test-Proportion Fertilized

Start Date:	3/3/2009	Test ID:	XXX0309074	Sample ID:	CA0048143
End Date:	3/3/2009	Lab ID:	CAABC	Sample Type:	EFF1-POTW
Sample Date:	3/3/2009	Protocol:	EPA600/R95/136, 1995	Test Species:	SP-Strongylocentrotus purpuratus
Comments:	Plant Final Effluent				

Dose-Response Plot



Sperm Cell Fertilization Test-Proportion Fertilized

Start Date:	3/3/2009	Test ID:	XXX0309074	Sample ID:	CA0048143
End Date:	3/3/2009	Lab ID:	CAABC	Sample Type:	EFF1-POTW
Sample Date:	3/3/2009	Protocol:	EPA600/R95/136, 1995	Test Species:	SP-Strongylocentrotus purpuratus
Comments:	Plant Final Effluent				

Auxiliary Data Summary

Conc-%	Parameter	Mean	Min	Max	SD	CV%	N
N Control	Temp C	15.20	15.20	15.20	0.00	0.00	2
0.56		15.20	15.20	15.20	0.00	0.00	2
1		15.20	15.20	15.20	0.00	0.00	2
1.8		15.20	15.20	15.20	0.00	0.00	2
3.2		15.20	15.20	15.20	0.00	0.00	2
5.6		15.20	15.20	15.20	0.00	0.00	2
N Control	pH	8.00	8.00	8.00	0.00	0.00	2
0.56		8.00	8.00	8.00	0.00	0.00	2
1		8.00	8.00	8.00	0.00	0.00	2
1.8		8.00	8.00	8.00	0.00	0.00	2
3.2		8.00	8.00	8.00	0.00	0.00	2
5.6		8.00	8.00	8.00	0.00	0.00	2
N Control	DO mg/L	7.60	7.60	7.60	0.00	0.00	2
0.56		7.10	7.10	7.10	0.00	0.00	2
1		7.00	7.00	7.00	0.00	0.00	2
1.8		7.00	7.00	7.00	0.00	0.00	2
3.2		6.80	6.80	6.80	0.00	0.00	2
5.6		6.70	6.70	6.70	0.00	0.00	2
N Control	Salinity ppt	34.00	34.00	34.00	0.00	0.00	2
0.56		34.00	34.00	34.00	0.00	0.00	2
1		34.00	34.00	34.00	0.00	0.00	2
1.8		34.00	34.00	34.00	0.00	0.00	2
3.2		33.00	33.00	33.00	0.00	0.00	2
5.6		32.00	32.00	32.00	0.00	0.00	2

APPENDIX 8.2. RESUMES OF KEY PERSONNEL

SCOTT C. JOHNSON

CORE COMPETENCIES:

- Laboratory Management - Managed all facets of the City of Los Angeles' Santa Monica Bay and Los Angeles River NPDES monitoring programs including water quality, benthic ecology, toxicity testing, reporting and permit negotiations.
- Project Management Managed the scheduling, budgeting, resource allocation, risk analysis, customer communications and conflict management for projects ranging from the environmental to software business areas.
- Technical Management - Lead teams composed of programmers, DBAs, statisticians, ecologists, and technical writers.
- Executive Management - Responsible for business planning/ market sbategy, human resources, and finances.
- Presentation Skills - Skilled at scientific presentation, group facilitation, software demonstrations and training seminars.
- Proposals - Strategy and team development, pricing, writing, and contract negotiation.
- Science - Background includes laboratory and field biology, chemistry and statistics.

EMPLOYMENT HISTORY&. EXPERIENCE:

Aquatic Bioassay&. Consulting Laboratories, Ventura CA
Laboratory Director, Director of Aquatic Operations &. Environmental Consulting - January 2002 to present
Mr. Johnson is responsible for all ocean and freshwater monitoring and laboratory operations, environmental assessments, reporting and marine consulting. He is responsible for the NPDES marine monitoring programs for the largest municipal dischargers on the central California coast including the cities of Oxnard, Goleta, Santa Barbara, Avalon and San Luis Obispo.
Other monitoring programs he is either responsible for or providing services to include the ongoing Marina del Rey TMDL survey, the Ventura River Assessment Program, Lake Elsinor monitoring program and the Haiwee Reservoir study. Mr. Johnson ensures that all field and laboratory operations are conducted with strict adherence to the proper protocols and that all results and reports are provided to the client in an accurate and timely fashion.

eLabor. Camarillo. CA
Vice President, Professional Services - October 1999 to January 2002
As Vice President in charge of the Professional Services Division, reporting directly to the CEO, Mr. Johnson was responsible for a staff composed of 50 employees mandated with the implementation and support of a workforce management product suite delivered as either a hosted (ASP) or premise based solution. His primary responsibilities include all divisional budgeting, P&L, human resources, strategic partners and customer relationships.

Director, Project Services - February 1999 to October 1999
As Director Mr. Johnson managed a team of project managers who were responsible for the successful implementation of client server database applications to Fortune 500 clients. My responsibilities included managing client relationships, company-wide revenue and resource forecasting, day-to-day project management operations such as scheduling, budgeting and resource allocations, project costing and technical sales. Additionally, I helped to establish the roles and responsibilities of the Director level position and worked with the executive management team to solve operational problems faced by this quickly growing company.

JTS, Oiai. CA
Owner - October 1998 to June 1999
As a sole proprietor I provided Independent consulting services to both private and government agencies in need of database and web site development, data synthesis, project management and technical writing.

EcoAnalysis, Inc., Oiai. CA
President. 1996 to October 1998 .
EcoAnalysis was an information and consulting services company composed of professional programmers, ecologists and managers specializing in information synthesis and the development of client server information management systems for the environmental industry.
Mr. Johnson was promoted to President by the Board of Directors to guide a restructuring process in 1997 that included:
defining the company vision, development of a detailed business plan that refocused the company and resulting in the development of 3 'core' software applications, expanded sales and marketing efforts nationwide, initiated negotiations for partnerships/acquisitions with several large environmental engineering firms/ and refinanced/restructured debt/loans.
He built relationships with targeted potential clients, strategic partners, and investment bankers; reviewed company cash flow, income and balance sheet reports; was responsible for hiring technical, management and support personnel;
and lead the marketing and sales effort including strategic planning, proposal planning, advertising and presentations.

EcoAnalysis, Inc. (continued)

Division Management. 1994 to 1996 .

Initially hired as the Director of the TOXIS product line (a toxicity testing database and analysis tool), Mr. Johnson was promoted to Division Manager of the Environmental Consulting Division.

In 1995 he was asked to lead the Information Management Division where his responsibilities included: leading the daily project related operations of the programming teams, statisticians and ecologists; personnel hiring, operations budgets and P&ls; initiation of marketing efforts and the generation of proposals.

Project Experience - 1994 to 1998 .

Mr. Johnson managed the development of several large, client-server database systems for federal, state and municipal agencies that were striving to meet EPA regulatory standards.

His key strength is the management of technical and political issues that arise between project team members, the client and their regulatory agencies. On several occasions he assisted to facilitate compromise solutions between several separate technical groups within agencies to ensure project success.

He was responsible for ensuring successful project completion through aggressive management of staff schedules, milestones, resource allocation, implementation strategies, data model and application development, interfacing between the client and programmers, and contract disputes and resolutions.

City of Los Angeles, Los Angeles, CA

Laboratory Manager - 1992 to 1994
Laboratory Supervisor -1988 to 1992
Water Biologist - 1984 to 1988

As Laboratory Manager and Supervisor Mr. Johnson was in charge of the City of Los Angeles' NPDES ocean monitoring program for Santa Monica Bay that included administration of an annual budget and management of 33 professional staff.

The program was designed to assess the impacts of effluent emanating from the City's Hyperion Treatment Plant (420 MGD) on the water quality and biota of Santa Monica Bay. Mr. Johnson was responsible for assuring the timely and accurate completion of all NPDES ocean monitoring programs and reporting including:

bacteriology, benthic infauna and trawling, rig fishing, seafood consumption, water quality, chronic and acute bioassays and microlayer.

Other responsibilities included: Senior Editor of the Santa Monica Bay Annual Assessments Report, management of NPDES negotiations for the Hyperion Treatment Plants with the EPA and state regional board direct communications with the Department of Health Services and other agencies regarding bathing water standards and swimming safety in Santa Monica Bay . Mr. Johnson was Chairperson of the Southern California Toxicity Testing Association's Policy Committee (1990 to 1995).

As a Water Biologist, Mr. Johnson was responsible for the Los Angeles River monitoring program and participation in all facets of the Santa Monica Bay ocean monitoring program.

County Sanitation Districts of Los Angeles. Whittier. CA
Laboratory Technician - 1982 to 1984

As Laboratory Technician, Mr. Johnson participated in all facets of the Sanitation District's marine monitoring programs including benthic infauna, trawling, water quality, bacteriology, data entry and quality assurance.

EDUCATION

M.S. Biology, California State University, Long Beach - 1988
B.A. Biology, Minor Chemistry, California State University, Long Beach – 1981
Limnology Program, University Uppsala, Sweden - 1979

THOMAS (TIM) MIKEL
Senior Scientist

PROFESSIONAL BACKGROUND

AQUATIC BIOASSAY AND CONSULTING LABORATORIES
Laboratory President (1988 to Present)

Experienced with regional, state, and federal environmental agencies. Specialist in statistical evaluation of environmental data. Joint Chair for Mollusk Section of 20th Edition of *Standard Methods*. Chair of Methods Committee for Southern California Toxicity Assessment Group (SCTAG). Co-chair of the 1998 Southern California Bight Pilot Project Toxiciy Committee. Board Member of Southern California Society of Environmental Toxicology and Chemistry.

CHEMICAL RESEARCH LABORATORIES
Laboratory Director (1985 to 1988)

Director of 35 scientists and staff of a complete environmental bioassay, chemistry, bacteriology, and ocean monitoring laboratory. Designer and author of several new bioassay techniques. Frequent guest speaker for numerous environmental health agencies. Project manager for City of Oxnard, Chevron USA, and THUMS Long Beach ocean monitoring projects.

JACOBS ENVIRONMENTAL
Laboratory Director (1976 to 1985)

Director of Jacobs Ventura environmental laboratory. Designer of the Ecological Restoration Project of Upper Newport Bay. Developed hazardous waste bioassay and chemical analysis laboratories at this location. Responsible for all freshwater and marine NPDES bioassays. Project manager of all receiving water monitoring projects.

VENTURA COLLEGE
Oceanography Instructor (1978 to 1979)

Instructor for physical, chemical, and biological oceanography.

SANTA BARBARA UNDERSEAS FOUNDATION
Assistant Director (1974 to 1975)

Chief marine biologist for the Anacapa Island Underwater Nature Trail in cooperation with the U.S. National Park Service.

U.S. DEPARTMENT OF THE INTERIOR
Marine Biologist (1973 to 1974)

Chief marine biologist for intertidal surveys conducted near Big Sur, California. Served as chief biological consultant for team of professional archaeologists.

ACADEMIC BACKGROUND

M.A. 1975. Population and Aquatic Biology. University of California, Santa Barbara.

B.A. 1973. Marine Biology, California State University, Moss Landing Marine Laboratories.

PROFESSIONAL SOCIETIES

Southern California Academy of Sciences

Society of Environmental Toxicity and Chemistry. Board Member, Southern California Chapter.

***Standard Methods*, Joint Task Group Chair for 20th Edition (1996), Section 8610 - Molluscan Bioassays.**

Southern California Bight Pilot Project – Toxicity Subcommittee Co-Chair.

Southern California Toxicology Assessment Group (SCTAG), Chair of the Methods Committee (since 1993)

Southern California Association of Marine Invertebrate Taxonomists (SCAMIT).

PUBLICATIONS

"The prevalence of non-indigenous species in southern California embayments and their effects on benthic macroinvertebrate communities" (in press). Southern California Coastal Water Research Project – Annual Report 2002 (with D. Montagne, R. Velarde, J. Ranasinghe, S. Weisberg, R. Smith, and A. Dalkey).

"Southern California Bight 1998 Regional Monitoring Program. Water Quality" (in prep.) Southern California Coastal Water Research Project (with J. Ranasinghe, D. Montagne, R. Smith, S. Weisberg, D. Cadien, R. Velarde, and A. Dalkey).

"Southern California Bight 1998 Regional Monitoring Program: VII. Benthic Macrofauna" 2002. Southern California Coastal Water Research Project (with J. Ranasinghe, D. Montagne, R. Smith, S. Weisberg, D. Cadien, R. Velarde, and A. Dalkey).

"Southern California Bight 1998 Regional Monitoring Program: I. Executive Summary" (in press). Southern California Coastal Water Research Project (with J. Ranasinghe, D. Montagne, S. Weisberg, S. Bay, M. Allen, J. Noblet, and B. Jones).

"Southern California Bight 1998 Regional Monitoring Program: V. Demersal Fishes and Megabenthic Invertebrates" 2002. Southern California Coastal Water Research Project (with M. Allen, A. Groce, D. Diener, J. Brown, S. Steinert, G. Deets, J. Noblet, S. Moore, D. Diehl, E. Jarvis, V. Raco-Rands, C. Thomas, Y. Ralph, R. Gartman, D. Cadien, and S. Weisberg).

"Southern California Bight 1998 Regional Monitoring Program: IV. Sediment Toxicity" 2000. Southern California Coastal Water Research Project (with S.Bay, D. Lapota, J. Anderson, J. Armstrong, A. Jirik, and S. Asato).

"Southern California Marine Monitoring Standard Data Transfer Formats" 2000. Southern California Coastal Water Research Project (with L. Cooper, S. Weisberg, D. Montagne, S. Walther, K. Walker, J. Shisko, I. Lee, S. Moore, G. Ferreri, P. Smith, R. Fairey, S. Chang, A. Soof, C. Roberts, M. Mengel, R. Wang, F. Lecaro, M. Emanuel, D. O'Donahue, G. Alfonso, M. Kelly, S. Meyer, L. King, R. Gossett, and H. Ngyyen).

"Molluscan Bioassays", Section 8610, *Standard Methods,* 20th Edition 1996.

"Marine Chronic Toxicity: Test of Effluent Quality from an Orange County Wastewater Treatment Plant." 1996. Society of Enironmental Toxicology and Chemistry (SETAC) Annual Meeting. Washington D.C. (with Tom Gerlinger). Submitted for publication.

"Drilling Fluid Bioassays Using Pacific Ocean Mysid Shrimp, Acanthomysis sculpta, a Preliminary Introduction." Aquatic Toxicology and Hazard Assessment: 10th Vol. ASTM STP 971. American Society of Testing and Materials. 1988 (with Michael Machuzak).

"The California Assessment Manual: Determination of Hazardous Wastes." 1985. California Water Pollution Control Federation Journal.

"Ecological Restoration Project of Upper Newport Bay." 1977. U.S. Environmental Protection Agency.

"Marine Wastewater Outfalls as Artificial Reefs." 1985. Bulletin of Marine Sciences.

PRESENTATIONS

"The Relationship Between Individual and Taxa Counts of Benthic Infauna From Southern California Bight Harbors." 2002 Southern California Society of Environmental Toxicology and Chemistry, Annual Meeting.

"Diversity-Abundance Relationships in Benthic Habitats of the Southern California Bight." 2002. Southern California Academy of Sciences Annual Meeting.

"Benthic Sediment Surveys of Haiwee Reservoir." 2001 Southern California Society of Environmental Toxicology and Chemistry, Annual Meeting.

"Sediment Toxicity in the Southern California Bight Using Marine Amphipods." 2000. Southern California Society of Environmental Toxicology and Chemistry, Annual Meeting.

"Marine Chronic Toxicity: Test of Effluent Quality from an Orange County Wastewater Treatment Plant." 1996. Society of Environmental Toxicology and Chemistry (SETAC) Annual Meeting. Washington D.C. (with Tom Gerlinger).

Afternoon Session Chair. 1995. Southern California Toxicity Assessment Group (SCTAG), Annual Meeting and Toxicity Workshop.

Afternoon Session Chair. 1994. Southern California Toxicity Assessment Group (SCTAG), Annual Meeting and Statistics Workshop.

"Experiments with Organic Buffers and Pure Oxygen for Ammonia Conversion in Acute Municipal Wastewater Bioassays." 1993. Southern California Toxicity Assessment Group (SCTAG). Annual Meeting.

"Chronic Toxicity Tests Using *Ceriodaphnia dubia* and Interpretation of Test Results Using "Toxstat"." 1992. Santa Ana Regional Water Quality Control Board and University of California, Riverside Extension.

"An Aquatic Bioassay Primer." 1992. California Water Pollution Control Association.

"Toxicity Testing - Acute and Chronic Bioassays." 1991. California Water Pollution Control Association.

"Chemical and Biological Analysis of Hazardous Waste." 1987. Hazardous Materials Conference. Ventura County Environmental Health Department.

"Sediment Bioassays Using Mysid Shrimp." 1985. 10th Annual Aquatic Toxicity Symposium. American Society for Testing and Materials (ASTM).

"Determination of Hazardous Waste by Biological and Chemical Methods." 1985. Hazardous Waste Compliance Workshop. Ventura County Environmental Health Department.

"Marine Wastewater Outfalls as Artificial Reefs." 1983. Third International Artificial Reef Conference.

AWARDS AND HONORS

American Men and Women in Science. 1986 to Present.

Who's Who in America. 1996 to Present.

University of California Research Grant. 1975.

SPECIAL FIELDS OF KNOWLEDGE

Infaunal Ecology and Toxicity of of Harbor and Coastal Benthos

Statistical Evaluation of Environmental Data.

Oceanographic Sampling and Analysis, Marine Invertebrate Taxonomy.

Acute and Chronic, Freshwater and Marine Bioassays: Testing and Development.

MICHAEL J. MACHUZAK
Senior Scientist

PROFESSIONAL BACKGROUND

AQUATIC BIOASSAY AND CONSULTING LABORATORIES Assistant Laboratory Director (1996 to Present)

Responsible for chronic and acute, freshwater and marine bioassays; as well oceanographic field work at Aquatic Bioassay. Responsible for bioassay report preparation, set-up and analysis, client interface, and quality control. Mr. Machuzak is a member of the Bight 2008 Toxicity and Field Methods committees.

AB LAB AQUACULTURE INDUSTRIES, INC. Director (1988 to 1996)

Responsible for the quality control, collection, maintenance, production, and shipping of live commercial abalone. Design and maintained grow-out facilities in Oxnard and Port Hueneme, California.

CHEMICAL RESEARCH LABORATORIES Chief Marine Biologist (1985 to 1986)

Supervisor of the Biology Department involving bioassays, microbiology, benthic taxonomy and oceanographic research surveys. Responsible for the quality control of the marine research and bioassay programs. Involved in client contact and interface with California and Federal regulatory agencies.

ACADEMIC BACKGROUND

1981. Biology. Eastern Kentucky University.

PROFESSIONAL SOCIETIES

Southern California Toxicology Assessment Group (SCTAG). Methods, QNQC, and Policy Subcommittees.

Southern California Environmental Chemists Society (SCECS).

American Society of Testing and Materials (ASTM).

Southern California Chapter of the Society of Environmental Toxicologists and Chemists (SETAC)

PUBLICATIONS

"Drilling Fluid Bioassays Using Pacific Ocean Mysid Shrimp, *Acanthomysis sculpta,* a Preliminary Introduction." Aquatic Toxicology and Hazard Assessment: 10th Vol. ASTM STP 971. American Society of Testing and Materials. 1988 (with Thomas Mikel).

"Observations of Growth Responses on Red Abalone, *Haliotus rufescens* When Subjected to Various Types of Natural, Non-Marine and Artificial Diets." Second International Symposium on Abalone Biology, Fisheries Culture, February 1994.

SPECIAL FIELDS OF KNOWLEDGE

Acute and Chronic, Freshwater and Marine Bioassays.

Oceanographic Sampling and Analysis.

Environmental Chemical and Bacteriological Testing.

Quality Control

Karin J. Wisenbaker
Marine Biologist

MS. WISENBAKER IS A MARINE BIOLOGIST WITH AQUATIC BIOASSAY AND CONSULTING LABORATORIES IN VENTURA, CA. AT AQUATIC BIOASSAY SHE IS THE FIELD MANAGER OF BOTH THE FRESHWATER BIOASSESSMENT AND MARINE MONITORING PROGRAMS FOR CLIENTS WHO REPRESENT SOME OF THE LARGEST STATE AND MUNICIPAL AGENCIES IN SOUTHERN CALIFORNIA. HER PRIMARY AREAS OF FOCUS INCLUDE MARINE AND FRESHWATER ECOLOGY, DATA MANAGEMENT AND REPORTING.

AQUATIC BIOASSAY & CONSULTING LABORATORIES INC.

PROJECT EXPERIENCE:

Marine Monitoring – Ms. Wisenbaker is the field manager of the marine monitoring programs for several central and southern California agencies including the Goleta Sanitary District, the Cities of Oxnard, San Luis Obispo, Santa Barbara, Montecito, Summerland, Avalon and Carpentaria, and the Los Angeles Department of Beaches and Harbors. These programs include sampling and analysis for icthyoplankton, water quality, sediment chemistry and toxicity, bioaccumulation, trawled organisms, benthic infauna, and microbiology. For each of these programs, Ms. Wisenbaker is responsible for equipment maintenance, field mobilization, and data management. Ms. Wisenbaker also manages Aquatic Bioassay's infauna sorting laboratory. Ms. Wisenbaker began her career with the Southern California Marine Institute where she was the Environmental Projects Coordinator.

Freshwater Bioassessment Monitoring – Ms. Wisenbaker is the field manager responsible for coordinating and mobilizing bioassessment monitoring for three of southern California's largest ambient watershed monitoring programs and numerous NPDES point source discharge agencies. Some of these include the Ventura, Riverside and Malibu Watershed Protection Agencies, and the Cities of Ventura, Camarillo, Simi Valley, Moorepark and the Newhall Land and Farming Company.

EMPLOYMENT HISTORY & EXPERIENCE:

Aquatic Bioassay & Consulting Laboratories, Ventura CA

Marine Biologist – September 2003 to present

Ms. Wisenbaker is responsible for the mobilization and sampling of ocean and freshwater monitoring, data management as well as managing the infauna and benthic macroinvertebrate sorting laboratory. She is responsible for mobilizing the field work of freshwater bioassessment and marine monitoring programs for some of the largest agencies in southern California including the Los Angeles Department of Water and Power, the Los Angeles Department of Beaches and Harbors, the Ventura County Watershed District, the Santa Ana Regional Water Quality Control Board, the State of California's Contaminated Sediments Task Force, the City of Oxnard, the Goleta Sanitary District, the City of Santa Barbara, the City of Avalon and the City of San Luis Obispo. Ms. Wisenbaker ensures all the field sampling gear is in good condition and that field and laboratory operations are conducted with strict adherence to the proper protocols.

Southern California Marine Institute, Terminal Island CA

Environmental Projects Coordinator – September 2001 to August 2003

As Environmental Projects Coordinator, Ms. Wisenbaker was a citizen water quality monitoring coordinator. Her responsibilities included water quality training, education,

the development of quality assurance protocols, data management and report writing. Ms. Wisenbaker wrote and implemented grants for water quality studies and collected and reported oceanographic data off of volunteer observation ships for the National Oceanic & Atmospheric Administration.

Instructional Technician – March 1994 – August 2001

Ms. Wisenbaker taught students from 4th grade to college onboard three scientific research vessels. Her responsibilities included teaching of the local marine flora and fauna and to demonstrate the use of scientific gear such as otter trawls, CTD, van Veen grabs, and plankton nets. Ms. Wisenbaker was also an on board technician during scientific research trips with researchers from universities and consulting firms. She was responsible for the maintenance of all on board scientific gear.

EDUCATION

B.S. Biology, California State University, Northridge - 2000

PROFESSIONAL AFFILIATIONS

- Southern California Chapter of the Society of Environmental Toxicologist and Chemists (SETAC)
- Member Southern California Association of Marine Invertebrate Taxonomists (SCAMIT)
- Member Southern California Academy of Sciences (SCAS)

Beth Maturino
Lead Technician

PROFESSIONAL BACKGROUND

AQUATIC BIOASSAY AND CONSULTING LABORATORIES
Aquatic Biologist (1994 to Present)

Responsible for chronic and acute, freshwater and marine bioassays at Aquatic Bioassay. Responsible for bioassay report preparation, set-up and analysis, client interface, and quality control. Responsible for bacteriological analysis of receiving water samples as well as bacteriological QA/QC.

ACADEMIC BACKGROUND

Technical training, Biology. St. Luis University Bagiou City, Phillipines

SPECIAL FIELDS OF KNOWLEDGE

Acute and Chronic, Freshwater and Marine Bioassays.

Sediment Bioassays.

Environmental Chemical and Bacteriological Testing.

Health and Maintenance of Marine and Freshwater Bioassay Organisms.

Joseph Freas
Lead Technician

PROFESSIONAL BACKGROUND

AQUATIC BIOASSAY AND CONSULTING LABORATORIES
Aquatic Biologist (July 2006 to Present)

Responsible for chronic and acute, freshwater and marine bioassays at Aquatic Bioassay. Responsible for bioassay report preparation, set-up and analysis, client interface, and quality control.

ACADEMIC BACKGROUND

B.S. 2006. Biology. California State University Channel Islands

SPECIAL FIELDS OF KNOWLEDGE

Acute and Chronic, Freshwater and Marine Bioassays.

Freshwater and Marine sediment toxicity bioassays.

Data analysis and report preparation.

Health and Maintenance of Marine and Freshwater Bioassay Organisms.

APPENDIX 8.3. EXAMPLE OF A CHRONIC BIOASSY WORKSHEET

CHEMICAL ANALYSIS DATA SHEET-_____

Start Date: _____ Lab#: _____

End Date: _____ Date Rec'd: _____

Renewal Sample Used:

DAY	0	1	2	3	4	5	6	7
Initials								
DISSOLVED OXYGEN mg/L								
CONTROL								
TEMPERATURE °C								
CONTROL								
pH								
CONTROL								
CONDUCTIVITY umohs								
CONTROL								
ALKALINITY								
CONTROL								
100%								
HARDNESS								
CONTROL								
100%								

Residual Chlorine 1st Sample_____ 2nd Sample_____ 3rd Sample_____

CERIODAPHNIA SURVIVAL & REPRODUCTION -

Aquatic Bioassay & Consulting Laboratories, Inc.

START DATE:_____ LAB #: _____

END DATE: _____ DATE RECD:_____

Conc.	Day#	Initials	# YOUNG / REPLICATE									
			1	2	3	4	5	6	7	8	9	10
CON	3											
	4											
	5											
	6											
	7											
	Total											
10%	3	-										
	4	-										
	5	-										
	6	-										
	7	-										
		-										
	Total	-										
18%	3	-										
	4	-										
	5	-										
	6	-										
	7	-										
		-										
	Total	-										
32%	3	-										
	4	-										
	5	-										
	6	-										
	7	-										
		-										
	Total	-										
56%	3	-										
	4	-										
	5	-										
	6	-										
	7	-										
		-										
	Total	-										
100%	3	-										
	4	-										
	5	-										
	6	-										
	7	-										
		-										
	Total	-										

Used Neonates ____/____/____ 0800-1600 Brood Board #:_____

ABC LABORATORIES – FATHEAD MINNOW GROWTH

Company: ______________________ Lab #: ______________________
Sample I.D.: ______________________ Rec'd. Dates: ______________________
Date & Time Start: ______________________ ______________________
Date & Time End: ______________________ ______________________

Conc.	Rep.#	INITIAL	1	2	3	4	5	6	FINAL
CONTROL	1	15							
	2	15							
	3	15							
	4	15							
	1	15							
	2	15							
	3	15							
	4	15							
	1	15							
	2	15							
	3	15							
	4	15							
	1	15							
	2	15							
	3	15							
	4	15							
	1	15							
	2	15							
	3	15							
	4	15							
	1	15							
	2	15							
	3	15							
	4	15							

CHAMBER NUMBER	EFF. CONC.	REPL. #	NUMBER FISH	BOAT TARE	BOAT + FISH	FISH WEIGHT (g)	AVG. WT. PER FISH (g)
	CONTROL	1					
		2					
		3					
		4					
		1					
		2					
		3					
		4					
		1					
		2					
		3					
		4					
		1					
		2					
		3					
		4					
		1					
		2					
		3					
		4					
		1					
		2					
		3					
		4					

APPENDIX 8.4. DOHS LABORATORY CERTIFICATION

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC HEALTH
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

ENVIRONMENTAL LABORATORY CERTIFICATION

Is hereby granted to

AQUATIC BIOASSAY & CONSULTING LABORATORIES, INC.

29 NORTH OLIVE STREET

VENTURA, CA 93001

Scope of certification is limited to the
"Accredited Fields of Testing"
which accompanies this Certificate.

Continued certification status depends on successful completion of site visit, proficiency testing studies, and payment of applicable fees.

This Certificate is granted in accordance with provisions of Section 100825, et seq. of the Health and Safety Code.

Certificate No.: **1907**

Expiration Date: **07/31/2009**

Effective Date: **07/01/2007**

Richmond, California
subject to forfeiture or revocation

George C. Kulasingam, Ph.D.
Program Chief
Environmental Laboratory Accreditation Program

CALIFORNIA DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

AQUATIC BIOASSAY & CONSULTING LABORATORIES, INC. Lab Phone (805) 643-5621

29 NORTH OLIVE STREET
VENTURA, CA 93001

Certificate No: 1907 **Renew Date: 07/31/2007**

Field of Testing: 107 - Microbiology of Wastewater			
107.020	001	Total Coliform	SM9221B
107.040	001	Fecal Coliform	SM9221C,E (MTF/EC)
107.100	001	Fecal Streptococci	SM9230B
107.100	002	Enterococci	SM9230B
Field of Testing: 108 - Inorganic Chemistry of Wastewater			
108.050	001	pH	EPA 150.1
108.251	001	Dissolved Oxygen	EPA 360.2
108.590	001	Biochemical Oxygen Demand	SM5210B
Field of Testing: 113 - Whole Effluent Toxicity of Wastewater			
113.010	001A	Fathead Minnow (P. promelas)	EPA 600/4-90/027F, Static
113.010	001B	Fathead Minnow (P. promelas)	EPA 600/4-90/027F, Static Renewal
113.010	003A	Rainbow trout (O. mykiss)	EPA 600/4-90/027F, Static
113.010	003B	Rainbow trout (O. mykiss)	EPA 600/4-90/027F, Static Renewal
113.010	005A	Daphnid (C. dubia)	EPA 600/4-90/027F, Static
113.010	005B	Daphnid (C. dubia)	EPA 600/4-90/027F, Static Renewal
113.010	006A	Daphnia spp.	EPA 600/4-90/027F, Static
113.010	006B	Daphnia spp.	EPA 600/4-90/027F, Static Renewal
113.010	008A	Topsmelt (A. affinis)	EPA 600/4-90/027F, Static
113.010	008B	Topsmelt (A. affinis)	EPA 600/4-90/027F, Static Renewal
113.010	009A	Silverside (Menidia spp.)	EPA 600/4-90/027F, Static
113.010	009B	Silverside (Menidia spp.)	EPA 600/4-90/027F, Static Renewal
113.010	012A	Mysid (M. bahia)	EPA 600/4-90/027F, Static
113.010	012B	Mysid (M. bahia)	EPA 600/4-90/027F, Static Renewal
113.021	001A	Fathead Minnow (P. promelas)	EPA 2000 (EPA-821-R-02-012), Static
113.021	001B	Fathead Minnow (P. promelas)	EPA 2000 (EPA-821-R-02-012), Static Renewal
113.022	003A	Rainbow trout (O. mykiss)	EPA 2019 (EPA-821-R-02-012), Static
113.022	003B	Rainbow trout (O. mykiss)	EPA 2019 (EPA-821-R-02-012), Static Renewal
113.023	005A	Daphnid (C. dubia)	EPA 2002 (EPA-821-R-02-012), Static
113.023	005B	Daphnid (C. dubia)	EPA 2002 (EPA-821-R-02-012), Static Renewal
113.024	006A	Daphnia spp.	EPA 2021 (EPA-821-R-02-012), Static
113.024	006B	Daphnia spp.	EPA 2021 (EPA-821-R-02-012), Static Renewal
113.025	009A	Silverside (Menidia spp.)	EPA 2006 (EPA-821-R-02-012), Static
113.025	009B	Silverside (Menidia spp.)	EPA 2006 (EPA-821-R-02-012), Static Renewal
113.027	012A	Mysid (M. bahia)	EPA 2007 (EPA-821-R-02-012), Static
113.027	012B	Mysid (M. bahia)	EPA 2007 (EPA-821-R-02-012), Static Renewal

As of 12/04/2006 , this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

113.028	008A	Topsmelt (A. affinis)	EPA-821-R-02-012, Static
113.028	008B	Topsmelt (A. affinis)	EPA-821-R-02-012, Static Renewal
113.040	001	Fathead Minnow (P. promelas)	EPA 1000 (EPA/600/4-91/002)
113.041	001	Fathead Minnow (P. promelas)	EPA 1000 (EPA-821-R-02-013)
113.050	005	Daphnid (C. dubia)	EPA 1002 (EPA/600/4-91/002)
113.051	005	Daphnid (C. dubia)	EPA 1002 (EPA-821-R-02-013)
113.060	020	Green algae (S. capricornutum)	EPA 1003 (EPA/600/4-91/002)
113.061	020	Green algae (S. capricornutum)	EPA 1003 (EPA-821-R-02-013)
113.080	009	Silverside (Menidia spp.)	EPA 1006 (EPA/600/4-91/003)
113.081	009	Silverside (Menidia spp.)	EPA 1006 (EPA-821-R-02-014)
113.090	012	Mysid (M. bahia)	EPA 1007 (EPA/600/4-91/003)
113.091	012	Mysid (M. bahia)	EPA 1007 (EPA-821-R-02-014)
113.120	008	Topsmelt (A. affinis)	EPA 600/R-95/136
113.120	017D	Purple sea urchin (S. purpuratus)	EPA 600/R-95/136, Fertilization Test
113.120	017E	Purple sea urchin (S. purpuratus)	EPA 600/R-95/136, Development Test
113.120	022	Giant kelp (M. pyrifera)	EPA 600/R-95/136
113.120	023	Red abalone (H. rufescens)	EPA 600/R-95/136
Field of Testing: 119 - Toxicity Bioassay of Hazardous Waste			
119.010	001	Fathead Minnow (P. promelas)	Polisini & Miller (CDFG 1988)
119.010	003	Rainbow trout (O. mykiss)	Polisini & Miller (CDFG 1988)
Field of Testing: 126 - Microbiology of Recreational Water			
126.010	001	Total Coliform (Enumeration)	SM9221A,B,C
126.030	001	Fecal Coliform (Enumeration)	SM9221E
126.050	001	Total Coliform and E. coli	SM9223
126.080	001	Enterococci	IDEXX

APPENDIX 8.5. MOST RECENT DMR & WP STUDY RESULTS

ENVIRONMENTAL
RESOURCE ASSOCIATES®
The Industry Standard™

Elizabeth Maturino
Aquatic Bioassay
29 N Olive St
Ventura, CA 93001

DMR-QA 28 Final Report

DMR-QA Proficiency Testing

DMR-QA Study

Open Date: 05/01/08

Close Date: 08/29/08

Report Issued Date: 10/17/08

ENVIRONMENTAL
RESOURCE ASSOCIATES®
The Industry Standard™

Study: **DMR-QA 28**

ERA Customer Number: **A548301**

Laboratory Name: **Aquatic Bioassay**

WET Results

DMR-QA 28 Final Complete Report

ENVIRONMENTAL RESOURCE ASSOCIATES®
The Industry Standard™

Elizabeth Maturino
Aquatic Bioassay
29 N Olive St
Ventura, CA 93001
(805) 643-5621

EPA ID: CA00021
ERA Customer Number: A548301
Report Issued: 10/17/08
Study Dates: 05/01/08 - 08/29/08

Anal. No.	Test End Point	Reported Value %	Assigned Value %	Acceptance Limits %	Performance Evaluation	Method Description
DMRQA Fathead minnow (Test Code 13)						
48Hr., Acute, Non-Renewal, 25° C, MHSF						
Ammonium phosphate dibasic						
0754	LC50	38.6	28.0	11.5 - 44.4	Acceptable	EPA 2000
DMRQA Fathead minnow (Test Code 15)						
7-day Short term Chronic, Daily Renewal, MHSF						
Ammonium phosphate dibasic						
0808	IC25 (ON) Growth	51.63	31.1	15.9 - 46.2	Not Acceptable	EPA 1000
0809	IC25 (SN) Growth		38.5	9.67 - 67.3	Not Reported	
0810	NOEC (ON) Growth	50	25.0	12.5 - 50.0	Acceptable	EPA 1000
0811	NOEC (SN) Growth		25.0	12.5 - 50.0	Not Reported	
0756	NOEC Survival	50	25.0	12.5 - 50.0	Acceptable	EPA 1000
DMRQA Ceriodaphnia dubia (Test Code 19)						
48Hr., Acute Renewal, 25° C, MHSF						
Ammonium phosphate dibasic						
0764	LC50	> 100	53.7	11.7 - 95.7	Not Acceptable	EPA 2002
DMRQA Ceriodaphnia dubia (Test Code 21)						
7-day Short term Chronic, Daily Renewal, MHSF						
Potassium chloride						
0767	IC25 Reproduction	24.62	27.8	14.6 - 41.1	Acceptable	EPA 1002
0768	NOEC Reproduction	25	25.0	12.5 - 50.0	Acceptable	EPA 1002
0766	NOEC Survival	25	25.0	12.5 - 50.0	Acceptable	EPA 1002
DMRQA Daphnia magna (Test Code 32)						
48Hr., Acute, Non-Renewal, 20° C, MHSF						
Potassium chloride						
0788	LC50	75.8	64.4	51.0 - 77.8	Acceptable	EPA 2021
DMRQA Mysid (Test Code 42)						
48Hr., Acute, Non-Renewal, 20° C, 40 FSW						
Potassium chloride						
0798	LC50	48.3	38.4	14.8 - 61.9	Acceptable	EPA 2007
DMRQA Mysid (Test Code 43)						
7-day Short term Chronic, Daily Renewal, 40 FSW						
Potassium chloride						
0816	IC25 (ON) Growth	34.7	31.9	25.3 - 38.6	Acceptable	EPA 1007
0817	IC25 (SN) Growth		32.1	9.29 - 54.8	Not Reported	
0818	NOEC (ON) Growth	25	25.0	12.5 - 50.0	Acceptable	EPA 1007
0819	NOEC (SN) Growth		25.0	12.5 - 50.0	Not Reported	
0799	NOEC Survival	25	25.0	12.5 - 50.0	Acceptable	EPA 1007

ACCREDITED Lab Code: 1539-01

All analytes are included in ERA's A2LA accreditation. Lab Code: 1539-01

DMR-QA 28 Final Complete Report

ENVIRONMENTAL RESOURCE ASSOCIATES®
The Industry Standard™

Elizabeth Maturino
Aquatic Bioassay
29 N Olive St
Ventura, CA 93001
(805) 643-5621

EPA ID: CA00021
ERA Customer Number: A548301
Report Issued: 10/17/08
Study Dates: 05/01/08 - 08/29/08

Anal. No.	Test End Point	Reported Value %	Assigned Value %	Acceptance Limits %	Performance Evaluation	Method Description
DMRQA Inland silverside (Test Code 44)						
48Hr., Acute, Non-Renewal, 20° C, 40 FSW						
Phenol						
0803	LC50	37.4	30.1	16.5 - 43.7	Acceptable	EPA 2006

ACCREDITED Lab Code: 1539-01

All analytes are included in ERA's A2LA accreditation. Lab Code: 1539-01

AQUATIC BIOASSAY & CONSULTING LABORATORIES, INC.

TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

October 24, 2008

Dear Client:

In response to the "Not Acceptable" performance evaluation for EPA Method Test Code 15, *Fathead Minnow,* 7-day Short term chronic, Daily renewal, IC25 (ON) Growth and Method Test Code 19, Ceriodaphnia dubia, 48 Hr. Acute renewal, 25°, LC50 for the recent DMR-QA Study 28 we have determined the following.

The initial tests were conducted in duplicate. For test code 15, chronic fathead minnow test we had results of 55.2 and 48.1 for the IC25 growth. The averaged value of these two tests, 51.63 was reported. The test acceptance limits were 15.9-46.2. All other endpoints for this test were acceptable. We examined all test procedures with all analysts involved and determined there were no deviations from normal test procedures. Since our results for the other test endpoints were at the upper end of the acceptable range it is apparent that the fish used for this testing had uniformly more resistance to the ERA supplied unknown toxicant. We have used the same organism supplier for numerous years with success. Our internal reference toxicant tests are consistently acceptable. As populations of fathead minnows vary, the instance of having one test near, above or below, the test range is not abnormal. In addition, our reported value for the IC25 was only slightly higher than the upper end of the acceptance limit. Regardless, we immediately ordered backup check samples to further investigate this discrepancy.

With regard to 48 hr. acute LC50 results for test code 19, *Ceriodaphnia dubia,* Again this test was conduted in duplicate and both resulted in an LC50 >100. We examined all test procedures with all analysts involved and determined there were no deviations from normal test procedures. Since the upper range of the test acceptance limits were nearly 96% and as populations of *Ceriodaphnia dubia* vary, the instance of having one test near, above or below, the test range is not abnormal. Regardless, we immediately ordered backup check samples to further investigate this discrepancy.

The results of the back-up support testing will be supplied and discussed as soon as they are available.

The results of these tests reinforce the EPA guidance that multiple tests better define a waste.

Yours very truly,

Michael Machuzak
Laboratory Manager

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

AQUATIC
BIOASSAY &
CONSULTING
LABORATORIES, INC.

TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

November 13, 2008

Dear Client:

Enclosed you will find results from our backup check samples that we tested in relation to our DMR-QA Study 28 "Not Acceptable" results that were presented in our letter to you dated 24 October 2008.

Additional testing was conducted with fathead minnows, *Pimephales promelas*. We ordered a check sample from ERA and conducted a 7 day chronic toxicity test. The results of that test were in agreement with the ERA certified values. The certified survival NOEC endpoint was 25%. Our results were 25%. The certified growth NOEC was 25%. Our NOEC was 25% for the growth endpoint. The certified endpoint for the IC25 was 29.9% with an acceptance range of 22.0%-37.7%. Our result for this endpoint was 30.89%.

The check sample we tested with the water flea, *Ceriodaphnia dubia*, was also in agreement. The certified value for the 48 hour IC50 was 48.9% with an acceptance range of 20.0%-77.8%. Our result for this endpoint was 50.0%.

We found no other discrepancies with our routine test procedures.

The results of these tests reinforce the EPA guidance that multiple tests better define a waste.

Yours very truly,

Michael Machuzak
Laboratory Manager

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

AQUATIC BIOASSAY & CONSULTING LABORATORIES, INC.

TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

CHRONIC FATHEAD MINNOW SURVIVAL AND GROWTH BIOASSAY

DATE: 28 October 2008

STANDARD TOXICANT: ERA QA LOT # Q027-004

ENDPOINT: SURVIVAL

NOEC = 25.00 %

IC25 = 30.29 %
IC50 = 37.50 %

ENDPOINT: GROWTH

NOEC = 25.00 %

IC25 = 30.89 %
IC50 = 37.98 %

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:	10/28/2008	Test ID:	DMRQA28	Sample ID:	CODE 15
End Date:	11/4/2008	Lab ID:	CAABC	Sample Type:	ERA QC Lot# Q027-004
Sample Date:	10/28/2008	Protocol:	EPA-821-R-02-013	Test Species:	PP-Pimephales promelas
Comments:	DMRQA 28 Code 15 Tox Standard Check Sample				

Conc-%	1	2	3	4
N Control	1.0000	1.0000	1.0000	1.0000
6.25	1.0000	1.0000	1.0000	1.0000
12.5	1.0000	1.0000	1.0000	0.9333
25	1.0000	0.8667	0.9333	0.9333
50	0.0667	0.2000	0.0000	0.0000
100	0.0000	0.0000	0.0000	0.0000

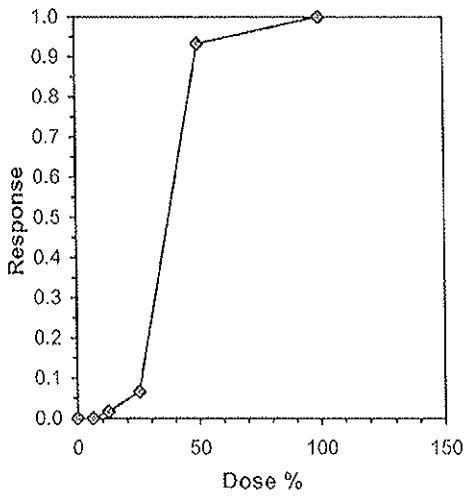
			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
N Control	1.0000	1.0000	1.4413	1.4413	1.4413	0.000	4			1.0000	1.0000
6.25	1.0000	1.0000	1.4413	1.4413	1.4413	0.000	4	18.00	10.00	1.0000	1.0000
12.5	0.9833	0.9833	1.4084	1.3096	1.4413	4.675	4	16.00	10.00	0.9833	0.9833
25	0.9333	0.9333	1.3144	1.1970	1.4413	7.600	4	12.00	10.00	0.9333	0.9333
*50	0.0667	0.0667	0.2459	0.1295	0.4636	64.190	4	10.00	10.00	0.0667	0.0667
*100	0.0000	0.0000	0.1295	0.1295	0.1295	0.000	4	10.00	10.00	0.0000	0.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.7759	0.884	0.87231	3.38396
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	25	50	35.3553	4
Treatments vs N Control				

Linear Interpolation (200 Resamples)

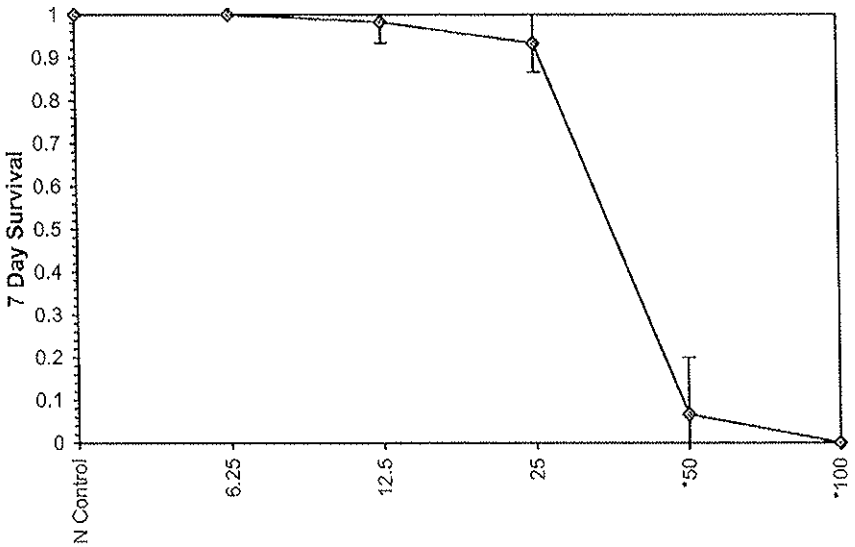
Point	%	SD	95% CL(Exp)		Skew
IC05	20.833	3.502	11.400	28.929	-0.4488
IC10	25.962	0.866	21.554	27.996	-2.0444
IC15	27.404	0.625	25.374	29.391	-0.1322
IC20	28.846	0.601	27.216	30.859	-0.0173
IC25	30.288	0.589	28.619	32.439	0.1136
IC40	34.615	0.627	33.049	36.930	0.4945
IC50	37.500	0.706	35.895	40.115	0.6530



Larval Fish Growth and Survival Test-7 Day Survival

Start Date:	10/28/2008	Test ID:	DMRQA28	Sample ID:	CODE 15
End Date:	11/4/2008	Lab ID:	CAABC	Sample Type:	ERA QC Lot# Q027-004
Sample Date:	10/28/2008	Protocol:	EPA-821-R-02-013	Test Species:	PP-Pimephales promelas
Comments:	DMRQA 28 Code 15 Tox Standard Check Sample				

Dose-Response Plot



Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:	10/28/2008	Test ID:	DMRQA28	Sample ID:	CODE 15
End Date:	11/4/2008	Lab ID:	CAABC	Sample Type:	ERA QA Lot#Q027-004
Sample Date:	10/28/2008	Protocol:	EPA-821-R-02-013	Test Species:	PP-Pimephales promelas
Comments:	DMRQA 28 Code 15 Tox Standard Check Sample				

Conc-%	1	2	3	4
N Control	0.2880	0.3113	0.3280	0.3447
6.25	0.3180	0.3173	0.3093	0.3240
12.5	0.3453	0.3293	0.3400	0.3200
25	0.3093	0.2880	0.3320	0.3080
50	0.0240	0.0740	0.0000	0.0000
100	0.0000	0.0000	0.0000	0.0000

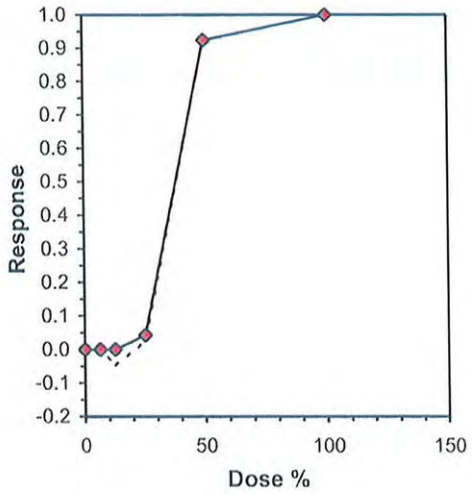
			Transform: Untransformed					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
N Control	0.3180	1.0000	0.3180	0.2880	0.3447	7.607	4			0.3229	1.0000
6.25	0.3172	0.9974	0.3172	0.3093	0.3240	1.899	4	17.00	10.00	0.3229	1.0000
12.5	0.3337	1.0493	0.3337	0.3200	0.3453	3.381	4	22.00	10.00	0.3229	1.0000
25	0.3093	0.9727	0.3093	0.2880	0.3320	5.815	4	15.50	10.00	0.3093	0.9579
*50	0.0245	0.0770	0.0245	0.0000	0.0740	142.390	4	10.00	10.00	0.0245	0.0759
*100	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	4	10.00	10.00	0.0000	0.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.91947	0.884	0.78616	2.00137
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	25	50	35.3553	4
Treatments vs N Control				

Linear Interpolation (200 Resamples)

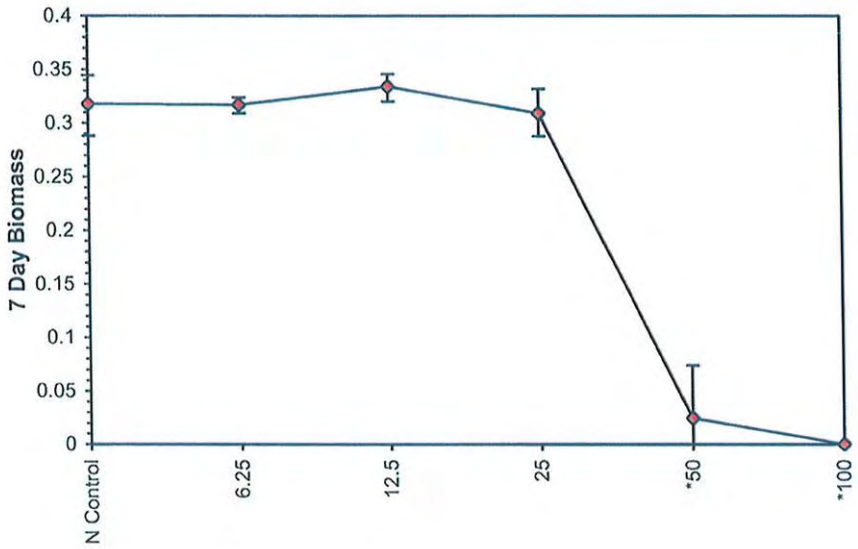
Point	%	SD	95% CL(Exp)		Skew
IC05	25.223	2.989	10.759	27.035	-2.1979
IC10	26.640	1.020	23.763	28.353	-3.1093
IC15	28.057	0.731	25.696	29.778	-0.5137
IC20	29.474	0.719	27.190	31.398	-0.3419
IC25	30.892	0.721	28.588	33.090	-0.1339
IC40	35.143	0.805	32.822	38.369	0.4582
IC50	37.978	0.913	35.569	41.764	0.6812



Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:	10/28/2008	Test ID:	DMRQA28	Sample ID:	CODE 15
End Date:	11/4/2008	Lab ID:	CAABC	Sample Type:	ERA QA Lot#Q027-004
Sample Date:	10/28/2008	Protocol:	EPA-821-R-02-013	Test Species:	PP-Pimephales promelas
Comments:	DMRQA 28 Code 15 Tox Standard Check Sample				

Dose-Response Plot



Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:	10/28/2008	Test ID:	DMRQA28	Sample ID:	CODE 15
End Date:	11/4/2008	Lab ID:	CAABC	Sample Type:	ERA QA Lot#Q027-004
Sample Date:	10/28/2008	Protocol:	EPA-821-R-02-013	Test Species:	PP-Pimephales promelas
Comments:	DMRQA 28 Code 15 Tox Standard Check Sample				

Auxiliary Data Summary

Conc-%	Parameter	Mean	Min	Max	SD	CV%	N
N Control	Temp C	24.68	24.00	25.50	0.61	3.16	8
6.25		24.68	24.00	25.50	0.61	3.16	8
12.5		24.68	24.00	25.50	0.61	3.16	8
25		24.68	24.00	25.50	0.61	3.16	8
50		24.68	24.00	25.50	0.61	3.16	8
100		24.35	24.00	24.70	0.49	2.89	2
N Control	pH	7.90	7.90	7.90	0.00	0.00	8
6.25		7.65	7.50	7.80	0.11	4.27	8
12.5		7.59	7.40	7.70	0.10	4.15	8
25		7.58	7.40	7.70	0.10	4.25	8
50		7.59	7.50	7.70	0.08	3.81	8
100		7.65	7.60	7.70	0.07	3.48	2
N Control	DO mg/L	7.36	6.70	8.10	0.53	9.85	8
6.25		7.11	6.50	7.90	0.52	10.19	8
12.5		7.14	6.30	8.00	0.58	10.70	8
25		7.16	6.40	7.90	0.52	10.05	8
50		7.14	6.50	7.90	0.52	10.06	8
100		7.30	6.80	7.80	0.71	11.52	2
N Control	Hardness mg/L	83.13	80.00	86.00	2.64	1.96	8
6.25		0.00	0.00	0.00	0.00		0
12.5		0.00	0.00	0.00	0.00		0
25		0.00	0.00	0.00	0.00		0
50		0.00	0.00	0.00	0.00		0
100		81.00	81.00	81.00	0.00	0.00	2
N Control	Cond-umhos	355.00	327.00	377.00	20.85	1.29	8
6.25		578.63	515.00	607.00	29.69	0.94	8
12.5		828.38	802.00	859.00	19.60	0.53	8
25		1326.50	1299.00	1380.00	24.91	0.38	8
50		2273.50	2193.00	2357.00	54.99	0.33	8
100		4181.00	4181.00	4181.00	0.00	0.00	2
N Control	Alkalinity mg/L	60.00	60.00	60.00	0.00	0.00	8
6.25		0.00	0.00	0.00	0.00		0
12.5		0.00	0.00	0.00	0.00		0
25		0.00	0.00	0.00	0.00		0
50		0.00	0.00	0.00	0.00		0
100		58.00	58.00	58.00	0.00	0.00	2

ENVIRONMENTAL RESOURCE ASSOCIATES®
The Industry Standard™

DataPacK™

Lot No. Q027-004

USEPA Test Code 15, USEPA Method Code 1000.0
Fathead Minnow
7-day, Short Term Chronic, Daily Renewal, 25°C
Moderately Hard Synthetic Freshwater (MHSF)
Reference Toxicant - Potassium Chloride - KCl

Whole Effluent Toxicity QC Standards

Catalog No AQC004

Test Endpoint	Certified Value [1] %	QC PALs ™ [2] %	PT PALs ™ [3] %
IC25 (ON) Growth	29.9	22.0 - 37.7	22.0 - 37.7
IC25 (SN) Growth	41.7	5.35 - 78.0	5.35 - 78.0
NOEC (ON) Growth	25.0	12.5 - 50.0	12.5 - 50.0
NOEC (SN) Growth	25.0	12.5 - 50.0	12.5 - 50.0
NOEC Survival	25.0	12.5 - 50.0	12.5 - 50.0

	Round Robin Data			
Test Endpoint	Mean %	Acceptable n	Total n	Toxicant Concentration
IC25 (ON) Growth	29.9	48	56	2.00 g/L
IC25 (SN) Growth	41.7	28	29	2.00 g/L
NOEC (ON) Growth	25.0	54	55	2.00 g/L
NOEC (SN) Growth	25.0	30	30	2.00 g/L
NOEC Survival	25.0	59	59	2.00 g/L

Please see footnotes on back

AQUATIC
BIOASSAY &
CONSULTING
LABORATORIES, INC.

TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

48 HOUR ACUTE CERIODAPHNIA SURVIVAL

DATE: 28 October - 08

STANDARD TOXICANT: ERA QC LOT#Q027-008

ENDPOINT: SURVIVAL

NOEC = 50.00 %

IC25 = 37.50 %
IC50 = 50.00 %

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

-48 Hr Survival

Start Date:	10/28/2008	Test ID:	DMRQA 28	Sample ID:	CA0000000
End Date:	10/30/2008	Lab ID:	CAABC	Sample Type:	ERA QC Lot#Q027-008
Sample Date:	10/28/2008	Protocol:	EPA-821-R-02-012	Test Species:	CD-Ceriodaphnia dubia
Comments:	DMR QA 28 Code 19 Tox Standard Check Sample				

Conc-%	1	2	3	4
N Control	1.0000	1.0000	1.0000	1.0000
6.25	1.0000	1.0000	1.0000	1.0000
12.5	1.0000	1.0000	1.0000	1.0000
25	1.0000	1.0000	1.0000	1.0000
50	0.4000	0.4000	1.0000	0.2000
100	0.0000	0.2000	0.0000	0.0000

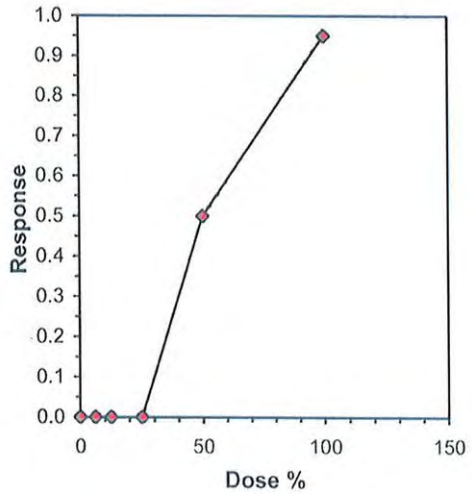
			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
N Control	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4			1.0000	1.0000
6.25	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	18.00	10.00	1.0000	1.0000
12.5	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	18.00	10.00	1.0000	1.0000
25	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	18.00	10.00	1.0000	1.0000
50	0.5000	0.5000	0.7946	0.4636	1.3453	48.029	4	12.00	10.00	0.5000	0.5000
*100	0.0500	0.0500	0.2850	0.2255	0.4636	41.771	4	10.00	10.00	0.0500	0.0500

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.62195	0.884	2.09856	10.2485
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	50	100	70.7107	2
Treatments vs N Control				

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)		Skew
IC05	27.500	2.186	26.352	36.833	7.8687
IC10	30.000	3.134	27.705	48.667	3.9785
IC15	32.500	4.272	29.057	60.500	3.0311
IC20	35.000	4.785	30.410	64.000	2.3994
IC25	37.500	5.314	31.762	67.500	1.9372
IC40	45.000	7.043	35.819	78.000	1.1956
IC50	50.000	8.451	38.524	85.000	0.8440



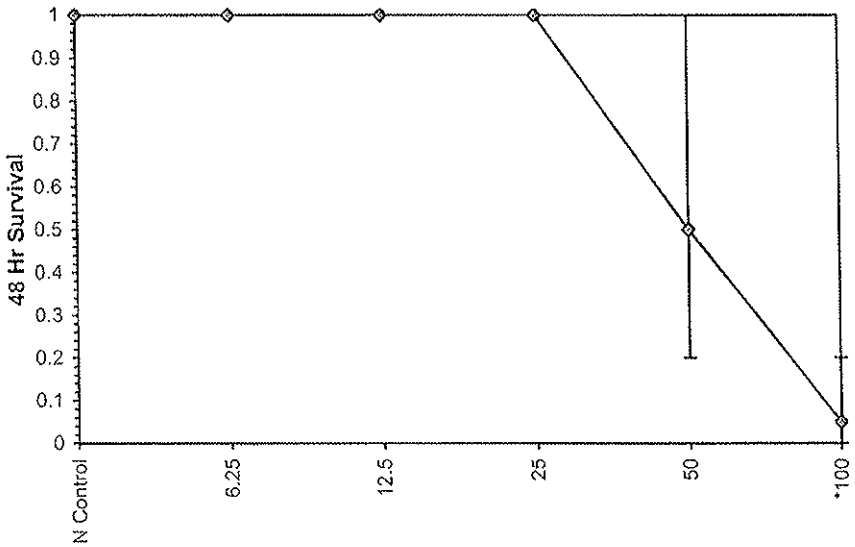
ToxCalc v5.0.23

Reviewed by:

-48 Hr Survival

Start Date:	10/28/2008	Test ID:	DMRQA 28	Sample ID:	CA0000000
End Date:	10/30/2008	Lab ID:	CAABC	Sample Type:	ERA QC Lot#Q027-008
Sample Date:	10/28/2008	Protocol:	EPA-821-R-02-012	Test Species:	CD-Ceriodaphnia dubia
Comments:	DMR QA 28 Code 19 Tox Standard Check Sample				

Dose-Response Plot



-48 Hr Survival

Start Date:	10/28/2008	Test ID:	DMRQA 28	Sample ID:	CA0000000
End Date:	10/30/2008	Lab ID:	CAABC	Sample Type:	ERA QC Lot#Q027-008
Sample Date:	10/28/2008	Protocol:	EPA-821-R-02-012	Test Species:	CD-Ceriodaphnia dubia

Comments: DMR QA 28 Code 19 Tox Standard Check Sample

Auxiliary Data Summary

Conc-%	Parameter	Mean	Min	Max	SD	CV%	N
N Control	Temp C	24.23	24.00	24.70	0.40	2.62	3
6.25		24.23	24.00	24.70	0.40	2.62	3
12.5		24.23	24.00	24.70	0.40	2.62	3
25		24.23	24.00	24.70	0.40	2.62	3
50		24.23	24.00	24.70	0.40	2.62	3
100		24.23	24.00	24.70	0.40	2.62	3
N Control	pH	7.87	7.80	7.90	0.06	3.05	3
6.25		7.50	7.40	7.60	0.10	4.22	3
12.5		7.47	7.40	7.50	0.06	3.22	3
25		7.47	7.40	7.50	0.06	3.22	3
50		7.47	7.40	7.50	0.06	3.22	3
100		7.53	7.50	7.60	0.06	3.19	3
N Control	DO mg/L	7.30	6.90	7.90	0.53	9.96	3
6.25		7.33	6.80	7.60	0.46	9.27	3
12.5		7.40	6.90	7.70	0.44	8.92	3
25		7.43	6.90	7.80	0.47	9.25	3
50		7.50	7.00	7.90	0.46	9.03	3
100		7.50	7.10	7.90	0.40	8.43	3
N Control	Hardness mg/L	84.33	81.00	86.00	2.89	2.01	3
6.25		0.00	0.00	0.00	0.00		0
12.5		0.00	0.00	0.00	0.00		0
25		0.00	0.00	0.00	0.00		0
50		0.00	0.00	0.00	0.00		0
100		73.33	73.00	74.00	0.58	1.04	3
N Control	Cond umhos	355.00	347.00	364.00	8.54	0.82	3
6.25		466.00	455.00	474.00	9.85	0.67	3
12.5		580.67	563.00	592.00	15.50	0.68	3
25		833.00	831.00	835.00	2.00	0.17	3
50		1317.67	1288.00	1333.00	25.70	0.38	3
100		2115.67	1801.00	2323.00	277.06	0.79	3
N Control	Alkalinity mg/L	60.00	60.00	60.00	0.00	0.00	3
6.25		0.00	0.00	0.00	0.00		0
12.5		0.00	0.00	0.00	0.00		0
25		0.00	0.00	0.00	0.00		0
50		0.00	0.00	0.00	0.00		0
100		55.00	55.00	55.00	0.00	0.00	3

ENVIRONMENTAL RESOURCE ASSOCIATES®
The Industry Standard™

DataPacK™

Lot No. Q027-008
USEPA Test Code 19, USEPA Method Code 2002.0
Ceriodaphnia dubia
48-hour, Acute, Daily Renewal, 25 °C
Moderately Hard Synthetic Freshwater (MHSF)
Reference Toxicant - Potassium Chloride - KCl

Whole Effluent Toxicity QC Standards

Catalog No AQC008

Test Endpoint	Certified Value [1] %	QC PALs ™ [2] %	PT PALs ™ [3] %
LC50	48.9	20.0 - 77.8	20.0 - 77.8

Test Endpoint	Round Robin Data Mean %	Acceptable n	Total n	Toxicant Concentration
LC50	48.8	54	55	1.00 g/L

Please see footnotes on back

ENVIRONMENTAL
RESOURCE ASSOCIATES®
The Industry Standard™

Elizabeth Maturino
Aquatic Bioassay
29 N Olive St
Ventura, CA 93001

WP-162 Final Report

WatR™ Pollution Proficiency Testing

WatR™ Pollution Study

Open Date: 07/14/08

Close Date: 08/28/08

Report Issued Date: 09/16/08

ENVIRONMENTAL RESOURCE ASSOCIATES®
The Industry Standard™

Study: **WP-162**

ERA Customer Number: **A548301**

Laboratory Name: **Aquatic Bioassay**

Microbiology Results

ENVIRONMENTAL RESOURCE ASSOCIATES®
The Industry Standard™

WP-162 Final Complete Report

Elizabeth Maturino
Aquatic Bioassay
29 N Olive St
Ventura, CA 93001
(805) 643-5621

EPA ID: CA00021
ERA Customer Number: A548301
Report Issued: 09/16/08
Study Dates: 07/14/08 - 08/28/08

Anal. No.	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description
WP WP Coliform MicrobE™							
2500	Total Coliforms (MF)	CFU/100mL		77.0	35.0 - 172	Not Reported	
2530	Fecal Coliforms - E.coli (MF)	CFU/100mL		45.0	9.00 - 228	Not Reported	
2500	Total Coliforms (MPN)	MPN/100mL	72.8	71.0	15.4 - 328	Acceptable	SM9223 COLert18
2530	Fecal Coliforms - E.coli (MPN)	MPN/100mL	72.8	75.6	17.4 - 329	Acceptable	SM9223 COLert18
WP WP Coliform MicrobE™							
2500	Total Coliforms (MF)	CFU/100mL		77.0	35.0 - 172	Not Reported	
2530	Fecal Coliforms - E.coli (MF)	CFU/100mL		45.0	9.00 - 228	Not Reported	
2500	Total Coliforms (MPN)	MPN/100mL	50	71.0	15.4 - 328	Acceptable	SM9221B LTB
2530	Fecal Coliforms - E.coli (MPN)	MPN/100mL	50	75.6	17.4 - 329	Acceptable	SM9221B LTB
WP Enterococci							
2520	Enterococci (MF)	CFU/100mL		594	345 - 1020	Not Reported	
2520	Enterococci (MPN)	MPN/100mL	387.3	472	142 - 1570	Acceptable	ENTEROLERT
2540	Fecal Streptococci (MF)	CFU/100mL		604	413 - 882	Not Reported	
2540	Fecal Streptococci (MPN)	MPN/100mL		551	123 - 2460	Not Reported	
WP Enterococci							
2520	Enterococci (MF)	CFU/100mL		594	345 - 1020	Not Reported	
2520	Enterococci (MPN)	MPN/100mL	900	472	142 - 1570	Acceptable	SM9230B MPN
2540	Fecal Streptococci (MF)	CFU/100mL		604	413 - 882	Not Reported	
2540	Fecal Streptococci (MPN)	MPN/100mL		551	123 - 2460	Not Reported	

ACCREDITED Lab Code: 1539-01

All analytes are included in ERA's A2LA accreditation. Lab Code: 1539-01