Copy of Request for Information

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

OCT - 9 2015

Mr. Lawrence Holley, Facility Manager
National Archives & Records Administration
8601 Adelphia Road
Room 2320
College Park, MD 20740-6001

Re: Request for Information for the National Archives & Records Administration's Wastewater Treatment Plant

Dear Mr. Holley,

Enclosed please find a Request for Information issued this date pursuant to Section 308 of the Act, 33 U.S.C. § 1318 that requires, among other things, that National Archives personnel provide detailed information regarding compliance of their Wastewater Treatment Plant (NPDES Permit # MD0065871). The requirement to provide EPA with the information requested is mandatory, and you must respond in accordance with the instructions and deadlines set forth in the Request for Information.

Please contact Mr. Michael Greenwald at (215) 814-2398 if you have any questions regarding this Request for Information.

greenwald.michael@epa.gov

Sincerely,

David B. McGuigan, Associate Director
Office of NPDES Permits & Enforcement
Water Protection Division

Enclosure

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Customer Service Hotline: 1-800-438-2474

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

In The Matter of:	:	
	:	Proceeding Under Section 308 of the Clean Water Act, 33 U.S.C. § 1318
National Archives & Records Administration 8601 Adelphia Road Room 2320 College Park, MD 20740-6001	:	REQUEST FOR INFORMATION

I. STATUTORY AUTHORITY

1. This Request for Information is issued under the authority vested in the United States Environmental Protection Agency (EPA) by Section 308 of the Clean Water Act (CWA or Act), 33 U.S.C. § 1318. The Administrator of the EPA has delegated this authority to the Regional Administrator of EPA Region III who in turn has delegated it to the Director of the Water Protection Division of EPA Region III who in turn has delegated it to the Associate Director of the Office of NPDES Permits and Enforcement. EPA hereby requires that the National Archives & Records Administration's Wastewater Treatment Plant (NARA WWTP), NPDES Permit # MD0065871 provide information described below related to compliance with the CWA.

II. STATUTORY AND REGULATORY BACKGROUND

2. EPA is authorized under Section 308 of the Federal Water Pollution Control Act ("Clean Water Act" or "the Act"), 33 U.S.C. § 1318, to require owners and operators of point sources to establish records and make such reports as may be necessary to carry out the purpose of the Act, including but not limited to:

   (a) Developing or assisting in the development of any effluent limitation, or other limitation, prohibition, effluent standard, pretreatment standard, or standard of performance under the Clean Water Act;

   (b) Determining whether any person is in violation of any such effluent limitation, or other limitation, prohibition or effluent standard, pretreatment standard, or standard of performance;

(c) Any requirement under Section 308 of the Clean Water Act; and

(d) Carrying out Sections 305, 311, 402, 404, and 504 of the Clean Water Act.

3. Any failure to respond as directed is punishable under the civil and criminal provisions of Section 309 of the Act, which provide for the assessment of penalties, injunctive relief and imprisonment.

You may, if you desire, assert a business confidentiality claim covering all or part of the information requested herein in the manner described in 40 C.F.R. Section 2.203(b). Information covered by such a claim will be disclosed by EPA only to the extent and by means of the procedures set forth in Subpart B, 40 C.F.R. Part 2. If no claim of confidentiality accompanies the information requested herein when it is received by EPA, it may be made available to the public by EPA without further notice. This inquiry is not subject to review by the Office of Management and Budget under the Paperwork Reduction Act, 44 U.S.C. Chapter 35. (See 5 C.F.R. § 1320.3(c)).

III. INSTRUCTIONS

4. Provide a separate narrative response for each question and for each subpart of each question set forth below. Precede each answer with the corresponding number of the question to which it responds.

5. Identify each person responding to any question contained in this Information Request on behalf of NARA WWTP, as well as each person consulted in the preparation of the response.

6. For each question, identify each document consulted, examined, or referred to in the preparation of the response or that contains information responsive to the question, and provide a true and correct copy of each such document if not provided in response to another specific question.

7. Indicate on each document produced in response to this Information Request, or in some other reasonable manner, the number of the question to which it corresponds.

8. If tabulation is requested, provide the requested information in tabular form in hard copy and also in tabular form in an electronic spreadsheet file of Lotus 1-2-3, Excel, or ASCII delimited format.

9. If requested information or documents are not known or are not available at the time of your response to this Information Request, but later become known or available, NARA WWTP must supplement its response to EPA. Moreover, should NARA WWTP find at any time after submission of its response that any portion is or becomes false, incomplete, or misrepresents the facts; NARA WWTP must provide EPA with a corrected response as soon as possible.

10. Section 308 of the Act, 33 U.S.C. § 1318, requires NARA WWTP to provide accurate and complete information in response to the questions contained in this request. All submissions provided pursuant to this Section 308 request shall be signed and dated by a responsible official of Rehoboth and must include the following certification:

"I certify that the information contained in or accompanying this submission is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I certify as having responsibility for the persons who, acting under my direct instruction, made the verification that this information is true, accurate, and complete.

Signed _____
Title Chief, Facilities + Property Branch
12/7/15

11. Submit your response to:

Mr. Michael Greenwald (3WP42)
NPDES Enforcement Branch
Water Protection Division
U. S. Environmental Protection Agency
1650 Arch Street
Philadelphia, PA 19103

12. If you have questions regarding this Information Request, you may contact Mr. Michael Greenwald of the NPDES Enforcement Branch at (215) 814-2398

IV. DEFINITIONS

The terms "document" and "documents" shall mean any format that records, stores, or presents information, and includes writings, memoranda, records, or information of any kind, formal or informal, whether wholly or partially handwritten or typed, whether in computer format, memory, or storage device, or in hard copy, including any form or

format of these types. If in computer format or memory, each such document shall be provided in a translated form useable and readable by EPA, with all necessary documentation and support. All documents in hard copy should also include: (a) a copy of each document which is not an exact duplicate of a document which is provided; (b) each copy which has any writing, notation, or the like on it; c) drafts; (d) attachments to or enclosures with any document; and (e) every other document referred to or incorporated into each document.

13. The term "identify" with respect to a natural person means to provide that person's name, address, telephone number, title, and relationship to NARA WWTP. The term "identify" with respect to a business entity means to provide that entity's name, address, and relationship to NARA WWTP, and to provide the name, address, telephone number, and title of an individual who can provide information related to, and on behalf of, the entity.

14. The term "Day" shall mean a calendar day. In computing any period of time under this Request pursuant to Section 308, where the last day would fall on a Saturday, Sunday, federal or state holiday, the period shall run until the close of the next business day.

V. INFORMATION REQUESTED

15. AND NOW, this 7th day of October, 2015, NARA WWTP is hereby directed, pursuant to Section 308 of the Act, 33 U.S.C. § 1318, to provide the following information, no later than 30 days from the effective date of this Request for Information:

16. For operations at NARA WWTP, NPDES Permit # MD0065871, with effective permit date of December 1, 2009, expiration date November 30, 2014, and re-application date of October 1, 2012, provide the letter of re-application for permit coverage and the letter of acceptance from Maryland Department of the Environment (MDE). If no re-application letter was submitted or documents are unavailable, please provide an explanation in your response.

17. From January 1, 2012 to present, identify specific steps taken by NARA WWTP to address any effluent exceedance. For the following pollutants, provide the root cause analyses completed to evaluate processes contributing to the effluent exceedance and long term plans to correct the processes to comply with the effluent limits listed in Permit Section I.A:

    a. Total Residual Chlorine;

b. Copper;
c. Total Zinc.

18. Provide a copy of site plans with the locations of outfalls identified, stormwater pipes and conveyance, and any effluent discharge from pipes at your facility and the plant.

19. Provide a copy of the Biomonitoring Study Plan required by Permit Section I.K. With your response include any revisions to the plan and any correspondence from MDE regarding the plan. Include dates of submittal of the plan and acceptance.

20. Provide all documentation and reports that provide the results of Whole Effluent Toxicity (WET) testing with dates of testing required by the Biomonitoring Study Plan. Include the correspondence and dates of any submissions to MDE. If any WET result documents required by the permit were not provided to MDE or are not available, provide an explanation as to why.

21. Provide all documentation of the Toxicity Reduction Evaluations (TREs) performed required by Permit Section I.L along with any letters from MDE requiring said testing.

22. An inspection conducted by MDE on February 22, 2013 indicated that a lateral connected to Outfall 001 had been repaired due to a lack of flow present from Outfall 001. Please provide:

    a. A narrative of how this problem was discovered, including dates of discovery;
    b. Any documentation related to the discovery of this problem, including CCTV footage taken, evaluations performed, or testing performed;
    c. Provide any documentation available to certify the completion of this repair, including dates of repair processes and completion;
    d. Provide a narrative and any documentation of investigations or other follow-up work performed to address how effluent flow from this defective lateral may have impacted the surrounding environment.

23. Provide a description on the method(s) used to measure flow at Outfall 001 according to Permit Section I.G. In your response include a narrative description of plant specific factors, such as batch flows and operational factors that would affect flow rates. Include all documentations of flow measurements dating back to December 1, 2009 from Outfall 001.

VI. EFFECTIVE DATE

24. The effective date of this Request for Information shall be the date it is received by the Authority.

Date: 10/7/15

David B. McGuigan, Ph.D.
Associate Director
Office of NPDES Permits & Enforcement
Water Protection Division

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION III
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Mr. Lawrence Holley, Facility Manager
National Archives and Records Administration
8601 Adelphia Road
Room 2320
College Park, MD 20740-6001

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- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. Lawrence Holley, Facility Manager
National Archives and Records Administration
8601 Adelphia Road
Room 2320
College Park, MD 20740-6001

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A. Signature

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☐ Agent
☐ Addressee

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Extension Request

National Archives and Records Administration

8601 Adelphi Road
College Park, Maryland 20740-6001

Date :November 5, 2015

Attn of :Michael Greenwald

Subject :Extension Request

Dear Mr. Greenwald,

Concerning the "Request for Information" from your office dated October 9, 2015 to the National Archives and Records Administration regarding compliance of our Wastewater Treatment Plant NPDES Permit # MD0065871.

The letter was addressed to Mr. Lawrence Holley, the Facility Manager. He retired on March 31, 2015 and his position has not been filled at this time. The mail was ultimately forwarded to me on or about October 15, 2015.

I am requesting an extension of at least 30 days, 6 weeks if possible, due to the amount of information requested, the time needed to compile said information, the 2 Holidays in October and the fact that I did not receive the letter until mid October.

Thank you in advance for your anticipated consideration of this request. I am,

Sincerely,

11/5/15

Donald Overfelt
Chief, Facilities and Property Management Branch
Donald.overfelt@nara.gov
301-837-3712

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

NOV 19 2015

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Donald Overfelt
Chief, Facilities and Property Management Branch
8601 Adelphi Road
College Park, MD 20740-6001

Re: Request for Extension of Deadline of Request for Information pursuant to Section 308 of the Act, 33 U.S.C. § 1318 issued to National Archives and Records Administration

Dear Mr. Weber:

This is in response to your letter dated November 5, 2015 requesting an extension in time to respond to a Clean Water Act (CWA) Section 308 request for information issued to the National Archives and Records Administration (NARA) Wastewater Treatment Plant (Permit #MD0065871). The original request required a due date of no later than thirty (30) days from receipt of the request. According to our records the letter was received by NARA on October 9, 2015. EPA is willing provide a time extension of 30 days. The response will now be due on or before December 9, 2015.

As defined in Section III(9) of the issued request for information, if requested information or documents are not known of or available at the time of your response, but later become known or available, please provide that to EPA in a supplemental response letter.

Please contact Mr. Michael Greenwald at (215) 814-2398 if you have any questions regarding this matter.

Sincerely,

David B. McGuigan, Associate Director
Water Protection Division

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Customer Service Hotline: 1-800-438-2474

Introduction and Summary

LB&B
SSOCIATES INC.

November 30, 2015

Mr. Kevin Anderson
National Archives and Records Administration
8601 Adelphi Road
College Park, Maryland 20740

Dear Mr. Anderson

In response to your email of Wednesday, November 25, 2015 the following information is provided.

Mr. Holley submitted to Maryland Department of the Environment renewal application for Groundwater Discharge Permit, October 2, 2014. Current Permit #09-DP-2904, NODES Permit MD0065871.

Maryland Department of Environment Water Management Administration Compliance Program conducted audit inspection November 17, 2014. Inspector Renato Cuizon conducted the inspection.

Mr. Holley received notification from MDE that Groundwater Discharge Permit application was not the correct permit and that a Surface Water Discharge Permit application should be submitted. The Surface Water Discharge permit application, forms 3510-1 and 3510-2C were submitted by Mr. Holley. (*I do not have a copy of his letter to MDE or the letter/email from MDE requiring the different permit application.)*

Mr. Holley, Don Overfelt, Bob Gentry, Bill Santos, Kyle Jones and myself met with MDE engineers Robert Pudmericky and Michel Richardson in early April 2015 to discuss our attempts to meet permit compliance and present our efforts to date.

Cooling tower water discharge is measured daily at the Central Plant at a water meter and recorded. Daily Discharge numbers are compiled monthly and submitted with the quarterly DMR. Discharged water flows through a series of filters and ion exchange tanks before release to the 01 Outfall. Barclay Water Management samples discharge water monthly at sample points in the Central Plant before release to the 01 Outfall. The monthly laboratory analysis from Barclay is submitted with the quarterly DMR. Mircobac Laboratories provides quarterly sampling at the 01 Outfall for the Toxic Chemical Bioassay.

In an attempt to determine if flow from Outfall 01 through the retention area would affect analysis results for chlorine, copper, and zinc, samples were taken below the retention area to compare with samples taken at the discharge in the Central Plant. Sample results were varied, including some higher chlorine results past the retention area.

8601 Adelphi Road • College Park, MD 20740 • Phone: 301-837-3257 • Fax: 301-837-0303

Mr. Holley received approval of the Biomonitoring Study Plan from MDE on April 4, 2013. I have records of Toxic Chemical Bioassay for May 1, 2013. We received no response from MDE and assumed no further sampling was required (see email from Mr. Holley 4-11-2014). Four quarters for 2014 of the Bioassay report were submitted and one additional report was generated at the direction of MDE. The Bioassay's for the first two quarters in 2015 were also submitted. There should be cover letters and copies of each report from Mr. Holley in the NARA files.

Sincerely,

Walt Hayes, Program Manager

cc: Mark Sprouse
Don Overfelt
Robert Gentry

Update on National Archives II MDE Discharge Permit Compliance

Executive Summary

Since March 27, 2015 has undertaken significant system modifications to ensure cooling tower blowdown water discharged to the environment is within limits of the State of Maryland. After commissioning and tuning, several samples were taken to assess system performance. Although the results were mixed, the trend is toward meeting discharge limits. Several efforts are underway to ensure copper discharged to the environment is within limits proscribed by the State of Maryland.

Background

On 27MAR15, LB&B Associates presented to representatives of the Maryland Department of the Environment efforts undertaken to comply with the requirements of the MDE discharge permit. Specifically, the mitigation of elevated copper levels in the cooling tower blowdown water was discussed. Copper levels above the Maryland State limits are a result of using an on-site well for cooling tower makeup water. Water from this well exceeds the surface water discharge limits. Although the operation of the cooling tower tends to increase copper concentration, it is important to clarify that no process within the National Archives II facility introduces any copper into the cooling tower water.

An MDE letter to the National Archives and Records Administration, dated November 17, 2014 indicated that past (2013, Q1) copper concentrations of cooling tower discharge water was in excess of 3500 μg/l for both the daily maximum and monthly average values. Between 2013 and 2015, LB&B Associates has expended labor and capital to mitigate the high copper concentrations discharged to the environment. To mitigate the copper concentration in the cooling tower blowdown water, LB&B contracted with Evoqua Water Technologies to install a resin exchange system that specifically targets dissolved copper and zinc. The interim cost for this system has been $62,700. LB&B Associates has also spent in excess of $30,000 on laboratory sampling to verify copper removal. Lastly, hundreds of hours of engineering trade and operational time have been dedicated to this project.

For review, the table below lists the sample data is reproduced from the March 2015 presentation to demonstrate past copper removal performance.

	Total Copper (µg/l)			
Sample Month	**Untreated Water**	**Treated Water**	**Removal Rate**	**Required Removal Rate**
Apr 2014	230	80	65%	96.09%
May 2014	264	20	92%	96.59%
July 2014	242	38	84%	96.28%
Aug 2014	370	100	73%	97.57%
Nov 2014	330	70	79%	97.27%
Dec 2014	92	66	28%	90.22%
Jan 2015	290	60	79%	96.90%
Feb 2015	520	140	73%	98.30%

Table 1. Historical Cooling Tower Blowdown Copper Removal at National Archives II Facility

Steps Taken Since March 2015

Since meeting with representatives of the Maryland Department of the Environment, LB&B Associates, in concert with our water treatment provider (Evoqua Water Technologies) has been improving the cooling tower blowdown copper removal system. Specifically, the amount of resin used to treat the cooling tower blowdown water was doubled. Secondly, the flow through the resin media was split into two parallel trains. This effectively slowed the water flow through the resin tanks and brought the throughput in line with optimum dissolved copper and zinc removal.

During system recommissioning and tuning, periodic samples were taken to continually assess system performance. Sample analysis revealed a mixed bag of results. Copper removal rate had increased substantially. In fact, the copper removal rates were in line with predicted removal rates to meet (or exceed) the Maryland State copper removal limits. Results varied, one sample met the Maryland State limit and a second was within 1 ppb of the limit. Other samples recorded higher than the limit, although they were drawn within 24-hours of samples that met the limit.

Cooling tower blowdown samples were taken and provided to three different labs. Evoqua Water Technologies took samples and sent them to their corporate lab in Rochester, Minnesota. Barclay Water Management, a general water treatment subcontractor at the National Archives II facility, took samples and sent them to their lab in Cambridge, Massachusetts. In addition, at the

direction of LB&B Associates, Barclay representatives took additional samples and sent them to EMSL Analytical, Inc, an EPA-Certified lab in Cinnaminson, New Jersey, with a local office near the National Archives II facility. What became apparent is that there is a level of error an tolerance that must be accounted for when taking samples. Identical samples sent to different labs yield different results. To correct for this, all samples are now taken simultaneously and sent out on the same day. Below is a table of all samples taken between March 2015 and July 2015:

		Total Copper (µg/l)			
Sample Month	**Sample Lab**	**Untreated Water**	**Treated Water**	**Removal Rate**	**Required Removal Rate**
24APR15	EMSL	350	16	95.42%	97.43%
15MAY15	EMSL	590	18	96.95%	98.47%
29JUN15	Evoqua	582	5	99.14	98.45
30JUN15	EMSL	Not Available	24	Not Available	Not Available
30JUN15	Barclay	Not Available	59	Not Available	Not Available
22JUL15	EMSL	410	18	95.61%	97.80%
22JUL15	Barclay	456	21	95.39%	98.03%
22JUL15	Evoqua	200	14	93.00%	95.50%

Table 2. Cooling Tower Blowdown Copper Removal at National Archives II Facility, March 2015 – July 2015

In addition, two bio-essays were performed since March 2015. One bio-essay came back positive and one came back negative.

Conclusion

Progress continues at the National Archives II facility with respect to reducing total copper discharged to the environment. Modifications made to the copper removal system has yielded better results. Although the sample size is small, the system has shown that it can bring copper discharge within the Maryland State limits. Bio-essays have shown mixed results. This is an improvement over past results. However, more work needs to be done. LB&B Associates continues to work with all labs to ensure consistency in analysis reporting. In addition, there is a concern that there may be some organic chemistry in play. There may be an organic component present that binds to the dissolved copper and then releases the copper after passing through the resin tanks. To this end we will begin testing with activated carbon filters to remove this constituent. The carbon filters will be installed in August 2015 and additional samples will be analyzed to ensure water discharged to the environment is within limits.

Response to Paragraph 16

MARYLAND DEPARTMENT OF THE ENVIRONMENT
MDE 1800 Washington Boulevard • Baltimore MD 21230
410-537-3000 • 1-800-633-6101

Martin O'Malley
Governor

Anthony G. Brown
Lieutenant Governor

Shari T. Wilson
Secretary

Robert M. Summers, Ph.D.
Deputy Secretary

STATE DISCHARGE PERMIT NUMBER	09-DP-2904	NPDES PERMIT NUMBER	MD0065871
EFFECTIVE DATE	December 1, 2009	EXPIRATION DATE	November 30, ~~2010~~ 2014
MODIFICATION DATE:		REAPPLICATION DATE	

Pursuant to the provisions of Title 9 of the Environment Article, Annotated Code of Maryland, and regulations promulgated thereunder, and the provisions of the Clean Water Act, 33 U.S.C. § 1251 et seq. and implementing regulations 40 CFR Parts 122, 123, 124, and 125, the Department of the Environment, hereinafter referred to as the "Department," hereby authorizes

National Archives and Records Administration
8601 Adelphi Road
College Park, Maryland 20740

TO DISCHARGE FROM

a government records storage and preservation facility

LOCATED AT

8601 Adelphi Road, College Park, Prince George's County, Maryland 20740

VIA OUTFALL

001 as identified and described herein

TO

an unnamed tributary to Paint Branch, which, as Use I waters, is protected for water contact recreation, fishing, aquatic life and wildlife in accordance with the following special and general conditions and map(s) made a part hereof.

I. SPECIAL CONDITIONS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the effective period of this permit, the permittee is authorized to discharge non-contact cooling water via Outfall 001 (Maryland Coordinates 812.0 E and 425.0 N).

As specified below, such discharge shall be limited and monitored by the permittee at the discharge pipe from the cooling water system.

PARAMETER	QUANTITY OR LOADING			QUALITY OR CONCENTRATION				FREQUENCY OF ANALYSIS	SAMPLE TYPE	NOTES
	MONTHLY AVERAGE	DAILY MAXIMUM	UNITS	MINIMUM	MONTHLY AVERAGE	DAILY MAXIMUM	UNITS			
Flow	Report	Report	gpd					1/Month	Measured	
Temperature					Report	90	°F	1/Month	i-s	(1)
Total Residual Chlorine					0.011	0.019	mg/l	1/Month	Grab	(2) (3)
Dissolved Oxygen				5.0			mg/l	1/Month	Grab	(4)
pH				6.5		8.5		1/Month	Grab	(2)
Total Zinc					120	120	ug/l	1/Month	Grab	(5)(6)(7)
Dissolved Zinc					Report	Report	ug/l	1/Month	Grab	(5)(6)
Total Copper					9	13	ug/l	1/Month	Grab	(5)(6)(7)
Dissolved Copper					Report	Report	ug/l	1/Month	Grab	(5)(6)
Hardness (as $CaCO_3$)					Report	Report	mg/l	1/Month	Grab	(8)
Total Nitrogen					Report	Report	mg/l	1/Month	Grab	(9)
Total Phosphorus					Report	Report	mg/l	1/Month	Grab	(9)

I. SPECIAL CONDITIONS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS – Continued from previous page

There shall be no discharge of floating solids or persistent foam in other than trace amounts. Persistent foam is foam that does not dissipate within one half-hour of point of discharge.

(1) Monitoring is required May through October only.

(2) The discharge of wastewater from the cleaning of the cooling water system with acids, solvents, or detergents is prohibited. If caustic inorganic cleaners or chlorine shock treatment are used, both the pH and chlorine limits are applicable during those periods, and the permittee shall monitor the discharge for those pollutants during those periods of discharge. If the permittee practices chemical dechlorination, then the pH limit is applicable. If none of these activities occurs, the permittee shall so note in the comments section of the discharge monitoring report.

(3) Because the minimum level (quantification level) for chlorine is 0.10 mg/l, all results below this minimum level shall be reported as <0.10 mg/l.

(4) Monitoring for dissolved oxygen is required only if chemical dechlorination is conducted. The permittee shall so note on the discharge monitoring report.

(5) Test results of non-detectable levels are not acceptable unless the detection level is less than the permit limit or the permittee demonstrates to the Department that a lower detection level is not practically achievable for this wastewater.

(6) EPA Test Method 200.8. An alternate test method may be substituted as long as the Department concurs that its detection level is less than the applicable Toxic Substance Criteria in COMAR 26.08.02.03 or the permittee demonstrates to the Department that a lower detection level is not practically achievable for this wastewater. Sample preservation procedures, container materials, and maximum allowable holding times must be specified in any application to the Department for use of an alternate test method(s). Written approval from the Department must be given before any alternate test method(s) is used.

(7) The limits for copper and zinc become effective six months after the effective date of the permit.

(8) To be taken at same time as metals samples.

(9) After one year of monitoring, the Department may reduce or eliminate monitoring requirements upon a written request from the permittee. This change can be made without reopening the permit.

I. SPECIAL CONDITIONS

B. DEFINITIONS

1. "Bypass" means the intentional diversion of wastes from any portion of a treatment facility.

2. "Daily determination of concentration" means one analysis performed on any given sample representing flow during a calendar day, with one number in mg/l or other appropriate units as an outcome.

3. The "daily maximum" effluent concentration means the highest reading of any daily determination of concentration.

4. The "daily maximum" temperature means the highest temperature observed during a 24-hour period or, if flows are of shorter duration during the operating day.

5. "Estimated" flow means a calculated volume or discharge rate which is based on a technical evaluation of the sources contributing to the discharge including, but not limited to, pump capabilities, water meters, and batch discharge volumes.

6. "Grab sample" means an individual sample collected in less than 15 minutes. Grab samples collected for pH and total residual chlorine shall be analyzed within 15 minutes of time of sample collection.

7. "i-s" = immersion stabilization - means a calibrated device immersed in the effluent stream until the reading is stabilized.

8. "Measured" flow means any method of liquid volume measurement the accuracy of which has been previously demonstrated in engineering practice, or for which a relationship to absolute volume has been obtained.

9. The "minimum" value means the lowest value measured during a 24-hour period.

10. The "monthly, quarterly, semi-annual, or annual average" effluent concentration means the value calculated by computing the arithmetic mean of all the daily determinations of concentration made during any calendar-month, 3-month, 6-month, or 12-month period respectively.

11. "Nitrogen, Total" means the sum of organic nitrogen, ammonia nitrogen, nitrate, and nitrite. All values shall be reported as nitrogen (as N).

12. "Solvent" is defined as an organic substance capable of dissolving another to form a uniformly dispersed mixture. Organic solvents include, but are not limited to, aromatic hydrocarbons, aliphatic hydrocarbons, esters, ethers, ketones, amines, and nitrated and chlorinated hydrocarbons.

13. "Upset" means the exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

C. TOXIC POLLUTANT REPORTING

The permittee shall notify the Department as soon as it is known or suspected that any toxic pollutants which are not specifically limited by this permit have been discharged at levels specified in 40 CFR Part 122.42(a).

D. REMOVED SUBSTANCES

1. Within 30 days after notification by the Department, the permittee shall provide information on the disposal of any removed substances, as defined by General Condition B.7, including the following information:

   a. A suitable map showing all areas used for disposal of removed substances.

   b. The physical, chemical, and biological characteristics, as appropriate; quantities of any removed substances; and the method of disposal.

   c. If disposal is handled by persons other than the permittee, identification of the contractor or subcontractor, their mailing address, and the information specified in a and b above.

2. The Department's notification may also require the permittee to provide the above information prior to the use of new or additional disposal areas, contractors, or subcontractors.

E. ANALYTICAL LABORATORY

Within 30 days after the effective date of this permit, the permittee shall submit to the Department the name and address of the analytical laboratory (including the permittee's own laboratory) which is used to perform the monitoring required by this permit.

If the laboratory changes during the effective period of this permit, the permittee shall notify the Department of the new laboratory within 30 days after the change.

F. WASTEWATER OPERATOR CERTIFICATION – [Reserved]

G. FLOW MONITORING

In lieu of providing measured flow (defined in the Special Conditions Definitions section) at Outfall 001, the permittee may estimate flows and submit the following information at the time of submission of the initial discharge monitoring report and/or upon any change in the methodology:

1. a description of the methodology used to estimate flow at each outfall where flow measurement equipment is not present;

2. documentation appropriate to the methodology utilized which provides information necessary to support the validity of the reported flow estimate. If actual measurements or observations are made, a description of typical sampling times, locations, and persons performing the measurements/observations should also be provided.

3. a description of the factors (e.g., batch discharges, intermittent operation, etc.) which cause flow at the outfall to fluctuate significantly from the estimate provided.

H. FLOW BASIS FOR ANNUAL DISCHARGE PERMIT FEE

The Department will calculate permit fees annually and will invoice the permittee based upon average discharge flow. Permit fees are payable in advance to the Department by July 1 of each fiscal year (July 1 through June 30).

The permittee shall provide to the Department's Industrial Discharge Permits Division by May 1 of each year an updated average discharge flow value for the next billing period if the flow volume used to calculate the most recent annual permit fee (or, if the permit was renewed within the past year, the flow volume used to calculate the application fee) differs significantly from either of the following flow determinations:

1. average flow data from the current fiscal year as reported on the permittee's discharge monitoring reports, or

2. the estimated flow volume for the next billing period based upon recent changes at the facility.

The permittee shall include with their flow revision notification a summary of flow data reported on discharge monitoring reports for the previous year and any other supporting documentation to be used as the basis for the flow determination.

I. REAPPLICATION FOR A PERMIT

The Department is implementing a schedule for issuance of discharge permits grouped by geographical areas (watersheds). To implement the watershed-based schedule, the Department may revoke and reissue this permit concurrently with other permits in the watershed.

Unless the Department grants permission for a later date, the permittee shall submit a renewal application by no later than 10/01/2012, or notify the Department of the intent to cease discharging by the expiration date.

In the event that a timely and sufficient reapplication has been submitted and the Department is unable, through no fault of the permittee, to issue a new permit before the expiration date of this permit, the terms and conditions of this permit are automatically continued and remain fully effective and enforceable.

J. PERMIT REOPENER FOR TOTAL MAXIMUM DAILY LOAD (TMDL)

1. This permit may be reopened as a major modification to implement any applicable requirements associated with a Total Maximum Daily Load (TMDL) issued or approved for this watershed (ANACOSTIA RIVER, 02.14.02.05), including but not limited to: biological indicators.

2. No later than one year and 28 days after the effective date of this permit, the permittee shall submit (to the Industrial Discharge Permits Division) a table of the first twelve months of monitoring results for total nitrogen and total phosphorus. To ensure consistency with the Anacostia River Nutrients/Biochemical Oxygen Demand TMDL approved June 5, 2008, the permit may be reopened to propose effluent limitations upon a determination by the Department that a reasonable potential exists to exceed water quality standards.

K. BIOMONITORING PROGRAM

1. Within three months of the effective date of the permit, the permittee shall submit to the Department for approval a study plan to evaluate wastewater toxicity at Outfall 001 by using biomonitoring. The study plan should include at a minimum a discussion of:

   a. wastewater and production variability
   b. sampling & sample handling
   c. source & age of test organisms
   d. source of dilution water
   e. testing procedures/experimental design
   f. data analysis
   g. quality assurance/quality control
   h. report preparation
   i. testing schedule

2. The testing program shall consist of definitive quarterly chronic testing for one year. This testing shall be initiated no later than three months following the Department's acceptance of the study plan.

   a. Each quarterly testing shall include the Ceriodaphnia survival and reproduction test and the fathead minnow larval survival and growth test.

   b. If the receiving water is estuarine the permittee shall substitute estuarine species for those species specified above. Approved estuarine species for chronic testing are sheepshead minnow, inland silversides, and mysid shrimp. In all cases, testing must include one vertebrate species and one invertebrate species.

3. The samples used for biomonitoring shall be collected at the same time and location as the samples analyzed for the effluent limitations and monitoring requirements for this outfall. For chlorinated effluents, samples shall be collected after dechlorination.

4. The following EPA documents discuss the appropriate methods:

   a. Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms, Third Edition, EPA-821-R-02-014, October 2002.

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

5. Test results shall be submitted to the Department within one month of completion of each set of tests.

6. Test results shall be reported in accordance with MDE/WMA "Reporting Requirements for Effluent Biomonitoring Data," 3/21/03.

7. As a minimum, the reported chronic results shall be expressed as NOEC, LOEC, ChV, and IC_{25}.

8. If significant mortality occurs during the first 48 hours of the chronic tests, 48-hour LC50s shall be calculated and reported along with the chronic results.

9. If testing is not performed in accordance with MDE-approved study plan, additional testing shall be required by the Department.

10. If the test results of any two consecutive valid toxicity tests conducted within any 12-month period show acute or chronic toxicity, the permittee shall repeat the test within 30 days to confirm the findings of acute or chronic toxicity. If acute and/or chronic toxicity is confirmed, the permittee shall:

a. Eliminate the source of toxicity through operational changes as soon as possible but in any case not longer than within three months, or

b. Perform a TRE. If the permittee repeats the toxicity testing as stated above and the results of the repeat test do not confirm the acute or chronic toxicity, the Department will require the permittee to repeat the toxicity testing as stated above to reconfirm a finding of no acute or chronic toxicity. After reconfirmation, the permittee shall complete any remaining quarterly testing required.

11. If plant processes or operations change so that there is a significant change in the nature of the wastewater, the Department may require the permittee to conduct a new set of tests.

12. Submit all Biomonitoring related materials to:

Maryland Department of the Environment
Water Management Administration
Compliance Program
1800 Washington Boulevard, Suite 420
Baltimore, Maryland 21230-1708

L. TOXICITY REDUCTION EVALUATION

The permittee shall conduct a Toxicity Reduction Evaluation (TRE) when a review of toxicity test data by the Department indicates unacceptable acute or chronic effluent toxicity. A TRE is an investigation conducted to identify the causative agents of effluent toxicity, isolate the source(s), determine the effectiveness of control options, implement the necessary control measures and then confirm the reduction in toxicity.

1. Within 90 days following notification by the Department that a TRE is required, the permittee shall submit a plan of study and schedule for conducting a TRE. The permittee shall conduct the TRE study consistent with the submitted plan and schedule.

2. This plan should follow the framework presented in Generalized Methods for Conducting Industrial Toxicity Reduction Evaluations (EPA/600/2-88/070).

3. Beginning 60 days following the date of the Department's acceptance of the TRE study plan and every 60 days thereafter, the permittee shall submit progress reports including all relevant test data to the Department. This shall continue until completion of the toxicity reduction confirmation.

4. Within 60 days following completion of the toxicity identification, or the source identification phase of the TRE, the permittee shall submit to the Department a plan and schedule for implementing those measures necessary to eliminate acute toxicity and/or reduce chronic

toxicity to acceptable levels. The implementation of these measures shall begin immediately upon submission of this plan.

5. Within 60 days after completing implementation of the control measures to eliminate or reduce toxicity, the permittee shall submit to the Department for approval a study plan to confirm the elimination or reduction of toxicity by using biomonitoring.

6. If, for any reason, the implemented measures do not result in compliance with the Department's toxicity limitations, the permittee shall continue the TRE.

M. MIXING ZONES AND POLLUTION PREVENTION – [Reserved]

N. PROTECTION OF WATER QUALITY

It is a violation of this permit to discharge any substance not otherwise listed under the permit's "Effluent Limitations and Monitoring Requirements" special conditions at a level which would cause or contribute to any exceedance of the numerical water quality standards in COMAR 26.08.02.03 unless the level and the substance were disclosed in writing in the permit application prior to the issuance of the permit. If a discharge regulated by this permit causes or contributes to an exceedance of the water quality standards in COMAR 26.08.02.03, including but not limited to the general water quality standards, the Department is authorized to exercise its powers to modify, suspend or revoke this permit.

O. USE OF CHEMICAL CONDITIONERS IN COOLING WATER

1. If not already submitted with the permit application, no later than 30 days after the effective date of coverage under this permit, the permittee shall submit to the Department (Industrial Discharge Permits Division) the name of all previously authorized water treatment additives currently in use at the facility and potentially discharging to surface water of the State. No later than ten days after changing or adding any water treatment chemicals, the permittee shall submit the names of the new products to the Department. Accompanying this list shall be corresponding aquatic toxicity data, manufacturer's information on chemical composition of the product, the concentrations that will exist in the effluent (note: material safety data sheets seldom provide all of this information). Based on this information, if the Department determines that wastewater containing the additive is likely to cause toxicity, use of the additives will be prohibited. The Department, however, will approve its use if the permittee performs biomonitoring of the effluent and demonstrates that the effluent is nontoxic.

2. The permittee shall notify the Department (Industrial Discharge Permits Division) if and when it initiates the use of chemical dechlorination, or terminates the practice.

P. STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY – [Reserved]

II. GENERAL CONDITIONS

A. MONITORING AND REPORTING

1. REPRESENTATIVE SAMPLING

Samples and measurements taken as required herein shall be taken at such times as to be representative of the quantity and quality of the discharges during the specified monitoring periods.

2. REPORTING-MONITORING RESULTS SUBMITTED QUARTERLY

Monitoring results obtained during the calendar quarter shall be summarized on a Discharge Monitoring Report form (EPA No. 3320-1). For each effluent characteristic monitored at a frequency of once per month or less and not limited as a monthly average, the results obtained during the reporting period shall be summarized on a single report form for each quarter. More frequently monitored effluent characteristics and effluent characteristics limited as a monthly average shall be reported on a separate form for each calendar month of the reporting period. Results shall be submitted to the Department postmarked no later than the 28th day of the month following the end of the reporting period. Calendar quarter reporting periods end on the last day of the following months: March, June, September and December.

The reports shall be submitted to:

Maryland Department of the Environment
Water Management Administration
Compliance Program
1800 Washington Boulevard, Suite 425
Baltimore, Maryland 21230-1708

3. SAMPLING AND ANALYSIS METHODS

The analytical and sampling methods used shall conform to procedures for the analysis of pollutants as identified in Title 40 CFR Part 136 - "Guidelines Establishing Test Procedures for the Analysis of Pollutants" unless otherwise specified.

4. DATA RECORDING REQUIREMENTS

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

a. the exact place, date, and time of sampling or measurement;
b. the person(s) who performed the sampling or measurement;
c. the dates and times the analyses were performed;
d. the person(s) who performed the analyses;
e. the analytical techniques or methods used; and
f. the results of all required analyses.

5. MONITORING EQUIPMENT MAINTENANCE

The permittee shall periodically calibrate and perform maintenance procedures on all monitoring and analytical instrumentation to insure accuracy of measurements.

6. ADDITIONAL MONITORING BY PERMITTEE

If the permittee monitors any pollutant, using approved analytical methods as specified above, at the locations designated herein more frequently than required by this permit, the results of such monitoring, including the increased frequency, shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report form (EPA No. 3320-1).

7. RECORDS RETENTION

All records and information resulting from the monitoring activities required by this permit, including all records of analyses performed, calibration and maintenance of instrumentation, and original recordings from continuous monitoring instrumentation shall be retained for a minimum of three years. This period shall be automatically extended during the course of litigation, or when requested by the Department.

B. MANAGEMENT REQUIREMENTS

1. CHANGE IN DISCHARGE

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit at a level in excess of that authorized shall constitute a violation of the terms and conditions of this permit. Anticipated facility expansions, production increases or decreases, or process modifications, which will result in new, different, or an increased discharge of pollutants, shall be reported by the permittee by submission of a new application or, if such changes will not violate the effluent limitations specified in this permit, by notice to the Department. Following such notice, the permit may be modified by the Department to specify and limit any pollutants not previously limited.

2. NONCOMPLIANCE WITH EFFLUENT LIMITATIONS

If, for any reason, the permittee does not comply with or will be unable to comply with any daily maximum or daily minimum effluent limitation specified in this permit, the permittee shall notify the Inspection and Compliance Program by telephone at (410) 537-3510 within 24 hours of becoming aware of the noncompliance. Within five calendar days, the permittee shall provide the Department with the following information in writing:

a. a description of the non-complying discharge including its impact upon the receiving waters;

b. cause of noncompliance;

c. anticipated time the condition of noncompliance is expected to continue or if such condition has been corrected, the duration of the period of noncompliance;

d. steps taken by the permittee to reduce and eliminate the non-complying discharge;

e. steps to be taken by the permittee to prevent recurrence of the condition of noncompliance; and

f. a description of the accelerated or additional monitoring by the permittee to determine the nature and impact of the noncomplying discharge.

3. FACILITIES OPERATION

All treatment, control and monitoring facilities, or systems installed or used by the permittee, are to be maintained in good working order and operated efficiently.

4. ADVERSE IMPACT

The permittee shall take all reasonable steps to minimize or prevent any adverse impact to waters of the State or to human health resulting from noncompliance with any effluent limitations specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

5. BYPASSING

Any bypass of treatment facilities necessary to maintain compliance with the terms and conditions of this permit is prohibited unless:

a. the bypass is unavoidable to prevent a loss of life, personal injury or substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources;

b. there are no feasible alternatives;

c. notification is received by the Department within 24 hours (if orally notified, then followed by a written submission within five calendar days of the permittee's becoming aware of the bypass). Where the need for a bypass is known (or should have been known) in advance, this notification shall be submitted to the Department for approval at least ten calendar days before the date of bypass or at the earliest possible date if the period of advance knowledge is less than ten calendar days; and

d. the bypass is allowed under conditions determined by the Department to be necessary to minimize adverse effects.

6. CONDITIONS NECESSARY FOR DEMONSTRATION OF AN UPSET

An upset shall constitute an affirmative defense to an action brought for noncompliance with technology-based effluent limitations only if the permittee demonstrates, through properly signed, contemporaneous operating logs, or other relevant evidence, that:

a. an upset occurred and that the permittee can identify the specific cause(s) of the upset;

b. the permitted facility was at the time being operated in a prudent and workman-like manner and in compliance with proper operation and maintenance procedures;

c. the permittee submitted a 24-hour notification of upset in accordance with the reporting requirements of General Condition II.B.2 above;

d. the permittee submitted, within five (5) calendar days of becoming aware of the upset, documentation to support and justify the upset; and

e. the permittee complied with any remedial measures required to minimize adverse impact.

7. REMOVED SUBSTANCES

Wastes such as solids, sludges, or other pollutants removed from or resulting from treatment or control of wastewaters, or facility operations, shall be disposed of in a manner to prevent any removed substances or runoff from such substances from entering or from being placed in a location where they may enter the waters of the State.

8. POWER FAILURE

In order to maintain compliance with the effluent limitations and prohibitions of this permit, the permittee shall either:

a. provide an alternative power source sufficient to operate the wastewater collection and treatment facilities or,

b. halt, reduce or otherwise control production and all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater collection and treatment facilities.

C. RESPONSIBILITIES

1. RIGHT OF ENTRY

The permittee shall permit the Secretary of the Department, the Regional Administrator for the Environmental Protection Agency, or their authorized representatives, upon the presentation of credentials to:

a. enter upon the permittee's premises where an effluent source is located or where any records are required to be kept under the terms and conditions of this permit;

b. access and copy, at reasonable times, any records required to be kept under the terms and conditions of this permit;

c. inspect, at reasonable times, any monitoring equipment or monitoring method required in this permit;

d. inspect, at reasonable times, any collection, treatment, pollution management, or discharge facilities required under this permit; and

e. sample, at reasonable times, any discharge of pollutants.

2. TRANSFER OF OWNERSHIP OR CONTROL OF FACILITIES

In the event of any change in ownership or control of facilities from which the authorized discharge emanates, the permit may be transferred to another person if:

a. the permittee notifies the Department in writing, of the proposed transfer;

b. a written agreement, indicating the specific date of proposed transfer of permit coverage and acknowledging responsibilities of current and new permittees for compliance with the liability for the terms and conditions of this permit, is submitted to the Department; and

c. neither the current permittee nor the new permittee receive notification from the Department, within 30 calendar days, of intent to modify, revoke, reissue or terminate the existing permit.

3. REAPPLICATION FOR A PERMIT –[Reserved]

4. AVAILABILITY OF REPORTS

Except for data determined to be confidential under Section 308 of the Clean Water Act, 33 U.S.C. § 1318, all submitted data shall be available for public inspection at the offices of the Department and the Regional Administrator of the Environmental Protection Agency.

5. PERMIT MODIFICATION

A permit may be modified by the Department upon written request of the permittee and after notice and opportunity for a public hearing in accordance with and for the reasons set forth in 40 CFR § 122.62 and 122.63.

6. PERMIT MODIFICATION, SUSPENSION, OR REVOCATION

After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked and reissued in whole or in part during its term for causes including, but not limited to, the following:

a. violation of any terms or conditions of this permit;

b. obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;

c. a change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge; or

d. a determination that the permitted discharge poses a threat to human health or welfare or to the environment and can only be regulated to acceptable levels by permit modification or termination.

7. TOXIC POLLUTANTS

If a toxic effluent standard or prohibition (including any schedule of compliance specified in such toxic effluent standard or prohibition) is established by the U.S. Environmental Protection Agency, or pursuant to Section 9-314 of the Environment Article, Annotated Code of Maryland, for a toxic pollutant which is present in the discharges authorized herein and such standard is more stringent than any limitation upon such pollutant in this permit, this permit shall be revoked and reissued or modified in accordance with the toxic effluent standard or prohibition and the permittee so notified. Any effluent standard established in this case for a pollutant which is injurious to human health is effective and enforceable by the time set forth in the promulgated standard, even absent permit modification.

8. OIL AND HAZARDOUS SUBSTANCES PROHIBITED

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibility, liability, or penalties to which the permittee may be subject under Section 311 of the Clean Water Act (33. U.S.C. § 1321), or under the Annotated Code of Maryland.

9. CIVIL AND CRIMINAL LIABILITY

Except as provided in permit conditions on "bypassing," "upset," and "power failure," nothing in this permit shall be construed to preclude the institution of any legal action nor relieve the permittee from civil or criminal responsibilities and/or penalties for noncompliance with Title 9 of the Environment Article, Annotated Code of Maryland or any federal, local, or other State law or regulation.

10. PROPERTY RIGHTS/COMPLIANCE WITH OTHER REQUIREMENTS

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, State or local laws or regulations.

11. SEVERABILITY

The provisions of this permit are severable. If any provisions of this permit shall be held invalid for any reason, the remaining provisions shall remain in full force and effect. If the application of any provision of this permit to any circumstances is held invalid, its application to other circumstances shall not be affected.

12. WATER CONSTRUCTION AND OBSTRUCTION

This permit does not authorize the construction or placing of physical structures, facilities, or debris, or the undertaking of related activities in any waters of the State.

13. COMPLIANCE WITH WATER POLLUTION ABATEMENT STATUTES

The permittee shall comply at all times with the provisions of the Environment Article, Title 7, Subtitle 2 and Title 9, Subtitle 3 of the Annotated Code of Maryland and the Clean Water Act, 33 U.S.C. § 1251 et seq.

14. ACTION ON VIOLATIONS

The issue or reissue of this permit does not constitute a decision by the State not to proceed in administrative, civil, or criminal action for any violations of State law or regulations occurring before the issue or reissue of this permit, nor a waiver of the State's right to do so.

15. CIVIL PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS

In addition to civil penalties for violations of State water pollution control laws set forth in Section 9-342 of the Environment Article, Annotated Code of Maryland, the Clean Water Act provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the Act or in a permit issued under Section 404 of the Act, is subject to a civil penalty not to exceed $27,500 per day for each violation.

16. CRIMINAL PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS

In addition to criminal penalties for violations of State water pollution control laws set forth in Section 9-343 of the Environment Article, Annotated Code of Maryland, the Clean Water Act provides that:

a. any person who negligently violates Section 301, 302, 306, 307, 308, 318, or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the Act, or in a permit issued under Section 404 of the Act, is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than one (1) year, or by both.

b. any person who knowingly violates Section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the Act, or in a permit issued under Section 404 of the Act, is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than three (3) years, or by both.

c. any person who knowingly violates Section 301, 302, 306, 307, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the Act, or in a permit issued under Section 404 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, is subject to a fine of not more $25,000 or imprisonment of not more than 15 years, or both.

d. any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under the Act or who knowingly falsifies, tampers with or renders inaccurate any monitoring device or method required to be maintained under the Act, is subject to a fine of not more than $10,000 or by imprisonment for not more than two (2) years, or by both.

17. DUTY TO PROVIDE INFORMATION

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

18. SIGNATORY REQUIREMENTS

All applications, reports, or information submitted to the Director shall be signed and certified as required by 40 CFR 122.22.

19. REOPENER CLAUSE FOR PERMITS

This permit shall be modified, or alternatively, revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301, 304, and 307 of the Clean Water Act [33 USCS §§ 1311, 1314, 1317] if the effluent standard or limitation so issued or approved:

a. contains different conditions or is otherwise more stringent than any effluent limitation in this permit or

b. controls any pollutant not limited in this permit. This permit, as modified or reissued under this paragraph, shall also contain any other requirements of the Act then applicable.

D. AUTHORITY TO ISSUE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMITS

On September 5, 1974, the Administrator of the U.S. Environmental Protection Agency approved the proposal submitted by the State of Maryland for the operation of a permit program for discharges into navigable waters pursuant to Section 402 of the Clean Water Act, 33 U.S.C. Section 1342.

Pursuant to the aforementioned approval, this discharge permit is both a State of Maryland discharge permit and a NPDES permit.

This permit and the authorization to discharge shall expire at midnight on the expiration date. The permittee shall not discharge after that date unless a new application has been submitted to the Department in accordance with the renewal application provisions of this permit.

Jay G. Sakai, Director
Water Management Administration

Response to Paragraph 17

Response to Paragraph 17 of EPA Letter, Dated October, 7, 2015

Background

The National Archives and Records Administration, National Archives II facility has aggressively pursued a course of correcting discharges in exceeding EPA and Maryland Department of the Environment limits with respect to heavy metals, specifically copper and zinc. An analysis was performed in the Fall of 2012, and it was determined that the source water of high copper and zinc levels was attributed to the on-site cooling tower. The cooling tower is the heat sink associated with operation of the building chiller plant and is considered a mission critical piece of equipment.

The purpose of the National Archives II facility is to serve as a repository for the United States government official documents, audio tapes, and visual media. These storage areas must be kept, at all times, within a tight temperature envelope and require cooling during the warmer months. In addition, the chiller plant, and therefore the cooling tower, supports cooling operations of data centers within the facility.

With respect to chlorine present in the building outfall, further investigation is needed. Chlorine is not used in the cooling tower water treatment, and is not present in the well water used for cooling tower makeup water. Furthermore, chlorine has only been present on an intermittent basis. Because of this lack of persistence, a root cause has been difficult to find.

Review of Cooling Tower Operation

Cooling tower operation is considered an open loop process. Through operation of the cooling tower, water is lost in two primary ways: evaporation and cooling tower blowdown. In a typical year, cooling tower operation required approximately 27-million gallons of water. A majority of this water is lost to evaporation. A fractional portion of water, approximately 2-million gallons, is lost due to cooling tower blowdown.

Cooling tower blowdown is a necessary by-product of cooling tower operation. As water is circulated to the building chiller condensers, the working fluid within the chillers (refrigerant), rejects heat to the cooling tower circulating water. This heated water is returned to the cooling tower. Within the cooling tower, the circulating water is broken up into fine droplets and falls, by gravity, through a section of the cooling tower known as the cooling tower fill (Figure 1). As the water falls through the fill, it comes in contact with air that is draw upwards through the cooling tower fill. Given the high surface area of the fine droplets flowing down through the cooling tower fill, the circulated water surrenders its heat to the rising air flow and the cooled water collects in the cooling tower basin, and is recirculated back through chiller plant.

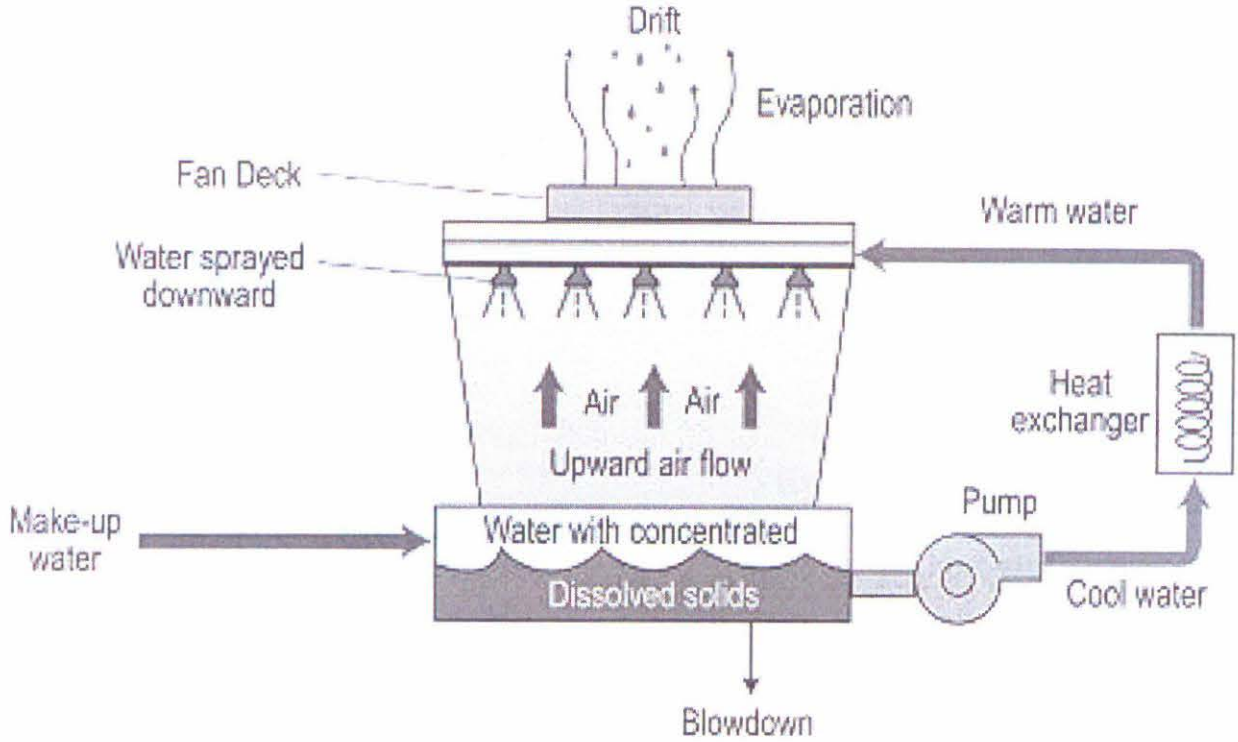


Figure 1. Basic Cooling Tower Operation

A portion of the water flowing downward through the cooling tower becomes water vapor within the cooling tower fill and becomes entrained in the upward air flow. This represents the before-mentioned loss due to evaporation. One of the defining characteristics of this water vapor loss/evaporation is that the water vapor is nearly pure water. Any impurities within the cooling tower circulating water, such as suspended solids, salts, and metallic ions, remain in the circulating water system. Over time, these impurities concentrate and if left in the system can lead to fouling/scaling of chiller condenser (heat exchanger) tubing. This in turn would reduce the ability to transfer heat from the chiller working fluid to the circulating water and therefore would increase demand for cooling tower circulating water.

To mitigate the effects of cooling tower circulating water impurity concentration, a portion of the water within the cooling tower is discharged to the environment. This periodic discharge is known as a cooling tower blowdown and is automatically controlled based on the conductivity of the cooling tower circulating water. Controlling based on conductivity minimizes the discharge to the environment because the discharge is based on the condition of the circulating water and not on a fixed schedule.

The effect of the cooling tower blowdown is that the cooling tower basin water level drops automatically triggers a cooling tower fill valve to open. The make-up water introduced via the fill valve has a much lower concentration of impurities and dilutes the concentration of impurities within the cooling tower circulating water.

At the National Archives II facility, the source of cooling tower make-up water is an on-site well. This well water is characterized as having a relatively low pH, and is also high in copper and zinc. In fact, the well water exceeds established EPA and Maryland Department of the Environment discharge limits for copper by more than a factor of more than 250.

Constituent	Units	10OCT2014	20AUG2015
pH	***	5.2	5.3
Conductivity	µmhos	148	152
Total Dissolved Solids	mg/L	96	99
Alkalinity as $CaCO_3$	mg/L	4	6
Chloride as Cl-	mg/L	30.1	32.6
Sodium	mg/L	8.0	9.5
Potassium	mg/L	1.6	1.5
Total Hardness as	mg/L	14.6	15.2
Calcium as CaCO3	mg/L	6.0	6.2
Magnesium as CaCO3	mg/L	8.6	9.0
Silica as SiO2	mg/L	9.3	9.6
Sulfur as SO4	mg/L	1.5	1.6
Iron, Dissolved	mg/L	< 0.05	< 0.05
Copper, Dissolved	mg/L	1.38	2.37
Zinc, Dissolved	mg/L	3.48	3.35
Aluminum, Dissolved	mg/L	< 0.05	< 0.05
Manganese, Dissolved	mg/L	0.08	
Total Phosphorus as PO4	mg/L	< 0.1	< 0.1

Table 1. National Archives II Well Water Analysis

Given these high initial levels, and the concentrating effect of cooling tower operation, the water discharged through the cooling tower blowdown exceeds limits set by the EPA and the Maryland Department of the Environment.

Copper and Zinc Mitigation Efforts

In the last calendar quarter of 2012, the National Archives II facility began an analysis of what existing technologies exist to remove copper and zinc from the well water. The analysis targeted both the solid and dissolved forms of each element, with particular emphasis on the dissolved species based on the EPA guidance document, EPA-882-R-07-001, "*Aquatic Life Ambient Freshwater Quality Criteria – Copper (2007).*" In addition, discussions were held as to whether the water treatment should occur before the well water entered the cooling tower or at the cooling tower blowdown discharge. Because of the much larger capital costs associated with treating an order of magnitude greater volume of water, the need for an accessory outbuilding in a protected area, and siting of supporting utilities, the decision was made to treat the cooling tower blowdown water.

Although the removal of heavy metals from water is a mature industry, there was some difficulty in obtaining three competitive bids based on a single technology. An RFQ was prepared and three qualified companies offered proposals. These proposals were evaluated on initial capital costs, a projected 5-year operating cost, past performance of the technology used at similar sites, and treatment system level of complexity. The outcome of the bid evaluation was a contract awarded to Siemens Water Technologies (now Evoqua Water Technologies) in April 2013.

The Evoqua Water Technologies system utilizes a proprietary resin media that presents attractive sites for water-based dissolved copper and zinc ions. The initial configuration of the Evoqua system comprised a 10-micron pre-filter, a 30 ft^3 "worker" tank, a 30 ft^3 "polishing" tank, and a 10-micron post-filter (Figure 2). These components were installed in-line with the building force main. It is important to note that the force main is supplied by only the cooling tower discharge piping and a series of at grade storm drains located exterior to the building. During normal operation, water flowing through the force main would pass through the 10-micron pre-filter, which would remove any bulk solids from the water. The filtered water would then enter the worker tank and as the water flowed through the resin media bed, copper and zinc ions would adhere to the resin media and the remainder of the water would exit the tank. The water would then enter the polishing tank. The purpose of the polishing tank is to remove any residual copper and zinc ions that were not removed in the worker tank. The polished water would then exit and pass through a post filter. The post filter was installed to ensure that no resin could pass from the tanks to the environment. Water exiting the post filter is then discharged to the environment via a building outfall.

Evoqua system performance was tracked in two ways. Copper and zinc concentration was periodically evaluated via a bench test and monthly tests by the National Archives II water

treatment sub-contractor. The monthly analysis by the sub-contractor provided further reporting data, in that water samples were analyzed for both dissolved copper, total copper, and total zinc. In addition to sampling analysis, water throughput of the system was tracked on a daily basis. If the water effluent copper or zinc exceeds established limits or if water throughput exceeds 250,000 gallons, the resin tanks are exchanged for new resin tanks. The resin tank exchange program is carried out through a separate service contract with Evoqua Water Technologies. "Spent" resin tanks are removed by Evoqua Water Technologies and shipped to a resin reprocessing facility in the State of Minnesota.

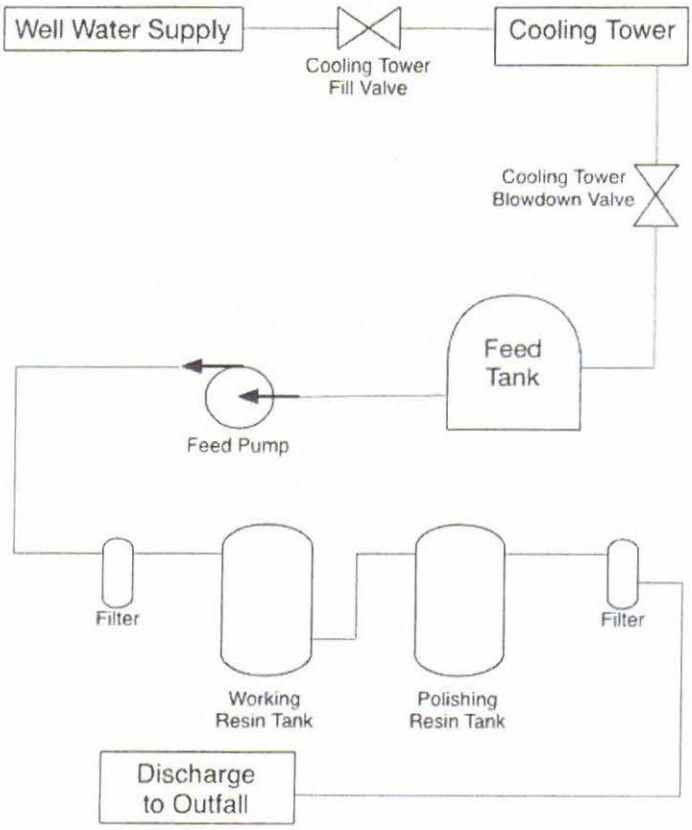


Figure 2. Simplified Evoqua System Process Diagram

All system components were installed by the third quarter of 2013. Commissioning operations continued during the Fall of 2013, but were hampered by two issues. The first was a concern that the intermittent nature of the cooling tower blowdown system could hamper system performance over the long term. The second was a particularly cold winter season, which limited demand on the facility chiller plant. Reduced chiller demand resulted in less evaporation from the cooling tower circulating water and therefore; a sharp reduction in cooling tower blowdown. National Archives II engineers, facility contacting engineers, and Evoqua engineers worked during this downturn to install a 1600-gallon feed tank and feed pump to better regulate flow through the resin media tanks.

By the Summer of 2014, all components were installed and full commissioning efforts began. During the commissioning period, periodic samples were taken and analyzed by National Archives II water treatment sub-contractor, Evoqua Water Technologies, and an additional contract was established with a local, EPA-certified third party water lab. As analysis results became available, data was tracked to analyze system performance. With respect to zinc, the system performed well and demonstrated the ability to maintain zinc concentrations below the established EPA and Maryland Department of the Environment limits. Copper removal was more problematic. Collected data showed that the Evoqua system was performing well at removing dissolved copper, but that suspended (solid) copper was complicating meeting discharge limits.

By August 2104, Evoqua Water Technologies was sent notice that the system had not met performance goals. Additional water samples were taken and sent to the Evoqua Water Technologies lab for further evaluation and modeling. The results of the additional modeling demonstrated that a reduction of system flow, and increased residence time within the worker and polishing tanks would achieve the desired results. The reduction in flow was achieved by adding a complete parallel train of worker and polishing tanks (Figure 3). These tanks were installed in March 2015. In addition, a 1-micron filter was installed to aid in the removal of suspended copper. Commissioning of the second train progressed during the Spring 2015. Water analysis during this period showed consistent copper removal rates that exceeded 96%. However, total copper measured at the system outlet remained in the rage of 15-25 ppb (microns/liter).

In late July 2015, two activated carbon tanks were installed in each worker polisher resin tank train to further condition the water (Figure 4). Since the installation of the activated carbon tanks, water analysis has shown two instances of copper concentration above the discharge limit and two instances in which the copper concentration is below the discharge limit.

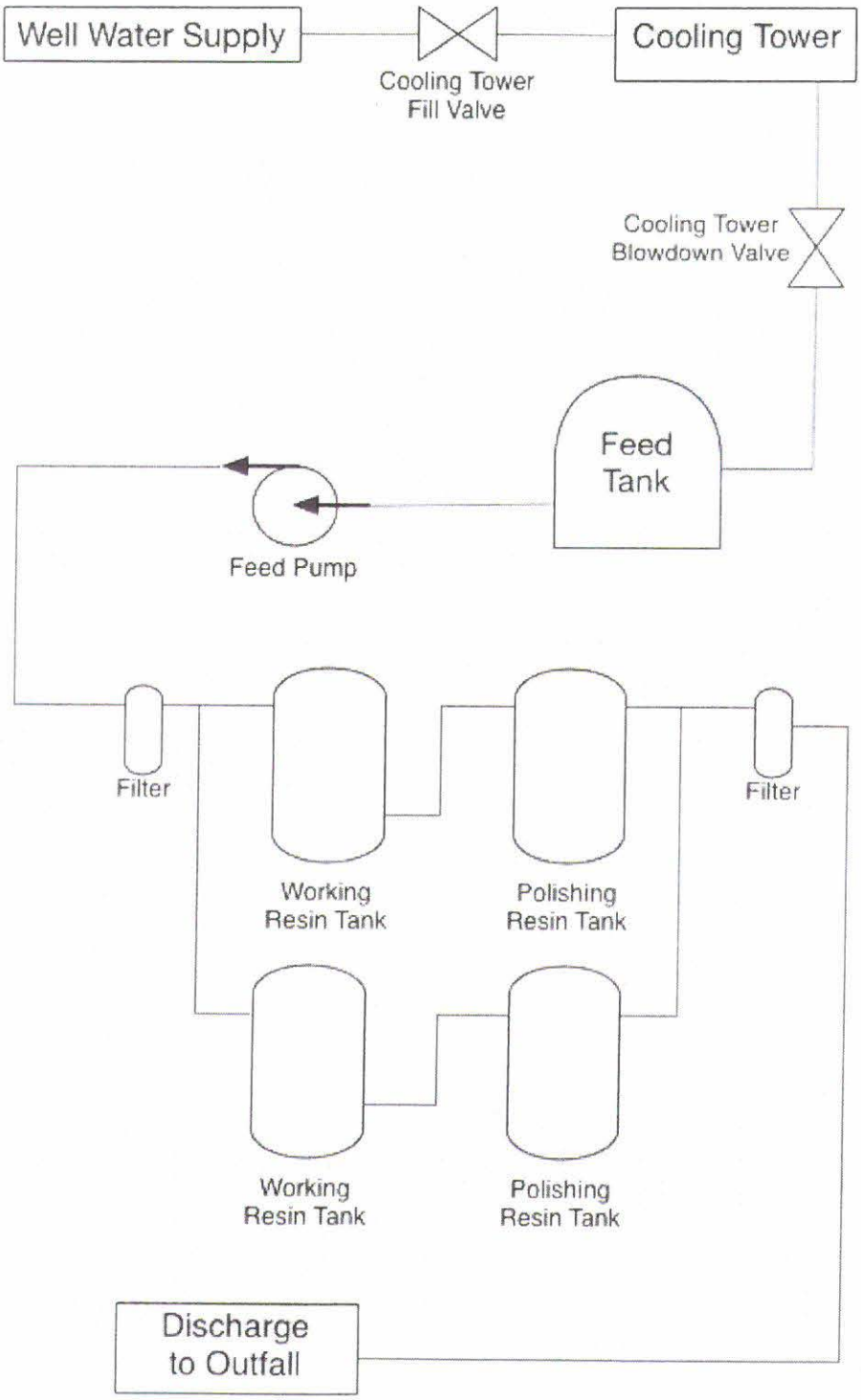


Figure 3. Evoqua System Modification – Two Train Configuration

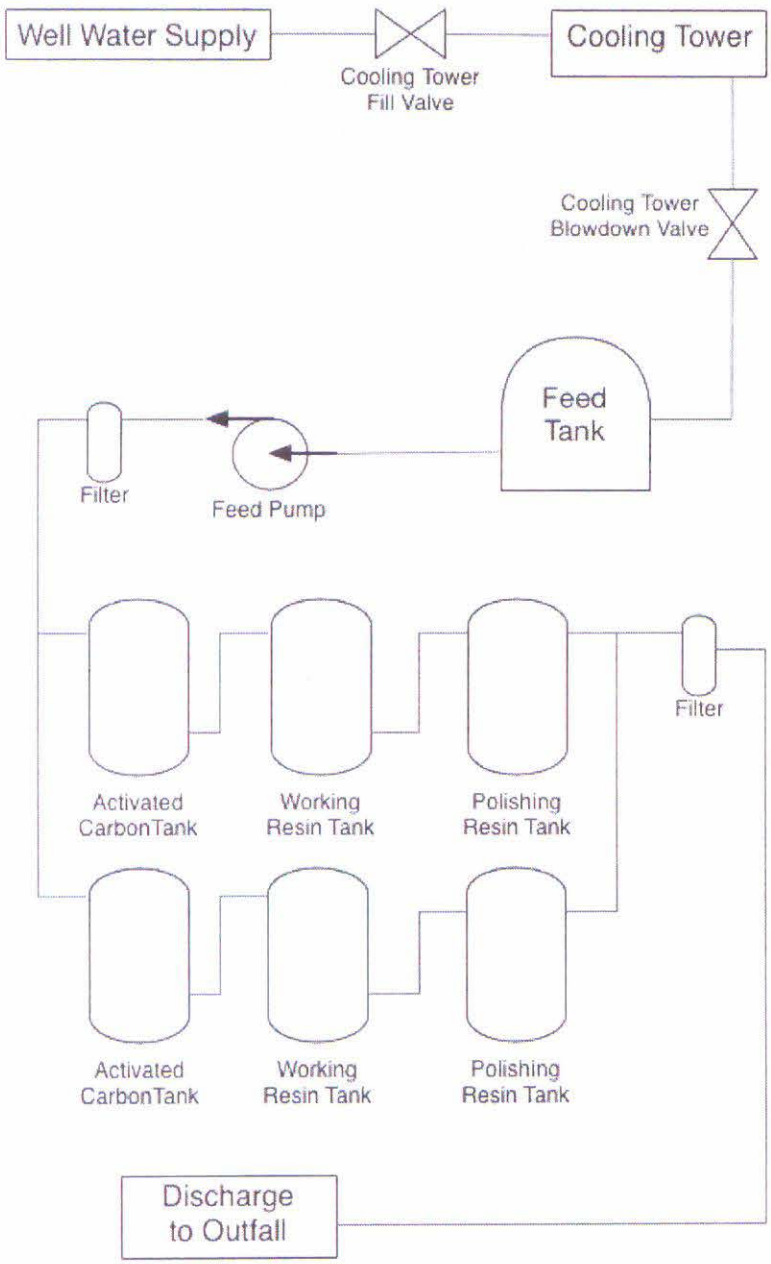


Figure 4. Evoqua Two-Train System with Activated Carbon Tanks

Summary of Evoqua System Performance

Over the past two years, the National Archives II facility has worked in concert with Evoqua Water Technologies to reduce zinc and copper concentrations in water discharged to the environment. The Evoqua system has consistently reduced zinc concentrations below the allowable limits. With respect to copper, the results have been mixed. As data has been collected and aggregated, it has become clear that the copper concentration in the cooling tower blowdown water varies. Initial analysis shows a correlation between the volume of water discharged and the copper concentration presented.

In addition, samples taken simultaneously and analyzed by different labs, using the same analysis procedure, have shown varying results. This is evident not only in the effluent copper concentration, but also the influent copper concentration. The continued variance associated with water analysis results must be rooted in the analytical instruments, the analytical procedure, or both. Refer to Appendix for water samples taken on the same day.

That being said, the Evoqua system has seen increased performance through each system modification. The National Archives II has plotted system performance over time as shown in Figure 5. Within this chart, the blue line represents the required system performance as a function of inlet copper concentration. The removal rate, shown as a percentage on the y-axis, is a simple ratio of the influent copper concentration to the effluent copper concentration. The continuous blue line was plotted by inputing an inlet copper concentration series (50, 100, 150, etc…), in parts per billion (ppb) and assuming a static effluent concentration of 9 ppb, which serves as the discharge limit established by the EPA and the Maryland Department of the Environment. Compliance with allowable discharge limits is demonstrated on this chart by plot points above the blue line.

As initially installed, the Evoqua system was comprised of a pre-filter, a working tank, a polishing tank, and post filter. Copper removal rates in this configuration are indicated in Figure 5 by red squares. Removal rates varied from 28% to 92%, and the average removal rate was 76%.

In April 2015, the Evoqua system was modified to include a second, parallel train of worker and polisher tanks. This parallel configuration was designed to slow the flow through the worker and polisher tanks. This increased the residence time of the discharge water within each tank, and therefore allowed greater interaction with the resin media within each tank. System performance increased dramatically and is indicated in Figure 5 by yellow triangles. Removal rates varied from 28% to 99%, and the average removal rate was 77%.

In August 2015, two activated carbon tanks were installed upstream of the resin media tanks. Although the sample size is smaller, system performance once again improved, and is indicated in Figure 5 by green diamonds. Removal rates varied from 92% to 97%, and the average removal rate was 95%.

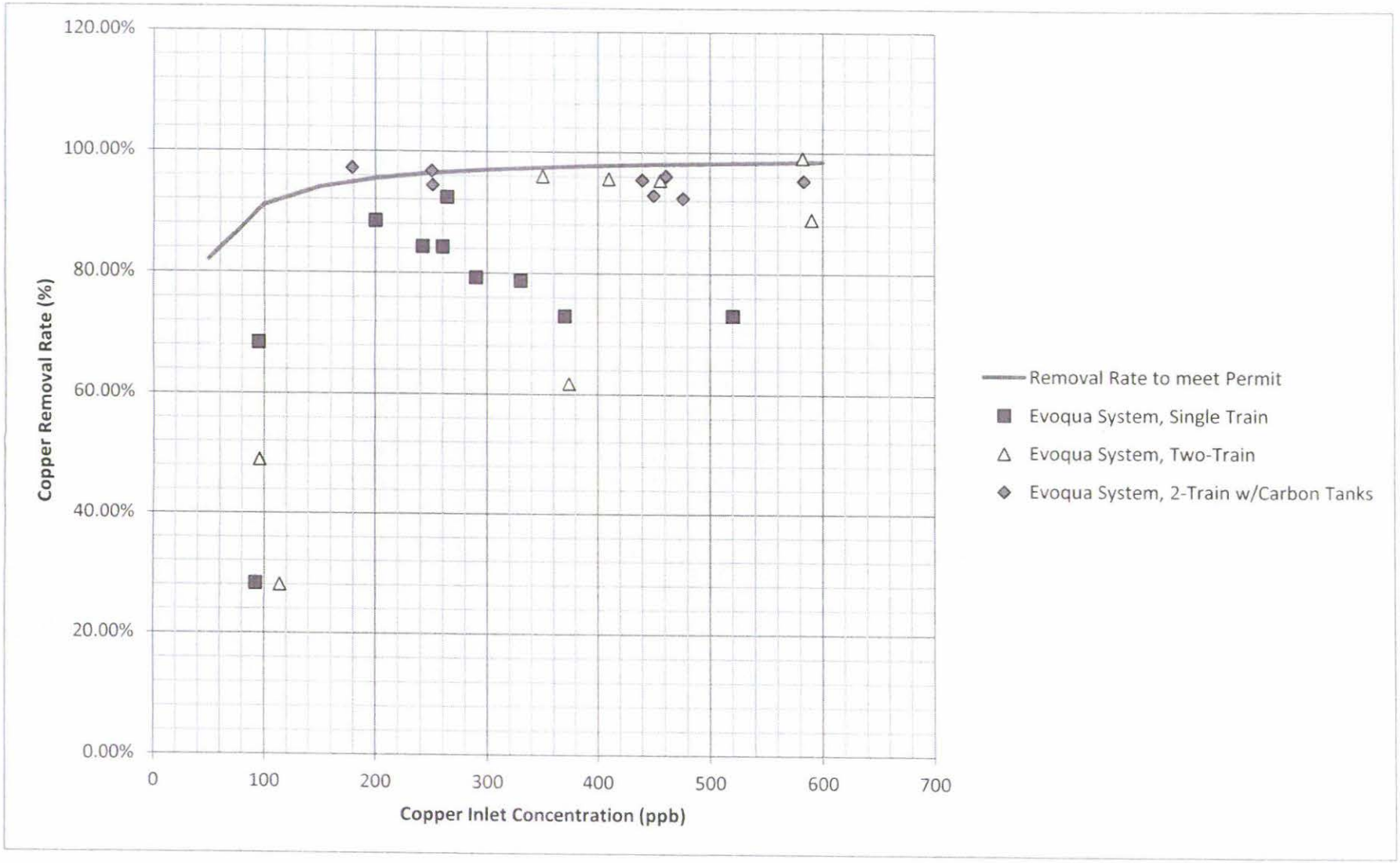


Figure 5. Evoqua System Copper Removal Rate

In summary, the Evoqua system has demonstrated its ability to remove significant amounts of copper from the discharge water, and with each physical improvement to the system configuration, performance has increased. However, a greater truth is evident and demonstrated by the blue permit line. As inlet copper concentration increases, an asymptotic relationship is revealed. For inlet copper concentrations above 400 ppb, the copper removal rate must be greater than 98% to remain within prescribed discharge limits.

Topographical Analysis of Water Discharged to the Environment

In addition to the extensive capital investment and water analysis over the past 24-months, the National Archives II facility also conducted a survey of the cooling tower discharge water flow path beyond the building outfall. The National Archives II facility is a Federal Government installation built upon land owned by the University of Maryland. It is bounded to the north by Metzerott Road, the west by local utility (PEPCO) transmission lines, to south by Adelphi Road, and to the east by the University of Maryland Golf Course.

The National Archives II building outfall discharge is on the north side of the building and into an intermittent stream that flows through a storm water retention pond, also north of the building. The storm water retention pond was constructed at the time of the National Archives II building construction and has been maintained, but not altered since building occupancy in 1994.

The storm water retention pond outfall forms the headwaters of what becomes the Paint Branch Creek. Water flows from the outfall, through two fairways on the University of Maryland Golf Course and settles into an approximately 5-acre marsh centrally located within the golf course boundaries. This reach, from outfall to marsh is approximately ½ miles in length and traverses a mostly wooded/forested downhill course with an approximate change in elevation of 500 feet (Figure 6).

During times of moderate (or greater) precipitation, the marsh fills and water exits the marsh through a creek on the east side of the marsh. The creek traverses a fairway and empties into a small pond on the golf course property. Water flows from the small pond into a creek that flows under Greenbelt Road (MD 193) located to the east. On the eastern side of MD 193, the creek carries the designation of Paint Branch Creek, and flows through the University of Maryland, College Park campus.

Figure 6. Flow from National Archives II Outfall to UMCP Golf Course

The National Archives II facility contractor engineering staff calculated the maximum rise in golf course marsh water level due to cooling tower blowdown operations. Careful review of cooling tower blowdown daily discharge logs indicate the maximum amount of water discharged in a 24-hour period was 60,000 gallons. Assuming no percolation of water as it traverses from the building outfall to the 5-acre marsh, the maximum marsh water level rise attributed to cooling tower blowdown would be 0.44 inches. This implies that water discharged from the National Archives II building outfall does not directly enter the greater environment. There exists a dwell time that water discharged resides in the marsh. Importantly, this dwell time allows for dilution of water discharged from the National Archives II building with golf course irrigation water and natural precipitation.

Although this in itself does not avail the National Archives II facility of meeting EPA and Maryland Department of the Environment discharge limits, the topography surrounding the National Archives II facility, and most importantly, common ownership of the land beneath the facility and the adjacent golf course, should serve as mitigating elements for regulating agencies to consider.

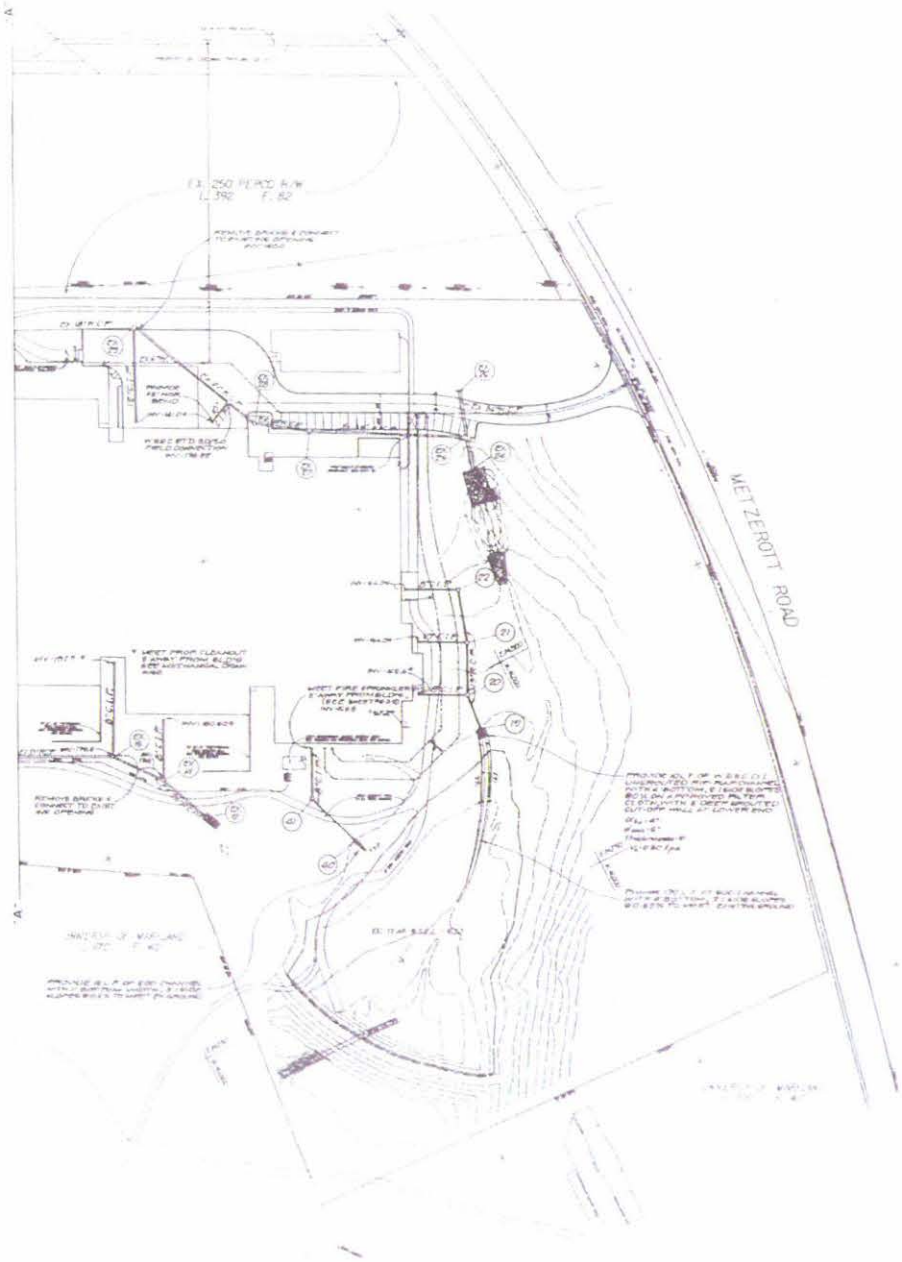
Adaptive Reuse of Water

Independent of the topographical analysis, the National Archives contacted the University of Maryland, College Park (UMDCP) Office of Sustainability in March 2015 to explore adaptive reuse of the National Archives II discharge water. Based on published data, if all of the water discharged from the National Archives II facility was reused as irrigation water on the golf course, the University of Maryland could reduce its reliance on utility (Washington Suburban Sanitary Commission) water by up to 20%. The UMDCP Office of Sustainability responded positively in September 2015 and an initial meeting was held. Two outcomes resulted from that meeting. The Office of Sustainability was provided with the water analysis of the National Archives II cooling tower discharge and is giving the proposal further review. Secondly, the long term plan for the University of Maryland Golf Course is to convert the 5-acre marsh into a lake. Talks are ongoing and the potential adaptive reuse remains a viable option going forward.

Conclusion

To ensure the National Archives II facility remains in compliance with established discharge limits for copper, zinc, and chlorine, substantial analysis, capital projects, topographical analysis and methods of adaptive reuse have been performed. Since 2012, the discharge limits for zinc have been achieved. With respect to copper, significant reductions have been realized, and limited success in achieving compliance has been accomplished. Further studies into the possibility that some of the copper is in the form of very fine (< 0.45 mg/L) colloidal suspension are underway. Potential adaptive reuse of the discharge water continues with the University of Maryland Golf Course and is considered a viable alternative. With respect to chlorine, additional research and investigation continues.

Response to Paragraph 18



ARCHIVES II

New National Archives Facility

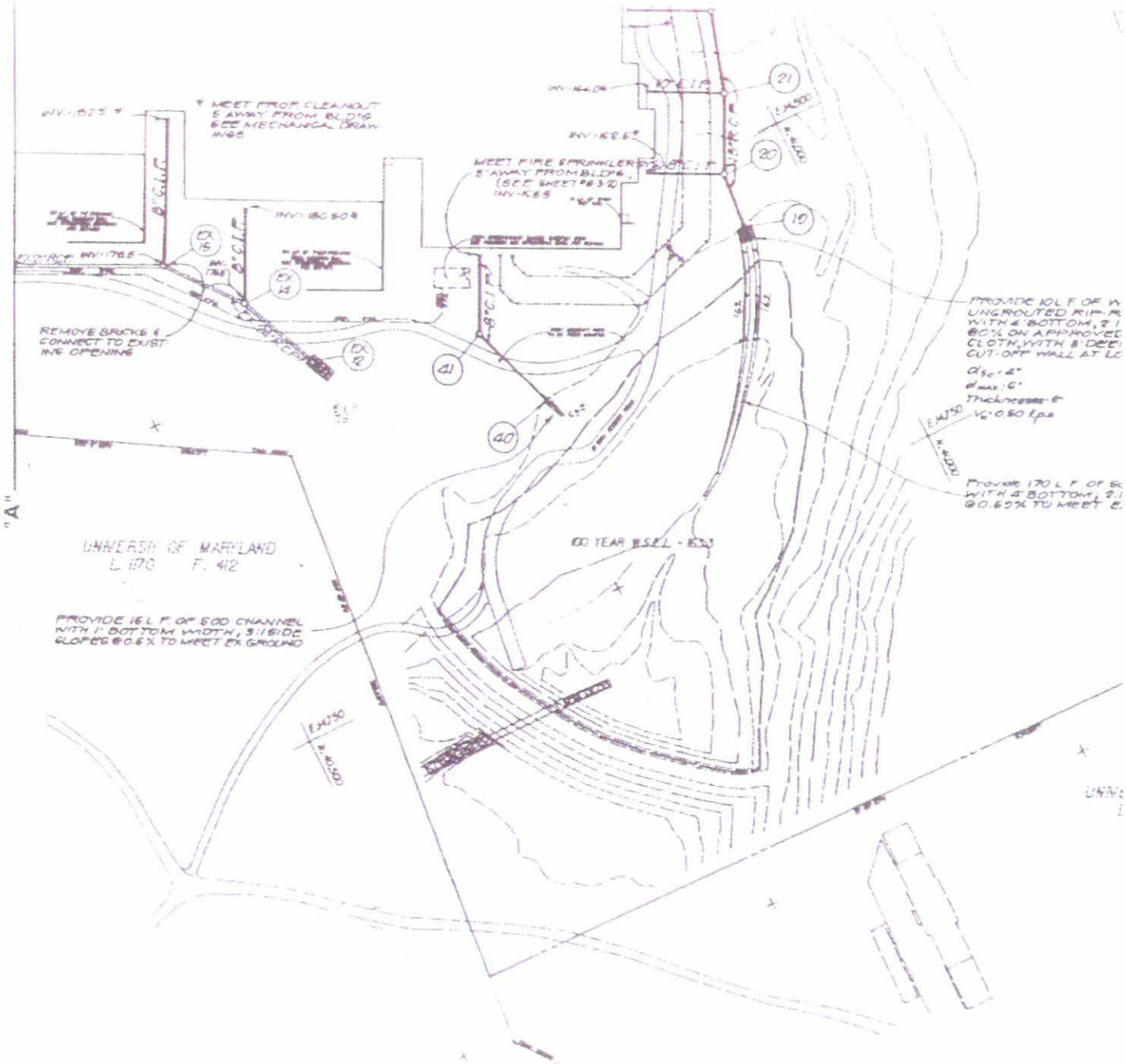
College Park, Maryland

Hellmuth, Obata & Kassabaum, P.C.

Greenhorne & O'Mara, Inc.

ON-SITE STORM DRAINAGE PLAN

2.2-7.2B



* MEET PROP. CLEANOUT 5' AWAY FROM BLDG. SEE MECHANICAL DRAWINGS
MEET FIRE SPRINKLERS 5' AWAY FROM BLDG. (SEE SHEET #6.3.2)
INV. 180.50
INV. 176.5
REMOVE BRICKS & CONNECT TO EXISTING OPENING
UNIVERSITY OF MARYLAND
L. 1170 F. 412
PROVIDE 16 L.F. OF SOD CHANNEL WITH 1' BOTTOM WIDTH, 3:1 SIDE SLOPES @ 0.6% TO MEET EX. GROUND
100 YEAR W.S.E.L. - 163.3
PROVIDE 10 L.F. OF W
UNGROUTED RIP-R
WITH 4' BOTTOM, 2:1
80% ON APPROVED
CLOTH, WITH 3' DEE
CUT-OFF WALL AT LO
Thickness = 6"
Provide 170 L.F. OF SO
WITH 4' BOTTOM, 2:1
@ 0.65% TO MEET E
"A"

Response to Paragraph 19

BIOMONITORING STUDY PLAN
NATIONAL ARCHIVES AND RECORDS ADMINISTRATION
PERMIT 09-DP-2904/MD0065871

Study Plan Reference: MICR-NARA-031813-SP
March 18, 2013

Prepared by

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cbi@coastalbio.com

Prepared for

Microbac Laboratories Inc.
Baltimore Division
2101 Van Deman St,
Baltimore, MD 21224
410-633-1800

BIOMONITORING PLAN

I. INTRODUCTION

The referenced permit requires the National Archives and Records Administration (NARA) to conduct definitive quarterly whole effluent toxicity (WET) tests for a period of one year after approval of the study plan. If two consecutive tests fail the criteria of LC50>100% or IC25>IWC, then the tests shall be repeated within 30 days to confirm toxicity. Referenced tests are the 7-day larval survival and growth test with *Pimephales promelas* (EPA method 1000.0) and the 3-brood survival and reproduction test with *Ceriodaphnia dubia* (EPA method 1002.0). Tests conducted for this study will comply with those methods described in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, 4th ed., EPA-821-R-02-013, October 2002 and results will be reported in accordance with MDE/WMA "Reporting Requirements for Effluent Biomonitoring Data".

II. WASTEWATER AND PRODUCTION VARIABILITY

Plant flow and water quality data for the period from April 2012 through February 2013 are provided in attachment A.

III. SAMPLING METHODS

Samples will be collected at the same time and location as samples analyzed for effluent limitation and monitoring requirements. Identity of individuals responsible for sample will be included on the sample chain-of-custody form. Samples will be chilled (1-6 °C) during sample collection and shipped with ice in insulated shippers via overnight carrier to the laboratory. Sample holding time (i.e. time from collection to first use) shall not exceed 36 h; samples shall be used for subsequent test renewals within 72 h after first use. Three sets of samples will be collected for use in chronic tests. The typical sampling schedule is described in the table below. Refer to the attached sampling instructions (Attachment B) provided to the permittee for additional information on sampling methods.

Sample Number	Begin Composite	End Composite	Use in WET Test	Total Volume (L)
1	Sun.	Mon.	Tues.	4
2	Mon.	Tues.	Wed., Thurs.	8
3	Wed.	Thurs.	Fri., Sat., Sun., Mon.	16

IV. TOXICITY TEST PROCEDURES, DATA ANALYSIS & QUALITY CONTROL

See attached test-specific protocols (Attachment C) describing toxicity testing methods, source of dilution water and test animals, data analysis methods, quality control/assurance procedures and report format. These protocols have been previously approved by MDE for compliance WET testing. Protocols and supporting laboratory SOPs, which provide detailed step-by-step procedures for all laboratory activities, adhere strictly to methods described in in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, 4th ed., EPA-821-R-02-013, October 2002. Results will be reported in accordance with MDE/WMA "Reporting Requirements for Effluent Biomonitoring Data".

V. TESTING SCHEDULE

The schedule described in the table below will be followed.

Period	Time Frame	Tests
1st Qtr	0-90 days after plan approval by MDE	Chronic Toxicity
2nd Qtr	91-180 days after plan approval by MDE	Chronic Toxicity
3rd Qtr	181-270 days after plan approval by MDE	Chronic Toxicity
4th Qtr	271-360 days after plan approval by MDE	Chronic Toxicity

VI. ATTACHMENTS

- Attachment A Flow and Water Quality Data 4/12 to 2/13 (Provided by Nalco)
- Attachment B Coastal Bioanalysts' Sample Collection Instructions and Chain of Custody Form
- Attachment C Coastal Bioanalysts' Standard Protocols for Estimating the Chronic Toxicity of Effluents to *Ceriodaphnia* and Fathead Minnows

ATTACHMENT A

Date	Current Reading	Previous Day Reading	Delta
4/1/2012	26,055,700	26,055,700	-
4/2/2012	26,055,700	26,055,700	-
4/3/2012	26,055,700	26,055,700	-
4/4/2012	26,055,700	26,055,700	-
4/5/2012	26,055,700	26,055,700	-
4/6/2012	26,055,700	26,055,700	-
4/7/2012	26,055,700	26,055,700	-
4/8/2012	26,055,700	26,055,700	-
4/9/2012	26,055,700	26,055,700	-
4/10/2012	26,055,700	26,055,700	-
4/11/2012	26,055,700	26,055,700	-
4/12/2012	26,055,700	26,055,700	-
4/13/2012	26,055,700	26,055,700	-
4/14/2012	26,055,700	26,055,700	-
4/15/2012	26,055,700	26,055,700	-
4/16/2012	26,055,700	26,055,700	-
4/17/2012	26,055,700	26,055,700	-
4/18/2012	26,055,700	26,055,700	-
4/19/2012	26,055,700	26,055,700	-
4/20/2012	26,055,700	26,055,700	-
4/21/2012	26,055,700	26,055,700	-
4/22/2012	26,055,700	26,055,700	-
4/23/2012	26,055,700	26,055,700	-
4/24/2012	26,055,700	26,055,700	-
4/25/2012	26,055,700	26,055,700	-
4/26/2012	26,055,700	26,055,700	-
4/27/2012	26,055,700	26,055,700	-
4/28/2012	26,055,700	26,055,700	-
4/29/2012	26,055,700	26,055,700	-
4/30/2012	26,055,700	26,055,700	-
		781,671,000	(781,671,000)
			-

Date	Current Reading	Previous Day Reading	Delta
5/1/2012	26,055,700	26,055,700	-
5/2/2012	26,055,700	26,055,700	-
5/3/2012	26,055,700	26,055,700	-
5/4/2012	26,055,700	26,055,700	-
5/5/2012	26,055,700	26,055,700	-
5/6/2012	26,055,700	26,055,700	-
5/7/2012	26,055,700	26,055,700	-
5/8/2012	26,055,700	26,055,700	-
5/9/2012	26,056,000	26,055,700	300
5/10/2012	26,056,000	26,056,000	-
5/11/2012	26,056,000	26,056,000	-
5/12/2012	26,056,000	26,056,000	-
5/13/2012	26,056,000	26,056,000	-
5/14/2012	26,056,000	26,056,000	-
5/15/2012	26,056,000	26,056,000	-
5/16/2012	26,056,000	26,056,000	-
5/17/2012	26,056,000	26,056,000	-
5/18/2012	26,056,000	26,056,000	-
5/19/2012	26,056,000	26,056,000	-
5/20/2012	26,056,000	26,056,000	-
5/21/2012	26,056,000	26,056,000	-
5/22/2012	26,056,200	26,056,000	200
5/23/2012	26,069,400	26,056,000	13,400
5/24/2012	26,069,400	26,069,400	-
5/25/2012	26,072,900	26,069,400	3,500
5/26/2012	26,086,400	26,072,900	13,500
5/27/2012	26,102,200	26,086,400	15,800
5/28/2012	26,102,300	26,102,200	100
5/29/2012	26,115,600	26,102,300	13,300
5/30/2012	26,145,800	26,115,600	30,200
5/31/2012	26,146,300	26,145,800	500
			90,800

Date	Current Reading	Previous Day Reading	Delta
6/1/2012	26,146,300	26,146,300	-
6/2/2012	26,146,300	26,146,300	-
6/3/2012	26,146,300	26,146,300	-
6/4/2012	26,150,800	26,146,300	4,500
6/5/2012	26,157,500	26,150,800	6,700
6/6/2012	26,160,700	26,157,500	3,200
6/7/2012	26,168,600	26,160,700	7,900
6/8/2012	26,174,200	26,168,600	5,600
6/9/2012	26,175,800	26,174,200	1,600
6/10/2012	26,190,500	26,175,800	14,700
6/11/2012	26,191,100	26,190,500	600
6/13/2012	26,212,600	26,191,100	21,500
6/14/2012	26,219,300	26,212,600	6,700
6/15/2012	26,227,900	26,219,300	8,600
6/16/2012	26,238,400	26,227,900	10,500
6/17/2012	26,238,900	26,238,400	500
6/18/2012	26,239,200	26,238,900	300
6/19/2012	26,246,900	26,239,200	7,700
6/20/2012	26,282,600	26,246,900	35,700
6/21/2012	26,302,000	26,282,600	19,400
6/22/2012	26,314,900	26,302,000	12,900
6/23/2012	26,314,900	26,314,900	-
6/24/2012	26,314,900	26,314,900	-
6/25/2012	26,329,400	26,314,900	14,500
6/26/2012	26,337,400	26,329,400	8,000
6/27/2012	26,341,500	26,337,400	4,100
6/28/2012	26,342,100	26,341,500	600
6/29/2012	26,371,600	26,342,100	29,500
6/30/2012	26,371,600	26,371,600	-
			225,300
			-
			-

Date	Current Reading	Previous Day Reading	Delta
7/1/2012	26,408,300	26,371,600	36,700
7/2/2012	-	0	-
7/3/2012	26,422,500	26,408,300	14,200
7/4/2012	26,435,400	26,422,500	12,900
7/5/2012	26,435,400	26,435,400	-
7/6/2012	26,464,000	26,435,400	28,600
7/7/2012	26,482,100	26,464,000	18,100
7/8/2012	26,501,200	26,482,100	19,100
7/9/2012	26,538,500	26,501,200	37,300
7/10/2012	26,538,500	26,538,500	-
7/11/2012	26,538,500	26,538,500	-
7/12/2012	26,576,100	26,538,500	37,600
7/13/2012	26,598,000	26,576,100	21,900
7/14/2012	26,610,800	26,598,000	12,800
7/15/2012	26,611,700	26,610,800	900
7/16/2012	26,611,700	26,611,700	-
7/17/2012	26,632,100	26,611,700	20,400
7/18/2012	26,659,400	26,632,100	27,300
7/19/2012	26,681,800	26,659,400	22,400
7/20/2012	26,700,100	26,681,800	18,300
7/21/2012	26,705,900	26,700,100	5,800
7/22/2012	26,705,900	26,705,900	-
7/23/2012	26,712,400	26,705,900	6,500
7/24/2012	26,733,000	26,712,400	20,600
7/25/2012	26,751,100	26,733,000	18,100
7/26/2012	26,751,500	26,751,100	400
7/27/2012	26,775,000	26,751,500	23,500
7/28/2012	26,788,700	26,775,000	13,700
7/29/2012	26,789,300	26,788,700	600
7/30/2012	26,807,500	26,789,300	18,200
7/31/2012	26,823,400	26,807,500	15,900
			451,800

Date	Current Reading	Previous Day Reading	Delta
8/1/2012	26,824,000	26,823,400	600
8/2/2012	26,846,700	26,824,000	22,700
8/3/2012	26,860,500	26,846,700	13,800
8/4/2012	26,871,800	26,860,500	11,300
8/5/2012	26,886,500	26,871,800	14,700
8/6/2012	26,887,300	26,886,500	800
8/7/2012	26,909,800	26,887,300	22,500
8/8/2012	26,928,400	26,909,800	18,600
8/9/2012	26,929,500	26,928,400	1,100
8/10/2012	26,950,100	26,929,500	20,600
8/11/2012	26,951,200	26,950,100	1,100
8/12/2012	26,969,600	26,951,200	18,400
8/13/2012	26,970,300	26,969,600	700
8/14/2012	26,994,800	26,970,300	24,500
8/15/2012	26,995,100	26,994,800	300
8/16/2012	27,015,800	26,995,100	20,700
8/17/2012	27,016,300	27,015,800	500
8/18/2012	27,037,900	27,016,300	21,600
8/19/2012	27,038,100	27,037,900	200
8/20/2012	27,048,300	27,038,100	10,200
8/21/2012	27,056,400	27,048,300	8,100
8/22/2012	27,063,000	27,056,400	6,600
8/23/2012	27,078,900	27,063,000	15,900
8/24/2012	27,090,000	27,078,900	11,100
8/25/2012	27,090,000	27,090,000	-
8/26/2012	27,090,000	27,090,000	-
8/27/2012	27,090,000	27,090,000	-
8/28/2012	27,127,500	27,090,000	37,500
8/29/2012	27,129,500	27,127,500	2,000
8/30/2012	27,129,500	27,129,500	-
8/31/2012	27,150,800	27,129,500	21,300
			-
			327,400

Date	Current Reading	Previous Day Reading	Delta
9/1/2012	27,172,400	27,150,800	21,600
9/2/2012	27,172,500	27,172,400	100
9/3/2012	27,180,700	27,172,500	8,200
9/4/2012	27,191,600	27,180,700	10,900
9/5/2012	27,211,900	27,191,600	20,300
9/6/2012	27,226,700	27,211,900	14,800
9/7/2012	27,228,400	27,226,700	1,700
9/8/2012	27,251,300	27,228,400	22,900
9/9/2012	27,251,300	27,251,300	-
9/10/2012	27,263,600	27,251,300	12,300
9/11/2012	27,264,400	27,263,600	800
9/12/2012	27,281,400	27,264,400	17,000
9/13/2012	27,281,400	27,281,400	0
9/14/2012	27,294,700	27,281,400	13,300
9/15/2012	27,296,400	27,294,700	1,700
9/16/2012	27,303,600	27,296,400	7,200
9/17/2012	27,305,700	27,303,600	2,100
9/18/2012	27,308,900	27,305,700	3,200
9/19/2012	27,321,700	27,308,900	12,800
9/20/2012	27,321,700	27,321,700	-
9/21/2012	27,327,000	27,321,700	5,300
9/22/2012	27,338,900	27,327,000	11,900
9/23/2012	27,344,000	27,338,900	5,100
9/24/2012	27,352,200	27,344,000	8,200
9/25/2012	27,356,700	27,352,200	4,500
9/26/2012	27,366,700	27,356,700	10,000
9/27/2012	27,366,700	27,366,700	-
9/28/2012	27,385,700	27,366,700	19,000
9/29/2012	27,388,000	27,385,700	2,300
9/30/2012	27,394,000	27,388,000	6,000
			243,200
			-
			-

Date	Current Reading	Previous Day Reading	Delta
10/1/2012	27,400,700	27,394,000	6,700
10/2/2012	27,406,000	27,400,700	5,300
10/3/2012	27,409,900	27,406,000	3,900
10/4/2012	27,414,200	27,409,900	4,300
10/5/2012	27,433,000	27,414,200	18,800
10/6/2012	27,433,800	27,433,000	800
10/7/2012	27,454,200	27,433,800	20,400
10/8/2012	27,454,200	27,454,200	-
10/9/2012	27,454,200	27,454,200	-
10/10/2012	27,459,000	27,454,200	4,800
10/11/2012	27,459,300	27,459,000	300
10/12/2012	27,467,000	27,459,300	7,700
10/13/2012	27,467,000	27,467,000	-
10/14/2012	27,467,000	27,467,000	-
10/15/2012	27,472,100	27,467,000	5,100
10/16/2012	27,478,300	27,472,100	6,200
10/17/2012	27,486,300	27,478,300	8,000
10/18/2012	27,486,300	27,486,300	-
10/19/2012	27,486,300	27,486,300	-
10/20/2012	27,487,100	27,486,300	800
10/21/2012	27,502,700	27,487,100	15,600
10/22/2012	27,507,700	27,502,700	5,000
10/23/2012	27,508,600	27,507,700	900
10/24/2012	27,508,900	27,508,600	300
10/25/2012	27,510,600	27,508,900	1,700
10/26/2012	27,517,200	27,510,600	6,600
10/27/2012	27,524,600	27,517,200	7,400
10/28/2012	27,533,600	27,524,600	9,000
10/29/2012	27,543,000	27,533,600	9,400
10/30/2012	27,543,000	27,543,000	-
10/31/2012	27,543,000	27,543,000	-
			149,000

Date	Current Reading	Previous Day Reading	Delta
11/1/2012	27,543,100	27,543,000	100
11/2/2012	27,547,100	27,543,100	4,000
11/3/2012	27,547,400	27,547,100	300
11/4/2012	27,553,800	27,547,400	6,400
11/5/2012	27,560,300	27,553,800	6,500
11/6/2012	27,560,300	27,560,300	-
11/7/2012	27,560,900	27,560,300	600
11/8/2012	27,562,100	27,560,900	1,200
11/9/2012	27,562,300	27,562,100	200
11/10/2012	27,564,800	27,562,300	2,500
11/11/2012	27,565,100	27,564,800	300
11/12/2012	27,565,400	27,565,100	300
11/13/2012	27,565,400	27,565,400	-
11/14/2012	27,575,600	27,565,400	10,200
11/15/2012	27,576,200	27,575,600	600
11/16/2012	27,578,300	27,576,200	2,100
11/17/2012	27,585,600	27,578,300	7,300
11/18/2012	27,589,300	27,585,600	3,700
11/19/2012	27,592,200	27,589,300	2,900
11/20/2012	27,592,500	27,592,200	300
11/21/2012	27,592,600	27,592,500	100
11/22/2012	27,593,900	27,592,600	1,300
11/23/2012	27,602,900	27,593,900	9,000
11/24/2012	27,603,200	27,602,900	300
11/25/2012	27,603,300	27,603,200	100
11/26/2012	27,610,000	27,603,300	6,700
11/27/2012	27,610,200	27,610,000	200
11/28/2012	27,659,300	27,610,200	49,100
11/29/2012	27,659,600	27,659,300	300
11/30/2012	27,696,700	27,659,600	37,100
			153,700

Date	Current Reading	Previous Day Reading	Delta
12/1/2012	27,697,100	27,696,700	400
12/2/2012	27,697,100	27,697,100	0
12/3/2012	27,697,100	27,697,100	0
12/4/2012	27,697,100	27,697,100	0
12/5/2012	27,697,100	27,697,100	0
12/6/2012	27,697,100	27,697,100	0
12/7/2012	27,697,100	27,697,100	0
12/8/2012	27,697,100	27,697,100	0
12/9/2012	27,697,600	27,697,100	500
12/10/2012	27,714,500	27,697,600	16,900
12/11/2012	27,735,000	27,714,500	20,500
12/12/2012	27,741,800	27,735,000	6,800
12/13/2012	27,757,800	27,741,800	16,000
12/14/2012	27,757,800	27,757,800	0
12/15/2012	27,757,800	27,757,800	0
12/16/2012	27,757,800	27,757,800	0
12/17/2012	27,757,800	27,757,800	0
12/18/2012	27,757,800	27,757,800	0
12/19/2012	27,766,600	27,757,800	8,800
12/20/2012	27,776,200	27,766,600	9,600
12/21/2012	27,776,200	27,776,200	0
12/22/2012	27,776,200	27,776,200	0
12/23/2012	27,776,200	27,776,200	0
12/24/2012	27,776,200	27,776,200	0
12/25/2012	27,776,200	27,776,200	0
12/26/2012	27,776,200	27,776,200	0
12/27/2012	27,776,600	27,776,200	400
12/28/2012	27,794,000	27,776,600	17,400
12/29/2012	27,794,200	27,794,000	200
12/30/2012	27,813,400	27,794,200	19,200
12/31/2012	27,813,400	27,813,400	0
			98,900

Date	Current Reading	Previous Day Reading	Delta
1/1/2013	27,813,400	27,813,400	0
1/2/2013	27,813,400	27,813,400	0
1/3/2013	27,813,400	27,813,400	0
1/4/2013	27,813,400	27,813,400	0
1/5/2013	27,813,400	27,813,400	0
1/6/2013	27,827,000	27,813,400	13,600
1/7/2013	27,827,000	27,827,000	0
1/8/2013	27,827,000	27,827,000	0
1/9/2013	27,827,500	27,827,000	500
1/10/2013	27,830,000	27,827,500	2,500
1/11/2013	27,833,900	27,830,000	3,900
1/12/2013	27,833,900	27,833,900	0
1/13/2013	27,833,900	27,833,900	0
1/14/2013	27,834,000	27,833,900	100
1/15/2013	27,837,000	27,834,000	3,000
1/16/2013	27,848,600	27,837,000	11,600
1/17/2013	27,848,600	27,848,600	0
1/18/2013	27,848,600	27,848,600	0
1/19/2013	27,848,600	27,848,600	0
1/20/2013	27,848,600	27,848,600	0
1/21/2013	27,848,600	27,848,600	0
1/22/2013	27,848,700	27,848,600	100
1/23/2013	27,851,300	27,848,700	2,600
1/24/2013	27,853,200	27,851,300	1,900
1/25/2013	27,854,500	27,853,200	1,300
1/26/2013	27,856,300	27,854,500	1,800
1/27/2013	27,857,800	27,856,300	1,500
1/28/2013	27,859,200	27,857,800	1,400
1/29/2013	27,861,300	27,859,200	2,100
1/30/2013	27,863,600	27,861,300	2,300
1/31/2013	27,866,500	27,863,600	2,900
			53,100

Date	Current Reading	Previous Day Reading	Delta
2/1/2013	27,867,300	27,866,500	800
2/2/2013	27,868,900	27,867,300	1,600
2/3/2013	27,870,700	27,868,900	1,800
2/4/2013	27,873,100	27,870,700	2,400
2/5/2013	27,874,600	27,873,100	1,500
2/6/2013	27,875,200	27,874,600	600
2/7/2013	27,877,200	27,875,200	2,000
2/8/2013	27,879,500	27,877,200	2,300
2/9/2013	27,881,000	27,879,500	1,500
2/10/2013	27,882,300	27,881,000	1,300
2/11/2013	27,885,400	27,882,300	3,100
2/12/2013	27,885,400	27,885,400	0
2/13/2013	27,887,900	27,885,400	2,500
2/14/2013	27,890,500	27,887,900	2,600
2/15/2013	27,890,800	27,890,500	300
2/16/2013	27,893,300	27,890,800	2,500
2/17/2013	27,895,000	27,893,300	1,700
2/18/2013	27,899,800	27,895,000	4,800
2/19/2013	27,899,900	27,899,800	100
2/20/2013	27,904,400	27,899,900	4,500
2/21/2013	27,904,800	27,904,400	400
2/22/2013	27,909,300	27,904,800	4,500
2/23/2013	27,911,500	27,909,300	2,200
2/24/2013	27,916,200	27,911,500	4,700
2/25/2013	27,924,300	27,916,200	8,100
2/26/2013	27,924,700	27,924,300	400
2/27/2013	27,928,400	27,924,700	3,700
2/28/2013	27,935,600	27,928,400	7,200
			69,100

Analytical Resources

1601 West Diehl Road Naperville IL 60563-1198

Phone: 630-305-1000 Fax: 630-305-2921 Email: globallimssupport@nalco.com

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Final - Report Number: 609445

L B & B ASSOC INC - NATIONAL ARCHIVES II
8601 ADELPHI RD
COLLEGE PARK MD 20740 USA
Sold To: 0001020557 **Ship To:** 0001020557
Representative: Lester W Simeon

Sample Number	NW055678
Date Sampled	9-Apr-2012 14:00
Date Received	11-Apr-2012
Date Completed	11-May-2012
Date Authorized	11-May-2012

Water

This sample was analyzed as received, the results being as follows:

Sampling point: MDE Discharge

Water

Cations - Metals **Test Method: CW14024**	**Filtered**	**Total**
Aluminum (Al)	0.63 mg/L	3.8 mg/L
Barium (Ba)	0.05 mg/L	0.4 mg/L
Boron (B)	0.03 mg/L	<0.6 mg/L
Cadmium (Cd)	<0.01 mg/L	<0.2 mg/L
Calcium (Ca)	25 mg/L	31 mg/L
Calcium (CaCO3)	63 mg/L	76 mg/L
Chromium (Cr)	<0.02 mg/L	<0.5 mg/L
Copper (Cu)	0.66 mg/L	2.5 mg/L
Iron (Fe)	0.24 mg/L	4.5 mg/L
Lead (Pb)	<0.11 mg/L	<3.0 mg/L
Lithium (Li)	0.01 mg/L	<0.2 mg/L
Magnesium (Mg)	7.4 mg/L	7.4 mg/L
Magnesium (CaCO3)	31 mg/L	31 mg/L
Manganese (Mn)	0.07 mg/L	1.6 mg/L
Molybdenum (Mo)	<0.04 mg/L	<1.2 mg/L
Nickel (Ni)	0.09 mg/L	<0.3 mg/L
Phosphorus (P)	9.0 mg/L	13 mg/L
Potassium (K)	5.6 mg/L	<6.0 mg/L
Silicon (Si)	19 mg/L	23 mg/L
Silica (SiO2)	41 mg/L	50 mg/L
Sodium (Na)	46 mg/L	46 mg/L
Sodium (CaCO3)	100 mg/L	100 mg/L
Strontium (Sr)	0.11 mg/L	0.2 mg/L
Vanadium (V)	<0.01 mg/L	<0.3 mg/L
Zinc (Zn)	0.58 mg/L	1.8 mg/L
Total Hardness (CaCO3)	95 mg/L	110 mg/L

	Total
Conductivity at 25°C	460 µS/cm
Nitrogen (N) - Kjeldahl	<10 mg/L

An ISO 9001:2008 Certified Laboratory
Certificate No. 88758-2010-AQ-USA-ANAB Rev. 1

Authorized by Rebecca G. Abdelnour
Senior Chemist

Analytical Resources
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8601 ADELPHI RD
COLLEGE PARK MD 20740 USA
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Representative: Lester W Simeon

Sample Number	NW055678
Date Sampled	9-Apr-2012 14:00
Date Received	11-Apr-2012
Date Completed	11-May-2012
Date Authorized	11-May-2012

Water

This sample was analyzed as received, the results being as follows:

Sampling point: MDE Discharge

Analytical Resources

1601 West Diehl Road Naperville IL 60563-1198

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Final - Report Number: 627727

L B & B ASSOC INC - NATIONAL ARCHIVES II
8601 ADELPHI RD
COLLEGE PARK MD 20740 USA
Sold To: 0001020557 **Ship To:**
Representative: Jeffrey M Quinton

Sample Number	NW059131
Date Sampled	8-May-2012 11:00
Date Received	21-May-2012
Date Completed	6-Jun-2012
Date Authorized	6-Jun-2012

Water

This sample was analyzed as received, the results being as follows:

Sampling point: MDE Discharge

Water

Cations - Metals **Test Method: CW14024**	**Filtered**	**Total**
Aluminum (Al)	0.42 mg/L	0.44 mg/L
Barium (Ba)	0.06 mg/L	0.07 mg/L
Boron (B)	0.04 mg/L	0.04 mg/L
Cadmium (Cd)	<0.01 mg/L	<0.01 mg/L
Calcium (Ca)	32 mg/L	32 mg/L
Calcium (CaCO3)	79 mg/L	79 mg/L
Chromium (Cr)	<0.02 mg/L	<0.02 mg/L
Copper (Cu)	0.45 mg/L	0.46 mg/L
Iron (Fe)	0.32 mg/L	0.52 mg/L
Lead (Pb)	<0.10 mg/L	<0.10 mg/L
Lithium (Li)	0.01 mg/L	0.01 mg/L
Magnesium (Mg)	11 mg/L	11 mg/L
Magnesium (CaCO3)	45 mg/L	45 mg/L
Manganese (Mn)	0.05 mg/L	0.06 mg/L
Molybdenum (Mo)	<0.04 mg/L	<0.04 mg/L
Nickel (Ni)	0.11 mg/L	0.11 mg/L
Phosphorus (P)	7.9 mg/L	7.9 mg/L
Potassium (K)	8.2 mg/L	8.2 mg/L
Silicon (Si)	17 mg/L	17 mg/L
Silica (SiO2)	36 mg/L	36 mg/L
Sodium (Na)	71 mg/L	71 mg/L
Sodium (CaCO3)	160 mg/L	160 mg/L
Strontium (Sr)	0.16 mg/L	0.16 mg/L
Vanadium (V)	<0.01 mg/L	<0.01 mg/L
Zinc (Zn)	0.39 mg/L	0.40 mg/L x 1000 = ug/L
Total Hardness (CaCO3)	120 mg/L	120 mg/L

	Total
Conductivity at 25°C	710 µS/cm
Nitrogen (N) - Kjeldahl	2.1 mg/L

Analytical Resources
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Final - Report Number: 627727
L B & B ASSOC INC - NATIONAL ARCHIVES II
8601 ADELPHI RD
COLLEGE PARK MD 20740 USA
Sold To: 0001020557 **Ship To:**
Representative: Jeffrey M Quinton

Sample Number	NW059131
Date Sampled	8-May-2012 11:00
Date Received	21-May-2012
Date Completed	6-Jun-2012
Date Authorized	6-Jun-2012

Water

This sample was analyzed as received, the results being as follows:

Sampling point: MDE Discharge

Analytical Resources

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Final - Report Number: 639444

L B & B ASSOC INC - NATIONAL ARCHIVES II
8601 ADELPHI RD
COLLEGE PARK MD 20740 USA
Sold To: 0001020557 **Ship To:** 0001020557
Representative: Jeffrey M Quinton

Sample Number	NW060797
Date Sampled	7-Jun-2012 11:00
Date Received	8-Jun-2012
Date Completed	21-Jun-2012
Date Authorized	21-Jun-2012

Water

This sample was analyzed as received, the results being as follows:

Sampling point: MDE Discharge

Water

Cations - Metals **Test Method: CW14024**	**Filtered**	**Total**
Aluminum (Al)	0.73 mg/L	0.9 mg/L
Barium (Ba)	0.10 mg/L	0.1 mg/L
Boron (B)	0.06 mg/L	<0.2 mg/L
Cadmium (Cd)	<0.01 mg/L	<0.1 mg/L
Calcium (Ca)	43 mg/L	43 mg/L
Calcium (CaCO3)	110 mg/L	110 mg/L
Chromium (Cr)	<0.02 mg/L	<0.2 mg/L
Copper (Cu)	0.77 mg/L	0.9 mg/L
Iron (Fe)	0.34 mg/L	0.7 mg/L
Lead (Pb)	<0.11 mg/L	<1.0 mg/L
Lithium (Li)	0.02 mg/L	<0.1 mg/L
Magnesium (Mg)	16 mg/L	16 mg/L
Magnesium (CaCO3)	68 mg/L	68 mg/L
Manganese (Mn)	0.33 mg/L	0.4 mg/L
Molybdenum (Mo)	<0.04 mg/L	<0.4 mg/L
Nickel (Ni)	0.2 mg/L	0.2 mg/L
Phosphorus (P)	9.6 mg/L	9.6 mg/L
Potassium (K)	12 mg/L	12 mg/L
Silicon (Si)	30 mg/L	30 mg/L
Silica (SiO2)	64 mg/L	64 mg/L
Sodium (Na)	110 mg/L	110 mg/L
Sodium (CaCO3)	240 mg/L	240 mg/L
Strontium (Sr)	0.22 mg/L	0.2 mg/L
Vanadium (V)	<0.01 mg/L	<0.1 mg/L
Zinc (Zn)	0.85 mg/L	0.9 mg/L
Total Hardness (CaCO3)	180 mg/L	180 mg/L

Analytical Resources

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Final - Report Number: 639444

L B & B ASSOC INC - NATIONAL ARCHIVES II
8601 ADELPHI RD
COLLEGE PARK MD 20740 USA
Sold To: 0001020557 **Ship To:** 0001020557
Representative: Jeffrey M Quinton

Sample Number	NW060797
Date Sampled	7-Jun-2012 11:00
Date Received	8-Jun-2012
Date Completed	21-Jun-2012
Date Authorized	21-Jun-2012

Water

This sample was analyzed as received, the results being as follows:

Sampling point: MDE Discharge

Anions Test Method: CW15000	**Filtered**
Chloride (Cl)	210 mg/L
Nitrite (NO2)	<0.20 mg/L
Bromide (Br)	0.58 mg/L
Nitrate (NO3)	56 mg/L
Sulfate (SO4)	27 mg/L
Chloride (CaCO3)	290 mg/L
Nitrate (CaCO3)	45 mg/L
Sulfate (CaCO3)	28 mg/L

	Total
Conductivity at 25°C	970 µS/cm
Nitrogen (N) - Kjeldahl	<10.0 mg/L

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Final - Report Number: 668051
L B & B ASSOC INC - NATIONAL ARCHIVES II
8601 ADELPHI RD
COLLEGE PARK MD 20740 USA
Sold To: 0001020557 **Ship To:** 0001020557
Representative: Jeffrey M Quinton

Sample Number	NW063867
Date Sampled	10-Jul-2012 12:30
Date Received	11-Jul-2012
Date Completed	26-Jul-2012
Date Authorized	26-Jul-2012

Water Analysis

This sample was analyzed as received, the results being as follows:

Sampling point: MDE Discharge/ Jul 2012

Water

Cations - Metals **Test Method: CW14024**	**Filtered**	**Total**
Aluminum (Al)	0.55 mg/L	0.55 mg/L
Barium (Ba)	0.11 mg/L	0.11 mg/L
Boron (B)	0.07 mg/L	0.07 mg/L
Cadmium (Cd)	<0.01 mg/L	<0.01 mg/L
Calcium (Ca)	43 mg/L	43 mg/L
Calcium (CaCO3)	110 mg/L	110 mg/L
Chromium (Cr)	<0.02 mg/L	<0.02 mg/L
Copper (Cu)	0.48 mg/L	0.48 mg/L
Iron (Fe)	0.32 mg/L	0.34 mg/L
Lead (Pb)	<0.10 mg/L	<0.10 mg/L
Lithium (Li)	0.02 mg/L	0.02 mg/L
Magnesium (Mg)	17 mg/L	17 mg/L
Magnesium (CaCO3)	71 mg/L	71 mg/L
Manganese (Mn)	0.26 mg/L	0.26 mg/L
Molybdenum (Mo)	<0.04 mg/L	<0.04 mg/L
Nickel (Ni)	0.13 mg/L	0.13 mg/L
Phosphorus (P)	5.5 mg/L	5.5 mg/L
Potassium (K)	11 mg/L	11 mg/L
Silicon (Si)	26 mg/L	26 mg/L
Silica (SiO2)	55 mg/L	55 mg/L
Sodium (Na)	97 mg/L	97 mg/L
Sodium (CaCO3)	210 mg/L	210 mg/L
Strontium (Sr)	0.21 mg/L	0.21 mg/L
Vanadium (V)	<0.01 mg/L	<0.01 mg/L
Zinc (Zn)	0.38 mg/L	0.38 mg/L
Total Hardness (CaCO3)	180 mg/L	180 mg/L

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Authorized by Kimberly Jackson
Senior Chemist

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Final - Report Number: 668051
L B & B ASSOC INC - NATIONAL ARCHIVES II
8601 ADELPHI RD
COLLEGE PARK MD 20740 USA
Sold To: 0001020557 **Ship To:** 0001020557
Representative: Jeffrey M Quinton

Sample Number	NW063867
Date Sampled	10-Jul-2012 12:30
Date Received	11-Jul-2012
Date Completed	26-Jul-2012
Date Authorized	26-Jul-2012

Water Analysis

This sample was analyzed as received, the results being as follows:

Sampling point: MDE Discharge/ Jul 2012

Anions Test Method: CW15000	**Filtered**
Chloride (Cl)	210 mg/L
Nitrite (NO2)	<0.20 mg/L
Bromide (Br)	0.29 mg/L
Nitrate (NO3)	50 mg/L
Sulfate (SO4)	53 mg/L
Chloride (CaCO3)	290 mg/L
Nitrate (CaCO3)	40 mg/L
Sulfate (CaCO3)	55 mg/L

	Total
Conductivity at 25°C	950 µS/cm
Nitrogen (N) - Kjeldahl	1.5 mg/L

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Senior Chemist

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Final - Report Number: 693257
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8601 ADELPHI RD
COLLEGE PARK MD 20740 USA
Sold To: 0001020557 **Ship To:** 0001020557
Representative: Jeffrey M Quinton

Sample Number	NW066657
Date Sampled	9-Aug-2012 13:00
Date Received	10-Aug-2012
Date Completed	30-Aug-2012
Date Authorized	30-Aug-2012

Water Analysis

This sample was analyzed as received, the results being as follows:

Sampling point: MDE Discharge/ Aug 2012

Water

Cations - Metals **Test Method: CW14024**	**Filtered**	**Total**
Aluminum (Al)	0.78 mg/L	0.9 mg/L
Barium (Ba)	0.11 mg/L	0.1 mg/L
Boron (B)	0.07 mg/L	<0.2 mg/L
Cadmium (Cd)	<0.01 mg/L	<0.1 mg/L
Calcium (Ca)	41 mg/L	43 mg/L
Calcium (CaCO3)	100 mg/L	110 mg/L
Chromium (Cr)	<0.02 mg/L	<0.2 mg/L
Copper (Cu)	0.73 mg/L	0.9 mg/L
Iron (Fe)	0.41 mg/L	0.5 mg/L
Lead (Pb)	<0.11 mg/L	<1.0 mg/L
Lithium (Li)	0.02 mg/L	<0.1 mg/L
Magnesium (Mg)	17 mg/L	18 mg/L
Magnesium (CaCO3)	71 mg/L	72 mg/L
Manganese (Mn)	0.40 mg/L	0.4 mg/L
Molybdenum (Mo)	<0.04 mg/L	<0.4 mg/L
Nickel (Ni)	0.17 mg/L	0.2 mg/L
Phosphorus (P)	7.6 mg/L	7.9 mg/L
Potassium (K)	10 mg/L	10 mg/L
Silicon (Si)	27 mg/L	28 mg/L
Silica (SiO2)	58 mg/L	60 mg/L
Sodium (Na)	95 mg/L	95 mg/L
Sadium (CaCO3)	210 mg/L	210 mg/L
Strontium (Sr)	0.21 mg/L	0.2 mg/L
Vanadium (V)	<0.01 mg/L	<0.1 mg/L
Zinc (Zn)	0.82 mg/L	0.9 mg/L
Total Hardness (CaCO3)	170 mg/L	180 mg/L

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Authorized by Acile Said
R&D Laboratory Technician

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Final - Report Number: 693257
L B & B ASSOC INC - NATIONAL ARCHIVES II
8601 ADELPHI RD
COLLEGE PARK MD 20740 USA
Sold To: 0001020557 **Ship To**: 0001020557
Representative: Jeffrey M Quinton

Sample Number	NW066657
Date Sampled	9-Aug-2012 13:00
Date Received	10-Aug-2012
Date Completed	30-Aug-2012
Date Authorized	30-Aug-2012

Water Analysis

This sample was analyzed as received, the results being as follows:

Sampling point: MDE Discharge/ Aug 2012

Anions Test Method: CW15000	**Filtered**
Chloride (Cl)	200 mg/L
Nitrite (NO2)	<0.20 mg/L
Bromide (Br)	0.28 mg/L
Nitrate (NO3)	49 mg/L
Sulfate (SO4)	43 mg/L
Chloride (CaCO3)	280 mg/L
Nitrate (CaCO3)	39 mg/L
Sulfate (CaCO3)	45 mg/L

	Total
Conductivity at 25°C	900 µS/cm
Nitrogen (N) - Kjeldahl	<10.0 mg/L

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Authorized by Acile Said
R&D Laboratory Technician

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Final - Report Number: 693429
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8601 ADELPHI RD
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Sold To: 0001020557 **Ship To:** 0001020557
Representative: Jeffrey M Quinton

Sample Number	NW066980
Date Sampled	11-Aug-2012 11:00
Date Received	14-Aug-2012
Date Completed	30-Aug-2012
Date Authorized	30-Aug-2012

Water Analysis

This sample was analyzed as received, the results being as follows:

Sampling point: WSSC Inlet

Water

Cations - Metals **Test Method: CW14024**	**Filtered**	**Total**
Aluminum (Al)	<0.03 mg/L	<0.03 mg/L
Barium (Ba)	0.03 mg/L	0.03 mg/L
Boron (B)	0.03 mg/L	0.03 mg/L
Cadmium (Cd)	<0.01 mg/L	<0.01 mg/L
Calcium (Ca)	37 mg/L	37 mg/L
Calcium (CaCO3)	93 mg/L	93 mg/L
Chromium (Cr)	<0.02 mg/L	<0.02 mg/L
Copper (Cu)	<0.03 mg/L	<0.03 mg/L
Iron (Fe)	<0.02 mg/L	0.13 mg/L
Lead (Pb)	<0.10 mg/L	<0.10 mg/L
Lithium (Li)	<0.01 mg/L	<0.01 mg/L
Magnesium (Mg)	9.3 mg/L	9.3 mg/L
Magnesium (CaCO3)	38 mg/L	38 mg/L
Manganese (Mn)	<0.01 mg/L	<0.01 mg/L
Molybdenum (Mo)	<0.04 mg/L	<0.04 mg/L
Nickel (Ni)	<0.01 mg/L	<0.01 mg/L
Phosphorus (P)	0.35 mg/L	0.38 mg/L
Potassium (K)	3.9 mg/L	3.9 mg/L
Silicon (Si)	3.0 mg/L	3.0 mg/L
Silica (SiO2)	6.3 mg/L	6.3 mg/L
Sodium (Na)	19 mg/L	19 mg/L
Sodium (CaCO3)	41 mg/L	41 mg/L
Strontium (Sr)	0.20 mg/L	0.20 mg/L
Vanadium (V)	<0.01 mg/L	<0.01 mg/L
Zinc (Zn)	<0.01 mg/L	<0.01 mg/L
Total Hardness (CaCO3)	130 mg/L	130 mg/L

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Representative: Jeffrey M Quinton

Sample Number	NW066980
Date Sampled	11-Aug-2012 11:00
Date Received	14-Aug-2012
Date Completed	30-Aug-2012
Date Authorized	30-Aug-2012

Water Analysis

This sample was analyzed as received, the results being as follows:

Sampling point: WSSC Inlet

Anions Test Method: CW15000	**Filtered**
Chloride (Cl)	34 mg/L
Nitrite (NO2)	<0.20 mg/L
Bromide (Br)	<0.20 mg/L
Nitrate (NO3)	3.7 mg/L
Sulfate (SO4)	44 mg/L
Chloride (CaCO3)	47 mg/L
Nitrate (CaCO3)	3.0 mg/L
Sulfate (CaCO3)	46 mg/L

	Total
Conductivity at 25°C	370 µS/cm
Nitrogen (N) - Kjeldahl	<10.0 mg/L

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Final - Report Number: 714188
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8601 ADELPHI RD
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Sold To: 0001020557 **Ship To:** 0001020557
Representative: Jeffrey M Quinton

Sample Number	NW069395
Date Sampled	5-Sep-2012 10:00
Date Received	6-Sep-2012
Date Completed	26-Sep-2012
Date Authorized	27-Sep-2012

Water Analysis

This sample was analyzed as received, the results being as follows:

Sampling point: MDE Discharge

Water

Cations - Metals **Test Method: CW14024**	**Filtered**	**Total**
Aluminum (Al)	0.95 mg/L	0.95 mg/L
Barium (Ba)	0.11 mg/L	0.11 mg/L
Boron (B)	0.05 mg/L	0.05 mg/L
Cadmium (Cd)	<0.01 mg/L	<0.01 mg/L
Calcium (Ca)	41 mg/L	41 mg/L
Calcium (CaCO3)	100 mg/L	100 mg/L
Chromium (Cr)	<0.02 mg/L	<0.02 mg/L
Copper (Cu)	1.1 mg/L	1.1 mg/L
Iron (Fe)	0.50 mg/L	0.51 mg/L
Lead (Pb)	<0.10 mg/L	<0.10 mg/L
Lithium (Li)	0.02 mg/L	0.02 mg/L
Magnesium (Mg)	16 mg/L	16 mg/L
Magnesium (CaCO3)	64 mg/L	64 mg/L
Manganese (Mn)	0.60 mg/L	0.60 mg/L
Molybdenum (Mo)	<0.04 mg/L	<0.04 mg/L
Nickel (Ni)	0.18 mg/L	0.18 mg/L
Phosphorus (P)	9.5 mg/L	9.5 mg/L
Potassium (K)	13 mg/L	13 mg/L
Silicon (Si)	30 mg/L	30 mg/L
Silica (SiO2)	65 mg/L	65 mg/L
Sodium (Na)	100 mg/L	100 mg/L
Sodium (CaCO3)	230 mg/L	230 mg/L
Strontium (Sr)	0.19 mg/L	0.19 mg/L
Vanadium (V)	<0.01 mg/L	<0.01 mg/L
Zinc (Zn)	0.96 mg/L	0.96 mg/L
Total Hardness (CaCO3)	160 mg/L	160 mg/L

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Final - Report Number: 714188
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8601 ADELPHI RD
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Representative: Jeffrey M Quinton

Sample Number	NW069395
Date Sampled	5-Sep-2012 10:00
Date Received	6-Sep-2012
Date Completed	26-Sep-2012
Date Authorized	27-Sep-2012

Water Analysis

This sample was analyzed as received, the results being as follows:

Sampling point: MDE Discharge

Anions Test Method: CW15000	**Filtered**
Chloride (Cl)	190 mg/L
Nitrite (NO2)	<0.20 mg/L
Bromide (Br)	0.38 mg/L
Nitrate (NO3)	51 mg/L
Sulfate (SO4)	36 mg/L
Chloride (CaCO3)	270 mg/L
Nitrate (CaCO3)	41 mg/L
Sulfate (CaCO3)	38 mg/L

	Total
Conductivity at 25°C	880 µS/cm
Nitrogen (N) - Kjeldahl	2.1 mg/L

Analytical Resources
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Final - Report Number: 742057
L B & B ASSOC INC - NATIONAL ARCHIVES II
8601 ADELPHI RD
COLLEGE PARK MD 20740 USA
Sold To: 0001020557 **Ship To:** 0001020557
Representative: Jeffrey M Quinton

Sample Number	NW072987
Date Sampled	9-Oct-2012 14:00
Date Received	12-Oct-2012
Date Completed	31-Oct-2012
Date Authorized	31-Oct-2012

Water Analysis

This sample was analyzed as received, the results being as follows:

Sampling point: MDE Discharge/Oct 2012

Water

Cations - Metals **Test Method: CW14024**	**Filtered**	**Total**
Aluminum (Al)	1.3 mg/L	1.4 mg/L
Barium (Ba)	0.11 mg/L	0.12 mg/L
Boron (B)	0.06 mg/L	0.06 mg/L
Cadmium (Cd)	<0.01 mg/L	<0.01 mg/L
Calcium (Ca)	35 mg/L	37 mg/L
Calcium (CaCO3)	89 mg/L	93 mg/L
Chromium (Cr)	<0.02 mg/L	<0.02 mg/L
Copper (Cu)	2.0 mg/L	2.1 mg/L
Iron (Fe)	0.94 mg/L	1.0 mg/L
Lead (Pb)	<0.10 mg/L	<0.10 mg/L
Lithium (Li)	0.02 mg/L	0.02 mg/L
Magnesium (Mg)	15 mg/L	16 mg/L
Magnesium (CaCO3)	61 mg/L	64 mg/L
Manganese (Mn)	0.81 mg/L	0.86 mg/L
Molybdenum (Mo)	<0.04 mg/L	<0.04 mg/L
Nickel (Ni)	0.20 mg/L	0.21 mg/L
Phosphorus (P)	11 mg/L	11 mg/L
Potassium (K)	9.3 mg/L	9.9 mg/L
Silicon (Si)	24 mg/L	25 mg/L
Silica (SiO2)	51 mg/L	53 mg/L
Sodium (Na)	90 mg/L	96 mg/L
Sodium (CaCO3)	200 mg/L	210 mg/L
Strontium (Sr)	0.19 mg/L	0.20 mg/L
Vanadium (V)	<0.01 mg/L	<0.01 mg/L
Zinc (Zn)	1.5 mg/L	1.6 mg/L
Total Hardness (CaCO3)	150 mg/L	160 mg/L

Analytical Resources
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Final - Report Number: 742057
L B & B ASSOC INC - NATIONAL ARCHIVES II
8601 ADELPHI RD
COLLEGE PARK MD 20740 USA
Sold To: 0001020557 **Ship To:** 0001020557
Representative: Jeffrey M Quinton

Sample Number	NW072987
Date Sampled	9-Oct-2012 14:00
Date Received	12-Oct-2012
Date Completed	31-Oct-2012
Date Authorized	31-Oct-2012

Water Analysis

This sample was analyzed as received, the results being as follows:

Sampling point: MDE Discharge/Oct 2012

Anions Test Method: CW15000	**Filtered**
Chloride (Cl)	190 mg/L
Nitrite (NO2)	<0.20 mg/L
Bromide (Br)	0.23 mg/L
Nitrate (NO3)	53 mg/L
Sulfate (SO4)	34 mg/L
Chloride (CaCO3)	270 mg/L
Nitrate (CaCO3)	43 mg/L
Sulfate (CaCO3)	35 mg/L

	Total
Conductivity at 25°C	870 µS/cm
Nitrogen (N) - Kjeldahl	3.2 mg/L

Customer Analytical Services
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Final - Report Number: 763153
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8601 ADELPHI RD
COLLEGE PARK MD 20740 USA
Sold To: 0001020557 **Ship To:** 0001020557
Representative: Jeffrey M Quinton

Sample Number	NW076227
Date Sampled	8-Nov-2012 15:00
Date Received	9-Nov-2012
Date Completed	28-Nov-2012
Date Authorized	28-Nov-2012

Water Analysis

This sample was analyzed as received, the results being as follows:

Sampling point: MDE Discharge 1 Nov 2012

Water

Cations - Metals **Test Method: CW14024**	**Filtered**	**Total**
Aluminum (Al)	1.6 mg/L	1.7 mg/L
Barium (Ba)	0.13 mg/L	0.14 mg/L
Boron (B)	0.08 mg/L	0.08 mg/L
Cadmium (Cd)	<0.01 mg/L	<0.01 mg/L
Calcium (Ca)	39 mg/L	41 mg/L
Calcium (CaCO3)	96 mg/L	100 mg/L
Chromium (Cr)	<0.02 mg/L	<0.02 mg/L
Copper (Cu)	2.8 mg/L	3.1 mg/L
Iron (Fe)	1.6 mg/L	1.9 mg/L
Lead (Pb)	<0.10 mg/L	<0.10 mg/L
Lithium (Li)	0.02 mg/L	0.02 mg/L
Magnesium (Mg)	15 mg/L	16 mg/L
Magnesium (CaCO3)	61 mg/L	65 mg/L
Manganese (Mn)	1.0 mg/L	1.1 mg/L
Molybdenum (Mo)	<0.04 mg/L	<0.04 mg/L
Nickel (Ni)	0.22 mg/L	0.23 mg/L
Phosphorus (P)	14 mg/L	15 mg/L
Potassium (K)	9.9 mg/L	11 mg/L
Silicon (Si)	31 mg/L	33 mg/L
Silica (SiO2)	66 mg/L	71 mg/L
Sodium (Na)	100 mg/L	110 mg/L
Sodium (CaCO3)	220 mg/L	240 mg/L
Strontium (Sr)	0.20 mg/L	0.22 mg/L
Vanadium (V)	<0.01 mg/L	<0.01 mg/L
Zinc (Zn)	1.7 mg/L	1.8 mg/L
Total Hardness (CaCO3)	160 mg/L	160 mg/L

Customer Analytical Services

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Final - Report Number: 763153

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Sold To: 0001020557 **Ship To**: 0001020557
Representative: Jeffrey M Quinton

Sample Number	NW076227
Date Sampled	8-Nov-2012 15:00
Date Received	9-Nov-2012
Date Completed	28-Nov-2012
Date Authorized	28-Nov-2012

Water Analysis

This sample was analyzed as received, the results being as follows:

Sampling point: MDE Discharge 1 Nov 2012

Anions Test Method: CW15000	**Filtered**
Chloride (Cl)	190 mg/L
Nitrite (NO2)	<0.20 mg/L
Bromide (Br)	0.36 mg/L
Nitrate (NO3)	51 mg/L
Sulfate (SO4)	34 mg/L
Chloride (CaCO3)	270 mg/L
Nitrate (CaCO3)	41 mg/L
Sulfate (CaCO3)	36 mg/L

	Total
Conductivity at 25°C	850 µS/cm
Nitrogen (N) - Kjeldahl	<10.0 mg/L

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Final - Report Number: 786067
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Representative: Jeffrey M Quinton

Sample Number	NW078656
Date Sampled	5-Dec-2012 11:00
Date Received	10-Dec-2012
Date Completed	28-Dec-2012
Date Authorized	28-Dec-2012

Water Analysis

This sample was analyzed as received, the results being as follows:

Sampling point: MDE Discharge/ DEC 2012

Water

Cations - Metals **Test Method: CW14024**	**Filtered**	**Total**
Aluminum (Al)	1.4 mg/L	1.4 mg/L
Barium (Ba)	0.11 mg/L	0.11 mg/L
Boron (B)	0.06 mg/L	0.06 mg/L
Cadmium (Cd)	<0.01 mg/L	<0.01 mg/L
Calcium (Ca)	31 mg/L	31 mg/L
Calcium (CaCO3)	77 mg/L	78 mg/L
Chromium (Cr)	<0.02 mg/L	<0.02 mg/L
Copper (Cu)	2.5 mg/L	2.6 mg/L
Iron (Fe)	1.5 mg/L	1.6 mg/L
Lead (Pb)	<0.10 mg/L	<0.10 mg/L
Lithium (Li)	0.01 mg/L	0.02 mg/L
Magnesium (Mg)	12 mg/L	12 mg/L
Magnesium (CaCO3)	48 mg/L	48 mg/L
Manganese (Mn)	0.95 mg/L	0.95 mg/L
Molybdenum (Mo)	<0.04 mg/L	<0.04 mg/L
Nickel (Ni)	0.18 mg/L	0.18 mg/L
Phosphorus (P)	12 mg/L	12 mg/L
Potassium (K)	7.4 mg/L	7.6 mg/L
Silicon (Si)	26 mg/L	26 mg/L
Silica (SiO2)	55 mg/L	56 mg/L
Sodium (Na)	78 mg/L	80 mg/L
Sodium (CaCO3)	170 mg/L	170 mg/L
Strontium (Sr)	0.17 mg/L	0.17 mg/L
Vanadium (V)	<0.01 mg/L	<0.01 mg/L
Zinc (Zn)	1.4 mg/L	1.4 mg/L
Total Hardness (CaCO3)	120 mg/L	130 mg/L

Customer Analytical Services
1601 West Diehl Road Naperville IL 60563-1198
{@phoneLabel} {@faxLabel} {@eMailLabel}

NALCO An Ecolab Company | ECOLAB

Final - Report Number: 786067
L B & B ASSOC INC - NATIONAL ARCHIVES II
8601 ADELPHI RD
COLLEGE PARK MD 20740 USA
Sold To: 0001020557 **Ship To**: 0001020557
Representative: Jeffrey M Quinton

Sample Number	NW078656
Date Sampled	5-Dec-2012 11:00
Date Received	10-Dec-2012
Date Completed	28-Dec-2012
Date Authorized	28-Dec-2012

Water Analysis

This sample was analyzed as received, the results being as follows:

Sampling point: MDE Discharge/ DEC 2012

Anions Test Method: CW15000	**Filtered**
Chloride (Cl)	150 mg/L
Nitrite (NO2)	<0.20 mg/L
Bromide (Br)	0.31 mg/L
Nitrate (NO3)	39 mg/L
Sulfate (SO4)	26 mg/L
Chloride (CaCO3)	210 mg/L
Nitrate (CaCO3)	31 mg/L
Sulfate (CaCO3)	28 mg/L

	Total
Conductivity at 25°C	710 µS/cm
Nitrogen (N) - Kjeldahl	4.0 mg/L

An ISO 9001:2008 Certified Laboratory
Certificate No. SS758-2010-AQ-USA-ANAB Rev. 1

Authorized by Rebecca G. Abdelnour
Senior Chemist

Customer Analytical Services
1601 West Diehl Road Naperville IL 60563-1198
Phone: 630-305-1000 Fax: 630-305-2921 Email: globallimssupport@nalco.com

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Final - Report Number: 802414
L B & B ASSOC INC - NATIONAL ARCHIVES II
8601 ADELPHI RD
COLLEGE PARK MD 20740 USA
Sold To: 0001020557 **Ship To**: 0001020557
Representative: Jeffrey M Quinton

Sample Number	NW081076
Date Sampled	10-Jan-2013 11:00
Date Received	11-Jan-2013
Date Completed	25-Jan-2013
Date Authorized	25-Jan-2013

Water Analysis

This sample was analyzed as received, the results being as follows:

Sampling point: MDE Discharge/ Jan 2013

Water

Cations - Metals **Test Method: CW14024**	**Filtered**	**Total**
Aluminum (Al)	1.3 mg/L	1.4 mg/L
Barium (Ba)	0.11 mg/L	0.12 mg/L
Boron (B)	0.06 mg/L	0.06 mg/L
Cadmium (Cd)	<0.01 mg/L	<0.01 mg/L
Calcium (Ca)	30 mg/L	30 mg/L
Calcium (CaCO3)	74 mg/L	75 mg/L
Chromium (Cr)	<0.02 mg/L	<0.02 mg/L
Copper (Cu)	3.2 mg/L	3.3 mg/L
Iron (Fe)	2.6 mg/L	2.8 mg/L
Lead (Pb)	<0.10 mg/L	<0.10 mg/L
Lithium (Li)	0.02 mg/L	0.02 mg/L
Magnesium (Mg)	12 mg/L	12 mg/L
Magnesium (CaCO3)	49 mg/L	50 mg/L
Manganese (Mn)	1.1 mg/L	1.2 mg/L
Molybdenum (Mo)	<0.04 mg/L	<0.04 mg/L
Nickel (Ni)	0.18 mg/L	0.19 mg/L
Phosphorus (P)	11 mg/L	11 mg/L
Potassium (K)	7.6 mg/L	8.0 mg/L
Silicon (Si)	27 mg/L	27 mg/L
Silica (SiO2)	57 mg/L	58 mg/L
Sodium (Na)	83 mg/L	87 mg/L
Sodium (CaCO3)	180 mg/L	190 mg/L
Strontium (Sr)	0.15 mg/L	0.16 mg/L
Vanadium (V)	<0.01 mg/L	<0.01 mg/L
Zinc (Zn)	1.5 mg/L	1.5 mg/L
Total Hardness (CaCO3)	120 mg/L	120 mg/L

	Total
Conductivity at 25°C	720 µS/cm
Nitrogen (N) - Kjeldahl	3.4 mg/L

An ISO 9001:2008 Certified Laboratory
Certificate No. 88758-2010-AQ-USA-ANAB Rev. 1

Authorized by Timothy Murphy
Laboratory Technician IV

Customer Analytical Services
1601 West Diehl Road Naperville IL 60563-1198
Phone: 630-305-1000 Fax: 630-305-2921 Email: globallimssupport@nalco.com

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Final - Report Number: 802414
L B & B ASSOC INC - NATIONAL ARCHIVES II
8601 ADELPHI RD
COLLEGE PARK MD 20740 USA
Sold To: 0001020557 **Ship To:** 0001020557
Representative: Jeffrey M Quinton

Sample Number	NW081076
Date Sampled	10-Jan-2013 11:00
Date Received	11-Jan-2013
Date Completed	25-Jan-2013
Date Authorized	25-Jan-2013

Water Analysis

This sample was analyzed as received, the results being as follows:

Sampling point: MDE Discharge/ Jan 2013

ATTACHMENT B

Coastal Bioanalysts

6400 Enterprise Court, Gloucester, VA 23061
PH: 804-694-8285, FAX: 804-695-1129
www.coastalbio.com

SAMPLING INSTRUCTIONS – WET TESTS

Note: If samples arrive in questionable condition and we cannot contact you we will still process the samples but must flag the data in the final report. Be sure to record a contact phone number on the sampling form. The regulatory authority may invalidate tests using questionable samples.

SAMPLE HOLD TIME IS 36 H Samples must arrive at the lab no later than 1500 (3:00 P.M.) the day following collection to insure sufficient processing time. This means that if samples are to be shipped then Priority Overnight service must be selected. Samples shipped by standard overnight delivery may not arrive until near the close of the business day and require after-hours processing to meet the sample holding time. Samples requiring after-hours, weekend or holiday set up are subject to a surcharge.

SAMPLES MUST BE CHILLED (>0 to 6°C) Grab samples must be immediately placed in a refrigerator or on ice to chill to < 6° C prior to packing in a shipping container. Ice and/or frozen ice packs used for shipping cannot both chill down a warm sample and hold the sample at ≤ 6° C during transit. **Composite samples** must be chilled during collection. Record temperature of sample holding chamber of autosampler to document that ice was present or refrigeration used during collection. Immediately place sample(s) in a refrigerator or on ice to hold at < 6° C prior to packing for shipment.

SAMPLING MUST BE DOCUMENTED Use only black, waterproof pen for all entries on chain-of-custody form. Fill in information requested completely, using "military" time (e.g. 1400 for 2:00 p.m.). For composite samples document the composite period and collection information (e.g. pulse volumes and frequencies). If preparing flow-proportional composites "by hand" (different volumes for different flows at fixed intervals), attach a separate sheet with sample data.

SAMPLES MUST BE LABELLED When labeling sample containers record I.D. directly on the containers (not caps) with Sharpie® or other permanent marker. Gummed labels should not be used because they may fall off when wet.

SAMPLE VOLUME The correct sample volumes must be collected on the dates specified. Otherwise, insufficient sample will be available for daily test renewals or holding time may be exceeded. DO NOT alter sample dates or volumes without first calling us to arrange a new schedule. Fill container(s) completely, minimizing headspace.

FIELD MEASUREMENTS Obtain within 15 minutes of collection of grab sample or last subsample of a composite:

1. **Discharge temperature**: Immerse thermometer directly into the discharge or a discharge aliquot.
2. **Discharge pH**: Immerse pH probe directly into the discharge or a discharge aliquot.
3. **Sample temperature**: Immerse thermometer into an aliquot of the collected sample. Also record temperature of sample chamber in autosampler (composite samples).
4. **Sample total residual chlorine (TRC) concentration**: Measure on an aliquot of the collected sample.

SHIPPING Sample temperature and hold time are critical to proper shipping. **EPA METHODS REQUIRE THAT SAMPLES WHICH ARRIVE AT THE LAB >6° C OR OVER 36 H OLD BE REJECTED.** If samples are shipped:

1. Frozen ice packs or wet ice will maintain the temperature of a previously chilled sample but will not both cool down a warm sample and maintain it at ≤ 6°C during transit.
2. IF WET ICE IS USED: Leaking boxes will be returned by FedEx and UPS (they treat leaking boxes as hazardous waste). Be sure to bag ice prior to placing it in with samples. Use heavy-duty trash bags with cable ties or knot.
3. Do not remove Styrofoam shippers (if used) from corrugated boxes prior to shipping. The boxes increase durability.
4. Ship samples by Priority (Not Standard) Overnight carrier (UPS or FedEx) or courier. DO NOT use US Postal Service or Airborne Express as these carriers do not provide reliable delivery service to our location.
5. FRIDAY SAMPLES (SATURDAY DELIVERY): Carefully follow UPS or FedEx Priority/Saturday Delivery instructions on the airbill.
    a. Indicating only Priority Overnight will result in the sample arriving the next business day (i.e. Monday), invalidating the sample/test. The Saturday Delivery box must be checked.
    b. Be sure that a Saturday Delivery sticker is attached next to the address label.
    c. Fax (804-695-1129) or call (804-694-8285) the tracking number for all Friday samples. This will enable us to track the sample on Saturday if there are delivery problems.

Ship to: Sample Receiving, Coastal Bioanalysts, Inc., 6400 Enterprise Ct., Gloucester, VA 23061

Coastal Bioanalysts
6400 Enterprise Court, Gloucester, VA 23061
PH: 804-694-8285, FAX: 804-695-1129
www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011H Rev. 1/14/11)

Lab Sample ID (Lab Use Only)

								-	
A	A	A	A	Y	Y	N	N		A
Project ID									Spl

CBI Login #_____

FACILITY INFORMATION

CLIENT/FACILITY NAME		CONTACT & PHONE #
NPDES PERMIT NO		OUTFALL # OR LOCATION
SAMPLE CHLORINATED?	SAMPLE DECHLORINATED?	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?

TESTS REQUESTED:	SPECIES OR EPA METH #	ACUTE ☐	CHRONIC ☐
	SPECIES OR EPA METH #	ACUTE ☐	CHRONIC ☐
OTHER TESTS:			

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	SAMPLE END DATE & TIME	AUTOSAMPLER TEMP. (°C)

TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION*	NUMBER SUBSAMPLES_____	VOL (ml) SUBSAMPLES_____	TIME INCREMENT_____
	SET VOLUME SUBSAMPLE_____	SET VOLUME FLOW_____	TOTAL VOLUME_____

*FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

(PRINTED NAME/AFFILIATION SAMPLER/ANALYST) _____ (SIGNATURE) _____ (DATE) _____

RELINQUISHED BY	DATE	TIME	RECEIVED BY

SHIPPING METHOD: UPS_____ FEDEX_____ HAND DELIVERY_____

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE___ OTHER_____

SAMPLE TEMP: (°C)_____ ARRIVED ON ICE? Y___ N___ CUSTODY SEAL: INTACT___ BROKEN___ ABSENT___

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

ATTACHMENT C

STANDARD PROTOCOL FOR ESTIMATING THE CHRONIC TOXICITY OF EFFLUENTS TO *Ceriodaphnia dubia*
(EPA Method 1002.0)

Protocol Reference Identification MD-CCD07
October 10, 2007

Prepared by

Coastal Bioanalysts, Inc.
6400 Enterprise Court
Gloucester, VA 23061
(804) 694-8285
www.coastalbio.com

1.0 STATEMENT OF OBJECTIVES

The purpose of this 3-brood (6-8 day) survival and reproduction test is to estimate the acute and chronic toxicity of effluents to *Ceriodaphnia dubia*. The 48-hr LC50, highest no-observed-effect-concentration (NOEC), the lowest-observed-effect-concentration (LOEC) and Chronic Value (geometric mean of the LOEC and NOEC) for survival and reproductive biomass and IC25 for reproductive biomass will be estimated statistically for the exposure period to gain information on the threshold for chronic toxicity. This protocol serves two objectives. Its first purpose is to describe, in moderate detail, how the test will be performed and what information will be collected and archived as a record of the test. Its second purpose is to serve as a formal agreement with the Maryland Department of the Environment concerning whether data collected as defined by this protocol will be acceptable to the agency. Methods are derived from EPA-821-R-02-013 (Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, 4th ed. October 2002), EPA-821-R-02-012 (Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, 5th ed. October 2002) and Reporting Requirements for Effluent Biomonitoring Data (Water Management Administration, Maryland Department of the Environment 3/21/03).

2.0 EFFLUENT IDENTIFICATION AND HANDLING

A minimum of three effluent samples will be collected over a 4-6 day span. Effluent samples, collected as indicated in the NPDES discharge permit, will be delivered to Coastal Bioanalysts, Inc. (CBI) facilities for testing. Chain of custody will be maintained for all samples by CBI personnel. The following information will be provided on the chain-of-custody form by individuals responsible for sample collection (e.g. permittee, contracting lab, etc.): sampler name and permittee identification, collection method, times, dates, number, interval and volume of composite subsamples (when applicable). Samples will be chilled to 0-6° C until used in tests. Temperature will be measured immediately upon receipt of sample. Maximum lapsed time from collection to initiation of tests or first use of samples shall not exceed 36 hr.; samples will not be used for renewals more than 72 h past first use.

To remove indigenous organisms that may interfere with the test, the effluent samples will be filtered through a 60 um Nitex mesh prior to testing. Prior to use, oxygen concentration, pH, alkalinity, hardness, conductivity, chlorine (total residual) and ammonia (if present or suspected) will be measured in undiluted effluent (see 3.2 below). Color, turbidity and other visual observations will also be noted. Oxygen concentrations will be adjusted to levels specified in EPA-821-R-02-013 ($\geq$4.0 mg/l, $\leq$100% saturation) after warming by aeration as needed. If pH falls outside the range of 6.0 to 9.0 (see 3.1 below), pH will be adjusted to 7.0 using semiconductor grade NaOH or trace metal grade HCl, respectively. If dechlorination of effluent is required (TRC > 0.02 mg/l), effluent will be dechlorinated with reagent grade 1 N sodium thiosulfate. All effluent treatments will be described (e.g. aeration duration, volume and strength of acid or base added, etc.) and documented. Oxygen concentration, pH, TRC and conductivity will be measured before and after treatment as applicable.

3.0 DESCRIPTION OF TEST METHODOLOGY

3.1 Test Methods

The test will consist of five different concentrations of effluent (termed "treatments") and a freshwater control containing only dilution water. Each control and treatment will be tested in ten replicates. A randomized block design, in which the offspring from a single female are individually placed into one beaker of each treatment in a block (i.e. one row of six beakers; blocking by known parentage) at the initiation of the test, will be utilized.

One cladoceran will be tested in each container (ten per treatment). Test containers will consist of borosilicate glass scintillation vials each containing 15 ml of test solution. The concentrations will be such that 100% effluent and a geometric series of 30 or 50% dilutions will be tested to estimate the NOEC, LOEC and IC25 of effluent for the species. Dilutions for all replicates of each treatment are prepared in a single flask and then allotted to each chamber to reduce variability of concentration within treatments. Daily renewals will be performed by transferring individuals to clean chambers containing fresh solution and food (YCT/*Selenastrum*).

If pH falls outside the range of 6.0 to 9.0 the test design shall consist of the following treatments tested in ten replicates: standard dilution water controls, 100% unadjusted effluent and a geometric dilution series comprised of five concentrations using effluent in which pH has been adjusted as described in sect. 2.0 above. In cases where effluent is dechlorinated (see sect. 2.0 above), two controls will be included in the design: standard dilution water controls and thiosulfate controls containing the same volume and concentration of thiosulfate as effluent.

The test animals will be uniformed-aged *Ceriodaphnia dubia* $\leq$ 24 hours ($\pm$ 4 hours) old. *Ceriodaphnia* will be cultured in-house in synthetic freshwater (SFW). The test animals will be obtained from adult females individually cultured in glass scintillation vials. Only neonates from females producing 8 or more offspring in their third or subsequent brood will be used to initiate the test. Offspring from a single female will be placed into one chamber of each treatment for a given replicate (i.e. block). In this way the performance of the offspring of individual females can be tracked. One individual will be placed in each chamber. The time at which animals are added to test solutions will be recorded as the test initiation time. Food will be added to new test chambers each day prior to transfer of animals. A feeding regime of 0.1 ml each of YCT and *Selenastrum* concentrate (ca. 3.0-3.5 x 10^7 cells/ml) per 15 ml of test solution will be used.

Observations will be made daily during renewals to determine number of dead, live and/or affected individuals and number of offspring. Observations of erratic swimming, loss of reflex, unusual behavior, presence of males, aborted/dead young, discoloration, etc. will be noted. Death is defined as the absence of movement, even with gentle stimulation. Tests will be terminated when 60% of the surviving control females have produced their third brood (day 6-8).

The containers will not be artificially aerated. The temperature will be thermostatically controlled so that it is maintained at the desired test temperature of 25$\pm$1° C (maximum-minimum difference 3° C). Fluorescent lights will be used to maintain illumination at 50-100 ft. candles and a photoperiod of 16:8 L:D.

The dilution water used for these tests will be synthetic freshwater (SFW) prepared as described in EPA-821-R-02-013; the water will be moderately hard or of similar hardness as the receiving water. Oxygen concentration, pH, alkalinity, hardness, conductivity, and temperature of each batch of dilution water will be documented. The dissolved oxygen concentration of the dilution water shall be between 90-100% saturation at initiation of tests.

3.2 Water Quality Measurements

The dissolved oxygen concentration, pH and temperature will be measured daily before and after renewal in each treatment. Conductivity will be measured at the beginning of each 24 h period in each treatment. 'After renewal' measurements will be obtained from the mixing flask while 'before renewal' measurements will be made from pooled replicate solutions after transfer of organisms to fresh solutions. Measurements are made in this fashion to provide sufficient volume for accurate measurements with the conductivity cell, dissolved oxygen probe and thermometer.

The following instrumentation/analytical methods will be used for all water quality measurements of effluents, dilution waters and test dilutions. Instruments calibration will be checked daily and all calibrations, repairs and adjustments documented in instrument logs.

Oxygen	Dissolved oxygen meter (analog), Clark-type polarographic probe with automatic temperature and salinity compensation.
Conductivity	Portable meter, digital, temperature compensated 0-1999 uS (uMHOS) (used for most freshwater samples)
Conductivity	Portable SCT meter, analog, temperature compensated 0-50000 uS, 3 scales (used for freshwater, high conductivity freshwater and saltwater samples)
pH	Portable and benchtop meters, digital, temperature compensated two-point calibration/slope adj., gel-filled probe
Temperature	Electronic digital thermometer
Hardness	EDTA titration
Alkalinity	Sulfuric acid titration
Chlorine	DPD Colorimetric
Ammonia	Ion-selective electrode

3.3 Data Analysis

The 48-hr LC50 will be determined from count data obtained on test day 2. The chronic adverse responses of the cladocerans will be calculated as the reproduction and percentages of animals surviving in each treatment at the termination of the test (day 6-8). For all treatments and controls the number of offspring produced (in the first three broods only) per female, whether or not the female survived until the end of the test, is used for analysis. If an animal (not identified as a male) dies before producing offspring a zero is used for analysis. For controls the number of offspring produced in the first three broods per surviving female is also calculated to determine if the minimum acceptability criterion (15 offspring) has been met.

Males are included in the analysis of the survival endpoint but are excluded from analysis for the reproduction endpoint. If any replicate block contains $\geq$ 50% males then the entire block is excluded from analysis for the reproduction endpoint. Test acceptability criteria (TAC) for survival and reproduction must be met prior to exclusion of any blocks due to the presence of males. If after exclusion of males, or blocks containing $\geq$ 50% males, less than 8 replicates (80%) of the controls remain the test is invalid.

The NOECs, LOECs, IC25 and chronic values (geometric mean of the NOEC and LOEC) will be based on the concentration of effluent expressed as percent by volume. NOECs and LOECs for survival will be determined using Fisher's Exact test. NOECs and LOECs for reproduction will be determined using Dunnett's, Steel's Many-one, Wilcoxon Rank Sum (with Bonferroni adjustment) or t-test (with Bonferroni adjustment); the appropriate test will be based on equality of replicates, data normality (Chi-square test)

and homogeneity of variance (Bartlett's test). Statistical endpoints will be calculated using the ToxCalc (Vers. 5.0) software package. Updated or improved programs will be implemented as they become available.

The percent minimum significant difference (PMSD) for reproduction will be determined using parametric methods, regardless of whether parametric or non-parametric tests are used for hypothesis testing, and compared with EPA criteria to determine appropriateness of NOEC determinations. Data will be plotted and examined for any upward, downward, inverted or other trends. Concentration-response curves will be evaluated using guidance referenced in EPA-821-R-02-013.

4.0 QUALITY ASSURANCE PROGRAM

All tests shall be monitored by a Quality Assurance Officer (QAO) experienced in environmental toxicology testing. The QAO will perform critical phase inspections and audit the conduct of the test and final reports to assure compliance with protocols and standard operating procedures applicable to the test.

Valid tests must have a minimum control performance of 80% survival for all organisms, 60% of the surviving control females must produce 3 or more broods, the average brood size (from sum of first three broods only) must be 15 or greater per surviving female and at least 8 replicates (80%) of the control animals must remain after removal of males, or blocks with males, from consideration. Additional criteria for acceptability as outlined in EPA-821-R-02-013 shall also be met. For this test to be acceptable, no unauthorized significant deviations from this protocol or standard operating procedures shall have occurred. The report on the test results will identify any amendments or deviations, identify any correspondence associated with protocol amendments, and discuss the effect of the amendments and/or deviations on the test results.

Reference toxicity tests will be performed as described in EPA-821-R-02-013. The reference toxicant shall consist of high purity (Sigma "Ultra" grade) potassium chloride. Chronic reference tests will be performed monthly. Control tables of cumulative NOECs for survival and reproduction and IC25s for reproduction will be maintained to determine acceptability of chronic reference tests. Control mortality, reproduction, LC50s, NOECs, IC25s,PMSDs, control chart limits, and date of most recent chronic reference toxicant tests will also be reported in the final report.

In the laboratory all reagents, samples, etc. used in the tests shall be logged into data logs and pertinent information, such as lot number, strength, purity, etc. noted. Chain of custody shall be maintained to control distribution of all test samples. Log sheets of all sample preparation activities, instrument calibrations and repair, animal culture data, etc. shall be maintained as raw data. All raw data, documentation, records, protocols, and final reports generated by these tests shall be archived in a secure location for a period of not less than five years.

5.0 TEST REPORT

The report will contain all the information outlined above and contain the following general components: outfall identification, testing period, cumulative testing information, sampling information, descriptions of effluent and dilution water characteristics, test animal source and acclimation, test initiation, renewal and termination times, deviations from protocols (if applicable), summary information regarding survival, reproduction, incidence of males, NOECs, LOECs, ChV, IC25, PMSD, chronic values, 48-h LC50, summary water quality measurements (means, standard deviations), copies of all raw data (bench sheets) and computer printouts.

STANDARD PROTOCOL FOR ESTIMATING THE CHRONIC TOXICITY OF EFFLUENTS TO THE FATHEAD MINNOW, *Pimephales promelas*

(EPA Method 1000.0)

Protocol Reference Identification MD-CPP07
October 10, 2007

Prepared by

Coastal Bioanalysts, Inc.
6400 Enterprise Court
Gloucester, VA 23061
(804) 694-8285
www.coastalbio.com

1.0 STATEMENT OF OBJECTIVES

The purpose of this 7-day larval survival and growth test is to estimate the acute and chronic toxicity of effluents to the fathead minnow *Pimephales promelas*. The LC50 (48-hr), highest no-observed-effect-concentration (NOEC), the lowest-observed-effect-concentration (LOEC) and Chronic Value (geometric mean of the LOEC and NOEC) for survival and biomass and IC25 for biomass will be estimated statistically for the exposure period to gain information on the threshold for chronic toxicity. This protocol serves two objectives. Its first purpose is to describe, in moderate detail, how the test will be performed and what information will be collected and archived as a record of the test. Its second purpose is to serve as a formal agreement with the Maryland Department of the Environment concerning whether data collected as defined by this protocol will be acceptable to the agency. Methods are derived from EPA-821-R-02-013 (Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, 4th ed. October 2002), EPA-821-R-02-012 (Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, 5th ed. October 2002) and Reporting Requirements for Effluent Biomonitoring Data (Water Management Administration, Maryland Department of the Environment 3/21/03).

2.0 EFFLUENT IDENTIFICATION AND HANDLING

A minimum of three effluent samples will be collected over a 4-6 day span. Effluent samples, collected as indicated in the NPDES discharge permit, will be delivered to Coastal Bioanalysts, Inc. (CBI) facilities for testing. Chain of custody will be maintained for all samples by CBI personnel. The following information will be provided on the chain-of-custody form by individuals responsible for sample collection (e.g. permittee, contracting lab, etc.): sampler name and permittee identification, collection method, times, dates, number, interval and volume of composite subsamples (when applicable). Samples will be chilled to 0-6° C until used in tests. Temperature will be measured immediately upon receipt of sample. Maximum lapsed time from collection to initiation of tests or first use of samples shall not exceed 36 hr.; samples will not be used for renewals more than 72 h past first use.

To remove indigenous organisms that may interfere with the test, the effluent samples will be filtered through a 60 um Nitex mesh prior to testing. Prior to use, oxygen concentration, pH, alkalinity, hardness, conductivity, chlorine (total residual) and ammonia (if present or suspected) will be measured in undiluted effluent (see 3.2 below). Color, turbidity and other visual observations will also be noted. Oxygen concentrations will be adjusted to levels specified in EPA-821-R-02-013 ($\geq$4.0 mg/l, $\leq$100% saturation) after warming by aeration as needed. If pH falls outside the range of 6.0 to 9.0 (see 3.1 below), pH will be adjusted to 7.0 using semiconductor grade NaOH or trace metal grade HCl, respectively. If dechlorination of effluent is required (TRC > 0.02 mg/l), effluent will be dechlorinated with reagent grade 1 N sodium thiosulfate. All effluent treatments will be described (e.g. aeration duration, volume and strength of acid or base added, etc.) and documented. Oxygen concentration, pH, TRC and conductivity will be measured before and after treatment as applicable.

3.0 DESCRIPTION OF TEST METHODOLOGY

3.1 Test Methods

The test will consist of five different concentrations of effluent (termed "treatments") and a freshwater control containing only dilution water. Each control and treatment will be tested in four replicates. Chambers will be arranged in a randomized block design. Fish test containers will consist of 1000 ml beakers (600 ml min) each containing 500 ml (min. 250 ml) of test solution. Ten fish will be tested in each container (forty per treatment). The concentrations will be such that 100% effluent and a geometric

series of 30 or 50% dilutions will be tested to estimate the LC50, NOEC, LOEC and IC25 of effluent for the species. Dilutions for all replicates of each treatment are prepared in a single flask and then allotted to each chamber to reduce variability of concentration within treatments. Daily renewals will be performed by siphoning off 80-90% of the solution, uneaten food and debris and refilling with fresh solution.

If pH falls outside the range of 6.0 to 9.0 the test design shall consist of the following treatments tested in four replicates: standard dilution water controls, 100% unadjusted effluent and a geometric dilution series comprised of five concentrations using effluent in which pH has been adjusted as described in sect. 2.0 above. In cases where effluent is dechlorinated (see sect. 2.0 above), two controls will be included in the design: standard dilution water controls and thiosulfate controls containing the same volume and concentration of thiosulfate as effluent.

Fish, obtained by natural spawning of laboratory reared brood stock (cultured in-house or purchased locally from Chesapeake Cultures Inc., Gloucester, VA), will be $\leq$ 24 h old. Post-hatch fish will be fed *Artemia* nauplii *ad libitum* until added to test. Fish will be randomly allocated to test chambers a few at a time until each chamber contains 10 fish. The time at which animals are added to test solutions will be recorded as the test initiation time. Fish will be fed 24-h old Artemia nauplii twice daily: in the morning before renewal and later after renewal. Fish will not be fed on test day 7.

Observations will be made daily during renewals to determine number of dead, live and/or affected individuals. Dead animals will be removed when observed. Observations of erratic swimming, loss of reflex, cannibalism, unusual behavior, discoloration, etc. will be noted. Death is defined as the absence of movement, even with gentle stimulation with a glass probe. Fish dry weights (pooled for each chamber) will be determined on day 7. Tests will be terminated within 1 hr. of the time of day at which they were initiated.

The containers will not be artificially aerated unless dissolved oxygen concentration cannot be otherwise maintained above 4.0 mg/l; if aeration is required then all chambers will be gently aerated with glass pasteur pipettes at a rate of ca. 100 bubbles/min. The temperature will be thermostatically controlled so that it is maintained at the desired test temperature of $25 \pm 1^{\circ}$ C (maximum-minimum difference 3° C). Fluorescent lights will be used to maintain illumination at 50-100 ft. candles and a photoperiod of 16:8 L:D.

The dilution water used for these tests will be synthetic freshwater (SFW) prepared as described in EPA-821-R-02-013. the water will be moderately hard or of similar hardness as the receiving water. Oxygen concentration, pH, alkalinity, hardness, conductivity, and temperature of each batch of dilution water will be documented. The dissolved oxygen concentration of the dilution water shall be between 90-100% saturation at initiation of tests.

3.2 Water Quality Measurements

The dissolved oxygen concentration, pH and temperature will be measured daily before and after renewal in each treatment. Conductivity will be measured at the beginning of each 24 h period in each treatment. Measurements are made on subsamples poured directly from the test chambers. Measurements are made in this fashion to prevent transfer of any potential fish pathogens present in samples from one test to another or from one treatment to another.

The following instrumentation/analytical methods will be used for all water quality measurements of effluents, dilution waters and test dilutions. Instruments calibration will be checked daily and all calibrations, repairs and adjustments documented in instrument logs.

Oxygen	Dissolved oxygen meter (analog), Clark-type polarographic probe with automatic temperature and salinity compensation.
Conductivity	Portable meter, digital, temperature compensated 0-1999 uS (uMHOS) (used for most freshwater samples)
Conductivity	Portable SCT meter, analog, temperature compensated 0-50000 uS, 3 scales (used for freshwater, high conductivity freshwater and saltwater samples)
pH	Portable and benchtop meters, digital, temperature compensated two-point calibration/slope adj., gel-filled probe
Temperature	Electronic digital thermometer
Hardness	EDTA titration
Alkalinity	Sulfuric acid titration
Chlorine	DPD Colorimetric
Ammonia	Ion-selective electrode

3.3 Data Analysis

Survival data on test day 2 will be used to determine the 48-hr LC50. The chronic adverse responses of the fish will be calculated as the biomass (net dry weight each replicate/initial number of animals) and percentages of animals surviving in each treatment at 7 days. The NOECs, LOECs, chronic values (geometric mean of the NOEC and LOEC) and IC25 will be based on the concentration of effluent expressed as percent by volume. NOECs and LOECs for survival and dry weight will be determined using Dunnett's, Steel's Many-one, Wilcoxon Rank Sum (with Bonferroni adjustment) or t-test (with Bonferroni adjustment); the appropriate test will be based on equality of replicates, data normality (Shapiro-Wilks test) and homogeneity of variance (Bartlett's test).

The percent minimum significant difference (PMSD) for growth will be determined using parametric methods, regardless of whether parametric or non-parametric tests are used for hypothesis testing, and compared with EPA criteria to determine appropriateness of NOEC determinations. Data will be plotted and examined for any upward, downward, inverted or other trends. Concentration-response curves will be evaluated using guidance referenced in EPA-821-R-02-013.

The statistical endpoints described above will be calculated using the ToxCalc (Vers. 5.0) computer program. Updated or improved programs will be implemented as they become available.

4.0 QUALITY ASSURANCE PROGRAM

All tests shall be monitored by a Quality Assurance Officer (QAO) experienced in environmental toxicology testing. The QAO will perform critical phase inspections and audit the conduct of the test and

final reports to assure compliance with protocols and standard operating procedures applicable to the test.

The test will be considered unacceptable if more than 20 percent of the organisms in the control chambers die during the exposure period or if average control fish dry weight (net dry weight each replicate/surviving number of animals) does not equal or exceed 0.25 mg. upon termination of the test. Additional criteria for acceptability as outlined in EPA-821-R-02-013 shall also be met. For this test to be acceptable, no unauthorized significant deviations from this protocol or standard operating procedures shall have occurred. The report on the test results will identify any amendments or deviations, identify any correspondence associated with protocol amendments, and discuss the effect of the amendments and/or deviations on the test results.

Reference toxicity tests will be performed as described in EPA-821-R-02-013. The reference toxicant shall consist of high purity (Sigma "Ultra" grade) potassium chloride. Chronic reference tests will be performed monthly for fish cultured in-house. An appropriate reference test (chronic) will be performed concurrently with the effluent test for each of batch of purchased animals. Control tables of cumulative NOECs for survival and growth and IC25s for growth will be maintained to determine acceptability of chronic reference tests. Control mortality, growth, LC50s, NOECs, PMSDs, IC25s, control chart limits, and date of most recent chronic reference toxicant tests will also be reported in the final report.

In the laboratory all reagents, samples, etc. used in the tests shall be logged into data logs and pertinent information, such as lot number, strength, purity, etc. noted. Chain of custody shall be maintained to control distribution of all test samples. Log sheets of all sample preparation activities, instrument calibrations and repair, animal culture data, etc. shall be maintained as raw data. All raw data, documentation, records, protocols, and final reports generated by these tests shall be archived in a secure location for a period of not less than five years.

5.0 TEST REPORT

The report will contain all the information outlined above and contain the following general components: outfall identification, testing period, cumulative testing information, sampling information, descriptions of effluent and dilution water characteristics, test animal source and acclimation, test initiation, renewal and termination times, deviations from protocols (if applicable), summary information regarding survival, growth, NOECs, LOECs, chronic values, PMSDs, IC25s, LC50s and summary water quality measurements (means, standard deviations), copies of all raw data (bench sheets) and computer printouts.

Response to Paragraph 20

MARYLAND DEPARTMENT OF THE ENVIRONMENT
1800 Washington Boulevard • Baltimore MD 21230
MDE 410-537-3000 • 1-800-633-6101 • www.mde.state.md.us

Martin O'Malley
Governor

Anthony G. Brown
Lieutenant Governor

Robert M. Summers, Ph.D.
Secretary

April 4, 2013

Mr. Lawrence M. Holley Sr.
Facility Manager, Archives II BFF
National Archives and Records Administration
8601 Adelphi Road
College Park, Maryland 2074

Re: Biomonitoring Study Plan for NPDES Permit MD00065871 and State Permit 09-DP-2904

Dear Mr. Holley:

The Maryland Department of the Environment has received the Biomonitoring Study Plan for the above facility. The submission of this study plan, which was prepared by Coastal Bioanalysts Inc., is required by Special Condition K of the above permit which was to be completed within three months of the effective date of the permit, December 1, 2009.

The Biomonitoring Study Plan was reviewed and it is acceptable as submitted to fulfill the biomonitoring requirements of the above discharge permit. Whole effluent toxicity (WET) testing may begin in accordance with the proposed testing schedule in your plan. Samples for WET testing should be planned ?planed and collected during periods that best represent the facility's routine operations, that is, intervals of time when the effluent sample matrix is representative of all of the facility's operational waste streams.

Please submit WET test report data to the Maryland Department of the Environment, Water Management Administration, Compliance Program, Suite 420 at the above address within 30 days of the completion of each set of tests.

If you or your testing contractor have questions regarding your WET testing program or you anticipate any changes to the above submission, please contact Mr. Ronald Wicks at 410-537-3607 or at rwicks@mde.state.md.us.

Sincerely,

James F. Craig, District Manager
Compliance Program
Water Management Administration

Cc Michael Richardson
Sharon Talley
Scott Boylan

Microbac Laboratories, Inc.

Baltimore Division

2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800
Fax: 410-633-6553
www.microbac.com

COVER LETTER

May 01, 2013
Report No.: 13D1601

John Mack
LB&B Associates
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740

RE: Toxic Chemical Bioassay (4 Quarters)

The report of analyses contains test results for samples received at Microbac Laboratories, Inc., Baltimore Division on 04/19/2013 16:00. The samples were subcontracted to.

The enclosed results were obtained from and applicable to the sample(s) as received at the laboratory. All sample results are reported on an "as received" basis unless otherwise noted.

All data included in this report has been reviewed and meet the applicable project and certification specific requirements, unless otherwise noted.

This report has been paginated in its entirety and shall not be reproduced except in full, without the written approval of Microbac Laboratories, Inc.

We appreciate the opportunity to service your analytical needs. If you have any questions, please feel free to contact us.

This Data Package contains the following:

- This Cover Page
- Cooler Receipt Log
- Chain of Custody
- Subcontract Report/Data

5/1/2013

Final report reviewed by: Mark B. Horan/Laboratory Director Report issue date

All samples received in proper condition and results conform to ISO 17025 standards unless otherwise noted.

If we have not met or exceeded your expectations, please contact the Director or Trevor Boyce, President at tboyce@microbac.com or Robert Morgan, Chief Operation Officer, at rmorgan@microbac.com.

Microbac Laboratories, Inc.
Baltimore Division
2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-18
Fax: 410-633-6
www.microbac.co

CERTIFICATE OF ANALYSIS

LB&B Associates	Project: Toxic Chemical Bioassay (4 Quarters)	Report: 13D1601
Fac. Ops & Maint., 8601 Adelphi Road	Project Number: National Archives	Reported: 05/01/2013 12:01
College Park, MD 20740	Project Manager: John Mack	

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Cooler Receipt Log

Cooler ID: Default Cooler **Cooler Temp:** °C

Custody Seals Intact:	No	COC/Containers Agree:	No
Containers Intact:	No	Correct Preservation:	No
Received On Ice:	No	Correct Number of Containers Received:	No
Radiation Scan Acceptable:	No	Sufficient Sample Volume for Testing:	No
COC Present:	No	Samples Received in Proper Condition:	No

Comments:

Microbac®

Microbac Laboratories Inc., Baltimore Division
2101 Van Deman St, Baltimore, MD 21224
Tel: 410-633-1800
Fax: 410-633-6553
www.microbac.com

Work Order Number: 13D1601

Chain of Custody Record

Page 1 of 1

Instructions for completing the Chain of Custody Record on back.

Client Name LBB	Project	Turnaround Time	QC and EDD Type (Required)	
Address	Location National Archives	[ ] Standard (7 Business Days)	[ ] Level I (NAC)	[ ] EDD
City, State, Zip	PO #	[ ] RUSH* Needed By: _____	[ ] Level II**	Format: _____
Contact Bob Gentry	Compliance Monitoring? [ ] Yes [ ] No	* Please notify lab prior to drop off.	[ ] Level III**	Comments:
Telephone #	(1)Agency/Program		[ ] Level IV**	

Sampled by (PRINT) JD Sampler Signature _____ Sampler Phone # _____ Sampler (DW)Cert# _____

Send Report via [ ] e-mail (address) _____ [ ] Mail [ ] Telephone [ ] Fax (fax #) _____

*** Matrix Types: Air(A), Childrens Product(CP), Food(F), Paint(P), Soil/Solid (S), Oil(O), Wipe(WI), Drinking Water (DW), Groundwater (GW), Surface Water (SW), Waste Water (WW), Other (specify)

Client Sample ID	Matrix***	Grab	Composite	Filtered	Date Collected	Time Collected	No. of Containers	Bio Assay	Comments
outfall 001			X		4/16/13	0907	2		All samples shipped to CBI
outfall 001			X		4/17/13	0903	4		
outfall 001			X		4/19/13	0715	8		

Possible Hazard Identification [ ] Hazardous [ ] Non-Hazardous [ ] Radioactive Sample Disposition [ ] Dispose as appropriate [ ] Return [ ] Archive

Number of Containers:	Relinquished By (signature)	Printed Name/Affiliation	Date/Time	Received By (signature)	Printed Name/Affiliation
Cooler Number:	[signature]	MLI	4/19/13 1600	[signature]	MLI
Temp upon receipt(°C): N/A	Relinquished By (signature)	Printed Name/Affiliation	Date/Time	Received By (signature)	Printed Name/Affiliation
Sample Received on Ice or Refrigerated from Client: Yes / No					
Radiation Scan Acceptable Yes / No	Relinquished By (signature)	Printed Name/Affiliation	Date/Time	Received for Lab By (signature)	Printed Name/Affiliation

13D1601

Page 3 of 23

501 12.11 ** Surcharge May Apply to add'l QC Packages** WHITE - ORIGINAL LAB YELLOW - RECEIPT

Client: Microbac Laboratories, Inc.
Project ID: MICR1320
Client Sample ID: National Archives II Outfall 001
Permit No.: MD0065871
Sample Period: 4/16/13 to 4/19/13

Coastal Bioanalysts, Inc.

Report of Analysis: Whole Effluent Toxicity (WET)

Submitted To:	Prepared By:
Mr. Michael Arbaugh Sr. Microbac Laboratories, Inc. Baltimore Division 2101 Van Deman Street Baltimore, MD 21224	Coastal Bioanalysts, Inc. 6400 Enterprise Court Gloucester, VA 23061 (804) 694-8285 www.coastalbio.com Contact: Peter F. De Lisle, Technical Director

Chronic Test Results*

Species-Test Method	Endpoint	NOEC	LOEC	ChrV	PMSD	IC25	48-h LC50	95% C.L.
C. dubia	Survival	12.5	25	17.7	N/A	N/A	70.7	54.5-91.7
EPA 1002.0	Reproduction	<6.25	6.25	<6.25	19	5.6	N/A	N/A
P. promelas	Survival	50	100	70.7	N/A	N/A	>100	N/A
EPA 1000.0	Biomass	<6.25	6.25	<6.25	12	10.1	N/A	N/A

*Note: Details regarding test conduct and data analysis provided in attached bench sheets and printouts as applicable.

Chronic Test Biological Summary Data		Sample Concentration (%)					
Species-Method	Endpoint	Control	6.25	12.5	25.0	50.0	100
C. dubia EPA 1002.0	Survival (%):	100	100	100	30	0	0
	Repro (# young):	28.6	20.6	13.4	8.6	3.3	0
P. promelas EPA 1000.0	Survival (%):	100	100	98	93	93	83
	Biomass (mg):	0.582	0.460	0.422	0.367	0.377	0.358

Test Information Species-Method	Start Date/Time End Date/Time	Organism Source	Hatch/Harvest Date/Time	Acclimation Temp.	Acclimation Water	Test Aerated?
C. dubia EPA 1002.0	4/17/13 1300 4/23/13 1045	CBI Stock	4/16/13 1440 4/16/13 1635	25° C	Mod. Hard Syn. FW	No
P. promelas EPA 1000.0	4/17/13 1315 4/24/13 1400	CBI Stock	4/16/13 1700 4/17/13 0930	25° C	Mod. Hard Syn. FW	No

Sample/Dilution Water Data	Chronic Test			
	Sample		Dilution Water*	
Water Quality Parameter (Units)	Mean	Std. Dev.	Mean	Std. Dev.
Arrival Temperature (°C)	1	0	N/A	N/A
Use Temperature (°C)	25	0	25	0
Conductivity (µS/cm)	607	90	295	4.6
pH (S.U.)	7.53	0.12	7.73	0.06
Dissolved Oxygen (mg/l)	8.2	0	8.2	0
Total Hardness (mg/l as $CaCO_3$)	111	22	89	7.4
Alkalinity (mg/l as $CaCO_3$)	58	8.3	60	0.5
Total Residual Chlorine (mg/l)	<Q.L.	0	N/A	N/A
Ammonia (mg/l NH_3-N)	<1.0	0	N/A	N/A

*Dilution water = Moderately hard synthetic freshwater

Client: Microbac Laboratories, Inc.
Project ID: MICR1320
Client Sample ID: National Archives II Outfall 001
Permit No.: MD0065871
Sample Period: 4/16/13 to 4/19/13

Coastal Bioanalysts, Inc.

Sample Aging/Use/Pretreatment				
CBI Sample I.D.	**Collection Date/Time**	**Date(s)/Time(s) 1st Used in Tests**	**Date(s)/Time(s) Used in Renewals**	**Sample Adjustments**
MICR1320-A	4/16/13 0907	4/17/13 1300, 1315	N/A	Aerated 3 min
MICR1320-B	4/17/13 0903	4/18/13 1425, 1505	4/19/13 1310, 1330	Aerated 3.5-4 min
MICR1320-C	4/19/13 0715	4/20/13 1455, 1510	4/21/13 1255, 1340 4/22/13 1350, 1430 4/23/13 1145	Aerated 3-4 min

Chronic Test Water Quality (Mean/Std. Dev.)												
Test:	*C. dubia* 1002.0						*P. promelas* 1000.0					
% Conc:	**Cont.**	**6.25**	**12.5**	**25.0**	**50.0**	**100**	**Cont.**	**6.25**	**12.5**	**25.0**	**50.0**	**100**
Temp.	25	25	25	25	25	25	25	25	25	25	25	25
(°C)	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
D.O.	8.3	8.3	8.3	8.1	7.9	7.9	7.4	7.4	7.3	7.3	7.4	7.5
(mg/l)	0.3	0.4	0.4	0.2	0.2	0.2	0.7	0.6	0.6	0.6	0.5	0.5
pH	7.89	7.95	7.92	7.88	7.77	7.65	7.57	7.54	7.52	7.50	7.46	7.37
(S.U.)	0.25	0.28	0.25	0.21	0.14	0.16	0.20	0.21	0.21	0.21	0.21	0.23
Cond.	290	293	314	373	455	609	293	315	333	371	445	594
(µS/cm)	5.8	10	6.2	22	48	90	3.1	3.6	8.0	17	33	67

Chronic Test QA/QC Reference Toxicant: KCl Units: mg/l Test Organism Source: CBI Stock Cultures									
Species-Method	**Data**	**% Survival**		**Reproduction (# Young) or Biomass (mg)**					**RTT in**
(Ref. Test Date)	**Source**	**Cont.**	**NOEC**	**Cont.**	**NOEC**	**PMSD**	**IC25**	**IC25 A.L.**	**Control?**
C. dubia 1002.0	RTT	100	500	35.0	250	19	349	N/A	Yes
(4/1/13-4/7/13)	CC	97	500	26.0	250	22	315	226-405	
P. promelas 1000.0	RTT	98	500	0.58	500	15	626	N/A	Yes
(4/1/13-4/8/13)	CC	98	500	0.71	500	15	608	567-650	

Note: RTT = Reference Toxicant Test, CC = Control Chart, Cont. = Control group.

The results of analysis contained within this report relate only to the sample as received in the laboratory. This report shall not be reproduced except in full without written approval from the laboratory. Unless noted below, these test results meet all requirements of NELAP.

APPROVED:

Peter F. De Lisle, Ph.D.
Technical Director

4/29/13
Date

Deviations from, additions to, or exclusions from the test method, non-standard conditions or data qualifiers and, as appropriate, a statement of compliance/non-compliance: **NONE**

GLOSSARY OF TERMS AND ABBREVIATIONS

A.L. (Acceptance Limits): The results of a given reference toxicant test are compared to the control chart mean value ± 2 standard deviations. These limits approximate the 95% probability limits for the "true" reference toxicant value.

Chronic Value (ChrV): The geometric mean of the NOEC and LOEC. Units are same as test concentration units.

C.L. (Confidence Limits): These are the probability limits, based on the data set and statistical model employed, that the "true value" lies within the limits specified. Typically limits are based on 95% or 99% probabilities.

Control chart: A cumulative summary chart of results from QC tests with reference toxicants. The results of a given reference toxicant test are compared to the control chart mean value and 95% Acceptance Limits (A.L.) (mean ± 2 standard deviations).

IC25: The concentration of sample or chemical, calculated from the data set using statistical models, causing a 25% reduction in test organism growth, reproduction, etc. The lower the IC25, the more toxic the chemical or sample. Units are same as test concentration units.

LC50: The concentration of sample or chemical, calculated from the data set using statistical models, causing a 50% reduction in test organism survival. The lower the LC50, the more toxic the chemical or sample. Units are same as test concentration units. Note: The LC50 value must always be associated with the duration of exposure. Thus 48-h LC50, 96-h LC50, etc. are calculated.

LOEC: Lowest-observable-effect-concentration. The lowest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit a statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Units are same as test concentration units.

PMSD: Percent Minimum Significant Difference: The minimum difference which can exist between a test treatment and the controls in a particular test and be statistically significant; a measure of test sensitivity. The lower the PMSD the more sensitive the test.

N/A: Not applicable.

N/D: Not determined or measured.

NOAEC: No-observable-acute-effect-concentration. The highest concentration of sample or chemical in an acute test dilution series in which the test organisms exhibit no statistically significant reduction in the test end point (e.g. survival) compared to control organisms. Units are same as test concentration units.

NOEC: No-observable-effect-concentration. The highest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit no statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Some regulatory definitions also require that the NOEC be less than the LOEC. Units are same as test concentration units.

Q.L.: Quantitation Limit. Level, concentration, or quantity of a target variable (analyte) that can be reported at a specified degree of confidence.

T.U.: Toxic units. Expresses the relative toxicity of an effluent in such a manner that the larger the toxic unit value the more toxic the effluent. $T.U._{Ac}$ = 100/LC50. $T.U._{Chr}$ = 100/NOEC or 100/IC25. A dimensionless unit.

BASELINE TEST INFO – *Ceriodaphnia* 3-BROOD TEST

Coastal Bioanalysts, Inc
Form ETF0051E
Effective Date: 2/1/09

TEST ORGANISM INFO

Species: *Ceriodaphnia dubia*

Source: CBI Stock Cultures

Acclimation: **Water:** Mod. hard syn. FW ✓

Other: _____

Temp. (°C): 25

Brood Release: (start date/time) 4/16/13 1440

Brood Release: (end date/time) 4/16/13 1635

Feeding Prior to Test: *Selenastrum* + YCT mix[1]

Feeding During Test: *Selenastrum* + YCT mix[1]

TEST DESIGN

Test Chamber: ~30 ml glass vial ✓

Other _____

Solution Vol: 15 ml ✓

Other _____

Illumination: 16:8 L:D 10-20 uE/m²/s

Number of Replicates/Concentration: 10

Initial Number of Daphnids/Replicate: 1

Template No. 24

TEST SET UP (Day 0)

Set Up Date: 4/17/13

Set Up By: GB

Time Water Added: 1250

Time Animals Added: 1300

NOTES

[1]Food added daily to dilution water and test solutions at renewal for a final feeding level of 0.2 ml of YCT + algae mix per chamber (chamber algae concentration 2-2.3E5 cells/ml)

Peer Review by: PB Date: 4/23/13

Test I.D. MICR1320 -CCD

WATER QUALITY DATA – *Ceriodaphnia dubia* 3-BROOD TEST COASTAL BIOANALYSTS, INC FORM ETF0054D EFFECTIVE DATE: 2/12/10

Parameter	Treatment	Day 0 Initial	Day 1 Final	Day 1 Initial	Day 2 Final	Day 2 Initial	Day 3 Final	Day 3 Initial	Day 4 Final	Day 4 Initial	Day 5 Final	Day 5 Initial	Day 6 Final	Day 6 Initial	Day 7 Final
TEMP (°C)	C	25	25	25	25	25	25	25	25	25	26	25	24		
	1	25	25	25	25	25	25	25	25	25	26	25	24		
	2	25	25	25	25	25	25	25	25	25	26	25	24		
	3	25	25	25	25	25	25	25	25	25	26	25	24		
	4	25	25	25	25	25	25	25	25	25	26	—	—		
	5	25	25	25	25	25	25	25	25	25	26	—	—		
pH (S.U.)	C	7.63	8.36	7.73	7.87	7.69	8.04	7.57	8.08	7.85	8.25	7.76	7.88		
	1	7.69	8.39	7.75	7.97	7.71	8.24	7.62	8.09	7.81	8.42	7.77	7.91		
	2	7.71	8.35	7.75	8.01	7.71	8.31	7.62	8.00	7.79	8.18	7.77	7.89		
	3	7.71	8.24	7.76	8.02	7.71	8.18	7.59	7.85	7.75	8.09	7.75	7.87		
	4	7.71	8.04	7.74	7.84	7.69	7.89	7.55	7.81	7.65	7.81	—	—		
	5	7.68	7.93	7.69	7.77	7.64	7.82	7.39	7.58	7.45	7.56	—	—		
D.O. (mg/l)	C	8.2	8.7	8.2	8.4	8.0	8.4	8.0	8.5	7.9	9.0	8.1	8.1		
	1	8.2	8.8	8.2	8.3	7.9	8.6	7.9	8.5	7.9	9.4	8.1	8.0		
	2	8.2	8.8	8.2	8.4	7.9	8.9	7.8	8.5	7.8	8.9	8.1	8.0		
	3	8.2	8.4	8.2	8.4	8.0	8.4	7.8	8.1	7.8	8.4	8.1	7.8		
	4	8.2	7.9	8.2	7.9	8.0	8.0	7.8	7.9	7.8	7.7	—	—		
	5	8.2	7.9	8.2	8.0	8.0	7.6	7.8	7.9	7.8	7.6	—	—		
COND (uS/cm)	C	293		295		283		296		283		291			
	1	310		324		318		311		307		313			
	2	328		350		351		328		325		326			
	3	362		403		399		358		356		358			
	4	430		509		505		417		413		—			
	5	575		710		701		529		531		—			
Replicate:		S	B	S	I	S	A/I	S	G/I	S	B, I	S	J	S	
Initials:		GB	Ag		RCD		BH		RCD		AG		bjd		

C= 0 %	2= 12.5 %	4= 50.0 %
1= 6.25 %	3= 25.0 %	5= 100 %

Note: D.O. values > 8.3 mg/L (saturation conc.) due to photosynthetic activity of algal food. BH

TEST I.D. MICR/320 -CCD

REPRODUCTION/SURVIVAL DATA – *Ceriodaphnia* 3-BROOD TEST

Coastal Bioanalysts, Inc
Form ETF0053E
Effective Date: 2/12/10

Treat-ment	REP	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
C	A	0	0	0	0	10	0	
	B	0	0	3	10	0	14	
	C	0	0	4	0	14	18	
	D	0	0	4	0	10	18	
Lab	E	0	0	4	0	10	20	
Control	F	0	0	5	0	12	18	
	G	0	0	4	0	8	12	
	H	0	0	5	0	10	18	
	I	0	0	4	0	8	10	
	J	0	0	5	0	10	12	
1	A	0	0	4	10	0	10	
	B	0	0	4	6	0	12	
	C	0	0	3	0	14	14	
	D	0	0	4	0	12	14	
6.25%	E	0	0	4	0	10	10	
Conc.	F	0	0	5	0	10	14	
	G	0	0	0	6	6	0	
	H	0	0	5	0	8	6	
12.5	I	0	0	5	0	8	8	
Spl. Vol.	J	0	0	3	0	3	6	
2	A	0	0	2	0	3	6	
	B	0	0	3	6	0	8	
	C	0	0	2	0	4	6	
	D	0	0	5	0	1	14	
12.5%	E	0	0	3	0	0	10	
Conc.	F	0	0	5	0	3	4	
	G	0	0	4	0	7	6	
	H	0	0	3	0	2	2	
25	I	0	0	5	0	0	10	
Spl. Vol.	J	0	0	1	0	0	8	

Treat-ment	REP	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
3	A	0	0	4	8	0/X	—	
	B	0	0	5	0	0/X	—	
	C	0	0	3	0	4/X	—	
	D	0	0	5	0	5/X	—	
25.0%	E	0	0	5	0	6	6	
Conc.	F	0	0	3	0	5/X	—	
	G	0	0	3	0	5	3/X	
	H	0	0	5	0	0/X	—	
50	I	0	0	6	0	3	0	
Spl. Vol.	J	0	0	4	0	6	0	
4	A	0	0	0	4	0/X	—	—
	B	0	0	4	4	0/X	—	—
	C	0	0	4/x	—	—	—	—
	D	0	0	5/x	—	—	—	—
50.0%	E	0	0	4/x	—	—	—	—
Conc.	F	0	0	3/x	—	—	—	—
	G	0	0	4	0/X	—	—	—
	H	0	0/X	—	—	—	—	—
100	I	0	0	0/x	—	—	—	—
Spl. Vol.	J	0	0	5/x	—	—	—	—
5	A	0/X	—	—	—	—	—	
	B	0/X	—	—	—	—	—	
	C	0/X	—	—	—	—	—	
	D	0/X	—	—	—	—	—	
100%	E	0/X	—	—	—	—	—	
Conc.	F	0/X	—	—	—	—	—	
	G	0/X	—	—	—	—	—	
	H	0/X	—	—	—	—	—	
200	I	0	0	0	0	0/X	—	
Spl. Vol.	J	0/X	—	—	—	—	—	

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Count/Renewal Time*:	1425	1310	1455	1255	1430	1045	/
Initials:	AL	RCD	BH	RCD	AL	bja	/

*Counts are number of live offspring at renewal; dead adults indicated by a "X" with dashes (-) for subsequent test days. Time of final count (day 6 or 7) = test end time. Males, if present, identified (M) at test end. See printout of statistical analyses for total number of offspring by replicate.

Note: "Spl. Vol." = Volume sample added to total volume of 200 ml for preparation of dilutions.

NOTES:

Test I.D. MICR1320 -CCD

Ceriodaphnia Survival and Reproduction Test-48 Hr Survival

Start Date:	4/17/2013 13:00	Test ID:	MICR1320CD	Sample ID:	NATIONAL ARCHIVES II OUTFALL 00
End Date:	4/23/2013 10:45	Lab ID:	CBI	Sample Type:	WW
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	DATA ENTERED BY PB				

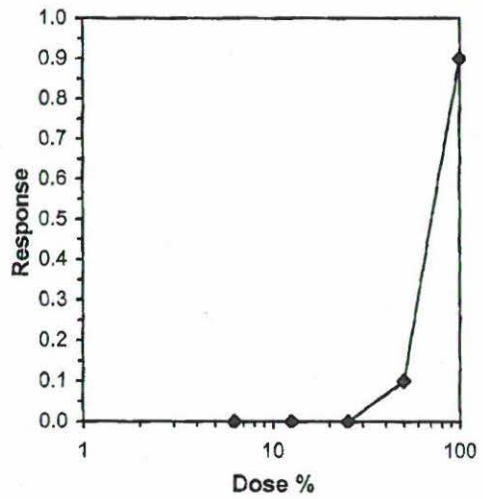
Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000
100	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000

			Transform: Arcsin Square Root					Number	Total
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Resp	Number
CONTROL	1.0000	1.0000	1.0472	1.0472	1.0472	0.000	10	0	10
6.25	1.0000	1.0000	1.0472	1.0472	1.0472	0.000	10	0	10
12.5	1.0000	1.0000	1.0472	1.0472	1.0472	0.000	10	0	10
25	1.0000	1.0000	1.0472	1.0472	1.0472	0.000	10	0	10
50	0.9000	0.9000	0.9948	0.5236	1.0472	16.644	10	1	10
100	0.1000	0.1000	0.5760	0.5236	1.0472	28.748	10	9	10

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.01)	2.61523	1.035	8E-15	23.3311
Equality of variance cannot be confirmed				

Trimmed Spearman-Karber

Trim Level	EC50	95% CL	
0.0%			
5.0%			
10.0%	70.711	62.951	79.427
20.0%	70.711	62.951	79.427
Auto-10.0%	70.711	54.525	91.700



ToxCalc v5.0.23

Reviewed by: PB

Ceriodaphnia Survival and Reproduction Test-6 Day Survival

Start Date:	4/17/2013 13:00	Test ID:	MICR1320CD	Sample ID:	NATIONAL ARCHIVES II OUTFALL 00
End Date:	4/23/2013 10:45	Lab ID:	CBI	Sample Type:	WW
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia

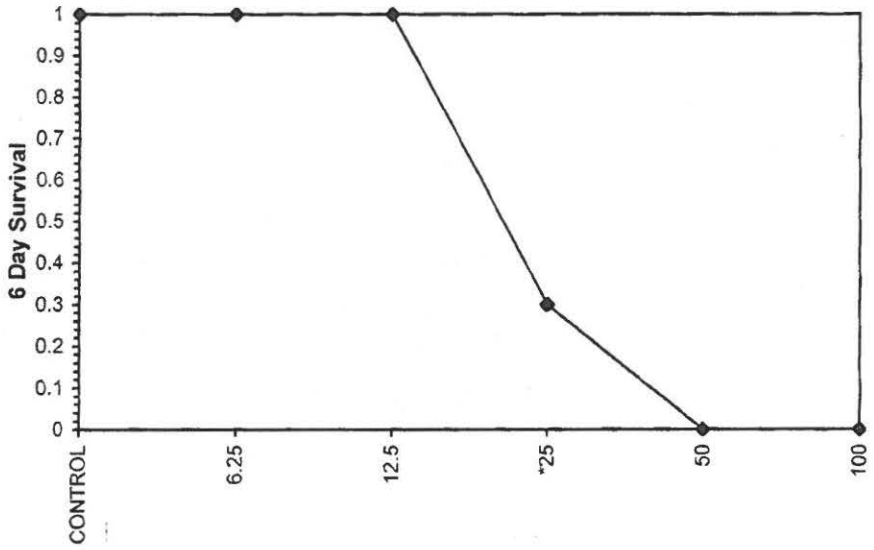
Comments: DATA ENTERED BY PB

Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	1.0000	1.0000
50	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
100	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Conc-%	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's Exact P	1-Tailed Critical
CONTROL	1.0000	1.0000	0	10	10	10		
6.25	1.0000	1.0000	0	10	10	10	1.0000	0.0500
12.5	1.0000	1.0000	0	10	10	10	1.0000	0.0500
*25	0.3000	0.3000	7	3	10	10	0.0015	0.0500
50	0.0000	0.0000	10	0	10	10		
100	0.0000	0.0000	10	0	10	10		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Fisher's Exact Test	12.5	25	17.6777	8

Dose-Response Plot



Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	4/17/2013 13:00	Test ID:	MICR1320CD	Sample ID:	NATIONAL ARCHIVES II OUTFALL 00
End Date:	4/23/2013 10:45	Lab ID:	CBI	Sample Type:	WW
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	DATA ENTERED BY PB				

Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	16.000	27.000	36.000	32.000	34.000	35.000	24.000	33.000	22.000	27.000
6.25	24.000	22.000	31.000	30.000	24.000	12.000	19.000	21.000	12.000	11.000
12.5	17.000	12.000	20.000	13.000	12.000	17.000	7.000	15.000	9.000	12.000
25	5.000	7.000	10.000	17.000	8.000	11.000	5.000	9.000	10.000	4.000
50	8.000	4.000	5.000	4.000	3.000	4.000	0.000	0.000	5.000	0.000
100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
CONTROL	28.600	1.0000	28.600	16.000	36.000	22.851	10				28.600	1.0000
*6.25	20.600	0.7203	20.600	11.000	31.000	34.870	10	2.958	1.999	5.405	20.600	0.7203
*12.5	13.400	0.4685	13.400	7.000	20.000	29.265	10	5.621	1.999	5.405	13.400	0.4685
25	8.600	0.3007	8.600	4.000	17.000	44.261	10				8.600	0.3007
50	3.300	0.1154	3.300	0.000	8.000	79.600	10				3.300	0.1154
100	0.000	0.0000	0.000	0.000	0.000	0.000	10				0.000	0.0000

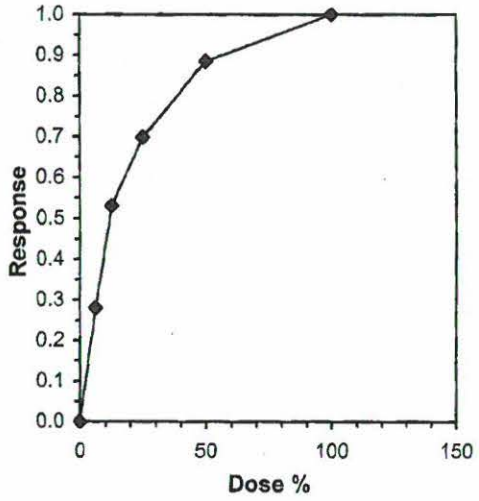
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.97252	0.9	-0.2863	-0.5143
Bartlett's Test indicates equal variances (p = 0.21)	3.14073	9.21034		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	<6.25	6.25			5.40536	0.189	578.133	36.563	2.8E-05	2, 27

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05*	1.117	0.862	0.712	3.749	4.3399
IC10*	2.234	1.135	1.424	6.488	2.2790
IC15*	3.352	1.351	2.135	7.197	1.3516
IC20*	4.469	1.459	2.847	7.972	0.8587
IC25*	5.586	1.514	3.559	9.008	0.5965
IC40	9.236	1.655	5.694	12.589	0.1671
IC50	11.719	2.000	8.967	17.120	1.1475

* indicates IC estimate less than the lowest concentration



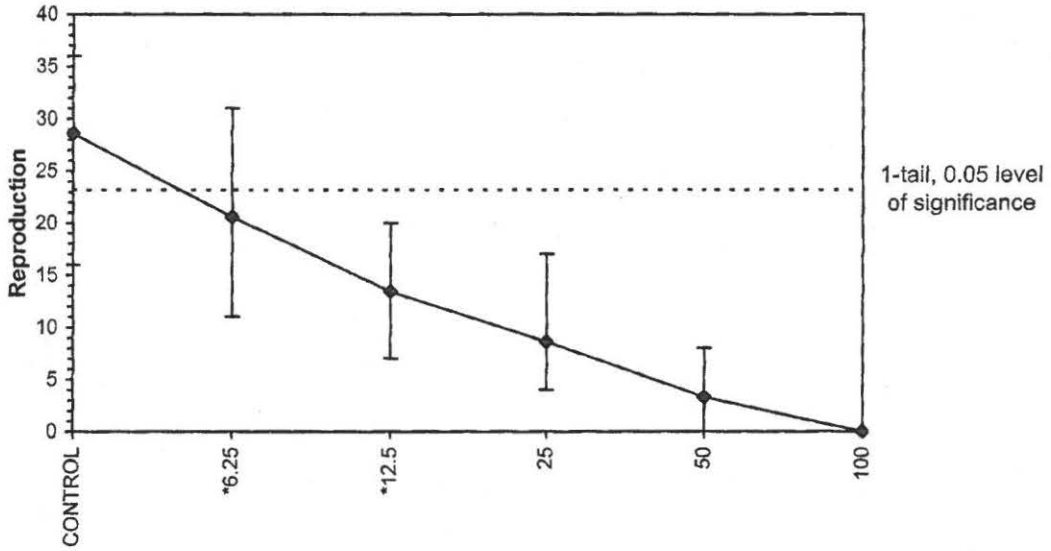
ToxCalc v5.0.23

Reviewed by: PD

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	4/17/2013 13:00	Test ID:	MICR1320CD	Sample ID:	NATIONAL ARCHIVES II OUTFALL 00
nd Date:	4/23/2013 10:45	Lab ID:	CBI	Sample Type:	WW
ample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	DATA ENTERED BY PB				

Dose-Response Plot



BASELINE TEST INFO – FATHEAD 7 DAY TEST

Coastal Bioanalysts, Inc
Form ETF0041C
Effective Date: 2/1/09

TEST ORGANISM INFO

Species: *Pimephales promelas*

Source: CBI Stock Cultures: ✓

Other: _____

Hatch Date/Time: 04/16/13 1700
(start)

Hatch Date/Time: 04/17/13 0930
(end)

Acclimation: **Water:** Mod. hard syn. FW ✓

Other: _____

Temp. (°C): 25

Feeding Prior to Test: *Artemia ad libitum* 2X/day

Feeding During Test: *Artemia* 0.15 g/rep 2X/day

Arrival Date: NA
(non-CBI)

TEST DESIGN

Test Chamber: 1000 ml Tri-pour beaker ✓

Other _____

Solution Vol: 500 ml ✓

Other _____

Illumination: 16:8 L:D 10-20 uE/m²/s

Number of Replicates/Concentration: 4

Initial Number of Fish/Replicate: 10

TEST SET UP (Day 0)

Set Up Date: 04/17/13

Set Up By: bja

Time Water Added: 1305

Time Animals Added: 1315

NOTES

Peer Review by PB/GB Date 4/25/13

Test I.D. MTCR1320 -CPP

WATER QUALITY DATA – *Pimephales promelas* 7-day Larval Test COASTAL BIOANALYSTS, INC FORM ETF0042C EFFECTIVE DATE: 2/15/10

Parameter	Treatment	Day 0 Initial	Day 1 Final	Day 1 Initial	Day 2 Final	Day 2 Initial	Day 3 Final	Day 3 Initial	Day 4 Final	Day 4 Initial	Day 5 Final	Day 5 Initial	Day 6 Final	Day 6 Initial	Day 7 Final
TEMP (°C)	C	25	25	25	25	25	24	25	24	25	24	25	25	25	25
	1	25	25	25	25	25	24	25	24	25	24	25	25	25	25
	2	25	25	25	25	25	24	25	24	25	24	25	25	25	25
	3	25	25	25	25	25	24	25	24	25	24	25	25	25	25
	4	25	25	25	25	25	24	25	24	25	24	25	25	25	25
	5	25	25	25	25	25	24	25	24	25	24	25	25	25	25
pH (S.U.)	C	7.77	7.53	7.74	7.58	7.67	7.57	7.54	7.25	7.76	7.23	7.76	7.53	7.75	7.26
	1	7.77	7.55	7.78	7.52	7.67	7.43	7.56	7.25	7.74	7.20	7.74	7.46	7.72	7.23
	2	7.77	7.55	7.78	7.45	7.67	7.40	7.56	7.25	7.72	7.20	7.71	7.42	7.65	7.21
	3	7.77	7.54	7.78	7.45	7.67	7.35	7.55	7.23	7.69	7.15	7.67	7.36	7.61	7.19
	4	7.75	7.54	7.76	7.45	7.66	7.31	7.50	7.22	7.59	7.12	7.60	7.29	7.53	7.14
	5	7.70	7.53	7.71	7.43	7.62	7.27	7.39	7.14	7.43	7.00	7.40	7.22	7.33	6.99
D.O. (mg/l)	C	8.2	7.8	8.0	7.5	7.9	7.3	8.0	6.4	7.7	6.5	7.6	6.8	7.7	6.2
	1	8.2	7.8	8.0	7.4	7.8	6.8	7.8	6.7	7.6	6.5	7.5	6.9	7.7	6.3
	2	8.2	7.6	8.0	7.3	7.7	6.6	7.7	6.6	7.6	6.6	7.5	7.0	7.7	6.5
	3	8.2	7.6	8.0	7.3	7.7	6.6	7.7	6.5	7.5	6.7	7.5	7.1	7.8	6.5
	4	8.2	7.6	8.0	7.3	7.8	6.5	7.6	7.2	7.6	6.9	7.6	7.2	7.8	6.4
	5	8.2	7.6	8.0	7.4	7.9	6.4	7.6	7.1	7.7	7.1	7.7	7.4	7.8	6.5
COND (uS/cm)	C	298		294		289		294		290		292		295	
	1	316		319		319		316		310		311		313	
	2	333		343		346		330		326		327		328	
	3	370		393		395		364		356		358		358	
	4	441		490		493		432		418		421		421	
	5	588		684		694		558		540		545		547	
Replicate:		D	D	A	C	B	A	D	B	C	A	A	B	C	D
Initials:		bjâ	AG	AG	GB	RCD	RCD	BH	AG	RCD	GB	AG	GB	bjâ	GB

C= 0 %	2= 12.5 %	4= 50.0 %
1= 6.25 %	3= 25.0 %	5= 100 %

TEST I.D. MJCR1320 -CPP

SURVIVAL & GROWTH DATA – FATHEAD MINNOW 7 DAY TEST Coastal Bioanalysts, Inc Form ETF0043F Effective Date: 11/26/07

Treatment[1]	Rep Ltr	Number of Live Fish							Fish Dry Weight Data (mg)[2]			Notes
		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Pan #	Tot. Wt.	Tare Wt.	
C CONTROL	A	10	10	10	10	10	10	10	25	15.87	10.28	① Dead fuzzy fish.
	B	10	10	10	10	10	10	10	26	16.10	10.34	
	C	10	10	10	10	10	10	10	27	16.09	9.92	
	D	10	10	10	10	10	10	10	28	16.96	11.19	
1 C: 6.25%	A	10	10	10	10	10	10	10	29	14.23	10.20	
	B	10	10	10	10	10	10	10	30	13.10	7.86	
	C	10	10	10	10	10	10	10	31	12.09	7.68	
V: 100	D	10	10	10	10	10	10	10	32	15.05	10.35	
2 C: 12.5%	A	10	10	10	10	10	10	10	33	15.09	11.03	
	B	10	10	10	10	10	10	10	34	13.76	9.59	
	C	10	10	10	10	10	10	10	35	13.95	9.13	
V: 200	D	10	10	10	10	9	9	9	36	12.62	8.78	
3 C: 25.0%	A	10	10	10	10	9	9	9	37	12.56	9.09	
	B	10	10	10	10	10	10	10	38	11.04	6.91	
	C	10	10	10	10	9	9	9	39	10.81	7.34	
V: 400	D	10	10	10	10	10	10	9①	40	10.13	6.52	
4 C: 50.0%	A	10	10	10	10	10	10	9①	41	11.78	7.84	
	B	10	10	10	10	10	10	10	42	11.08	6.68	
	C	10	10	10	10	10	10	9①	43	12.23	9.13	
V: 800	D	10	10	10	10	10	10	9	44	12.25	8.63	
5 C: 100%	A	10	10	10	10	10	9	9	45	11.16	7.89	
	B	10	10	10	10	10	9	8①	46	13.04	9.54	
	C	10	10	10	10	10	10	8①	47	13.06	9.18	
V: 1600	D	10	10	10	10	10	10	8①	48	13.64	9.92	
Renewal/Count Time:		1505	1330	1510	1340	1350	1145	1400[3]	Tare Wt: Date: 4/28 Cal. Chk (100.00 mg[4]): 99.44 Init:			
Initials:		AC	RCD	BH	RCD	AC	kja	kja	Tot. Wt: Date: 4/25 Cal. Chk (100.00 mg[4]): 100.00 Init: RB			

[1] C = Concentration; V = Volume (ml) sample added to total volume of 1600 ml for preparation of solutions. [2] See printout of statistical analyses for biomass weights. [3] Time final count = test end time. [4] True value ± estimated uncertainty of calib. weight (NIST traceable annual certification) = 100.00 ± 0.01 mg

Test ID MTCR1320 -CPP

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:	4/17/2013 13:15	Test ID:	MICR1320	Sample ID:	NAT ARCHIVES II OUTFALL 001
End Date:	4/24/2013 14:00	Lab ID:	CBI	Sample Type:	WW
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	DATA ENTERED BY PB				

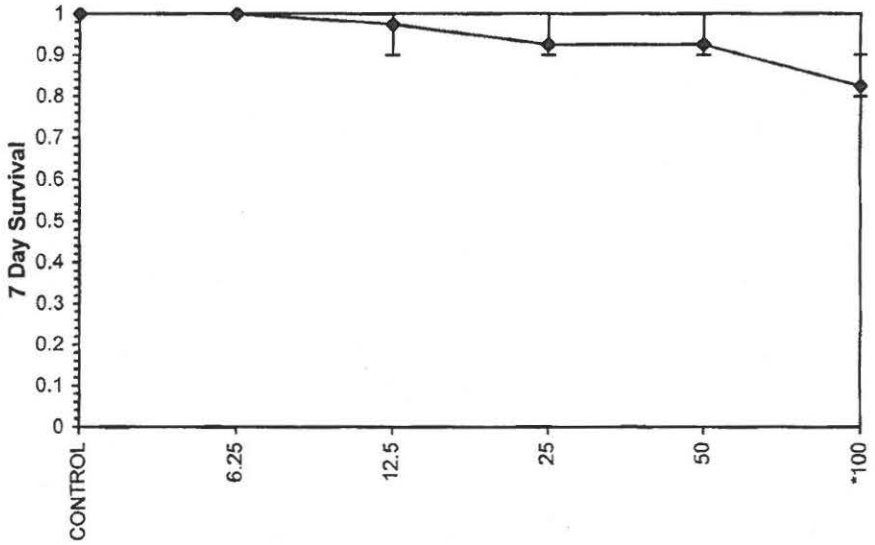
Conc-%	1	2	3	4
CONTROL	1.0000	1.0000	1.0000	1.0000
6.25	1.0000	1.0000	1.0000	1.0000
12.5	1.0000	1.0000	1.0000	0.9000
25	0.9000	1.0000	0.9000	0.9000
50	0.9000	1.0000	0.9000	0.9000
100	0.9000	0.8000	0.8000	0.8000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
CONTROL	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4		
6.25	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4	18.00	10.00
12.5	0.9750	0.9750	1.3713	1.2490	1.4120	5.942	4	16.00	10.00
25	0.9250	0.9250	1.2898	1.2490	1.4120	6.318	4	12.00	10.00
50	0.9250	0.9250	1.2898	1.2490	1.4120	6.318	4	12.00	10.00
*100	0.8250	0.8250	1.1426	1.1071	1.2490	6.209	4	10.00	10.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.87315	0.884	0.68828	0.97514
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

Dose-Response Plot



ToxCalc v5.0.23

Reviewed by: SD

Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:	4/17/2013 13:15	Test ID:	MICR1320	Sample ID:	NAT ARCHIVES II OUTFALL 001
End Date:	4/24/2013 14:00	Lab ID:	CBI	Sample Type:	WW
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	DATA ENTERED BY PB				

Conc-%	1	2	3	4
CONTROL	0.5590	0.5740	0.6170	0.5770
6.25	0.4030	0.5240	0.4410	0.4700
12.5	0.4060	0.4170	0.4820	0.3840
25	0.3470	0.4130	0.3470	0.3610
50	0.3940	0.4400	0.3100	0.3620
100	0.3270	0.3500	0.3880	0.3670

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
CONTROL	0.5818	1.0000	0.5818	0.5590	0.6170	4.260	4				0.5818	1.0000
*6.25	0.4595	0.7899	0.4595	0.4030	0.5240	11.100	4	4.083	2.360	0.0707	0.4595	0.7899
*12.5	0.4223	0.7258	0.4223	0.3840	0.4820	9.977	4	5.327	2.360	0.0707	0.4223	0.7258
*25	0.3670	0.6309	0.3670	0.3470	0.4130	8.547	4	7.172	2.360	0.0707	0.3718	0.6390
*50	0.3765	0.6472	0.3765	0.3100	0.4400	14.524	4	6.855	2.360	0.0707	0.3718	0.6390
100	0.3580	0.6154	0.3580	0.3270	0.3880	7.223	4				0.3580	0.6154

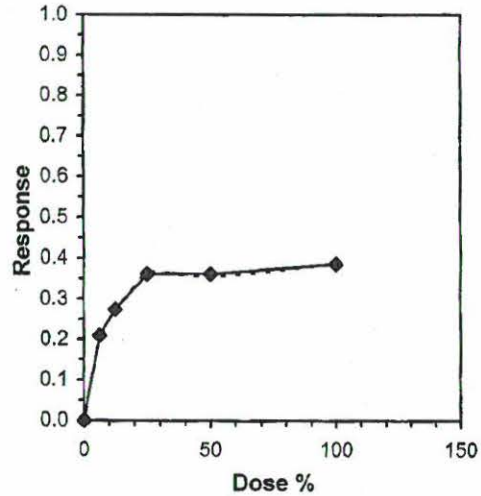
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.93415	0.868	0.34321	-0.4694
Bartlett's Test indicates equal variances (p = 0.72)	2.11165	13.2767		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	<6.25	6.25			0.07066	0.12147	0.03014	0.00179	2.0E-05	4, 15

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)		Skew
IC05*	1.487	0.312	1.001	2.967	1.2880
IC10*	2.974	0.623	2.001	5.935	1.2880
IC15*	4.461	0.932	3.002	9.026	1.2152
IC20*	5.948	1.744	4.002	14.634	1.4910
IC25	10.141	2.829	3.380	20.194	0.3639
IC40	>100				
IC50	>100				

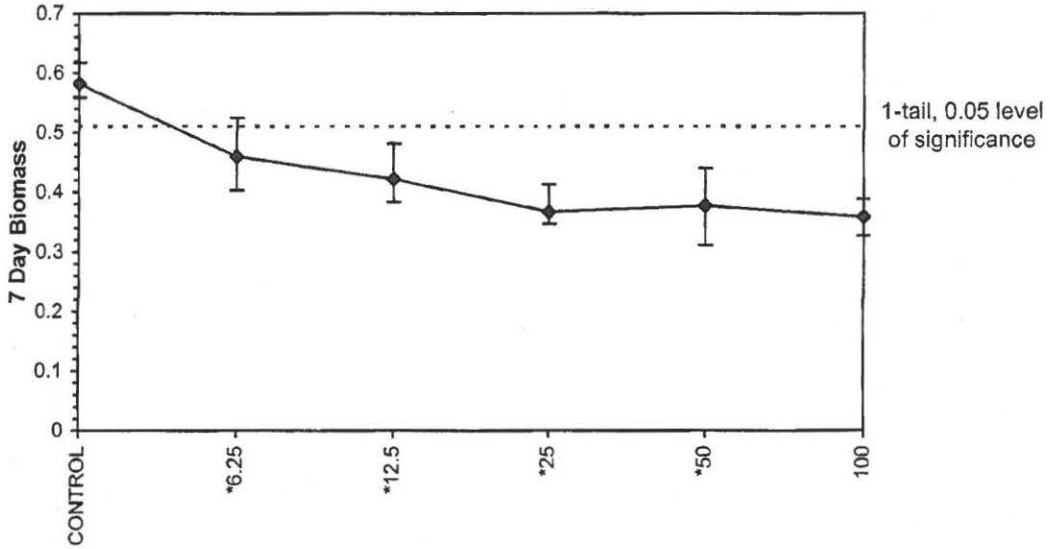
* indicates IC estimate less than the lowest concentration



Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:	4/17/2013 13:15	Test ID:	MICR1320	Sample ID:	NAT ARCHIVES II OUTFALL 001
'nd Date:	4/24/2013 14:00	Lab ID:	CBI	Sample Type:	WW
ample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	DATA ENTERED BY PB				

Dose-Response Plot



EFFLUENT SAMPLE & DILUTION WATER CHARACTERISTICS
FRESHWATER TESTS FORM ETF2031E

COASTAL BIOANALYSTS, INC
EFFECTIVE DATE: 1/14/10

INITIAL SAMPLE CHARACTERIZATION[1]					
Sample Bottle[2]	A-1	B-1	C-1		NOTES:
Tot. Res. Chlorine (mg/l)	<Q.L	<Q.L	<Q.L.		① 4/20/13 GA
Hardness (mg/l $CaCO_3$)	88	114	132		
Alkalinity (mg/l $CaCO_3$)	45	61	49		
NH_3-N (mg/l)	<1.0	<1.0	<1.0		
Color/Appearance[3]	C	C	C		
Obvious Odor?	NO	NO	NO		
Date/Time	4/17 1035	4/18 1100	4/20 1215		
Initials	GB	Ac	BH		____ TRC corrected for potential positive interference by Mn or Cr with KI & $NaAsO_2$

SAMPLE PREPARATION MEASUREMENTS (100% concentration)								
Sample Bottle[2]	A-1,2	B1-4	B1-4	C1-8	C1-8	C1-8	C1-8	
Prep Temperature (°C)	25	25	25	25	25	25	25	
Conductivity (uS/cm)[4]	581	707	NA	532	NA	NA	NA	
D.O. (mg/l) After Warming	9.6	10.0	10.7	9.8	9.7	10.4	10.0	
Aeration Time (min)	3.0	3.5	4.0	3.0	3.0	4.0	3.5	
Adjusted D.O.	8.2	8.2	8.2	8.2	8.1	8.2	8.2	
Final pH (S.U.)	7.66	7.65	7.58	7.41	7.56	7.46	7.37	
Tot. Res. Chlorine (mg/l)[5]	N.D.	N.D.	N.D	N.D.	N.D	N.D.	N.D.	
Sample Filtered (60 um)?	YES	YES	Yes	Yes	Yes	YES	YES	
Date/Time	4/17 1245	4/18 1330	4/19 1245	4/20 1415	4/21 1240	4/22 1335	4/23 1105	
Initials	bja	Ac	RCD	BH	RCD	Ac	bja	

DILUTION WATER CHARACTERISTICS								
Vat Number	1	1	2	2	3	3	3	
Temperature (°C)	25	25	25	25	25	25	25	
Conductivity (uS/cm)	299	292	303	290	295	292	293	
D.O. (mg/l)	8.2	8.2	8.2	8.2	8.2	8.2	8.2	
pH (S.U.)	7.79	7.71	7.73	7.82	7.73	7.63	7.73	
Hardness (mg/l $CaCO_3$)	~~90~~ 92 ①	92	98	98	82	82	82	
Alkalinity (mg/l $CaCO_3$)	60	60	61	61	60	60	60	
Date/Time	4/17 0830	4/18 0835	4/19 0830	4/20 0910	4/21 0915	4/22 0920	4/23 0815	
Initials	LA	Ac	GA	RCD	Ac	GA	GA	

[1]Q.L. = Quantification Limit, N.D. = Not Determined/Measured, NA = Not Applicable
[2]Ninth character of Laboratory Sample I.D. (on chain of custody form) and bottle number in collection series (e.g. "A-2" is sample bottle number 2 from "A" collection). Together with project ID below constitutes entire sample bottle ID.
[3]C-Clear, O-Opaque, T-Turbid, S-Solids (Sl-Slight, M-Moderate, H-Heavy), Y-Yellow, B-Brown, Bl-Black, G-Green
[4]Conductivity measured on first use of sample only
[5]Total residual chlorine measured after sample prep only if present in initial sample characterization

Peer Rev by RD Date 4/23/13 PROJECT I.D. MICR1320
(First 8 characters of Laboratory Sample ID)

Coastal Bioanalysts
6400 Enterprise Court, Gloucester, VA 23061
PH: 804-694-8285, FAX: 804-695-1129
www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011H Rev. 1/14/11)

Lab Sample ID (Lab Use Only): m I C R 1 3 2 0 - A

A A A A Y Y N N (Project ID) — A (Spl)

CBI Login # 13-0308

FACILITY INFORMATION LB&B

CLIENT/FACILITY NAME	National Archives II	CONTACT & PHONE #	Bob Gentry 301 837 3247
NPDES PERMIT NO	MD 0065871	OUTFALL # OR LOCATION	outfall 001
SAMPLE CHLORINATED?	N	SAMPLE DECHLORINATED?	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?

TESTS REQUESTED:	SPECIES OR EPA METH #	ACUTE ☐	CHRONIC ☒
	SPECIES OR EPA METH #	ACUTE ☐	CHRONIC ☒
OTHER TESTS:			

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	4/15/13 0907	SAMPLE END DATE & TIME	4/16/13 0907	AUTOSAMPLER TEMP. (°C)	4.5°
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION*	NUMBER SUBSAMPLES 97	VOL (ml) SUBSAMPLES 100 mls		TIME INCREMENT 15 min	
	SET VOLUME SUBSAMPLE —	SET VOLUME FLOW —		TOTAL VOLUME 9 L	

*FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
15.2°	7.14	4.5°	<0.03	4/16/13 0920	JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeffrey Duszynski MLI — (PRINTED NAME/AFFILIATION SAMPLER/ANALYST)

Jeffrey Duszynski — (SIGNATURE)

4/16/13 — (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
Jeffrey Duszynski	4/16/13	1300	VPS
	4/17/13	1030	J.B.

SHIPPING METHOD: UPS ✓ FEDEX____ HAND DELIVERY____

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER____

SAMPLE TEMP: (°C) 1 ARRIVED ON ICE? Y ✓ N___ CUSTODY SEAL: INTACT___ BROKEN___ ABSENT ✓

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

Coastal Bioanalysis
6400 Enterprise Court, Gloucester, VA 23061
PH: 804-694-8285, FAX: 804-695-1129
www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011H Rev. 1/14/11)

Lab Sample ID (Lab Use Only): M I C R 1 3 2 0 - B
A A A A Y Y N N (Project ID) — A (Spl)

CBI Login # 13-0314

FACILITY INFORMATION

CLIENT/FACILITY NAME	L&B/National Archives	CONTACT & PHONE #	Bob Gentry
NPDES PERMIT NO		OUTFALL # OR LOCATION	Outfall 001
SAMPLE CHLORINATED? N	SAMPLE DECHLORINATED? N	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?	

TESTS REQUESTED:	SPECIES OR EPA METH #	ACUTE ☐	CHRONIC ☒
	SPECIES OR EPA METH #	ACUTE ☐	CHRONIC ☒
OTHER TESTS:			

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	4/16/13 0918	SAMPLE END DATE & TIME	4/17/13 0903	AUTOSAMPLER TEMP. (°C)	3.4°
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION*	NUMBER SUBSAMPLES 97	VOL (ml) SUBSAMPLES 100 mls		TIME INCREMENT 15 min	
	SET VOLUME SUBSAMPLE —	SET VOLUME FLOW —		TOTAL VOLUME 9L	

*FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
20.2°	7.35	3.4°	<0.03	4/17/13 0910	JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeff Duszynski / Microbac — [signature] — 4/17/13
(PRINTED NAME/AFFILIATION SAMPLER/ANALYST) (SIGNATURE) (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
[signature]	4/17/13	1500	UPS
	4/18/13	1055	[signature]

SHIPPING METHOD: UPS ✓ FEDEX ____ HAND DELIVERY ____

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER ____

SAMPLE TEMP: (°C) 1 ARRIVED ON ICE? Y ✓ N ___ CUSTODY SEAL: INTACT ___ BROKEN ___ ABSENT ✓

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

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www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011H Rev. 1/14/11)

Lab Sample ID (Lab Use Only): M I C R 1 3 2 0 - C
A A A A Y Y N N (Project ID) — A (Spl)

CBI Login # 13-0325

FACILITY INFORMATION

CLIENT/FACILITY NAME	LBB / National Archives	CONTACT & PHONE #	Bob Gentry
NPDES PERMIT NO	MD 0065871	OUTFALL # OR LOCATION	Outfall 001
SAMPLE CHLORINATED?	N	SAMPLE DECHLORINATED? N	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?

TESTS REQUESTED:	SPECIES OR EPA METH #	ACUTE	CHRONIC*
		☐	☒
	SPECIES OR EPA METH #	ACUTE	CHRONIC*
		☐	☒

OTHER TESTS:

*A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING. WILL BE USED UNLESS INDICATED OTHERWISE. IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	4/18/13 0730	SAMPLE END DATE & TIME	4/19/13 0715	AUTOSAMPLER TEMP. (°C)	5.0°
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION*	NUMBER SUBSAMPLES 96	VOL (ml) SUBSAMPLES 200 ml/s		TIME INCREMENT 15 min	
	SET VOLUME SUBSAMPLE —	SET VOLUME FLOW —		TOTAL VOLUME 18L	

*FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
17.5°	6.83	5.0°	<0.03	4/19/13 0730	JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeffrey Duszynski / Microbac — [signature] — 4/19/13
(PRINTED NAME/AFFILIATION SAMPLER/ANALYST) (SIGNATURE) (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
[signature]	4/19/13	1500	UPS
	4/20/13	1205	[signature]

SHIPPING METHOD: UPS ☒ FEDEX____ HAND DELIVERY____

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER____

SAMPLE TEMP: (°C) 1° ARRIVED ON ICE? Y ✓ N___ CUSTODY SEAL: INTACT___ BROKEN___ ABSENT ✓

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

MICROBAC®

Microbac Laboratories, Inc.

Baltimore Division

2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800
Fax: 410-633-6553
www.microbac.com

COVER LETTER

Bob Gentry
LB&B Associates
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740

April 04, 2014
Report No.: 14C0918

RE: Toxic Chemical Bioassay (4 Quarters)

The report of analyses contains test results for samples received at Microbac Laboratories, Inc., Baltimore Division on 03/25/2014 11:00-03/28/2014 16:30. The samples were subcontracted to:

Coastal Bioanalyst

The enclosed results were obtained from and applicable to the sample(s) as received at the laboratory. All sample results are reported on an "as received" basis unless otherwise noted.

All data included in this report has been reviewed and meet the applicable project and certification specific requirements, unless otherwise noted.

This report has been paginated in its entirety and shall not be reproduced except in full, without the written approval of Microbac Laboratories, Inc.

We appreciate the opportunity to service your analytical needs. If you have any questions, please feel free to contact us.

This Data Package contains the following:

- This Cover Page
- Cooler Receipt Log
- Chain of Custody

Final report reviewed by:	Michael M. Gallion/Project Manager	4/4/2014 Report issue date

If we have not met or exceeded your expectations, please contact the Director or Trevor Boyce, President at tboyce@microbac.com or Robert Morgan, Chief Operation Officer, at rmorgan@microbac.com.

All samples received in proper condition and results conform to ISO 17025 standards unless otherwise noted.

MICROBAC®

Microbac Laboratories, Inc.

Baltimore Division

2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-18
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www.microbac.co

CERTIFICATE OF ANALYSIS

LB&B Associates	Project: Toxic Chemical Bioassay (4 Quarters)	Report: 14C0920
Fac. Ops & Maint., 8601 Adelphi Road	Project Number: Toxic Chemical Bioassay (4 Quarters)	Reported: 04/04/2014 08:19
College Park, MD 20740	Project Manager: Bob Gentry	

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Cooler Receipt Log

Cooler ID: Default Cooler **Cooler Temp:** 1.60°C **Work Order:** 14C0918

Custody Seals Intact:	Yes	COC/Containers Agree:	Yes
Containers Intact:	Yes	Correct Preservation:	Yes
Received On Ice:	Yes	Correct Number of Containers Received:	Yes
Radiation Scan Acceptable:	Yes	Sufficient Sample Volume for Testing:	Yes
COC Present:	Yes	Samples Received in Proper Condition:	Yes

Comments:

Cooler ID: Default Cooler **Cooler Temp:** **Work Order:** 14C0919

Custody Seals Intact:	Yes	COC/Containers Agree:	Yes
Containers Intact:	Yes	Correct Preservation:	Yes
Received On Ice:	Yes	Correct Number of Containers Received:	Yes
Radiation Scan Acceptable:	Yes	Sufficient Sample Volume for Testing:	Yes
COC Present:	Yes	Samples Received in Proper Condition:	Yes

Comments:

Cooler ID: Default Cooler **Cooler Temp:** 1.60°C **Work Order:** 14C0920

Custody Seals Intact:	Yes	COC/Containers Agree:	Yes
Containers Intact:	Yes	Correct Preservation:	Yes
Received On Ice:	Yes	Correct Number of Containers Received:	Yes
Radiation Scan Acceptable:	Yes	Sufficient Sample Volume for Testing:	Yes
COC Present:	Yes	Samples Received in Proper Condition:	Yes

Comments:

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Phone: 410-633-1800
Fax: 410-633-6553
www.microbac.com

14C0918

Tenatively Scheduled Date: **3/24/2014**

Client: **LB&B Associates**
Project: **Toxic Chemical Bioassay (4 Quarters)**
Project Number: **Toxic Chemical Bioassay (4 Quarters)**

Report To:
Bob Gentry
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone: (301) 837-3247

Invoice To:
Bill Sanchez
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone :(301) 837-3255

TAT 21 days

Sample ID: 001

Lab Sample ID: **14C0918-01**
Matrix: Wastewater
Type: Composite

Sample Start Date & Time: 3/24/14 0915
Sampled Date & Time: 3/25/14 0915
Volume: 10L

Analysis	Method	Container	Hold
SUBCONTRACT	Subout		120

Total Containers: 0

Sampled by: Jeff J. Duszynski	Date/Time: 3/25/14 1100	Received by: HNW
Printed Name: Jeff J. Duszynski		Printed Name: HNW
Relinquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:
Relinquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:

As Received at Laboratory: On Ice: Yes / No Cooler Temp 1.6 Rad Scan Acceptable: Yes / No Total Bottles 0

Notes:

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Phone: 410-633-1800
Fax: 410-633-6553
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14C0919

Tenatively Scheduled Date: **3/25/2014**

Client: **LB&B Associates**
Project: **Toxic Chemical Bioassay (4 Quarters)**
Project Number: **Toxic Chemical Bioassay (4 Quarters)**

Report To:
Bob Gentry
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone: (301) 837-3247

Invoice To:
Bill Sanchez
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone :(301) 837-3255

TAT 21 days

Sample ID: 001

Lab Sample ID: **14C0919-01**
Matrix: Wastewater
Type: Composite

Sample Start Date & Time: 3/25/14 0930
Sampled Date & Time: 3/26/14 0930
Volume: 15L

Analysis	Method	Container	Hold
SUBCONTRACT	Subout		120

Total Containers: 0

Sampled by: [signature]	Date/Time: 3/26/14 1430	Received by: [signature]
Printed Name: Jeff J. Duszynski		Printed Name:
Relinquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:
[illegible]uished by:	Date/Time:	Received by:
[illegible]d Name:		Printed Name:

As Received at Laboratory: On Ice: Yes / No Cooler Temp _____ Rad Scan Acceptable: Yes / No Total Bottles 0

Notes:

MICROBAC Microbac Laboratories, Inc., Baltimore Division
2101 Van Deman Street • Baltimore, MD 21224
Phone: 410-633-1800
Fax: 410-633-6553
www.microbac.com

14C0920

Tentatively Scheduled Date: **3/27/2014**

Client: **LB&B Associates**
Project: **Toxic Chemical Bioassay (4 Quarters)**
Project Number: **Toxic Chemical Bioassay (4 Quarters)**

Report To:
Bob Gentry
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone: (301) 837-3247

Invoice To:
Bill Sanchez
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone :(301) 837-3255

TAT 21 days

Sample ID: OC1

Lab Sample ID: **14C0920-01**
Matrix: Wastewater
Type: Composite

Sample Start Date & Time: 3/27/14 0815
Sampled Date & Time: 3/28/14 0815
Volume: 19L

Analysis	Method	Container	Hold
SUBCONTRACT	Subout		120

Total Containers: 0

Sampled by: [signature]	Date/Time: 3/28/14 1630	Received by: [signature]
Printed Name: Jeff J. Duszynski		Printed Name:
Relinquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:
Relinquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:

As Received at Laboratory: On Ice: Yes / No Cooler Temp 1.6 Rad Scan Acceptable: Yes / No Total Bottles 0

Notes:

Client: Microbac Laboratories, Inc.
Project ID: MICR1408
Client Sample ID: LBB/National Archives Outfall 001
Permit No.: MD0065871
Sample Period: 3/25/14 to 3/28/14

Coastal Bioanalysts, Inc.

Report of Analysis: Whole Effluent Toxicity (WET)

Submitted To:	**Prepared By:**
Mr. Michael Arbaugh Sr. Microbac Laboratories, Inc. Baltimore Division 2101 Van Deman Street Baltimore, MD 21224	Coastal Bioanalysts, Inc. 6400 Enterprise Court Gloucester, VA 23061 (804) 694-8285 www.coastalbio.com Contact: Peter F. De Lisle, Technical Director

Chronic Test Results*

Species-Test Method	Endpoint	NOEC	LOEC	ChrV	PMSD	$T.U._C$	IC25	48-h LC50	LC50 95% C.L.	$T.U._{Ac}$
C. dubia	Survival	100	>100	>100	N/A	N/A	N/A	>100	N/A	<1.00
EPA 1002.0	Reproduction	100	>100	>100	20	**<1.00**	>100	N/A	N/A	N/A
P. promelas	Survival	100	>100	>100	N/A	N/A	N/A	>100	N/A	<1.00
EPA 1000.0	Biomass	100	>100	>100	17	**<1.00**	>100	N/A	N/A	N/A

*Note: Details regarding test conduct and data analysis provided in attached bench sheets and printouts as applicable.

Chronic Test QA/QC Reference Toxicant: KCl Units: mg/l Test Organism Source: CBI Stock Cultures

Species-Method (Ref. Test Date)	Data Source	% Survival		Reproduction (# Young) or Biomass (mg)					RTT in Control?
		Cont.	NOEC	Cont.	NOEC	PMSD	IC25	IC25 A.L.	
C. dubia 1002.0	RTT	100	500	21.6	250	17	359	N/A	Yes
(3/5/14-3/11/14)	CC	98	500	26.3	250	22	336	262-410	
P. promelas 1000.0	RTT	100	500	0.61	500	15	606	N/A	Yes
(3/4/14-3/11/14)	CC	98	500	0.65	500	14	621	585-658	

Note: RTT = Reference Toxicant Test, CC = Control Chart, Cont. = Control group.

The results of analysis contained within this report relate only to the sample as received in the laboratory. This report shall not be reproduced except in full without written approval from the laboratory. Unless noted below, these test results meet all requirements of NELAP.

APPROVED:

Peter F. De Lisle, Ph.D.
Technical Director

4/3/14
Date

Deviations from, additions to, or exclusions from the test method, non-standard conditions or data qualifiers and, as appropriate, a statement of compliance/non-compliance: **NONE**

VELAP# 460030
EPA# VA01116

GLOSSARY OF TERMS AND ABBREVIATIONS

A.L. (Acceptance Limits): The results of a given reference toxicant test are compared to the control chart mean value ± 2 standard deviations. These limits approximate the 95% probability limits for the "true" reference toxicant value.

Chronic Value (ChrV): The geometric mean of the NOEC and LOEC. Units are same as test concentration units.

C.L. (Confidence Limits): These are the probability limits, based on the data set and statistical model employed, that the "true value" lies within the limits specified. Typically limits are based on 95% or 99% probabilities.

Control chart: A cumulative summary chart of results from QC tests with reference toxicants. The results of a given reference toxicant test are compared to the control chart mean value and 95% Acceptance Limits (A.L.) (mean ± 2 standard deviations).

IC25: The concentration of sample or chemical, calculated from the data set using statistical models, causing a 25% reduction in test organism growth, reproduction, etc. The lower the IC25, the more toxic the chemical or sample. Units are same as test concentration units.

LC50: The concentration of sample or chemical, calculated from the data set using statistical models, causing a 50% reduction in test organism survival. The lower the LC50, the more toxic the chemical or sample. Units are same as test concentration units. Note: The LC50 value must always be associated with the duration of exposure. Thus 48-h LC50, 96-h LC50, etc. are calculated.

LOEC: Lowest-observable-effect-concentration. The lowest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit a statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Units are same as test concentration units.

PMSD: Percent Minimum Significant Difference: The minimum difference which can exist between a test treatment and the controls in a particular test and be statistically significant; a measure of test sensitivity. The lower the PMSD the more sensitive the test.

N/A: Not applicable.

N/D: Not determined or measured.

NOAEC: No-observable-acute-effect-concentration. The highest concentration of sample or chemical in an acute test dilution series in which the test organisms exhibit no statistically significant reduction in the test end point (e.g. survival) compared to control organisms. Units are same as test concentration units.

NOEC: No-observable-effect-concentration. The highest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit no statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Some regulatory definitions also require that the NOEC be less than the LOEC. Units are same as test concentration units.

Q.L.: Quantitation Limit. Level, concentration, or quantity of a target variable (analyte) that can be reported at a specified degree of confidence.

T.U.: Toxic units. Expresses the relative toxicity of an effluent in such a manner that the larger the toxic unit value the more toxic the effluent. $T.U._{Ac} = 100/LC50$. $T.U._{Chr} = 100/NOEC$. A dimensionless unit.

Ceriodaphnia test set up bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

Test chamber:	~30 ml glass vial:	✓	Illumination & photoperiod:	50-100 ft-c 16L:8D
	Other:		Number of replicates/treatment:	10
Test solution volume:	15 ml:	✓	Initial number animals/replicate:	1
	Other (ml):		Template #:	5

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE	

SPECIES:	Ceriodaphnia dubia	
ACCLIMATION WATER:	Mod. Hard Synthetic Freshwater	
FEEDING (Culture &Test):	YCT + Selenastrum capricornutum mix	
SOURCE:	CBI Stock cultures	
ACCLIMATION TEMP (o C):	25	
BROOD RELEASE FROM:	3/25/14 14:10	
BROOD RELEASE TO:	3/25/14 20:20	
DATE/TIME WATER ADDED:	3/26/14 12:05	
DATE/TIME ANIMALS ADDED:	3/26/14 12:21	
ANIMAL AGE WINDOW (TAC 8 h):	6h 10m	
MAX AGE AT TEST START (TAC 24 h):	22h 11m	
TEST SET UP BY:	RCD	
TEST ID:	**MICR1408CCD**	
PEER REVIEW BY (Initial/Date):	**PB**	4/1/14 15:14
MICR1408CCD		

Ceriodaphnia daily water quality bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

		Day 0	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7	SUMMARY WATER QUALITY DATA			
	TRTMNT	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	MEAN	S.D.	MIN.	MAX.
pH (S.U.)	C	7.93	8.31	7.90	7.87	7.91	7.83	7.79	7.98	7.91	8.22	7.94	8.03			7.97	0.15	7.79	8.31
	1	7.91	8.46	7.88	8.25	7.90	8.21	7.79	8.06	7.89	8.12	7.92	8.10			8.04	0.20	7.79	8.46
	2	7.88	8.53	7.88	8.00	7.87	8.19	7.79	8.12	7.89	8.30	7.90	8.23			8.05	0.23	7.79	8.53
	3	7.83	8.55	7.84	8.07	7.82	8.15	7.74	8.33	7.83	8.22	7.86	8.16			8.03	0.25	7.74	8.55
	4	7.74	8.56	7.75	8.18	7.75	8.15	7.68	8.12	7.76	8.22	7.74	8.11			7.98	0.28	7.68	8.56
	5	7.60	8.34	7.59	8.08	7.54	8.12	7.54	8.05	7.63	8.05	7.56	8.21			7.86	0.31	7.54	8.34
Temp. (o C)	C	24	25	25	25	24	25	25	25	24	25	25	25			25	0.5	24	25
	1	24	25	25	25	24	25	25	25	24	25	25	25			25	0.5	24	25
	2	24	25	25	25	24	25	25	25	24	25	25	25			25	0.5	24	25
	3	25	25	25	25	25	25	25	25	24	25	25	25			25	0.3	24	25
	4	25	25	25	25	25	25	25	25	25	25	25	25			25	0.0	25	25
	5	25	25	25	25	25	25	25	25	25	25	25	25			25	0.0	25	25
Diss. Oxygen (mg/l)	C	8.0	8.6	7.9	7.9	8.0	8.2	7.8	8.5	7.9	8.0	8.0	8.3			8.1	0.3	7.8	8.6
	1	8.0	8.7	7.9	8.0	8.0	8.2	7.7	8.5	7.9	8.0	8.0	8.3			8.1	0.3	7.7	8.7
	2	7.9	9.0	8.0	8.1	7.9	8.4	7.7	8.6	7.9	8.7	8.1	8.3			8.2	0.4	7.7	9.0
	3	7.8	9.1	8.0	8.0	7.8	8.7	7.7	8.7	7.8	8.2	8.1	8.4			8.2	0.4	7.7	9.1
	4	7.8	8.8	8.0	8.2	7.7	8.6	7.7	8.9	7.9	8.2	8.2	8.5			8.2	0.4	7.7	8.9
	5	7.9	8.5	8.2	8.2	7.7	8.6	7.8	8.6	8.0	8.0	8.2	8.6			8.2	0.3	7.7	8.6
Cond. (uS/cm)	C	290		293		290		287		290		293				291	2.3	287	293
	1	330		298		297		308		311		309				309	11.9	297	330
	2	361		299		301		323		323		325				322	22.4	299	361
	3	432		303		308		358		357		355				352	46.5	303	432
	4	573		310		312		415		413		414				406	96.1	310	573
	5	831		324		325		531		530		535				513	186.2	324	831
Replicate measured		S	B	S	I	S	F	S	C	S	E	S	H			NOTE: Final D.O. Values >8.3 mg/l (saturation) may occur due to photosynthetic activity of algal food.			
Initials		RCD	AG		RCD		RCD		RCD		AG		GB						
Changes & Notes (Initials, date, specific change or notes)																			
												TRT ID:	1	2	3	4	5		
MICR1408CCD												CONC:	6.25%	12.5%	25.0%	50.0%	100%		

Ceriodaphnia daily reproduction count bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

TMNT	Rep	Repro Day 0	Repro Day 1	Repro Day 2	Repro Day 3	Repro Day 4	Repro Day 5	Repro Day 6	Repro Day 7	4th Broods Removed	TOTAL REPRO
	A	0	0	0	0	0	6	8			14
C	B	0	0	0	4	8	0	12			24
	C	0	0	0	6	8	0	14			28
Lab	D	0	0	0	6	6	0	12			24
Control	E	0	0	0	4	6	0	12			22
	F	0	0	0	4	10	0	12			26
	G	0	0	0	2	12	0	14			28
	H	0	0	0	4	10	0	10			24
	I	0	0	0	2	0	10	12			24
	J	0	0	0	2	10	0	12			24
	A	0	0	0	2	0	14	14			30
#1	B	0	0	0	2	8	0	14			24
	C	0	0	0	4	8	0	12			24
6.25%	D	0	0	0	2	4	0	14			20
	E	0	0	0	6	12	0	16			34
Vol. Effl:	F	0	0	0	6	8	0	14			28
12.5 ml	G	0	0	0	4	12	0	14			30
	H	0	0	0	4	8	0	14			26
	I	0	0	0	4	8	0	12			24
	J	0	0	0	4	8	0	14			26
	A	0	0	0	4	0	10	12			26
# 2	B	0	0	0	4	8	0	12			24
	C	0	0	0	6	8	0	14			28
12.5%	D	0	0	0	4	6	0	16			26
	E	0	0	0	6	8	0	14			28
Vol. Effl:	F	0	0	0	4	8	0	14			26
25 ml	G	0	0	0	0	6	8	16			30
	H	0	0	0	4	0	12	14			30
	I	0	0	0	2	10	0	12			24
	J	0	0	0	4	8	0	12			24
	A	0	0	0	2	0	10	12			24
# 3	B	0	0	0	4	0	0	0			4
	C	0	0	0	4	12	0	14			30
25.0%	D	0	0	0	4	10	0	16			30
	E	0	0	0	4	10	0	14			28
Vol. Effl:	F	0	0	0	4	8	0	14			26
50 ml	G	0	0	0	4	8	0	14			26
	H	0	0	0	4	10	0	12			26
	I	0	0	0	2	12	0	12			26
	J	0	0	0	2	12	0	14			28
	A	0	0	0	6	0	8	12			26
# 4	B	0	0	0	4	10	0	14			28
	C	0	0	0	6	10	0	16			32
50.0%	D	0	0	0	2	0	0	12			14
	E	0	0	0	6	10	0	12			28
Vol. Effl:	F	0	0	0	4	0	14	12			30
100 ml	G	0	0	0	4	8	0	16			28
	H	0	0	0	6	6	0	14			26
	I	0	0	0	2	0	7	16			25
	J	0	0	0	4	8	0	14			26
	A	0	0	0	6	10	0	16			32
# 5	B	0	0	0	2	6	0	12			20
	C	0	0	0	2	8	0	14			24
100%	D	0	0	0	6	10	0	14			30
	E	0	0	0	4	12	0	14			30
Vol. Effl:	F	0	0	0	6	12	0	16			34
200 ml	G	0	0	0	4	12	0	12			28
	H	0	0	0	6	14	0	12			32
	I	0	0	0	4	8	0	16			28
	J	0	0	0	6	12	0	14			32
INITIALS:		RCD	AG	RCD	RCD	RCD	AG	GB			
DATE & TIME:		3/26/14 12:21	3/27/14 14:03	3/28/14 13:02	3/29/14 15:20	3/30/14 13:07	3/31/14 10:36	4/1/14 12:19			
SAMPLE USED:		A	B	B	C	C	C				
CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE											

MICR1408CCD | Avg. young/surviving control (TAC 15 min): 23.8 | Surv. controls with 3 broods: 9

SAMPLE COLLECTION

SAMPLE	COLLECTION DATE & TIME
A	3/25/14 9:15
B	3/26/14 9:30
C	3/28/14 8:15
D	
E	

SAMPLE AGING

SAMPLE:	A
1st USE DATE/TIME:	3/26/14 12:21
LAST USE DATE/TIME:	3/26/14 12:21
TIME COLLECT TO 1st USE:	27h 6m
	(TAC 36 h max)
TIME 1st TO LAST USE:	0h 0m
	(TAC MAX 72 h)
SAMPLE:	B
1st USE DATE/TIME:	3/27/14 14:03
LAST USE DATE/TIME:	3/28/14 13:02
TIME COLLECT TO 1st USE:	28h 34m
	(TAC 36 h max)
TIME 1st TO LAST USE:	22h 58m
	(TAC MAX 72 h)
SAMPLE:	C
1st USE DATE/TIME:	3/29/14 15:20
LAST USE DATE/TIME:	3/31/14 10:36
TIME COLLECT TO 1st USE:	31h 6m
	(TAC 36 h max)
TIME 1st TO LAST USE:	43h 16m
	(TAC MAX 72 h)
SAMPLE:	D
1st USE DATE/TIME:	
LAST USE DATE/TIME:	
TIME COLLECT TO 1st USE:	0
	(TAC 36 h max)
TIME 1st TO LAST USE:	0
	(TAC MAX 72 h)
SAMPLE:	E
1st USE DATE/TIME:	
LAST USE DATE/TIME:	
TIME COLLECT TO 1st USE:	0
	(TAC 36 h max)
TIME 1st TO LAST USE:	0
	(TAC MAX 72 h)

Ceriodaphnia daily survival count bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

TRTMNT	Rep	#Live Day 0	#Live Day 1	#Live Day 2	#Live Day 3	#Live Day 4	#Live Day 5	#Live Day 6	#Live FINAL	MALE OR FEMALE	TOTAL REPRO	REPRO/ SURV FEM
	A	1	1	1	1	1	1	1	1	F	14	14
C	B	1	1	1	1	1	1	1	1	F	24	24
	C	1	1	1	1	1	1	1	1	F	28	28
Lab	D	1	1	1	1	1	1	1	1	F	24	24
Control	E	1	1	1	1	1	1	1	1	F	22	22
	F	1	1	1	1	1	1	1	1	F	26	26
	G	1	1	1	1	1	1	1	1	F	28	28
	H	1	1	1	1	1	1	1	1	F	24	24
	I	1	1	1	1	1	1	1	1	F	24	24
	J	1	1	1	1	1	1	1	1	F	24	24
	A	1	1	1	1	1	1	1	1	F	30	
#1	B	1	1	1	1	1	1	1	1	F	24	
	C	1	1	1	1	1	1	1	1	F	24	
6.25%	D	1	1	1	1	1	1	1	1	F	20	
	E	1	1	1	1	1	1	1	1	F	34	
	F	1	1	1	1	1	1	1	1	F	28	
	G	1	1	1	1	1	1	1	1	F	30	
	H	1	1	1	1	1	1	1	1	F	26	
	I	1	1	1	1	1	1	1	1	F	24	
	J	1	1	1	1	1	1	1	1	F	26	
	A	1	1	1	1	1	1	1	1	F	26	
# 2	B	1	1	1	1	1	1	1	1	F	24	
	C	1	1	1	1	1	1	1	1	F	28	
12.5%	D	1	1	1	1	1	1	1	1	F	26	
	E	1	1	1	1	1	1	1	1	F	28	
	F	1	1	1	1	1	1	1	1	F	26	
	G	1	1	1	1	1	1	1	1	F	30	
	H	1	1	1	1	1	1	1	1	F	30	
	I	1	1	1	1	1	1	1	1	F	24	
	J	1	1	1	1	1	1	1	1	F	24	
	A	1	1	1	1	1	1	1	1	F	24	
# 3	B	1	1	1	1	0	0	0	0	F	4	
	C	1	1	1	1	1	1	1	1	F	30	
25.0%	D	1	1	1	1	1	1	1	1	F	30	
	E	1	1	1	1	1	1	1	1	F	28	
	F	1	1	1	1	1	1	1	1	F	26	
	G	1	1	1	1	1	1	1	1	F	26	
	H	1	1	1	1	1	1	1	1	F	26	
	I	1	1	1	1	1	1	1	1	F	26	
	J	1	1	1	1	1	1	1	1	F	28	
	A	1	1	1	1	1	1	1	1	F	26	
# 4	B	1	1	1	1	1	1	1	1	F	28	
	C	1	1	1	1	1	1	1	1	F	32	
50.0%	D	1	1	1	1	1	1	1	1	F	14	
	E	1	1	1	1	1	1	1	1	F	28	
	F	1	1	1	1	1	1	1	1	F	30	
	G	1	1	1	1	1	1	1	1	F	28	
	H	1	1	1	1	1	1	1	1	F	26	
	I	1	1	1	1	1	1	1	1	F	25	
	J	1	1	1	1	1	1	1	1	F	26	
	A	1	1	1	1	1	1	1	1	F	32	
# 5	B	1	1	1	1	1	1	1	1	F	20	
	C	1	1	1	1	1	1	1	1	F	24	
100%	D	1	1	1	1	1	1	1	1	F	30	
	E	1	1	1	1	1	1	1	1	F	30	
	F	1	1	1	1	1	1	1	1	F	34	
	G	1	1	1	1	1	1	1	1	F	28	
	H	1	1	1	1	1	1	1	1	F	32	
	I	1	1	1	1	1	1	1	1	F	28	
	J	1	1	1	1	1	1	1	1	F	32	
		See Reproduction Sheet for Renewal Information					See ToxCalc printout for summary survival & reproduction data					
CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE												
MICR1408CCD		% Control survival (TAC 80% min):			100		% Surviving controls with 3 broods (TAC 60% min):			90		

Ceriodaphnia Survival and Reproduction Test-6 Day Survival

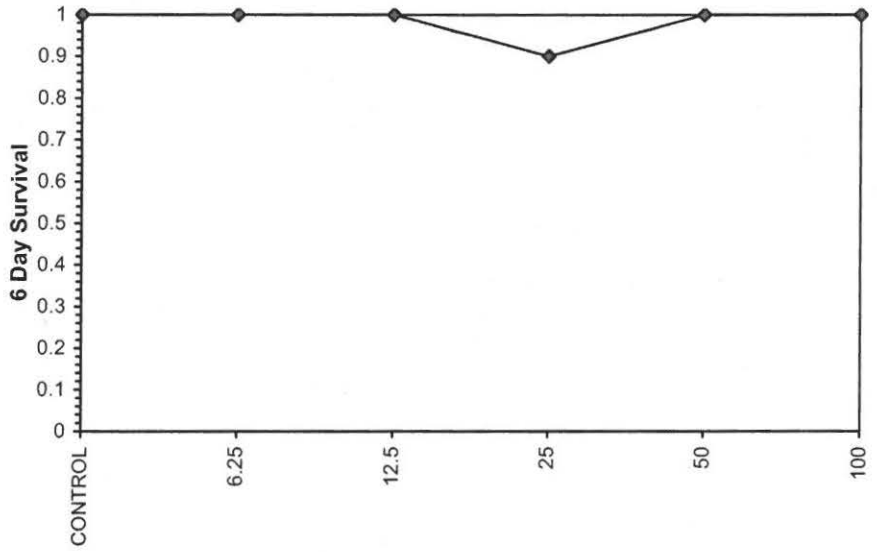
Start Date:		Test ID:	MICR1408CD	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	DATA ENTERED BY PB				

Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Conc-%	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's Exact P	1-Tailed Critical
CONTROL	1.0000	1.0000	0	10	10	10		
6.25	1.0000	1.0000	0	10	10	10	1.0000	0.0500
12.5	1.0000	1.0000	0	10	10	10	1.0000	0.0500
25	0.9000	0.9000	1	9	10	10	0.5000	0.0500
50	1.0000	1.0000	0	10	10	10	1.0000	0.0500
100	1.0000	1.0000	0	10	10	10	1.0000	0.0500

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Fisher's Exact Test		>100		1

Dose-Response Plot



Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	Test ID: MICR1408CD	Sample ID:	
End Date:	Lab ID: CBI	Sample Type:	
Sample Date:	Protocol: EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments: DATA ENTERED BY PB			

Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	14.000	24.000	28.000	24.000	22.000	26.000	28.000	24.000	24.000	24.000
6.25	30.000	24.000	24.000	20.000	34.000	28.000	30.000	26.000	24.000	26.000
12.5	26.000	24.000	28.000	26.000	28.000	26.000	30.000	30.000	24.000	24.000
25	24.000	4.000	30.000	30.000	28.000	26.000	26.000	26.000	26.000	28.000
50	26.000	28.000	32.000	14.000	28.000	30.000	28.000	26.000	25.000	26.000
100	32.000	20.000	24.000	30.000	30.000	34.000	28.000	32.000	28.000	32.000

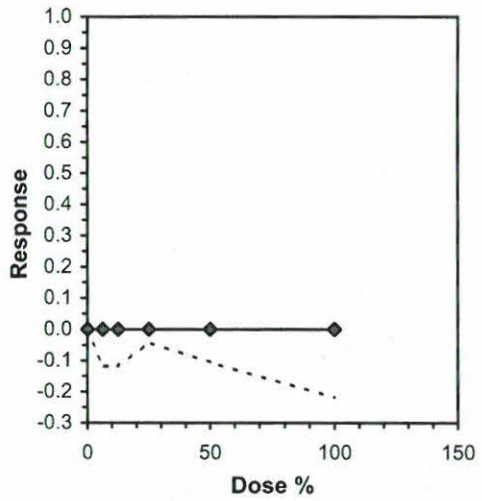
			Transform: Untransformed					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
CONTROL	23.800	1.0000	23.800	14.000	28.000	16.548	10			26.183	1.0000
6.25	26.600	1.1176	26.600	20.000	34.000	15.058	10	123.50	75.00	26.183	1.0000
12.5	26.600	1.1176	26.600	24.000	30.000	8.718	10	129.00	75.00	26.183	1.0000
25	24.800	1.0420	24.800	4.000	30.000	30.461	10	127.50	75.00	26.183	1.0000
50	26.300	1.1050	26.300	14.000	32.000	18.283	10	132.00	75.00	26.183	1.0000
100	29.000	1.2185	29.000	20.000	34.000	14.630	10	138.50	75.00	26.183	1.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.01)	1.43913	1.035	-2.1581	7.29417
Bartlett's Test indicates equal variances (p = 0.03)	12.1811	15.0863		

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

Linear Interpolation (200 Resamples)

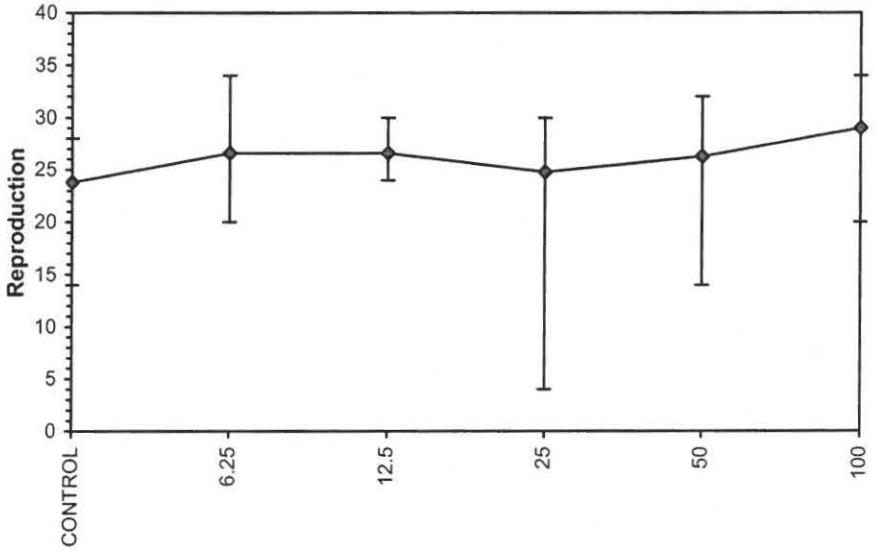
Point	%	SD	95% CL	Skew
IC05	>100			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	[illegible]			
IC40	>100			
IC50	>100			



Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	Test ID:	MICR1408CD	Sample ID:	
End Date:	Lab ID:	CBI	Sample Type:	
Sample Date:	Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	DATA ENTERED BY PB			

Dose-Response Plot



Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	Test ID: MICR1408CD	Sample ID:	
End Date:	Lab ID: CBI	Sample Type:	
Sample Date:	Protocol: EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments: DATA ENTERED BY PB			

Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	14.000	24.000	28.000	24.000	22.000	26.000	28.000	24.000	24.000	24.000
6.25	30.000	24.000	24.000	20.000	34.000	28.000	30.000	26.000	24.000	26.000
12.5	26.000	24.000	28.000	26.000	28.000	26.000	30.000	30.000	24.000	24.000
25	24.000	4.000	30.000	30.000	28.000	26.000	26.000	26.000	26.000	28.000
50	26.000	28.000	32.000	14.000	28.000	30.000	28.000	26.000	25.000	26.000
100	32.000	20.000	24.000	30.000	30.000	34.000	28.000	32.000	28.000	32.000

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
CONTROL	23.800	1.0000	23.800	14.000	28.000	16.548	10			
6.25	26.600	1.1176	26.600	20.000	34.000	15.058	10	-1.319	2.287	4.853
12.5	26.600	1.1176	26.600	24.000	30.000	8.718	10	-1.319	2.287	4.853
25	24.800	1.0420	24.800	4.000	30.000	30.461	10	-0.471	2.287	4.853
50	26.300	1.1050	26.300	14.000	32.000	18.283	10	-1.178	2.287	4.853
100	29.000	1.2185	29.000	20.000	34.000	14.630	10	-2.450	2.287	4.853

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.01)	1.43913	1.035	-2.1581	7.29417
Bartlett's Test indicates equal variances (p = 0.03)	12.1811	15.0863		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	4.85295	[illegible]	31.7767	22.5204	0.23507	5, 54

Dunnett's test for PMSD only-pd

Fathead minnow test set up bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

Test chamber:	1000 ml Poly Beaker	✓	Illumination & photoperiod:	50-100 ft-c 16L:8D
	Other:		Number of replicates/treatment:	4
Test solution vol. (250 ml min):	500 ml:	✓	Initial number animals/replicate:	10
	Other (ml):			

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE	

SPECIES:	Pimephales promelas	
ACCLIMATION WATER:	Mod. Hard Synthetic Freshwater	
FEEDING PRIOR TO TEST:	Artemia nauplii (<24 h old) ad libitum	
FEEDING DURING TEST:	Artemia nauplii (<24 h old, ~0.15 ml) 2x/day	
SOURCE:	CBI Stock cultures	
ACCLIMATION TEMP (o C):	25	
HATCH START DATE & TIME:	3/25/14 17:00	
HATCH END DATE & TIME:	3/26/14 9:00	
DATE/TIME WATER ADDED:	3/26/14 11:44	
DATE/TIME ANIMALS ADDED:	3/26/14 11:56	
ANIMAL AGE WINDOW:	16h 0m	
MAX AGE AT TEST START (TAC 24 h MAX):	18h 56m	
TEST SET UP BY:	AG	
TEST ID:	MICR1408CPP	
PEER REVIEW BY (Initial/Date):	PB. GB	4/3/14 9:54
MICR1408CPP		

Fathead minnow daily water quality bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

		Day 0		Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7	SUMMARY WATER QUALITY DATA			
	TRTMNT	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Final	MEAN	S.D.	MIN.	MAX.
pH (S.U.)	C	8.04	7.62	7.97	7.52	7.96	7.40	7.79	7.45	7.89	7.44	7.91	7.39	7.90	7.45	7.70	0.25	7.39	8.04
	1	8.03	7.62	7.95	7.46	7.94	7.40	7.86	7.33	7.86	7.42	7.88	7.36	7.89	7.45	7.68	0.26	7.33	8.03
	2	8.00	7.60	7.92	7.43	7.90	7.40	7.84	7.36	7.82	7.41	7.88	7.34	7.87	7.43	7.66	0.25	7.34	8.00
	3	7.94	7.58	7.88	7.41	7.87	7.38	7.80	7.36	7.80	7.37	7.85	7.34	7.83	7.40	7.63	0.24	7.34	7.94
	4	7.83	7.55	7.80	7.38	7.78	7.36	7.72	7.33	7.76	7.35	7.75	7.32	7.75	7.37	7.58	0.21	7.32	7.83
	5	7.60	7.50	7.62	7.34	7.58	7.31	7.56	7.29	7.63	7.37	7.56	7.27	7.52	7.35	7.46	0.13	7.27	7.63
Temp. (o C)	C	25	25	25	25	24	25	24	24	24	24	25	25	24	24	25	0.5	24	25
	1	25	25	25	25	24	25	24	24	24	24	25	25	24	24	25	0.5	24	25
	2	25	25	25	25	24	25	24	24	24	24	25	25	25	24	25	0.5	24	25
	3	25	25	25	25	24	25	24	24	24	24	25	25	25	24	25	0.5	24	25
	4	25	25	25	25	24	25	24	24	24	24	25	25	25	24	25	0.5	24	25
	5	25	25	25	25	24	25	24	24	24	24	25	25	25	24	25	0.5	24	25
Diss. Oxygen (mg/l)	C	8.1	7.4	8.0	7.7	8.0	7.3	8.0	7.1	8.0	6.9	7.7	6.9	7.9	7.1	7.6	0.4	6.9	8.1
	1	8.1	7.4	8.1	7.5	7.9	7.1	7.9	7.0	7.9	6.9	7.7	6.9	7.9	7.2	7.5	0.4	6.9	8.1
	2	8.1	7.4	8.1	7.4	7.8	7.0	7.8	6.9	7.9	7.0	7.7	6.9	7.9	7.2	7.5	0.4	6.9	8.1
	3	8.2	7.4	8.1	7.3	7.7	6.9	7.7	7.0	7.9	7.0	7.7	6.9	7.9	7.1	7.5	0.5	6.9	8.2
	4	8.2	7.4	8.1	7.3	7.7	6.9	7.7	7.0	7.9	7.1	7.7	7.0	7.9	7.1	7.5	0.4	6.9	8.2
	5	8.2	7.4	8.2	7.3	7.7	6.9	7.8	7.1	8.0	7.4	7.9	7.0	7.8	7.1	7.6	0.4	6.9	8.2
Cond. (uS/cm)	C	295		295		295		297		295		300		290		295	3.0	290	300
	1	332		307		301		312		313		316		310		313	9.7	301	332
	2	367		320		304		325		328		331		327		329	19.0	304	367
	3	435		334		309		351		357		361		355		357	38.7	309	435
	4	567		367		317		401		411		413		411		412	76.6	317	567
	5	844		460		347		499		520		519		522		530	151.8	347	844
Replicate measured		A	B	C	D	A	C	B	A	D	B	C	A	D	B				
Initials		AG	AG	AG	GB	RCD	RCD	RCD	RCD	RCD	GB	AG	GB	GB	GB				
Changes & Notes (Initials, date, specific change or notes)																			

	Test Aerated?	No		D.O. Highest conc. @ aeration:		TRT ID:	1	2	3	4	5	
MICR1408CPP	Date & Time Air Start:			Total live highest conc.@ aeration		CONC(%):	6.25%	12.5%	25.0%	50.0%	100%	

Fathead minnow daily biological measurements bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

TRTMNT	Rep	#Live Day 0	#Live Day 1	#Live Day 2	#Live Day 3	#Live Day 4	#Live Day 5	#Live Day 6	#Live Day 7	Total Dry Wt (mg)	Tare Wt (mg)	Wt Count	Pan Number
C	A	10	10	10	10	10	10	10	10	13.40	6.68	10	1
	B	10	10	10	10	9	9	9	9	12.55	6.65	10	2
Lab	C	10	10	10	10	10	10	10	10	13.77	7.74	10	3
Control	D	10	10	10	10	10	10	10	10	14.48	7.11	10	4
#1	A	10	10	10	10	10	10	10	10	13.93	6.71	10	5
6.25%	B	10	10	10	10	10	10	10	10	13.77	7.92	10	6
Vol. Effl:	C	10	10	10	10	10	10	10	10	14.43	7.41	10	7
100 ml	D	10	10	10	10	10	10	10	10	13.68	6.91	10	8
# 2	A	10	10	10	10	10	10	10	10	13.94	7.29	10	9
12.5%	B	10	10	10	10	10	10	10	9	13.56	8.11	10	10
Vol. Effl:	C	10	10	10	10	10	10	10	10	13.40	7.52	10	11
200 ml	D	10	10	10	10	10	10	10	10	14.25	6.89	10	12
# 3	A	10	10	10	10	10	10	10	10	13.74	6.75	10	13
25.0%	B	10	10	10	10	10	10	10	10	14.71	9.33	10	14
Vol. Effl:	C	10	10	10	10	10	10	10	10	14.56	8.70	10	15
400 ml	D	10	10	10	10	10	10	10	10	14.83	8.85	10	16
# 4	A	10	10	10	10	10	10	10	10	15.08	8.37	10	17
50.0%	B	10	10	10	10	10	10	10	10	14.94	8.25	10	18
Vol. Effl:	C	10	10	10	10	10	10	10	10	15.25	8.40	10	19
800 ml	D	10	10	10	10	10	10	9	9	12.02	6.48	10	20
# 5	A	10	10	10	10	9	9	9	9	13.84	8.08	10	21
100%	B	10	10	10	10	10	10	10	10	13.06	7.15	10	22
Vol. Effl:	C	10	10	10	10	10	10	10	10	13.35	7.50	10	23
1600 ml	D	10	10	10	10	10	10	10	10	15.25	8.44	10	24
INITIALS:		AG	AG	RCD	RCD	RCD	AG	GB	GB	PB	GB	See ToxCalc printout for summary survival & biomass data	
DATE & TIME:		3/26/14 11:56	3/27/14 13:38	3/28/14 11:48	3/29/14 14:41	3/30/14 12:17	3/31/14 11:03	4/1/14 11:55	4/2/14 11:59	4/3/14 9:49	3/28/14 12:49		
SAMPLE USED:		A	B	B	C	C	C	C	100 mg wt ck:	100.00	99.99	Test Duration:	7d 0h 3m
CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE													

MEAN % CONTROL SURVIVAL (TAC 80% MIN): 97.5

AVG. DRY WT. PER SURV. CONTROL (TAC 0.25 mg): 0.667

SAMPLE	COLLECTION DATE/TIME	1st USE DATE & TIME	LAST USE DATE & TIME	TIME COLLECT-1ST USE (TAC MAX 36h)	TIME 1st TO LAST USE (TAC MAX 72 h)
A	3/25/14 9:15	3/26/14 11:56	3/26/14 11:56	26h 41m	0h 0m
B	3/26/14 9:30	3/27/14 13:38	3/28/14 11:48	28h 9m	22h 10m
C	3/28/14 8:15	3/29/14 14:41	4/1/14 11:55	30h 27m	69h 14m
				0	0
				0	0

MICR1408CPP

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:		Test ID:	MICR1408PP	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	DATA ENTERED BY PB				

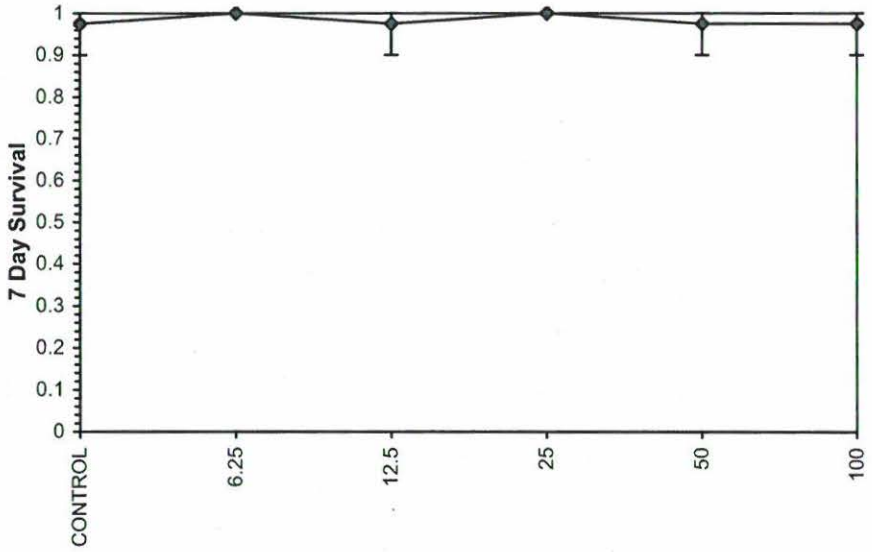
Conc-%	1	2	3	4
CONTROL	1.0000	0.9000	1.0000	1.0000
6.25	1.0000	1.0000	1.0000	1.0000
12.5	1.0000	0.9000	1.0000	1.0000
25	1.0000	1.0000	1.0000	1.0000
50	1.0000	1.0000	1.0000	0.9000
100	0.9000	1.0000	1.0000	1.0000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
CONTROL	0.9750	1.0000	1.3713	1.2490	1.4120	5.942	4		
6.25	1.0000	1.0256	1.4120	1.4120	1.4120	0.000	4	20.00	10.00
12.5	0.9750	1.0000	1.3713	1.2490	1.4120	5.942	4	18.00	10.00
25	1.0000	1.0256	1.4120	1.4120	1.4120	0.000	4	20.00	10.00
50	0.9750	1.0000	1.3713	1.2490	1.4120	5.942	4	18.00	10.00
100	0.9750	1.0000	1.3713	1.2490	1.4120	5.942	4	18.00	10.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.66392	0.884	-1.5103	0.921
Equality of variance cannot be confirmed				

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

Dose-Response Plot



Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:		Test ID:	MICR1408PP	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	DATA ENTERED BY PB				

Conc-%	1	2	3	4
CONTROL	0.6720	0.5900	0.6030	0.7370
6.25	0.7220	0.5850	0.7020	0.6770
12.5	0.6650	0.5450	0.5880	0.7360
25	0.6990	0.5380	0.5860	0.5980
50	0.6710	0.6690	0.6850	0.5540
100	0.5760	0.5910	0.5850	0.6810

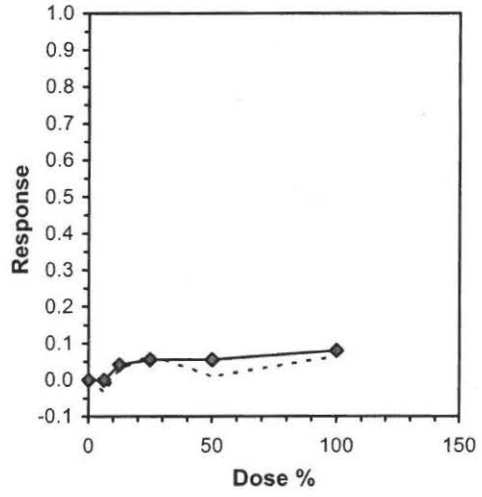
			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
CONTROL	0.6505	1.0000	0.6505	0.5900	0.7370	10.449	4				0.6610	1.0000
6.25	0.6715	1.0323	0.6715	0.5850	0.7220	9.015	4	-0.450	2.410	0.1124	0.6610	1.0000
12.5	0.6335	0.9739	0.6335	0.5450	0.7360	13.332	4	0.365	2.410	0.1124	0.6335	0.9584
25	0.6053	0.9304	0.6053	0.5380	0.6990	11.179	4	0.970	2.410	0.1124	0.6250	0.9455
50	0.6448	0.9912	0.6448	0.5540	0.6850	9.448	4	0.123	2.410	0.1124	0.6250	0.9455
100	0.6083	0.9350	0.6083	0.5760	0.6810	8.038	4	0.906	2.410	0.1124	0.6083	0.9202

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.96015	0.884	0.08495	-0.9322
Bartlett's Test indicates equal variances (p = 0.97)	0.85676	15.0863		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test		>100		1	0.11239	0 77	0.00261	0.00435	0.69983	5, 18

Linear Interpolation (200 Resamples)

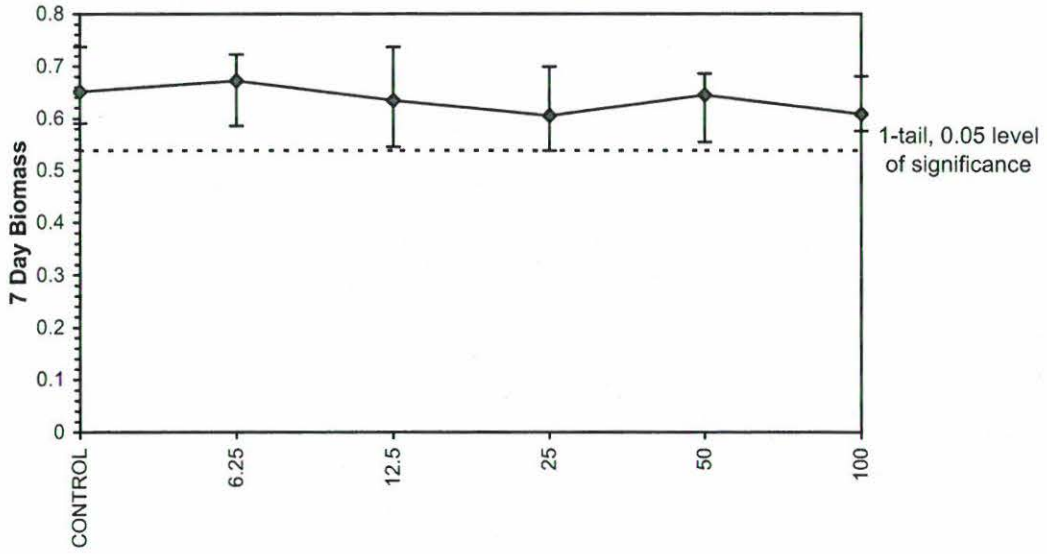
Point	%	SD	95% CL(Exp)	Skew
IC05	20.662			
IC10	>100			
IC15	>100			
IC20	>100			
IC25				
IC40	>100			
IC50	>100			



Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:	Test ID:	MICR1408PP	Sample ID:	
End Date:	Lab ID:	CBI	Sample Type:	
Sample Date:	Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	DATA ENTERED BY PB			

Dose-Response Plot



Effluent and Dilution Water Log (Freshwater Tests). FWEFFL061013

											SUMMARY WATER QUALITY DATA				
											MEAN	S.D.	MIN.	MAX.	PARAMETER
Initial sample charac-terization	Bottle(1):	A1	B1	C1											
	Arrival Temp. (oC, from CoC):	1	1	1							1	0.0	1	1	Arrival Temp.
	TRC (mg/l)(2):	<DL	<DL	<DL											
	TRC Corrected(2):														
	Hardness (mg/l):	140	82	98							107	30.0	82	140	Hardness (mg/l)
	Alkalinity (mg/l):	65	63	67							65	2.0	63	67	Alkalinity (mg/l)
	NH3-N (mg/l):	<1.0	<1.0	<1.0											
	Color/Appearance(3):	C	C	C											
	Obvious odor?	NO	NO	NO											
	Date & Time:	3/26/14 10:39	3/27/14 11:32	3/29/14 13:00											
	Initials:	GB	AG	RCD											
Sample prep measure-ments	Test Day:	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7		MEAN	S.D.	MIN.	MAX.	
	Bottle(s):	A1	B-1,2	B-1,2	C-1,2	C-1,2	C-1,2	C-1,2							
	Prep. Temp. (oC):	25	25	25	25	25	25	25			25	0.0	25	25	Temp. (oC)
	D.O. (mg/l) After Warming:	10.0	10.4	10.1	10.3	11.2	11.1	10.8							
	Aeration Time (min):	2	2	2	2	3	3	4							
	Adjusted D.O. (mg/l):	8.2	8.2	8.0	8.2	8.2	8.2	8.2			8.2	0.1	8.0	8.2	D.O. (mg/l)
	Final pH (S.U.):	7.57	7.56	7.62	7.40	7.67	7.50	7.52			7.55	0.09	7.40	7.67	pH (S.U.)
	Conductivity (uS/cm)(4):	853	321	NA	530	NA	NA	NA			568	268.0	321	853	Cond. (uS/cm)
	Final TRC (mg/l)(5):	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.							
	Sample Filtered (60 um)?	✓	✓	✓	✓	✓	✓	✓							
	Date & Time:	3/26/14 11:34	3/27/14 13:19	3/28/14 11:38	3/29/14 14:30	3/30/14 12:10	3/31/14 10:06	4/1/14 11:44							
	Initials:	AG	AG	RCD	RCD	RCD	AG	GB							
Dilution water	Test Day:	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7		MEAN	S.D.	MIN.	MAX.	
	Vat Number:	2	3	3	3	3	3	3							
	Temperature (oC):	24	25	25	25	25	25	24			25	0.5	24	25	Temp. (oC)
	Conductivity (uS/cm):	301	299	301	291	296	291	302			297	4.7	291	302	Cond. (uS/cm)
	D.O. (mg/l):	8.3	8.2	8.2	8.2	8.2	8.2	8.3			8.2	0.0	8.2	8.3	D.O. (mg/l)
	pH (S.U.):	7.80	7.79	7.84	7.90	7.97	7.89	7.84			7.86	0.06	7.79	7.97	pH (S.U.)
	Hardness (mg/l):	82	98	98	98	98	98	98			96	6.0	82	98	Hardness (mg/l)
	Alkalinity (mg/l):	61	58	58	58	58	58	58			58	1.1	58	61	Alkalinity (mg/l)
	Date & Time:	3/26/14 8:15	3/27/14 8:25	3/28/14 8:20	3/29/14 8:30	3/30/14 8:45	3/31/14 8:30	4/1/14 8:25							
	Initials:	GB	AG	GB	RCD	RCD	GB	GB							
	Changes & Notes (Initials, date, specific change or notes)														
	Peer review Initial/Date:	PB	4/1/14 15:04	DILUTION WATER TYPE:	Mod. Hard Synthetic Freshwater (EPA)										
PROJECT ID:	MICR1408	ADDITIONAL EFFLUENT TREATMENT:													

ND=Not Determined/Measured, NA=Not Applicable. 1) Ninth character of lab sample ID on chain of custody AND bottle number in collection series. Together with Project ID constitutes entire sample bottle ID. 2) TRC MDL 0.02 mg/l; QL 0.22 mg/l. Corrected value if Mn, Cr potential positive interference. Corrected using KI and NaAsO2. 3) C-clear, O-opaque, T-turbid, S-solids (Sl-slight, M-moderate, H-heavy), Y-yellow, B-brown, Bl-black, G-green, P-pink, Gr-grey, Or-orange. 4) Measured on first use of sample only. 5) Final TRC measured only if chlorine present in initial characterization.

Coastal Bioanalysts
6400 Enterprise Court, Gloucester, VA 23061
PH: 804-694-8285, FAX: 804-695-1129
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SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): M I C R 1 4 0 8 - A

A A A A Y Y N N (Project ID) — A (Spl)

CBI Login # 14-0239

FACILITY INFORMATION

CLIENT/FACILITY NAME	LBB/National Archives	CONTACT & PHONE #	Bob Gentry
NPDES PERMIT NO	MD0065871	OUTFALL # OR LOCATION	001
SAMPLE CHLORINATED?	N	SAMPLE DECHLORINATED?	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?

TESTS REQUESTED:	SPECIES OR EPA METH #	C. dubia	ACUTE ☐	CHRONIC ☑
	SPECIES OR EPA METH #	P. promelas	ACUTE ☐	CHRONIC ☑
OTHER TESTS:				

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	3/24/14 0915	SAMPLE END DATE & TIME	3/25/14 0915	AUTOSAMPLER TEMP. (°C)	
(TIME) OR FLOW PROPORTIONAL COMPOSITE INFORMATION*	NUMBER SUBSAMPLES 97	VOL (ml) SUBSAMPLES 100mls		TIME INCREMENT 15 min	
	SET VOLUME SUBSAMPLE —	SET VOLUME FLOW —		TOTAL VOLUME 10L	

*FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
5.7	7.3	1.6	7.2	<0.03	3/25/14 0920	JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeff Duszynski / microbac — (PRINTED NAME/AFFILIATION SAMPLER/ANALYST)
Jeff Duszynski — (SIGNATURE)
3/25/14 — (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
Jeff Duszynski	3/25/14		UPS
	3/26/14	1035	J.B.

SHIPPING METHOD: UPS ✓ FEDEX____ HAND DELIVERY____

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER____

SAMPLE TEMP: (°C) 1 ARRIVED ON ICE? Y ✓ N___ CUSTODY SEAL: INTACT___ BROKEN___ ABSENT ✓

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

Coastal Bioanalysts
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SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): M I C R I 4 0 8 - B
A A A A Y Y N N (Project ID) — A (Spl)

CBI Login # 14-0241

FACILITY INFORMATION

CLIENT/FACILITY NAME	LBB/National Archives	CONTACT & PHONE #	Bob Gentry
NPDES PERMIT NO	MD0065871	OUTFALL # OR LOCATION	001
SAMPLE CHLORINATED?	N	SAMPLE DECHLORINATED?	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?

TESTS REQUESTED:	SPECIES OR EPA METH #		ACUTE	CHRONIC
		C. dubia	☐	☑
		P. promelas	☐	☑

OTHER TESTS:

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	3/25/14 0930	SAMPLE END DATE & TIME	3/26/14 0930	AUTOSAMPLER TEMP. (°C)	1.9
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION*	NUMBER SUBSAMPLES 97	VOL (ml) SUBSAMPLES 200mls		TIME INCREMENT 15 MIN	
	SET VOLUME SUBSAMPLE —	SET VOLUME FLOW —		TOTAL VOLUME 16 L	

*FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
11.3	7.1	1.9	7.3	<0.03	3/26/14 0945	JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeff Duszynski / Microbac — [signature] — 3/26/14
(PRINTED NAME/AFFILIATION SAMPLER/ANALYST) (SIGNATURE) (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
[signature]	3/26/14	1500	UPS
	3/27/14	1100	[signature]

SHIPPING METHOD: UPS ✓ FEDEX____ HAND DELIVERY____

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER____

SAMPLE TEMP: (°C) <1 ARRIVED ON ICE? Y ✓ N___ CUSTODY SEAL: INTACT___ BROKEN___ ABSENT ✓

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

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SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): M I C R 1 4 0 8 - C
A A A A Y Y N N (Project ID) — A (Spl)

CBI Login # 14-0245

FACILITY INFORMATION

CLIENT/FACILITY NAME	GB/National Archives	CONTACT & PHONE #	Bob Gentry
NPDES PERMIT NO	MD00 65871	OUTFALL # OR LOCATION	001
SAMPLE CHLORINATED?	N	SAMPLE DECHLORINATED?	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?

TESTS REQUESTED:	SPECIES OR EPA METH #		ACUTE	CHRONIC
		C. dubia	☐	☑
		P. promelas	☐	☑

OTHER TESTS:

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	3/27/14 0815	SAMPLE END DATE & TIME	3/28/14 0815	AUTOSAMPLER TEMP. (°C)	2.8
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION*	NUMBER SUBSAMPLES 97	VOL (ml) SUBSAMPLES 200mls		TIME INCREMENT 15min	
	SET VOLUME SUBSAMPLE —	SET VOLUME FLOW —		TOTAL VOLUME 19L	

*FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
6.9	7.5	2.8	7.4	<0.03	3/28/14 0825	JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeff Duszynski / Microbac — [signature] — 3/28/14
(PRINTED NAME/AFFILIATION SAMPLER/ANALYST) (SIGNATURE) (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
[signature]	3/28/14	1700	UPS
	3/29/14	1300	[signature]

SHIPPING METHOD: UPS ✓ FEDEX ___ HAND DELIVERY ___

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ___ OTHER ___

SAMPLE TEMP: (°C) 1 ARRIVED ON ICE? Y ✓ N ___ CUSTODY SEAL: INTACT ___ BROKEN ___ ABSENT ✓

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

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Baltimore Division

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www.microbac.com

COVER LETTER

June 30, 2014
Report No.: 14E0250

Bob Gentry
LB&B Associates
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740

RE: Toxic Chemical Bioassay (4 Quarters)

The report of analyses contains test results for samples received at Microbac Laboratories, Inc., Baltimore Division on 06/25/2014 10:30. The samples were subcontracted to .

The enclosed results were obtained from and applicable to the sample(s) as received at the laboratory. All sample results are reported on an "as received" basis unless otherwise noted.

All data included in this report has been reviewed and meet the applicable project and certification specific requirements, unless otherwise noted.

This report has been paginated in its entirety and shall not be reproduced except in full, without the written approval of Microbac Laboratories, Inc.

We appreciate the opportunity to service your analytical needs. If you have any questions, please feel free to contact us.

This Data Package contains the following:

- This Cover Page
- Cooler Receipt Log
- Chain of Custody
- Subcontract Report/Data

		6/30/2014
Final report reviewed by:	Michael M. Gallion/Project Manager	Report issue date

All samples received in proper condition and results conform to ISO 17025 standards unless otherwise noted.

If we have not met or exceeded your expectations, please contact Michael M. Gallion/Project Manager at 410-633-1800. You may also contact Trevor Boyce, President at trevor.boyce@microbac.com

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Baltimore Division

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CERTIFICATE OF ANALYSIS

LB&B Associates	Project: Toxic Chemical Bioassay (4 Quarters)	Report: 14E0250
Fac. Ops & Maint., 8601 Adelphi Road	Project Number: Toxic Chemical Bioassay (4 Quarters)	Reported: 06/30/2014 14:26
College Park, MD 20740	Project Manager: Bob Gentry	

SAMPLE SUMMARY

Sample ID	Laboratory ID	Matrix	Type	Date Sampled	Date Received
Outfall 001	14E0250-01	Wastewater	Composite	6/17/14 9:00	6/25/14 10:30
Outfall 001	14E0250-01	Wastewater	Composite	6/17/14 9:00	6/25/14 10:30
Outfall 001	14E0250-01	Wastewater	Composite	6/17/14 9:00	6/25/14 10:30
Outfall 001	14E0259-01	Wastewater	Composite	6/18/14 9:28	6/25/14 10:30
Outfall 001	14E0259-01	Wastewater	Composite	6/18/14 9:28	6/25/14 10:30
Outfall 001	14E0259-01	Wastewater	Composite	6/18/14 9:28	6/25/14 10:30
Outfall 001	14E0264-01	Wastewater	Composite	6/20/14 10:00	6/25/14 10:30
Outfall 001	14E0264-01	Wastewater	Composite	6/20/14 10:00	6/25/14 10:30
Outfall 001	14E0264-01	Wastewater	Composite	6/20/14 10:00	6/25/14 10:30

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Michael M. Gallion, Project Manager

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Baltimore Division

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CERTIFICATE OF ANALYSIS

LB&B Associates	Project: Toxic Chemical Bioassay (4 Quarters)	Report: 14E0264
Fac. Ops & Maint., 8601 Adelphi Road	Project Number: Toxic Chemical Bioassay (4 Quarters)	Reported: 06/30/2014 14:26
College Park, MD 20740	Project Manager: Bob Gentry	

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Cooler Receipt Log

Cooler ID: Default Cooler **Cooler Temp:** **Work Order:** 14E0250

Custody Seals Intact:	Yes	COC/Containers Agree:	Yes
Containers Intact:	Yes	Correct Preservation:	Yes
Received On Ice:	Yes	Correct Number of Containers Received:	Yes
Radiation Scan Acceptable:	Yes	Sufficient Sample Volume for Testing:	Yes
COC Present:	Yes	Samples Received in Proper Condition:	Yes

Comments:

Cooler ID: Default Cooler **Cooler Temp:** **Work Order:** 14E0259

Custody Seals Intact:	Yes	COC/Containers Agree:	Yes
Containers Intact:	Yes	Correct Preservation:	Yes
Received On Ice:	Yes	Correct Number of Containers Received:	Yes
Radiation Scan Acceptable:	Yes	Sufficient Sample Volume for Testing:	Yes
COC Present:	Yes	Samples Received in Proper Condition:	Yes

Comments:

Cooler ID: Default Cooler **Cooler Temp:** **Work Order:** 14E0264

Custody Seals Intact:	Yes	COC/Containers Agree:	Yes
Containers Intact:	Yes	Correct Preservation:	Yes
Received On Ice:	Yes	Correct Number of Containers Received:	Yes
Radiation Scan Acceptable:	Yes	Sufficient Sample Volume for Testing:	Yes
COC Present:	Yes	Samples Received in Proper Condition:	Yes

Comments:

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14E0250

Tenatively Scheduled Date: **5/1/2014**

Client: **LB&B Associates**
Project: **Toxic Chemical Bioassay (4 Quarters)**
Project Number: **Toxic Chemical Bioassay (4 Quarters)**

Report To:
Bob Gentry
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone: (301) 837-3247

Invoice To:
Bob Gentry
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone :(301) 837-3247

TAT 21 days

Sample ID: Outfall 001

Lab Sample ID: **14E0250-01**
Matrix: Wastewater
Type: Composite

Sample Start Date & Time: 6/16/14 0900
Sampled Date & Time: 6/17/14 0900
Volume: 8L

Analysis	Method	Container	Hold
SUBCONTRACT	Subout		120

Total Containers: 0

Sampled by: [signature]	Date/Time: 6/25/14 1030	Received by: Bryan Reddick 6/25/14
Printed Name: Jeff J. Duszynski		Printed Name: MLI 1030
Relinquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:
nquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:

As Received at Laboratory: On Ice: Yes / No Cooler Temp _____ Rad Scan Acceptable: Yes / No Total Bottles 0

Notes:

Samples sub out to CBI

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14E0259

Tenatively Scheduled Date: **5/5/2014**

Client: **LB&B Associates**
Project: **Toxic Chemical Bioassay (4 Quarters)**
Project Number: **Toxic Chemical Bioassay (4 Quarters)**

Report To:
Bob Gentry
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone: (301) 837-3247

Invoice To:
Bob Gentry
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone :(301) 837-3247

TAT 21 days

Sample ID: CBT-511 001

Lab Sample ID: **14E0259-01**
Matrix: Wastewater
Type: Composite

Sample Start Date & Time: 6/17/14 0928
Sampled Date & Time: 6/18/14 0928
Volume: 9L

Analysis	Method	Container	Hold
SUBCONTRACT	Subout		120

Total Containers: 0

Sampled by: [signature]	Date/Time: 6/23/14 1032	Received by: B. Reddub 6/23/14 1032
Printed Name: Jeff J. Duszynski		Printed Name:
Relinquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:
Relinquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:

As Received at Laboratory: On Ice: Yes / No Cooler Temp _____ Rad Scan Acceptable: Yes / No Total Bottles 0

Notes:

Sample subcut to CBI

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14E0264

Tenatively Scheduled Date: **5/6/2014**

Client: **LB&B Associates**
Project: **Toxic Chemical Bioassay (4 Quarters)**
Project Number: **Toxic Chemical Bioassay (4 Quarters)**

Report To:
Bob Gentry
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone: (301) 837-3247

Invoice To:
Bob Gentry
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone :(301) 837-3247

TAT 21 days

Sample ID: outfall 001

Lab Sample ID: **14E0264-01**
Matrix: Wastewater
Type: Composite

Sample Start Date & Time: 6/19/14 1000
Sampled Date & Time: 6/20/14 1000
Volume: 1 gal

Analysis	Method	Container	Hold
SUBCONTRACT	Subout		120

Total Containers: 0

Sampled by: [signature]	Date/Time: 6/25/14 1030	Received by: B. Reddick 6/25/14 1030
Printed Name: Jeff J. Duszynski		Printed Name:
Relinquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:
Relinquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:

As Received at Laboratory: On Ice: Yes / No Cooler Temp _____ Rad Scan Acceptable: Yes / No Total Bottles 0

Notes:

Sample sub out to CBI

Client: Microbac Laboratories, Inc.
Project ID: MICR1409
Client Sample ID: LBB/National Archives II Outfall 001
Permit No.: MD0065871
Sample Period: 6/17/14 to 6/20/14

Coastal Bioanalysts, Inc.

Report of Analysis: Whole Effluent Toxicity (WET)

Submitted To:	**Prepared By:**
Mr. Michael Arbaugh Sr. Microbac Laboratories, Inc. Baltimore Division 2101 Van Deman Street Baltimore, MD 21224	Coastal Bioanalysts, Inc. 6400 Enterprise Court Gloucester, VA 23061 (804) 694-8285 www.coastalbio.com Contact: Peter F. De Lisle, Technical Director

Chronic Test Results*

Species-Test Method	Endpoint	NOEC	LOEC	ChrV	PMSD	$T.U._C$	IC25	48-h LC50	LC50 95% C.L.	$T.U._{Ac}$
C. dubia	Survival	50	100	70.7	N/A	N/A	N/A	>100	N/A	<1.00
EPA 1002.0	Reproduction	50	100	70.7	21	**<1.00**	>100	N/A	N/A	N/A
P. promelas	Survival	50	100	70.7	N/A	N/A	N/A	>100	N/A	<1.00
EPA 1000.0	Biomass	50	100	70.7	16	**1.75**	57.0	N/A	N/A	N/A

*Note: Details regarding test conduct and data analysis provided in attached bench sheets and printouts as applicable.

Chronic Test QA/QC Reference Toxicant: KCl Units: mg/l Test Organism Source: CBI Stock Cultures

Species-Method (Ref. Test Date)	Data Source	% Survival		Reproduction (# Young) or Biomass (mg)					RTT in Control?
		Cont.	NOEC	Cont.	NOEC	PMSD	IC25	IC25 A.L.	
C. dubia 1002.0	RTT	90	500	26.3	250	27	293	N/A	Yes
(6/7/14-6/13/14)	CC	99	500	26.7	250	21	341	268-415	
P. promelas 1000.0	RTT	98	500	0.52	500	22	649	N/A	Yes
(6/7/14-6/14/14)	CC	99	500	0.63	500	14	624	590-659	

Note: RTT = Reference Toxicant Test, CC = Control Chart, Cont. = Control group.

The results of analysis contained within this report relate only to the sample as received in the laboratory. This report shall not be reproduced except in full without written approval from the laboratory. Unless noted below, these test results meet all requirements of NELAP.

APPROVED:

Peter F. De Lisle, Ph.D.
Technical Director

6/26/14
Date

Deviations from, additions to, or exclusions from the test method, non-standard conditions or data qualifiers and, as appropriate, a statement of compliance/non-compliance: **NONE**

VELAP# 460030
EPA# VA01116

GLOSSARY OF TERMS AND ABBREVIATIONS

A.L. (Acceptance Limits): The results of a given reference toxicant test are compared to the control chart mean value ± 2 standard deviations. These limits approximate the 95% probability limits for the "true" reference toxicant value.

Chronic Value (ChrV): The geometric mean of the NOEC and LOEC. Units are same as test concentration units.

C.L. (Confidence Limits): These are the probability limits, based on the data set and statistical model employed, that the "true value" lies within the limits specified. Typically limits are based on 95% or 99% probabilities.

Control chart: A cumulative summary chart of results from QC tests with reference toxicants. The results of a given reference toxicant test are compared to the control chart mean value and 95% Acceptance Limits (A.L.) (mean ± 2 standard deviations).

IC25: The concentration of sample or chemical, calculated from the data set using statistical models, causing a 25% reduction in test organism growth, reproduction, etc. The lower the IC25, the more toxic the chemical or sample. Units are same as test concentration units.

LC50: The concentration of sample or chemical, calculated from the data set using statistical models, causing a 50% reduction in test organism survival. The lower the LC50, the more toxic the chemical or sample. Units are same as test concentration units. Note: The LC50 value must always be associated with the duration of exposure. Thus 48-h LC50, 96-h LC50, etc. are calculated.

LOEC: Lowest-observable-effect-concentration. The lowest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit a statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Units are same as test concentration units.

PMSD: Percent Minimum Significant Difference: The minimum difference which can exist between a test treatment and the controls in a particular test and be statistically significant; a measure of test sensitivity. The lower the PMSD the more sensitive the test.

N/A: Not applicable.

N/D: Not determined or measured.

NOAEC: No-observable-acute-effect-concentration. The highest concentration of sample or chemical in an acute test dilution series in which the test organisms exhibit no statistically significant reduction in the test end point (e.g. survival) compared to control organisms. Units are same as test concentration units.

NOEC: No-observable-effect-concentration. The highest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit no statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Some regulatory definitions also require that the NOEC be less than the LOEC. Units are same as test concentration units.

Q.L.: Quantitation Limit. Level, concentration, or quantity of a target variable (analyte) that can be reported at a specified degree of confidence.

T.U.: Toxic units. Expresses the relative toxicity of an effluent in such a manner that the larger the toxic unit value the more toxic the effluent. $T.U._{Ac} = 100/LC50$. $T.U._{Chr} = 100/NOEC$. A dimensionless unit.

Ceriodaphnia test set up bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

Test chamber:	~30 ml glass vial:	✓	Illumination & photoperiod:	50-100 ft-c 16L:8D
	Other:		Number of replicates/treatment:	10
Test solution volume:	15 ml:	✓	Initial number animals/replicate:	1
	Other (ml):		Template #:	9

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE	

SPECIES:	Ceriodaphnia dubia	
ACCLIMATION WATER:	Mod. Hard Synthetic Freshwater	
FEEDING (Culture &Test):	YCT + Selenastrum capricornutum mix	
SOURCE:	CBI Stock cultures	
ACCLIMATION TEMP (o C):	25	
BROOD RELEASE FROM:	6/17/14 14:25	
BROOD RELEASE TO:	6/17/14 20:10	
DATE/TIME WATER ADDED:	6/18/14 13:07	
DATE/TIME ANIMALS ADDED:	6/18/14 13:29	
ANIMAL AGE WINDOW (TAC 8 h):	5h 45m	
MAX AGE AT TEST START (TAC 24 h):	23h 4m	
TEST SET UP BY:	RCD	
TEST ID:	**MICR1409CCD**	
PEER REVIEW BY (Initial/Date):	**AG. PB**	6/24/14 15:12
MICR1409CCD		

Ceriodaphnia daily water quality bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

		Day 0	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7	SUMMARY WATER QUALITY DATA			
	TRTMNT	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	MEAN	S.D.	MIN.	MAX.
pH (S.U.)	C	7.76	7.79	7.73	7.98	7.75	7.79	7.86	7.78	7.79	7.92	7.84	8.04			7.84	0.10	7.73	8.04
	1	7.69	7.96	7.71	8.16	7.72	7.79	7.82	7.80	7.75	7.86	7.78	7.75			7.82	0.13	7.69	8.16
	2	7.67	7.78	7.68	8.17	7.68	7.70	7.78	7.81	7.70	7.75	7.73	7.99			7.79	0.15	7.67	8.17
	3	7.58	7.78	7.62	8.12	7.59	7.63	7.68	7.77	7.60	7.67	7.61	7.61			7.69	0.15	7.58	8.12
	4	7.41	7.74	7.47	7.58	7.40	7.62	7.48	7.58	7.36	7.73	7.35	7.68			7.53	0.14	7.35	7.74
	5	6.90	7.26	7.00	7.34	6.93	7.46	6.82	7.08	6.73	7.11	6.75	7.02			7.03	0.23	6.73	7.46
Temp. (o C)	C	25	25	25	25	25	25	25	25	25	25	25	25			25	0.0	25	25
	1	25	25	25	25	25	25	25	25	25	25	25	25			25	0.0	25	25
	2	25	25	25	25	25	25	25	25	25	25	25	25			25	0.0	25	25
	3	25	25	25	25	25	25	25	25	25	25	25	25			25	0.0	25	25
	4	25	25	25	25	25	25	25	25	25	25	25	25			25	0.0	25	25
	5	25	25	25	25	25	25	25	25	25	25	25	25			25	0.0	25	25
Diss. Oxygen (mg/l)	C	8.1	8.0	8.2	8.1	8.2	7.9	8.2	7.7	7.7	7.9	8.2	8.2			8.0	0.2	7.7	8.2
	1	8.1	8.2	8.2	8.1	8.2	7.9	8.2	7.8	7.7	7.9	8.2	7.8			8.0	0.2	7.7	8.2
	2	8.0	7.9	8.2	8.3	8.2	7.8	8.2	8.0	7.7	7.8	8.2	8.4			8.1	0.2	7.7	8.4
	3	8.0	8.1	8.2	8.4	8.2	7.8	8.2	8.1	7.7	7.8	8.2	7.6			8.0	0.2	7.6	8.4
	4	8.0	8.2	8.2	7.6	8.2	7.9	8.2	7.9	7.8	7.7	8.2	8.1			8.0	0.2	7.6	8.2
	5	8.0	8.2	8.2	7.9	8.2	8.1	8.2	8.0	7.9	7.8	8.2	8.3			8.1	0.2	7.8	8.3
Cond. (uS/cm)	C	293		292		290		298		290		291				292	3.0	290	298
	1	285		286		281		290		283		279				284	3.9	279	290
	2	271		274		269		275		267		270				271	3.0	267	275
	3	240		253		247		250		242		244				246	4.9	240	253
	4	190		206		202		199		183		186				194	9.3	183	206
	5	64		108		105		67		68		65				80	21.0	64	108
Replicate measured		S	B	S	I	S	E	S	H	S	F	S	C			NOTE: Final D.O. Values >8.3 mg/l (saturation) may occur due to photosynthetic activity of algal food.			
Initials		RCD	AG		BJA		GB		KK		GB		AG						
Changes & Notes (Initials, date, specific change or notes)																			

TRT ID:	1	2	3	4	5
CONC:	6.25%	12.5%	25.0%	50.0%	100%

MICR1409CCD

Ceriodaphnia daily reproduction count bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

TRTMNT	Rep	Repro Day 0	Repro Day 1	Repro Day 2	Repro Day 3	Repro Day 4	Repro Day 5	Repro Day 6	Repro Day 7	4th Broods Removed	TOTAL REPRO
	A	0	0	0	4	6	0	12			22
C	B	0	0	0	3	0	0	12			15
	C	0	0	0	0	4	8	0			12
Lab	D	0	0	0	5	6	0	8			19
Control	E	0	0	0	2	8	0	14			24
	F	0	0	0	3	4	0	18			25
	G	0	0	0	5	0	9	18			32
	H	0	0	0	2	0	4	12			18
	I	0	0	0	2	4	0	12			18
	J	0	0	0	3	6	0	14			23
	A	0	0	0	3	6	0	14			23
#1	B	0	0	0	3	0	0	12			15
	C	0	0	0	5	6	0	14			25
6.25%	D	0	0	0	3	0	0	14			17
	E	0	0	0	0	3	0	10			13
Vol. Effl:	F	0	0	0	3	0	0	12			15
12.5 ml	G	0	0	0	4	0	7	14			25
	H	0	0	0	3	0	8	16			27
	I	0	0	0	3	0	10	16			29
	J	0	0	0	5	6	0	12			23
	A	0	0	0	3	8	0	8			19
# 2	B	0	0	0	0	6	10	6			22
	C	0	0	0	3	6	0	18			27
12.5%	D	0	0	0	3	6	0	14			23
	E	0	0	0	2	4	0	12			18
Vol. Effl:	F	0	0	0	2	6	0	14			22
25 ml	G	0	0	0	2	0	8	12			22
	H	0	0	0	2	0	7	14			23
	I	0	0	0	3	0	9	12			24
	J	0	0	0	4	8	0	12			24
	A	0	0	0	4	0	10	10			24
# 3	B	0	0	0	3	6	0	10			19
	C	0	0	0	5	0	0	16			21
25.0%	D	0	0	0	4	0	0	14			18
	E	0	0	0	4	0	0	14			18
Vol. Effl:	F	0	0	0	3	0	0	12			15
50 ml	G	0	0	0	4	0	8	14			26
	H	0	0	0	2	0	7	10			19
	I	0	0	0	4	0	10	12			26
	J	0	0	0	4	6	0	14			24
	A	0	0	0	0	2	8	16			26
# 4	B	0	0	0	4	5	0	14			23
	C	0	0	0	3	0	4	14			21
50.0%	D	0	0	0	2	4	0	14			20
	E	0	0	0	5	6	0	14			25
Vol. Effl:	F	0	0	0	5	0	8	10			23
100 ml	G	0	0	0	6	0	10	12			26
	H	0	0	0	4	0	6	10			20
	I	0	0	0	4	0	7	10			21
	J	0	0	0	3	6	0	16			25
	A	0	0	0	4	6	0	12			22
# 5	B	0	0	0	0	4	7	0			11
	C	0	0	0	2	0	5	10			17
100%	D	0	0	0	2	0	7	14			23
	E	0	0	0	4	8	0	10			22
Vol. Effl:	F	0	0	0	5	8	0	10			23
200 ml	G	0	0	0	4	6	0	0			10
	H	0	0	0	2	0	9	12			23
	I	0	0	0	0	0	0	0			0
	J	0	0	0	5	0	10	14			29
INITIALS:		RCD	AG	BJA	GB	KK	GB	AG			
DATE & TIME:		6/18/14 13:29	6/19/14 14:56	6/20/14 13:46	6/21/14 15:27	6/22/14 14:38	6/23/14 15:28	6/24/14 15:06			
SAMPLE USED:		A	B	B	C	C	C				
CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE											

MICR1409CCD	Avg. young/surviving control (TAC 15 min):	20.8	Surv. controls with 3 broods:	8

SAMPLE COLLECTION

SAMPLE	COLLECTION DATE & TIME
A	6/17/14 9:00
B	6/18/14 9:28
C	6/20/14 10:00
D	
E	

SAMPLE AGING

SAMPLE:	A
1st USE DATE/TIME:	6/18/14 13:29
LAST USE DATE/TIME:	6/18/14 13:29
TIME COLLECT TO 1st USE:	28h 29m
	(TAC 36 h max)
TIME 1st TO LAST USE:	0h 0m
	(TAC MAX
SAMPLE:	B
1st USE DATE/TIME:	6/19/14 14:56
LAST USE DATE/TIME:	6/20/14 13:46
TIME COLLECT TO 1st USE:	29h 29m
	(TAC 36 h max)
TIME 1st TO LAST USE:	22h 50m
	(TAC MAX 72 h)
SAMPLE:	C
1st USE DATE/TIME:	6/21/14 15:27
LAST USE DATE/TIME:	6/23/14 15:28
TIME COLLECT TO 1st USE:	29h 28m
	(TAC 36 h max)
TIME 1st TO LAST USE:	48h 0m
	(TAC MAX 72 h)
SAMPLE:	D
1st USE DATE/TIME:	
LAST USE DATE/TIME:	
TIME COLLECT TO 1st USE:	0
	(TAC 36 h max)
TIME 1st TO LAST USE:	0
	(TAC MAX 72 h)
SAMPLE:	E
1st USE DATE/TIME:	
LAST USE DATE/TIME:	
TIME COLLECT TO 1st USE:	0
	(TAC 36 h max)
TIME 1st TO LAST USE:	0
	(TAC MAX

Ceriodaphnia daily survival count bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

TRTMNT	Rep	#Live Day 0	#Live Day 1	#Live Day 2	#Live Day 3	#Live Day 4	#Live Day 5	#Live Day 6	#Live FINAL	MALE OR FEMALE	TOTAL REPRO	REPRO/ SURV FEM
	A	1	1	1	1	1	1	1	1	F	22	22
C	B	1	1	1	1	1	1	1	1	F	15	15
	C	1	1	1	1	1	1	1	1	F	12	12
Lab	D	1	1	1	1	1	1	1	1	F	19	19
Control	E	1	1	1	1	1	1	1	1	F	24	24
	F	1	1	1	1	1	1	1	1	F	25	25
	G	1	1	1	1	1	1	1	1	F	32	32
	H	1	1	1	1	1	1	1	1	F	18	18
	I	1	1	1	1	1	1	1	1	F	18	18
	J	1	1	1	1	1	1	1	1	F	23	23
	A	1	1	1	1	1	1	1	1	F	23	
#1	B	1	1	1	1	1	1	1	1	F	15	
	C	1	1	1	1	1	1	1	1	F	25	
6.25%	D	1	1	1	1	1	1	1	1	F	17	
	E	1	1	1	1	1	1	1	1	F	13	
	F	1	1	1	1	1	1	1	1	F	15	
	G	1	1	1	1	1	1	1	1	F	25	
	H	1	1	1	1	1	1	1	1	F	27	
	I	1	1	1	1	1	1	1	1	F	29	
	J	1	1	1	1	1	1	1	1	F	23	
	A	1	1	1	1	1	1	1	1	F	19	
# 2	B	1	1	1	1	1	1	1	1	F	22	
	C	1	1	1	1	1	1	1	1	F	27	
12.5%	D	1	1	1	1	1	1	1	1	F	23	
	E	1	1	1	1	1	1	1	1	F	18	
	F	1	1	1	1	1	1	1	1	F	22	
	G	1	1	1	1	1	1	1	1	F	22	
	H	1	1	1	1	1	1	1	1	F	23	
	I	1	1	1	1	1	1	1	1	F	24	
	J	1	1	1	1	1	1	1	1	F	24	
	A	1	1	1	1	1	1	1	1	F	24	
# 3	B	1	1	1	1	1	1	1	1	F	19	
	C	1	1	1	1	1	1	1	1	F	21	
25.0%	D	1	1	1	1	1	1	1	1	F	18	
	E	1	1	1	1	1	1	1	1	F	18	
	F	1	1	1	1	1	1	1	1	F	15	
	G	1	1	1	1	1	1	1	1	F	26	
	H	1	1	1	1	1	1	1	1	F	19	
	I	1	1	1	1	1	1	1	1	F	26	
	J	1	1	1	1	1	1	1	1	F	24	
	A	1	1	1	1	1	1	0	0	F	26	
# 4	B	1	1	1	1	1	1	1	1	F	23	
	C	1	1	1	1	1	1	1	1	F	21	
50.0%	D	1	1	1	1	1	1	1	1	F	20	
	E	1	1	1	1	1	1	1	1	F	25	
	F	1	1	1	1	1	1	1	1	F	23	
	G	1	1	1	1	1	1	1	1	F	28	
	H	1	1	1	1	1	1	1	1	F	20	
	I	1	1	1	1	1	1	1	1	F	21	
	J	1	1	1	1	1	1	1	1	F	25	
	A	1	1	1	1	1	1	0	0	F	22	
# 5	B	1	1	1	1	1	1	1	1	F	11	
	C	1	1	1	1	1	1	1	1	F	17	
100%	D	1	1	1	1	1	1	1	1	F	23	
	E	1	1	1	1	1	1	0	0	F	22	
	F	1	1	1	1	1	1	0	0	F	23	
	G	1	1	1	1	1	0	0	0	F	10	
	H	1	1	1	1	1	1	1	1	F	23	
	I	1	1	1	1	0	0	0	0	F	0	
	J	1	1	1	1	1	1	1	1	F	29	

See Reproduction Sheet for Renewal Information

See ToxCalc printout for summary survival & reproduction data

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE	
MICR1409CCD	% Control survival (TAC 80% min): 100 % Surviving controls with 3 broods (TAC 60% min): 80

Ceriodaphnia Survival and Reproduction Test-6 Day Survival

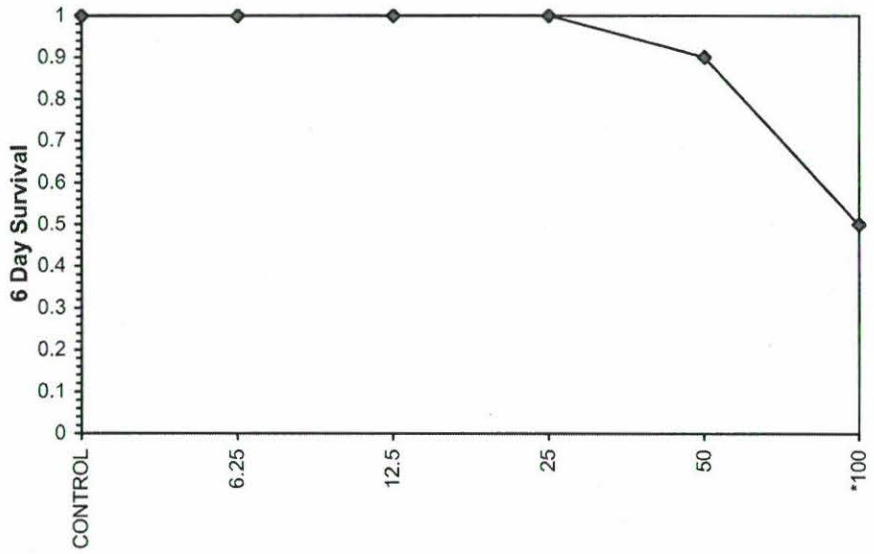
Start Date:		Test ID:	MICR1409CD	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	DATA ENTERED BY PB				

Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100	0.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	1.0000	0.0000	1.0000

Conc-%	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's Exact P	1-Tailed Critical
CONTROL	1.0000	1.0000	0	10	10	10		
6.25	1.0000	1.0000	0	10	10	10	1.0000	0.0500
12.5	1.0000	1.0000	0	10	10	10	1.0000	0.0500
25	1.0000	1.0000	0	10	10	10	1.0000	0.0500
50	0.9000	0.9000	1	9	10	10	0.5000	0.0500
*100	0.5000	0.5000	5	5	10	10	0.0163	0.0500

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Fisher's Exact Test	50	100	70.7107	2

Dose-Response Plot



Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:		Test ID:	MICR1409CD	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	DATA ENTERED BY PB				

Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	22.000	15.000	12.000	19.000	24.000	25.000	32.000	18.000	18.000	23.000
6.25	23.000	15.000	25.000	17.000	13.000	15.000	25.000	27.000	29.000	23.000
12.5	19.000	22.000	27.000	23.000	18.000	22.000	22.000	23.000	24.000	24.000
25	24.000	19.000	21.000	18.000	18.000	15.000	26.000	19.000	26.000	24.000
50	26.000	23.000	21.000	20.000	25.000	23.000	28.000	20.000	21.000	25.000
100	22.000	11.000	17.000	23.000	22.000	23.000	10.000	23.000	0.000	29.000

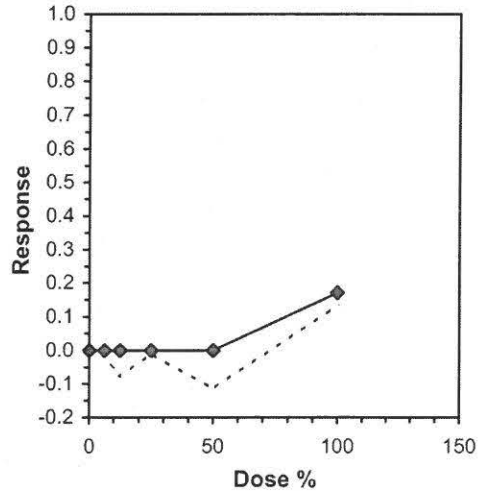
			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
CONTROL	20.800	1.0000	20.800	12.000	32.000	27.272	10				21.720	1.0000
6.25	21.200	1.0192	21.200	13.000	29.000	26.850	10	-0.207	2.223	4.289	21.720	1.0000
12.5	22.400	1.0769	22.400	18.000	27.000	11.372	10	-0.829	2.223	4.289	21.720	1.0000
25	21.000	1.0096	21.000	15.000	26.000	18.098	10	-0.104	2.223	4.289	21.720	1.0000
50	23.200	1.1154	23.200	20.000	28.000	11.813	10	-1.244	2.223	4.289	21.720	1.0000
100	18.000	0.8654	18.000	0.000	29.000	47.791	10				18.000	0.8287

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.98533	0.93	0.10338	0.06591
Bartlett's Test indicates equal variances (p = 0.05)	9.57164	13.2767		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	50	>50		2	4.28872	0.20619	10.72	18.6044	0.68133	4, 45

Linear Interpolation (200 Resamples)

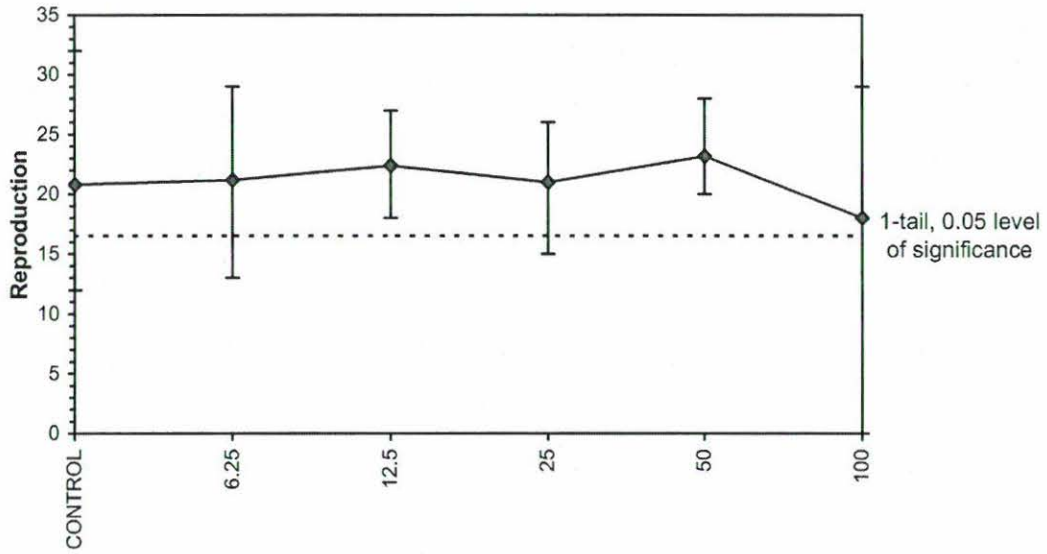
Point	%	SD	95% CL	Skew
IC05	64.597			
IC10	79.194			
IC15	93.790			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			



Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	Test ID: MICR1409CD	Sample ID:	
End Date:	Lab ID: CBI	Sample Type:	
Sample Date:	Protocol: EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments: DATA ENTERED BY PB			

Dose-Response Plot



Fathead minnow test set up bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

Test chamber:	1000 ml Poly Beaker	✓	Illumination & photoperiod:	50-100 ft-c 16L:8D
	Other:		Number of replicates/treatment:	4
Test solution vol. (250 ml min):	500 ml:	✓	Initial number animals/replicate:	10
	Other (ml):			

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE

SPECIES:	Pimephales promelas	
ACCLIMATION WATER:	Mod. Hard Synthetic Freshwater	
FEEDING PRIOR TO TEST:	Artemia nauplii (<24 h old) ad libitum	
FEEDING DURING TEST:	Artemia nauplii (<24 h old, ~0.15 ml) 2x/day	
SOURCE:	CBI Stock cultures	
ACCLIMATION TEMP (o C):	25	
HATCH START DATE & TIME:	6/17/14 17:00	
HATCH END DATE & TIME:	6/18/14 8:30	
DATE/TIME WATER ADDED:	6/18/14 13:59	
DATE/TIME ANIMALS ADDED:	6/18/14 14:17	
ANIMAL AGE WINDOW:	15h 30m	
MAX AGE AT TEST START (TAC 24 h MAX):	21h 17m	
TEST SET UP BY:	RCD	
TEST ID:	MICR1409CPP	
PEER REVIEW BY (Initial/Date):	PB. RCD	6/26/14 11:06
MICR1409CPP		

Fathead minnow daily water quality bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

		Day 0	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7	SUMMARY WATER QUALITY DATA			
	TRTMNT	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	MEAN	S.D.	MIN.	MAX.
pH (S.U.)	C	7.81	7.71	7.74	7.60	7.74	7.53	7.85	7.52	7.72	7.32	7.80	7.45	7.69	7.47	7.64	0.16	7.32	7.85
	1	7.82	7.65	7.74	7.54	7.73	7.51	7.81	7.38	7.73	7.32	7.76	7.42	7.71	7.41	7.61	0.17	7.32	7.82
	2	7.75	7.60	7.68	7.46	7.69	7.51	7.79	7.36	7.70	7.32	7.71	7.42	7.66	7.37	7.57	0.16	7.32	7.79
	3	7.66	7.53	7.62	7.45	7.62	7.48	7.65	7.36	7.59	7.32	7.67	7.35	7.58	7.22	7.51	0.15	7.22	7.67
	4	7.49	7.38	7.48	7.36	7.42	7.31	7.49	7.22	7.35	7.23	7.38	7.23	7.32	7.07	7.34	0.12	7.07	7.49
	5	6.89	6.82	7.01	7.03	6.98	6.88	6.85	6.68	6.71	6.58	6.74	6.68	6.67	6.64	6.80	0.15	6.58	7.03
Temp. (o C)	C	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	0.0	25	25
	1	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	0.0	25	25
	2	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	0.0	25	25
	3	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	0.0	25	25
	4	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	0.0	25	25
	5	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	0.0	25	25
Diss. Oxygen (mg/l)	C	8.0	7.7	7.8	7.6	8.0	7.4	7.9	7.0	7.6	6.6	7.8	6.6	7.5	6.8	7.5	0.5	6.6	8.0
	1	8.0	7.6	7.8	7.6	8.0	7.4	7.9	7.0	7.6	6.6	7.8	6.6	7.7	6.6	7.4	0.5	6.6	8.0
	2	8.0	7.5	7.8	7.6	8.0	7.4	7.9	6.6	7.7	6.7	7.8	6.7	7.6	6.6	7.4	0.5	6.6	8.0
	3	8.0	7.5	7.8	7.3	8.0	7.4	7.9	6.9	7.7	6.7	7.8	6.8	7.6	6.7	7.4	0.5	6.7	8.0
	4	8.0	7.5	7.8	7.4	8.0	7.4	7.8	7.0	8.0	6.8	7.9	6.8	7.7	6.8	7.5	0.5	6.8	8.0
	5	8.1	7.4	7.8	7.5	8.0	7.2	7.7	7.0	7.9	6.9	7.9	6.8	7.9	7.2	7.5	0.4	6.8	8.1
Cond. (uS/cm)	C	298		291		290		293		294		289		292		292	3.0	289	298
	1	286		285		279		286		281		281		281		283	2.9	279	286
	2	271		273		267		269		268		269		268		269	2.1	267	273
	3	242		249		245		247		243		241		240		244	3.3	240	249
	4	185		201		197		196		184		185		180		190	8.1	180	201
	5	60		96		98		73		63		64		57		73	17.1	57	98
Replicate measured		B	C	A	A	D	C	B	C	A	A	D	B	C	B				
Initials		RCD	AG	AG	GB	BJA	GB	GB	AG	KK	GB	GB	GB	AG	GB				

Changes & Notes (Initials, date, specific change or notes)

	Test Aerated?	No	D.O. Highest conc. @ aeration:		TRT ID:	1	2	3	4	5
MICR1409CPP	Date & Time Air Start:		Total live highest conc.@ aeration		CONC(%):	6.25%	12.5%	25.0%	50.0%	100%

Fathead minnow daily biological measurements bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

TRTMNT	Rep	#Live Day 0	#Live Day 1	#Live Day 2	#Live Day 3	#Live Day 4	#Live Day 5	#Live Day 6	#Live Day 7	Total Dry Wt (mg)	Tare Wt (mg)	Wt Count	Pan Number
C	A	10	10	10	9	9	8	8	8	13.29	7.26	10	1
	B	10	10	10	10	10	10	10	10	13.33	6.66	10	2
Lab	C	10	10	10	10	10	10	10	10	14.01	7.66	10	3
Control	D	10	10	10	10	10	10	10	10	14.34	7.68	10	4
#1	A	10	10	10	10	10	10	10	10	14.91	7.84	10	5
6.25%	B	10	10	10	10	10	10	10	10	14.51	7.06	10	6
Vol. Effl:	C	10	10	10	9	9	9	9	9	13.35	6.76	10	7
100 ml	D	10	10	10	10	8	7	7	7	10.98	6.03	10	8
# 2	A	10	10	10	10	10	10	10	10	14.19	6.90	10	9
12.5%	B	10	10	10	10	10	10	10	10	13.06	6.83	10	10
Vol. Effl:	C	10	10	10	10	10	10	10	10	14.79	7.61	10	11
200 ml	D	10	10	10	10	10	10	10	10	14.78	7.64	10	12
# 3	A	10	10	10	10	10	10	10	10	13.69	6.96	10	13
25.0%	B	10	10	10	10	10	10	10	10	14.96	8.39	10	14
Vol. Effl:	C	10	10	10	9	9	9	9	9	14.04	7.86	10	15
400 ml	D	10	10	10	10	9	9	9	9	14.52	8.36	10	16
# 4	A	10	10	10	10	10	10	10	10	14.30	8.29	10	17
50.0%	B	10	10	10	10	10	10	10	10	14.75	9.35	10	18
Vol. Effl:	C	10	10	10	10	10	10	10	10	14.97	8.77	10	19
800 ml	D	10	10	10	9	9	9	9	8	14.23	9.25	10	20
# 5	A	10	10	9	7	6	2	2	1	9.19	8.94	10	21
100%	B	10	10	9	8	8	7	6	6	10.66	9.30	10	22
Vol. Effl:	C	10	10	9	8	5	3	2	2	9.26	8.85	10	23
1600 ml	D	10	10	9	9	9	8	7	7	10.30	9.03	10	24
INITIALS:		RCD	AG	BJA	GB	KK	GB	AG	GB	PB	GB	See ToxCalc printout for summary survival & biomass data	
DATE & TIME:		6/18/14 14:17	6/19/14 15:43	6/20/14 14:42	6/21/14 16:07	6/22/14 15:44	6/23/14 14:56	6/24/14 13:02	6/25/14 14:07	6/26/14 11:01	6/21/14 13:01		
SAMPLE USED:		A	B	B	C	C	C	C	100 mg wt ck:	100.00	99.99	Test Duration:	6d 23h 51m
CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE													

MEAN % CONTROL SURVIVAL (TAC 80% MIN): 95

AVG. DRY WT. PER SURV. CONTROL (TAC 0.25 mg): 0.677

SAMPLE	COLLECTION DATE/TIME	1st USE DATE & TIME	LAST USE DATE & TIME	TIME COLLECT-1ST USE (TAC MAX 36h)	TIME 1st TO LAST USE (TAC MAX 72 h)
A	6/17/14 9:00	6/18/14 14:17	6/18/14 14:17	29h 17m	0h 0m
B	6/18/14 9:28	6/19/14 15:43	6/20/14 14:42	30h 16m	22h 58m
C	6/20/14 10:00	6/21/14 16:07	6/24/14 13:02	30h 7m	68h 55m
				0	0
				0	0

MiCR1409CPP

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:		Test ID:	MICR1409PP	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	DATA ENTERED BY PB				

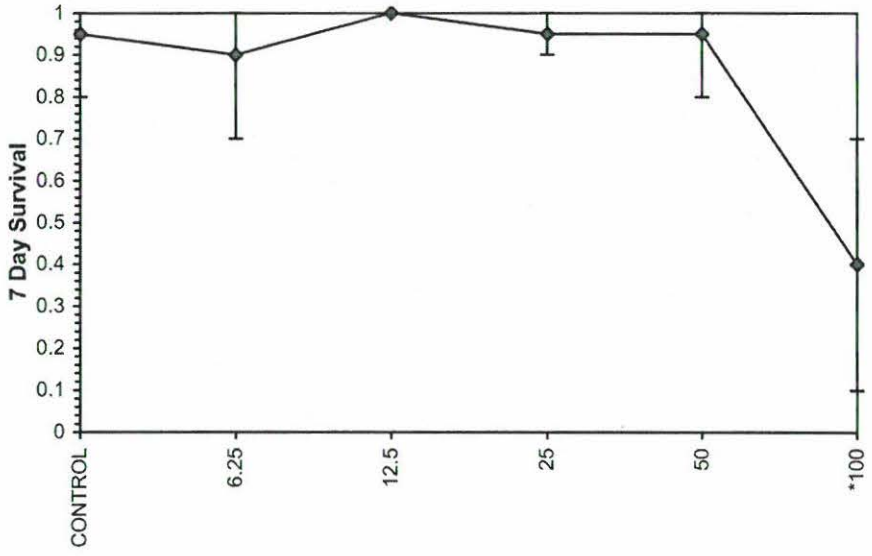
Conc-%	1	2	3	4
CONTROL	0.8000	1.0000	1.0000	1.0000
6.25	1.0000	1.0000	0.9000	0.7000
12.5	1.0000	1.0000	1.0000	1.0000
25	1.0000	1.0000	0.9000	0.9000
50	1.0000	1.0000	1.0000	0.8000
100	0.1000	0.6000	0.2000	0.7000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
CONTROL	0.9500	1.0000	1.3358	1.1071	1.4120	11.411	4		
6.25	0.9000	0.9474	1.2661	0.9912	1.4120	15.696	4	16.00	10.00
12.5	1.0000	1.0526	1.4120	1.4120	1.4120	0.000	4	20.00	10.00
25	0.9500	1.0000	1.3305	1.2490	1.4120	7.072	4	17.00	10.00
50	0.9500	1.0000	1.3358	1.1071	1.4120	11.411	4	18.00	10.00
*100	0.4000	0.4211	0.6657	0.3218	0.9912	48.572	4	10.00	10.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.93612	0.884	-0.4472	0.0477
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

Dose-Response Plot



Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:		Test ID:	MICR1409PP	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	DATA ENTERED BY PB				

Conc-%	1	2	3	4
CONTROL	0.6030	0.6670	0.6350	0.6660
6.25	0.7070	0.7450	0.6590	0.4950
12.5	0.7290	0.6230	0.7180	0.7140
25	0.6730	0.6570	0.6180	0.6160
50	0.6010	0.5400	0.6200	0.4980
100	0.0250	0.1360	0.0410	0.1270

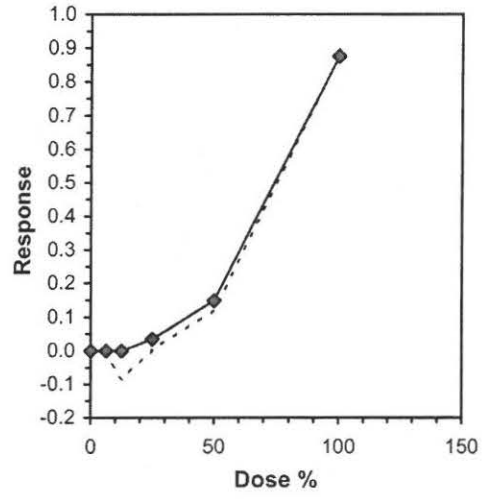
			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
CONTROL	0.6428	1.0000	0.6428	0.6030	0.6670	4.726	4				0.6634	1.0000
6.25	0.6515	1.0136	0.6515	0.4950	0.7450	16.901	4	-0.199	2.360	0.1040	0.6634	1.0000
12.5	0.6960	1.0828	0.6960	0.6230	0.7290	7.051	4	-1.209	2.360	0.1040	0.6634	1.0000
25	0.6410	0.9973	0.6410	0.6160	0.6730	4.444	4	0.040	2.360	0.1040	0.6410	0.9662
50	0.5648	0.8786	0.5648	0.4980	0.6200	9.930	4	1.770	2.360	0.1040	0.5648	0.8513
100	0.0823	0.1280	0.0823	0.0250	0.1360	69.739	4				0.0823	0.1240

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.92211	0.868	-1.1389	2.24287
Bartlett's Test indicates equal variances (p = 0.15)	6.75374	13.2767		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	50	>50		2	0.10398	0.16177	0.00894	0.00388	0.10638	4, 15

Linear Interpolation (200 Resamples)

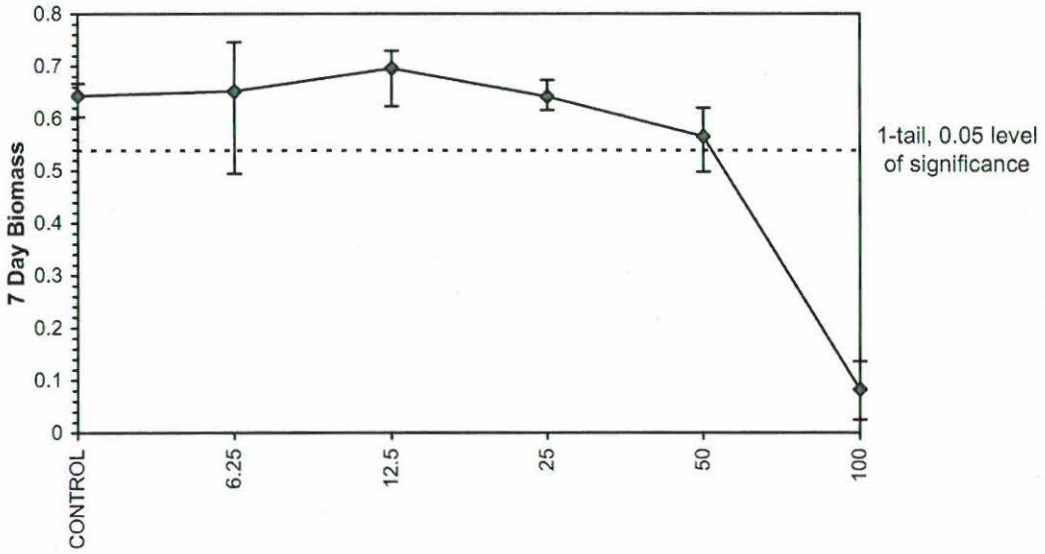
Point	%	SD	95% CL(Exp)		Skew
IC05	28.526	5.551	12.467	43.263	-0.0211
IC10	39.402	6.518	18.864	58.471	0.1088
IC15	50.088	5.068	28.598	57.320	-0.8353
IC20	53.525	3.081	40.696	60.741	-0.8572
IC25	56.962	2.468	48.477	63.696	-0.2393
IC40	67.275	2.102	59.836	73.191	-0.1454
IC50	74.149	1.977	67.144	79.988	-0.0336



Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:		Test ID:	MICR1409PP	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	DATA ENTERED BY PB				

Dose-Response Plot



Effluent and Dilution Water Log (Freshwater Tests). FWEFFL061013

											SUMMARY WATER QUALITY DATA				
											MEAN	S.D.	MIN.	MAX.	PARAMETER
Initial sample charac-terization	Bottle(1):	A1	B1	C1											
	Arrival Temp. (oC, from CoC):	1	1	1							1	0.0	1	1	Arrival Temp.
	TRC (mg/l)(2):	<DL	<DL	<DL											
	TRC Corrected(2):														
	Hardness (mg/l):	36	34	18							29	9.9	18	36	Hardness (mg/l)
	Alkalinity (mg/l):	13	17	3							11	7.2	3	17	Alkalinity (mg/l)
	NH3-N (mg/l):	<1.0	<1.0	<1.0											
	Color/Appearance(3):	C	C	C											
	Obvious odor?	NO	NO	NO											
	Date & Time:	6/18/14 11:14	6/19/14 10:54	6/21/14 12:22											
	Initials:	GB	AG	GB											
Sample prep measure-ments	Test Day:	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7		MEAN	S.D.	MIN.	MAX.	
	Bottle(s):	A1	B1	B1	C1	C1	C1	C1							
	Prep. Temp. (oC):	25	25	25	25	25	24	25			25	0.4	24	25	Temp. (oC)
	D.O. (mg/l) After Warming:	9.9	10.0	9.9	11.0	10.3	10.2	10.3							
	Aeration Time (min):	3	3	3	4.5	4	4	3							
	Adjusted D.O. (mg/l):	8.2	8.2	8.2	8.2	8.2	8.3	8.2			8.2	0.0	8.2	8.3	D.O. (mg/l)
	Final pH (S.U.):	6.94	6.98	6.87	6.78	6.69	6.78	6.66			6.81	0.12	6.66	6.98	pH (S.U.)
	Conductivity (uS/cm)(4):	61	101	NA	63	NA	NA	NA			75	22.5	61	101	Cond. (uS/cm)
	Final TRC (mg/l)(5):	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.							
	Sample Filtered (60 um)?	✓	✓	✓	✓	✓	✓	✓							
	Date & Time:	6/18/14 13:15	6/19/14 14:36	6/20/14 13:21	6/21/14 15:01	6/22/14 14:04	6/23/14 14:37	6/24/14 12:40							
	Initials:	RCD	AG	BJA	GB	KK	GB	AG							
Dilution water	Test Day:	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7		MEAN	S.D.	MIN.	MAX.	
	Vat Number:	3	3	1	1	2	2	2							
	Temperature (oC):	25	25	25	25	25	25	25			25	0.0	25	25	Temp. (oC)
	Conductivity (uS/cm):	295	295	291	290	294	294	292			293	2.0	290	295	Cond. (uS/cm)
	D.O. (mg/l):	8.2	8.2	8.2	8.2	8.2	8.2	8.2			8.2	0.0	8.2	8.2	D.O. (mg/l)
	pH (S.U.):	7.78	7.84	7.85	7.88	7.92	7.84	7.88			7.86	0.04	7.78	7.92	pH (S.U.)
	Hardness (mg/l):	86	86	84	84	82	82	82			84	1.6	82	86	Hardness (mg/l)
	Alkalinity (mg/l):	57	57	57	57	57	57	57			57	0.0	57	57	Alkalinity (mg/l)
	Date & Time:	6/18/14 8:20	6/19/14 8:30	6/20/14 8:30	6/21/14 8:40	6/22/14 9:45	6/23/14 9:20	6/24/14 9:10							
	Initials:	GB	AG	GB	GB	AG	GB	GB							
	Changes & Notes (Initials, date, specific change or notes)														
	Peer review Initial/Date:	AG. PB	6/24/14 12:44	DILUTION WATER TYPE:	Mod. Hard Synthetic Freshwater (EPA)										
PROJECT ID:	MICR1409	ADDITIONAL EFFLUENT TREATMENT:													

ND=Not Determined/Measured, NA=Not Applicable. 1) Ninth character of lab sample ID on chain of custody AND bottle number in collection series. Together with Project ID constitutes entire sample bottle ID. 2) TRC MDL 0.02 mg/l, QL 0.22 mg/l. Corrected value if Mn, Cr potential positive interference. Corrected using KI and NaAsO2. 3) C-clear, O-opaque, T-turbid, S-solids (Sl-slight, M-moderate, H-heavy), Y-yellow, B-brown, Bl-black, G-green, P-pink, Gr-grey, Or-orange. 4) Measured on first use of sample only. 5) Final TRC measured only if chlorine present in initial characterization.

Coastal Bioanalysts
6400 Enterprise Court, Gloucester, VA 23061
PH: 804-694-8285, FAX: 804-695-1129
www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): M I C R 1 4 0 9 - A

A A A A Y Y N N (Project ID) — A (Spl)

CBI Login # 14-0442

FACILITY INFORMATION

CLIENT/FACILITY NAME	LBB/National Archives	CONTACT & PHONE #	Bob Gentry
NPDES PERMIT NO		OUTFALL # OR LOCATION	001
SAMPLE CHLORINATED? N	SAMPLE DECHLORINATED?	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?	

TESTS REQUESTED:	SPECIES OR EPA METH #		ACUTE	CHRONIC
		C dubia	ACUTE ☐	CHRONIC ☑
		P promelas	ACUTE ☐	CHRONIC ☑

OTHER TESTS:

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	6/16/14 0900	SAMPLE END DATE & TIME	6/17/14 0900	AUTOSAMPLER TEMP. (°C)	5.7
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION*	NUMBER SUBSAMPLES 97	VOL (ml) SUBSAMPLES 100 ml/s		TIME INCREMENT 15 min	
	SET VOLUME SUBSAMPLE —	SET VOLUME FLOW —		TOTAL VOLUME 8 L	

*FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
20.9	6.4	5.7°	6.2	<0.03	6/17/14 0915	JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeffrey Duszynski/Microbac — [signature] — 6/17/14
(PRINTED NAME/AFFILIATION SAMPLER/ANALYST) (SIGNATURE) (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
[signature]	6/17/14		
	6/18/14	1050	[signature]

SHIPPING METHOD: UPS ✓ FEDEX ___ HAND DELIVERY ___

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER ___

SAMPLE TEMP: (°C) 1 ARRIVED ON ICE? Y ✓ N ___ CUSTODY SEAL: INTACT ✓ BROKEN ___ ABSENT ___

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

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PH: 804-694-8285, FAX: 804-695-1129
www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): M I C R 1 4 0 9 - B
A A A A Y Y N N (Project ID) — A (Spl)

CBI Login # 14-0464

FACILITY INFORMATION

CLIENT/FACILITY NAME	LBB / National Archives II	CONTACT & PHONE #	Bob Gentry
NPDES PERMIT NO		OUTFALL # OR LOCATION	001
SAMPLE CHLORINATED?	N	SAMPLE DECHLORINATED?	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?

TESTS REQUESTED:	SPECIES OR EPA METH #			
		C. dubia	ACUTE ☐	CHRONIC ☑
	SPECIES OR EPA METH #	P. promelas	ACUTE ☐	CHRONIC ☑
OTHER TESTS:				

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	6/17/14 0928	SAMPLE END DATE & TIME	6/18/14 0928	AUTOSAMPLER TEMP. (°C)	7.7
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION	NUMBER SUBSAMPLES 97	VOL (ml) SUBSAMPLES 100 ml/s		TIME INCREMENT 15 min	
	SET VOLUME SUBSAMPLE	SET VOLUME FLOW		TOTAL VOLUME	

FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
22.0	6.5	7.7	6.8	<0.03	6/18/14 0935	JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeffrey Duszynski / Microbac — [signature] — 6/18/14
(PRINTED NAME/AFFILIATION SAMPLER/ANALYST) (SIGNATURE) (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
[signature]	6/18/14	1300	UPS
	6/19/14	1045	[signature]

SHIPPING METHOD: UPS ✓ FEDEX____ HAND DELIVERY____

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER____

SAMPLE TEMP: (°C) 1 ARRIVED ON ICE? Y ✓ N___ CUSTODY SEAL: INTACT___ BROKEN___ ABSENT ✓

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

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PH: 804-694-8285, FAX: 804-695-1129
www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): M I C R 1 4 0 9 - C
A A A A Y Y N N (Project ID) — A (Spl)

CBI Login # 14-0423

FACILITY INFORMATION

CLIENT/FACILITY NAME	LBB / National Archives II	CONTACT & PHONE #	Bob Gentry
NPDES PERMIT NO		OUTFALL # OR LOCATION	001
SAMPLE CHLORINATED? N	SAMPLE DECHLORINATED?	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?	

TESTS REQUESTED:	SPECIES OR EPA METH #			
		C. dubia	ACUTE ☐	CHRONIC ☑
		P. promelas	ACUTE ☐	CHRONIC ☑
OTHER TESTS:				

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	6/19/14 1000	SAMPLE END DATE & TIME 6/20/14 1000	AUTOSAMPLER TEMP. (°C)
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION*	NUMBER SUBSAMPLES 97	VOL (ml) SUBSAMPLES 200 ml	TIME INCREMENT 15 min
	SET VOLUME SUBSAMPLE —	SET VOLUME FLOW —	TOTAL VOLUME 18L

*FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
19.4°	6.6	10.7	6.8	<0.03	6/20/14 1005	JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeffrey Duszynski / Microbac — [signature] — 6/20/14
(PRINTED NAME/AFFILIATION/SAMPLER/ANALYST) (SIGNATURE) (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
[signature]	6/20/14	1630	UPS
	6/21/14	1210	[signature]

SHIPPING METHOD: UPS ☒ FEDEX____ HAND DELIVERY____

DO NOT SHIP FEDEX STANDARD OVERNIGHT SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER____

SAMPLE TEMP: (°C)____ (____ ARRIVED ON ICE? Y ✓ N____ CUSTODY SEAL: INTACT ✓ BROKEN____ ABSENT____

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

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Baltimore Division

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www.microbac.com

COVER LETTER

Bob Gentry
LB&B Associates
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740

September 03, 2014
Report No.: 14H0312

RE: Toxic Chemical Bioassay (4 Quarters)

The report of analyses contains test results for samples received at Microbac Laboratories, Inc., Baltimore Division on 08/20/2014 12:55-08/22/2014 15:30. The samples were subcontracted to .

The enclosed results were obtained from and applicable to the sample(s) as received at the laboratory. All sample results are reported on an "as received" basis unless otherwise noted.

All data included in this report has been reviewed and meet the applicable project and certification specific requirements, unless otherwise noted.

ıis report has been paginated in its entirety and shall not be reproduced except in full, without the written approval of Microbac Laboratories, Inc.

We appreciate the opportunity to service your analytical needs. If you have any questions, please feel free to contact us.

This Data Package contains the following:

- This Cover Page
- Cooler Receipt Log
- Chain of Custody
- Subcontract Report/Data

		9/3/2014
Final report reviewed by:	Michael M. Gallion/Project Manager	Report issue date

All samples received in proper condition and results conform to ISO 17025 standards unless otherwise noted.

If we have not met or exceeded your expectations, please contact Michael M. Gallion/Project Manager at 410-633-1800. You may also contact Trevor Boyce, President at trevor.boyce@microbac.com

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Microbac Laboratories, Inc.

Baltimore Division

2101 Van Deman Street • Baltimore, MD 21224

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Fax: 410-633-6[illegible]
www.microbac.co[illegible]

CERTIFICATE OF ANALYSIS

LB&B Associates	Project: Toxic Chemical Bioassay (4 Quarters)	Report: 14H0312
Fac. Ops & Maint., 8601 Adelphi Road	Project Number: Toxic Chemical Bioassay (4 Quarters)	Reported: 09/03/2014 10:50
College Park, MD 20740	Project Manager: Bob Gentry	

SAMPLE SUMMARY

Sample ID	Laboratory ID	Matrix	Type	Date Sampled	Date Received
Outfall 001	14H0312-01	Wastewater	Composite	8/19/14 9:17	8/20/14 12:55
Outfall 001	14H0312-01	Wastewater	Composite	8/19/14 9:17	8/20/14 12:55
Outfall 001	14H0312-01	Wastewater	Composite	8/19/14 9:17	8/20/14 12:55
Outfall 001	14H0314-01	Wastewater	Composite	8/20/14 10:00	8/20/14 12:55
Outfall 001	14H0314-01	Wastewater	Composite	8/20/14 10:00	8/20/14 12:55
Outfall 001	14H0314-01	Wastewater	Composite	8/20/14 10:00	8/20/14 12:55
Outfall 001	14H0320-01	Wastewater	Composite	8/22/14 9:30	8/22/14 15:30
Outfall 001	14H0320-01	Wastewater	Composite	8/22/14 9:30	8/22/14 15:30
Outfall 001	14H0320-01	Wastewater	Composite	8/22/14 9:30	8/22/14 15:30

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Michael M. Gallion, Project Manager

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Microbac Laboratories, Inc.

Baltimore Division

2101 Van Deman Street • Baltimore, MD 21224

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Fax: 410-633-6553
www.microbac.com

CERTIFICATE OF ANALYSIS

LB&B Associates	Project: Toxic Chemical Bioassay (4 Quarters)	Report: 14H0320
Fac. Ops & Maint., 8601 Adelphi Road	Project Number: Toxic Chemical Bioassay (4 Quarters)	Reported: 09/03/2014 10:50
College Park, MD 20740	Project Manager: Bob Gentry	

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Cooler Receipt Log

Cooler ID: Default Cooler **Cooler Temp:** **Work Order:** 14H0312

Custody Seals Intact:	Yes	COC/Containers Agree:	Yes
Containers Intact:	Yes	Correct Preservation:	Yes
Received On Ice:	Yes	Correct Number of Containers Received:	Yes
Radiation Scan Acceptable:	Yes	Sufficient Sample Volume for Testing:	Yes
COC Present:	Yes	Samples Received in Proper Condition:	Yes

Comments:
shipped out on 8/19

Cooler ID: Default Cooler **Cooler Temp:** **Work Order:** 14H0314

Custody Seals Intact:	Yes	COC/Containers Agree:	Yes
Containers Intact:	Yes	Correct Preservation:	Yes
Received On Ice:	Yes	Correct Number of Containers Received:	Yes
Radiation Scan Acceptable:	Yes	Sufficient Sample Volume for Testing:	Yes
COC Present:	Yes	Samples Received in Proper Condition:	Yes

Comments:
shipped out on 8/20

Cooler ID: Default Cooler **Cooler Temp:** **Work Order:** 14H0320

Custody Seals Intact:	Yes	COC/Containers Agree:	Yes
Containers Intact:	Yes	Correct Preservation:	Yes
Received On Ice:	Yes	Correct Number of Containers Received:	Yes
Radiation Scan Acceptable:	Yes	Sufficient Sample Volume for Testing:	Yes
COC Present:	Yes	Samples Received in Proper Condition:	Yes

Comments:

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14H0312

Tentatively Scheduled Date: **8/4/2014**

Client: **LB&B Associates**
Project: **Toxic Chemical Bioassay (4 Quarters)**
Project Number: **Toxic Chemical Bioassay (4 Quarters)**

Report To:
Bob Gentry
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone: (301) 837-3247

Invoice To:
Bob Gentry
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone :(301) 837-3247

TAT 21 days

Sample ID: outfall 001

Lab Sample ID: **14H0312-01**
Matrix: Wastewater
Type: Composite

Sample Start Date & Time: 8/18/14 0917
Sampled Date & Time: 8/19/14 0917
Volume: 9L

Analysis	Method	Container	Hold
SUBCONTRACT	Subout		120

Total Containers: 0

Sampled by: [signature]	Date/Time: 8/20/14 1255	Received by: B Reddick 8/20/14 1255
Printed Name: Jeff J. Duszynski		Printed Name:
Relinquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:
nquished by:	Date/Time:	Received by:
ed Name:		Printed Name:

As Received at Laboratory: On Ice: Yes / No Cooler Temp _____ Rad Scan Acceptable: Yes / No Total Bottles 0

Notes:

Shipped out on 8/19

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14H0314

Tenatively Scheduled Date: **8/5/2014**

Client: **LB&B Associates**
Project: **Toxic Chemical Bioassay (4 Quarters)**
Project Number: **Toxic Chemical Bioassay (4 Quarters)**

Report To:
Bob Gentry
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone: (301) 837-3247

Invoice To:
Bob Gentry
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone :(301) 837-3247

TAT 21 days

Sample ID: outfall 001

Lab Sample ID: **14H0314-01**
Matrix: Wastewater
Type: Composite

Sample Start Date & Time: 8/19/14 1000
Sampled Date & Time: 8/20/14 1000
Volume: 9-10L

Analysis	Method	Container	Hold
SUBCONTRACT	Subout		120

Total Containers: 0

Sampled by: [signature]	Date/Time: 8/20/14 1255	Received by: B Reddick 8/20/14 1255
Printed Name: Jeff J. Duszynski		Printed Name:
Relinquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:
Relinquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:

As Received at Laboratory: On Ice: Yes / No Cooler Temp _____ Rad Scan Acceptable: Yes / No Total Bottles 0

Notes:

Shipped out on 8/20

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Phone: 410-633-1800
Fax: 410-633-6553
www.microbac.com

14H0320

Tenatively Scheduled Date: **8/7/2014**

Client: **LB&B Associates**
Project: **Toxic Chemical Bioassay (4 Quarters)**
Project Number: **Toxic Chemical Bioassay (4 Quarters)**

Report To:
Bob Gentry
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone: (301) 837-3247

Invoice To:
Bob Gentry
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone :(301) 837-3247

TAT 21 days

Sample ID: Outfall 001

Lab Sample ID: **14H0320-01**
Matrix: Wastewater
Type: Composite

Sample Start Date & Time: 8/21/14 0930
Sampled Date & Time: 8/22/14 0930
Volume: 19L

Analysis	Method	Container	Hold
SUBCONTRACT	Subout		120

Total Containers: 0

Sampled by: [signature] Printed Name: Jeff J. Duszynski	Date/Time: 8/22/14 1530	Received by: [signature] Printed Name: HNU
Relinquished by: Printed Name:	Date/Time:	Received by: Printed Name:
Relinquished by: Printed Name:	Date/Time:	Received by: Printed Name:

As Received at Laboratory: On Ice: Yes / No Cooler Temp _____ Rad Scan Acceptable: Yes / No Total Bottles 0

Notes:

Client: Microbac Laboratories, Inc.
Project ID: MICR1410
Client Sample ID: LBB/National Archives II Outfall 001
Permit No.: MD0065871
Sample Period: 8/19/14 to 8/22/14

Coastal Bioanalysts, Inc.

Report of Analysis: Whole Effluent Toxicity (WET)

Submitted To:	**Prepared By:**
Mr. Michael Arbaugh Sr. Microbac Laboratories, Inc. Baltimore Division 2101 Van Deman Street Baltimore, MD 21224	Coastal Bioanalysts, Inc. 6400 Enterprise Court Gloucester, VA 23061 (804) 694-8285 www.coastalbio.com Contact: Peter F. De Lisle, Technical Director

Chronic Test Results*

Species-Test Method	Endpoint	NOEC	LOEC	ChrV	PMSD	$T.U._C$	IC25	48-h LC50	LC50 95% C.L.	$T.U._{Ac}$
C. dubia	Survival	100	>100	>100	N/A	N/A	N/A	>100	N/A	<1.00
EPA 1002.0	Reproduction	25	50	35.4	18	**2.44**	40.9	N/A	N/A	N/A
P. promelas	Survival	100	>100	>100	N/A	N/A	N/A	>100	N/A	<1.00
EPA 1000.0	Biomass	50	100	70.7	24	**1.47**	67.9	N/A	N/A	N/A

*Note: Details regarding test conduct and data analysis provided in attached bench sheets and printouts as applicable.

Chronic Test QA/QC Reference Toxicant: KCl Units: mg/l Test Organism Source: CBI Stock Cultures

Species-Method (Ref. Test Date)	Data Source	% Survival Cont.	% Survival NOEC	Reproduction (# Young) or Biomass (mg) Cont.	NOEC	PMSD	IC25	IC25 A.L.	RTT in Control?
C. dubia 1002.0	RTT	100	500	28.9	250	15	349	N/A	Yes
(8/1/14-8/7/14)	CC	99	500	26.4	250	20	337	263-411	
P. promelas 1000.0	RTT	98	500	0.54	500	14	604	N/A	Yes
(8/1/14-8/8/14)	CC	99	500	0.62	500	14	626	592-661	

Note: RTT = Reference Toxicant Test, CC = Control Chart, Cont. = Control group.

The results of analysis contained within this report relate only to the sample as received in the laboratory. This report shall not be reproduced except in full without written approval from the laboratory. Unless noted below, these test results meet all requirements of NELAP.

APPROVED:

Peter F. De Lisle, Ph.D.
Technical Director

8/28/14
Date

Deviations from, additions to, or exclusions from the test method, non-standard conditions or data qualifiers and, as appropriate, a statement of compliance/non-compliance: **NONE**

VELAP# 460030
EPA# VA01116

GLOSSARY OF TERMS AND ABBREVIATIONS

A.L. (Acceptance Limits): The results of a given reference toxicant test are compared to the control chart mean value ± 2 standard deviations. These limits approximate the 95% probability limits for the "true" reference toxicant value.

Chronic Value (ChrV): The geometric mean of the NOEC and LOEC. Units are same as test concentration units.

C.L. (Confidence Limits): These are the probability limits, based on the data set and statistical model employed, that the "true value" lies within the limits specified. Typically limits are based on 95% or 99% probabilities.

Control chart: A cumulative summary chart of results from QC tests with reference toxicants. The results of a given reference toxicant test are compared to the control chart mean value and 95% Acceptance Limits (A.L.) (mean ± 2 standard deviations).

IC25: The concentration of sample or chemical, calculated from the data set using statistical models, causing a 25% reduction in test organism growth, reproduction, etc. The lower the IC25, the more toxic the chemical or sample. Units are same as test concentration units.

LC50: The concentration of sample or chemical, calculated from the data set using statistical models, causing a 50% reduction in test organism survival. The lower the LC50, the more toxic the chemical or sample. Units are same as test concentration units. Note: The LC50 value must always be associated with the duration of exposure. Thus 48-h LC50, 96-h LC50, etc. are calculated.

LOEC: Lowest-observable-effect-concentration. The lowest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit a statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Units are same as test concentration units.

PMSD: Percent Minimum Significant Difference: The minimum difference which can exist between a test treatment and the controls in a particular test and be statistically significant; a measure of test sensitivity. The lower the PMSD the more sensitive the test.

N/A: Not applicable.

N/D: Not determined or measured.

NOAEC: No-observable-acute-effect-concentration. The highest concentration of sample or chemical in an acute test dilution series in which the test organisms exhibit no statistically significant reduction in the test end point (e.g. survival) compared to control organisms. Units are same as test concentration units.

NOEC: No-observable-effect-concentration. The highest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit no statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Some regulatory definitions also require that the NOEC be less than the LOEC. Units are same as test concentration units.

Q.L.: Quantitation Limit. Level, concentration, or quantity of a target variable (analyte) that can be reported at a specified degree of confidence.

T.U.: Toxic units. Expresses the relative toxicity of an effluent in such a manner that the larger the toxic unit value the more toxic the effluent. $T.U._{Ac} = 100/LC50$. $T.U._{Chr} = 100/NOEC$. A dimensionless unit.

Ceriodaphnia test set up bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

Test chamber:	~30 ml glass vial:	✓	Illumination & photoperiod:	50-100 ft-c 16L:8D
	Other:		Number of replicates/treatment:	10
Test solution volume:	15 ml:	✓	Initial number animals/replicate:	1
	Other (ml):		Template #:	24

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE	

SPECIES:	Ceriodaphnia dubia	
ACCLIMATION WATER:	Mod. Hard Synthetic Freshwater	
FEEDING (Culture &Test):	YCT + Selenastrum capricornutum mix	
SOURCE:	CBI Stock cultures	
ACCLIMATION TEMP (o C):	25	
BROOD RELEASE FROM:	8/19/14 12:30	
BROOD RELEASE TO:	8/19/14 16:55	
DATE/TIME WATER ADDED:	8/20/14 11:41	
DATE/TIME ANIMALS ADDED:	8/20/14 11:54	
ANIMAL AGE WINDOW (TAC 8 h):		4h 25m
MAX AGE AT TEST START (TAC 24 h):		23h 25m
TEST SET UP BY:		AG
TEST ID:	**MICR1410CCD**	
PEER REVIEW BY (Initial/Date):	**PB**	8/27/14 11:25
MICR1410CCD		

Ceriodaphnia daily water quality bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

		Day 0		Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7	SUMMARY WATER QUALITY DATA			
	TRTMNT	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Final	MEAN	S.D.	MIN.	MAX.
pH (S.U.)	C	7.73	8.06	7.72	7.87	7.67	7.83	7.83	7.86	7.71	7.95	7.77	7.69				7.81	0.12	7.67	8.06
	1	7.72	8.11	7.71	8.05	7.65	7.86	7.78	7.79	7.67	7.86	7.76	7.82				7.82	0.14	7.65	8.11
	2	7.70	8.28	7.66	8.09	7.65	8.01	7.75	7.96	7.64	8.10	7.72	7.87				7.87	0.21	7.64	8.28
	3	7.66	8.26	7.59	7.95	7.58	8.07	7.69	7.91	7.56	8.10	7.66	7.88				7.83	0.24	7.56	8.26
	4	7.60	8.11	7.48	7.95	7.47	8.07	7.54	7.85	7.39	8.11	7.51	7.92				7.75	0.28	7.39	8.11
	5	7.50	7.99	7.22	7.80	7.21	7.83	7.25	7.61	7.05	7.78	7.22	7.71				7.51	0.31	7.05	7.99
Temp. (o C)	C	25	25	25	25	25	25	25	25	25	25	25	25				25	0.0	25	25
	1	25	25	25	25	25	25	25	25	25	25	25	25				25	0.0	25	25
	2	25	25	25	25	25	25	25	25	25	25	25	25				25	0.0	25	25
	3	25	25	25	25	25	25	25	25	25	25	25	25				25	0.0	25	25
	4	25	25	25	25	25	25	25	25	25	25	25	25				25	0.0	25	25
	5	25	25	25	25	25	25	24	25	25	25	25	25				25	0.3	24	25
Diss. Oxygen (mg/l)	C	8.2	8.5	8.2	8.3	8.0	7.9	8.2	8.3	7.9	8.4	8.0	7.6				8.1	0.3	7.6	8.5
	1	8.2	8.5	8.2	8.3	8.0	8.0	8.2	8.3	7.9	7.8	8.0	7.9				8.1	0.2	7.8	8.5
	2	8.2	8.8	8.2	8.4	8.0	8.1	8.2	8.4	7.8	8.4	8.0	8.0				8.2	0.3	7.8	8.8
	3	8.2	8.9	8.2	8.5	8.0	8.2	8.2	8.4	7.8	8.5	8.0	8.2				8.3	0.3	7.8	8.9
	4	8.2	8.6	8.2	8.5	8.0	8.3	8.2	8.4	7.9	8.6	8.1	8.2				8.3	0.2	7.9	8.6
	5	8.2	8.4	8.2	8.5	8.0	8.5	8.3	8.4	8.1	8.6	8.2	8.3				8.3	0.2	8.0	8.6
Cond. (uS/cm)	C	297		306		300		294		295		296					298	4.4	294	306
	1	342		305		305		294		295		293					306	18.6	293	342
	2	386		298		299		289		285		284					307	39.3	284	386
	3	470		291		291		271		268		264					309	79.6	264	470
	4	640		271		272		230		228		224					311	162.7	224	640
	5	972		227		231		142		145		142					310	327.1	142	972
Replicate measured		S	D	S	F	S	E	S	A	S	B	S	I				NOTE: Final D.O. Values >8.3 mg/l (saturation) may occur due to photosynthetic activity of algal food.			
Initials		AG	BJA		RCD		GB		RCD		AG		BJA							
Changes & Notes (Initials, date, specific change or notes)																				

TRT ID:	1	2	3	4	5
CONC:	6.25%	12.5%	25.0%	50.0%	100%

MICR1410CCD

Ceriodaphnia daily reproduction count bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

TRTMNT	Rep	Repro Day 0	Repro Day 1	Repro Day 2	Repro Day 3	Repro Day 4	Repro Day 5	Repro Day 6	Repro Day 7	4th Broods Removed	TOTAL REPRO
	A	0	0	0	3	6	0	16			25
C	B	0	0	0	5	10	0	14			29
	C	0	0	0	2	0	6	18			26
Lab	D	0	0	0	5	0	10	16			31
Control	E	0	0	0	3	0	10	18			31
	F	0	0	0	5	0	12	16			33
	G	0	0	0	2	0	8	18			28
	H	0	0	0	5	0	8	20			33
	I	0	0	0	4	0	10	14			28
	J	0	0	0	3	0	8	18			29
	A	0	0	0	2	6	0	20			28
#1	B	0	0	0	2	0	8	18			28
	C	0	0	0	3	0	4	20			27
6.25%	D	0	0	0	3	0	8	16			27
	E	0	0	0	3	0	8	20			31
Vol. Effl:	F	0	0	0	4	0	10	18			32
12.5 ml	G	0	0	0	2	0	6	16			24
	H	0	0	0	5	0	8	22			35
	I	0	0	0	3	0	8	14			25
	J	0	0	0	3	0	5	22			30
	A	0	0	0	3	0	8	12			23
# 2	B	0	0	0	3	0	6	12			21
	C	0	0	0	3	0	10	14			27
12.5%	D	0	0	0	6	0	10	18			34
	E	0	0	0	3	0	10	14			27
Vol. Effl:	F	0	0	0	3	0	10	18			31
25 ml	G	0	0	0	0	0	10	0			10
	H	0	0	0	5	0	10	20			35
	I	0	0	0	3	0	8	24			35
	J	0	0	0	2	0	5	20			27
	A	0	0	0	4	0	6	16			26
# 3	B	0	0	0	5	0	8	14			27
	C	0	0	0	3	0	8	14			25
25.0%	D	0	0	0	5	0	10	10			25
	E	0	0	0	0	0	10	14			24
Vol. Effl:	F	0	0	0	5	0	8	18			31
50 ml	G	0	0	0	0	4	8	0			12
	H	0	0	0	6	0	10	16			32
	I	0	0	0	4	0	8	14			26
	J	0	0	0	3	0	8	12			23
	A	0	0	0	0	0	10	6			16
# 4	B	0	0	0	2	6	0	10			18
	C	0	0	0	0	6	7	0			13
50.0%	D	0	0	0	3	0	8	10			21
	E	0	0	0	3	0	10	12			25
Vol. Effl:	F	0	0	0	2	0	8	10			20
100 ml	G	0	0	0	2	4	0	14			20
	H	0	0	0	3	0	10	14			27
	I	0	0	0	5	0	6	8			19
	J	0	0	0	3	0	8	12			23
	A	0	0	0	3	6	0	6			15
# 5	B	0	0	0	3	0	8	8			19
	C	0	0	0	4	0	7	10			21
100%	D	0	0	0	2	0	6	0			8
	E	0	0	0	2	0	10	10			22
Vol. Effl:	F	0	0	0	4	0	6	6			16
200 ml	G	0	0	0	5	0	6	8			19
	H	0	0	0	2	0	6	0			8
	I	0	0	0	4	0	8	10			22
	J	0	0	0	0	4	6	8			18
INITIALS:		AG	BJA	RCD	GB	RCD	AG	BJA			
DATE & TIME:		8/20/14 11:54	8/21/14 12:10	8/22/14 11:26	8/23/14 12:08	8/24/14 10:20	8/25/14 12:07	8/26/14 11:02			
SAMPLE USED:		A	B	B	C	C	C				
CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE											
MICR1410CCD		Avg. young/surviving control (TAC 15 min):			29.3	Surv. controls with 3 broods:		10			

SAMPLE COLLECTION

SAMPLE	COLLECTION DATE & TIME
A	8/19/14 9:17
B	8/20/14 10:00
C	8/22/14 9:30
D	
E	

SAMPLE AGING

SAMPLE:	A
1st USE DATE/TIME:	8/20/14 11:54
LAST USE DATE/TIME:	8/20/14 11:54
TIME COLLECT TO 1st USE:	26h 38m
	(TAC 36 h max)
TIME 1st TO LAST USE:	0h 0m
	(TAC MAX
SAMPLE:	B
1st USE DATE/TIME:	8/21/14 12:10
LAST USE DATE/TIME:	8/22/14 11:26
TIME COLLECT TO 1st USE:	26h 11m
	(TAC 36 h max)
TIME 1st TO LAST USE:	23h 15m
	(TAC MAX 72 h)
SAMPLE:	C
1st USE DATE/TIME:	8/23/14 12:08
LAST USE DATE/TIME:	8/25/14 12:07
TIME COLLECT TO 1st USE:	26h 38m
	(TAC 36 h max)
TIME 1st TO LAST USE:	47h 59m
	(TAC MAX 72 h)
SAMPLE:	D
1st USE DATE/TIME:	
LAST USE DATE/TIME:	
TIME COLLECT TO 1st USE:	0
	(TAC 36 h max)
TIME 1st TO LAST USE:	0
	(TAC MAX 72 h)
SAMPLE:	E
1st USE DATE/TIME:	
LAST USE DATE/TIME:	
TIME COLLECT TO 1st USE:	0
	(TAC 36 h max)
TIME 1st TO LAST USE:	0
	(TAC MAX

Ceriodaphnia daily survival count bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

TRTMNT	Rep	#Live Day 0	#Live Day 1	#Live Day 2	#Live Day 3	#Live Day 4	#Live Day 5	#Live Day 6	#Live FINAL	MALE OR FEMALE	TOTAL REPRO	REPRO/ SURV FEM
	A	1	1	1	1	1	1	1	1	F	25	25
C	B	1	1	1	1	1	1	1	1	F	29	29
	C	1	1	1	1	1	1	1	1	F	26	26
Lab	D	1	1	1	1	1	1	1	1	F	31	31
Control	E	1	1	1	1	1	1	1	1	F	31	31
	F	1	1	1	1	1	1	1	1	F	33	33
	G	1	1	1	1	1	1	1	1	F	28	28
	H	1	1	1	1	1	1	1	1	F	33	33
	I	1	1	1	1	1	1	1	1	F	28	28
	J	1	1	1	1	1	1	1	1	F	29	29
	A	1	1	1	1	1	1	1	1	F	28	
#1	B	1	1	1	1	1	1	1	1	F	28	
	C	1	1	1	1	1	1	1	1	F	27	
6.25%	D	1	1	1	1	1	1	1	1	F	27	
	E	1	1	1	1	1	1	1	1	F	31	
	F	1	1	1	1	1	1	1	1	F	32	
	G	1	1	1	1	1	1	1	1	F	24	
	H	1	1	1	1	1	1	1	1	F	35	
	I	1	1	1	1	1	1	1	1	F	25	
	J	1	1	1	1	1	1	1	1	F	30	
	A	1	1	1	1	1	1	1	1	F	23	
# 2	B	1	1	1	1	1	1	1	1	F	21	
	C	1	1	1	1	1	1	1	1	F	27	
12.5%	D	1	1	1	1	1	1	1	1	F	34	
	E	1	1	1	1	1	1	1	1	F	27	
	F	1	1	1	1	1	1	1	1	F	31	
	G	1	1	1	1	1	1	1	1	F	10	
	H	1	1	1	1	1	1	1	1	F	35	
	I	1	1	1	1	1	1	1	1	F	35	
	J	1	1	1	1	1	1	1	1	F	27	
	A	1	1	1	1	1	1	1	1	F	26	
# 3	B	1	1	1	1	1	1	1	1	F	27	
	C	1	1	1	1	1	1	1	1	F	25	
25.0%	D	1	1	1	1	1	1	1	1	F	25	
	E	1	1	1	1	1	1	1	1	F	24	
	F	1	1	1	1	1	1	1	1	F	31	
	G	1	1	1	1	1	1	1	1	F	12	
	H	1	1	1	1	1	1	1	1	F	32	
	I	1	1	1	1	1	1	1	1	F	26	
	J	1	1	1	1	1	1	1	1	F	23	
	A	1	1	1	1	1	1	1	1	F	16	
# 4	B	1	1	1	1	1	1	1	1	F	18	
	C	1	1	1	1	1	1	1	1	F	13	
50.0%	D	1	1	1	1	1	1	1	1	F	21	
	E	1	1	1	1	1	1	1	1	F	25	
	F	1	1	1	1	1	1	1	1	F	20	
	G	1	1	1	1	1	1	1	1	F	20	
	H	1	1	1	1	1	1	1	1	F	27	
	I	1	1	1	1	1	1	1	1	F	19	
	J	1	1	1	1	1	1	1	1	F	23	
	A	1	1	1	1	1	1	1	1	F	15	
# 5	B	1	1	1	1	1	1	1	1	F	19	
	C	1	1	1	1	1	1	1	1	F	21	
100%	D	1	1	1	1	1	1	0	0	F	8	
	E	1	1	1	1	1	1	1	1	F	22	
	F	1	1	1	1	1	1	1	1	F	16	
	G	1	1	1	1	1	1	1	1	F	19	
	H	1	1	1	1	1	1	1	1	F	8	
	I	1	1	1	1	1	1	1	1	F	22	
	J	1	1	1	1	1	1	1	1	F	18	

See Reproduction Sheet for Renewal Information

See ToxCalc printout for summary survival & reproduction data

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE	

MICR1410CCD	% Control survival (TAC 80% min):	100	% Surviving controls with 3 broods (TAC 60% min):	100

Ceriodaphnia Survival and Reproduction Test-6 Day Survival

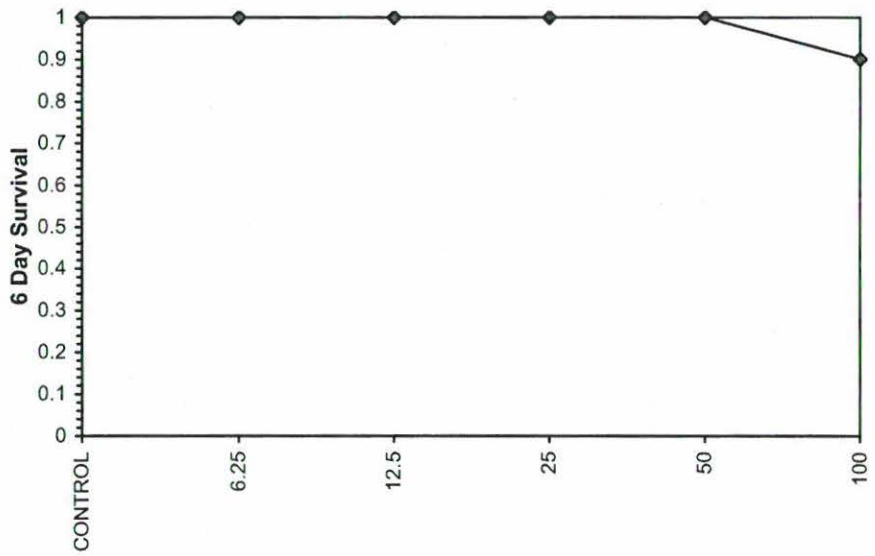
Start Date:	Test ID: MICR1410CD	Sample ID:	
End Date:	Lab ID: CBI	Sample Type:	
Sample Date:	Protocol: EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments: DATA ENTERED BY PB			

Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Conc-%	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's Exact P	1-Tailed Critical
CONTROL	1.0000	1.0000	0	10	10	10		
6.25	1.0000	1.0000	0	10	10	10	1.0000	0.0500
12.5	1.0000	1.0000	0	10	10	10	1.0000	0.0500
25	1.0000	1.0000	0	10	10	10	1.0000	0.0500
50	1.0000	1.0000	0	10	10	10	1.0000	0.0500
100	0.9000	0.9000	1	9	10	10	0.5000	0.0500

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Fisher's Exact Test		>100		1

Dose-Response Plot



Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:		Test ID:	MICR1410CD	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	DATA ENTERED BY PB				

Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	25.000	29.000	26.000	31.000	31.000	33.000	28.000	33.000	28.000	29.000
6.25	28.000	28.000	27.000	27.000	31.000	32.000	24.000	35.000	25.000	30.000
12.5	23.000	21.000	27.000	34.000	27.000	31.000	10.000	35.000	35.000	27.000
25	26.000	27.000	25.000	25.000	24.000	31.000	12.000	32.000	26.000	23.000
50	16.000	18.000	13.000	21.000	25.000	20.000	20.000	27.000	19.000	23.000
100	15.000	19.000	21.000	8.000	22.000	16.000	19.000	8.000	22.000	18.000

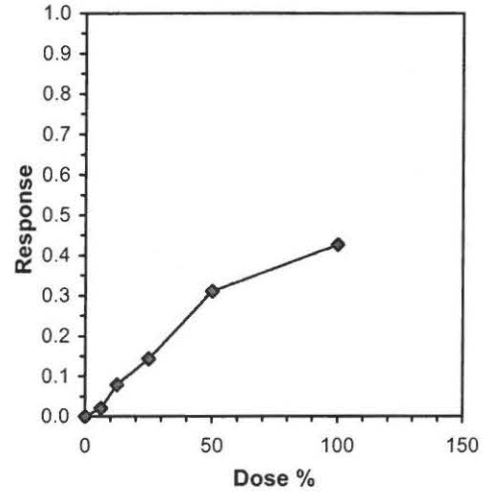
			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
CONTROL	29.300	1.0000	29.300	25.000	33.000	9.249	10				29.300	1.0000
6.25	28.700	0.9795	28.700	24.000	35.000	11.620	10	0.267	2.287	5.133	28.700	0.9795
12.5	27.000	0.9215	27.000	10.000	35.000	28.529	10	1.025	2.287	5.133	27.000	0.9215
25	25.100	0.8567	25.100	12.000	32.000	21.615	10	1.871	2.287	5.133	25.100	0.8567
*50	20.200	0.6894	20.200	13.000	27.000	20.451	10	4.054	2.287	5.133	20.200	0.6894
*100	16.800	0.5734	16.800	8.000	22.000	30.840	10	5.569	2.287	5.133	16.800	0.5734

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.96826	1.035	-1.0065	2.19755
Bartlett's Test indicates equal variances (p = 0.04)	11.7631	15.0863		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	[illegible]	50	[illegible]3	4	5.13261	0[illegible]7	250.137	25.1907	9.0E-07	5, 54

Linear Interpolation (200 Resamples)

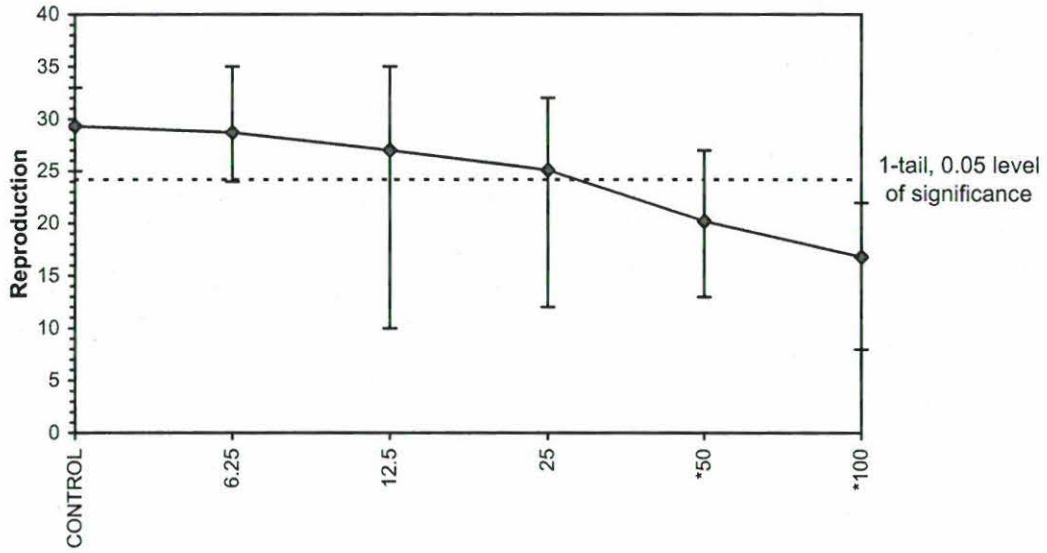
Point	%	SD	95% CL		Skew
IC05	9.430	4.941	3.392	22.215	0.6892
IC10	16.645	6.438	6.828	29.844	0.5117
IC15	25.995	7.509	9.944	35.767	-0.0591
IC20	33.469	7.862	12.001	44.621	-0.2655
IC25	4[illegible]	7.880	23.222	55.865	-0.0863
IC40	88.529				
IC50	>100				



Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	Test ID:	MICR1410CD	Sample ID:	
End Date:	Lab ID:	CBI	Sample Type:	
Sample Date:	Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	DATA ENTERED BY PB			

Dose-Response Plot



Fathead minnow test set up bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

Test chamber:	1000 ml Poly Beaker	✓	Illumination & photoperiod:	50-100 ft-c 16L:8D
	Other:		Number of replicates/treatment:	4
Test solution vol. (250 ml min):	500 ml:	✓	Initial number animals/replicate:	10
	Other (ml):			

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE	

SPECIES:	Pimephales promelas	
ACCLIMATION WATER:	Mod. Hard Synthetic Freshwater	
FEEDING PRIOR TO TEST:	Artemia nauplii (<24 h old) ad libitum	
FEEDING DURING TEST:	Artemia nauplii (<24 h old, ~0.15 ml) 2x/day	
SOURCE:	CBI Stock cultures	
ACCLIMATION TEMP (o C):	25	
HATCH START DATE & TIME:	8/19/14 17:00	
HATCH END DATE & TIME:	8/20/14 8:40	
DATE/TIME WATER ADDED:	8/20/14 11:30	
DATE/TIME ANIMALS ADDED:	8/20/14 11:53	
ANIMAL AGE WINDOW:	15h 40m	
MAX AGE AT TEST START (TAC 24 h MAX):	18h 53m	
TEST SET UP BY:		RCD
TEST ID:	MICR1410CPP	
PEER REVIEW BY (Initial/Date):	PB. RCD	8/28/14 10:19
MICR1410CPP		

Fathead minnow daily water quality bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

		Day 0		Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7	SUMMARY WATER QUALITY DATA			
	TRTMNT	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final		MEAN	S.D.	MIN.	MAX.
pH (S.U.)	C	7.79	7.72	7.71	7.54	7.73	7.46	7.77	7.47	7.74	7.61	7.77	7.20	7.72	7.35		7.61	0.18	7.20	7.79
	1	7.79	7.72	7.70	7.43	7.68	7.44	7.76	7.43	7.73	7.61	7.78	7.27	7.71	7.35		7.60	0.18	7.27	7.79
	2	7.75	7.72	7.66	7.35	7.68	7.37	7.74	7.47	7.69	7.61	7.76	7.27	7.68	7.32		7.58	0.18	7.27	7.76
	3	7.71	7.70	7.63	7.32	7.57	7.34	7.68	7.40	7.61	7.54	7.66	7.24	7.65	7.27		7.52	0.17	7.24	7.71
	4	7.64	7.63	7.54	7.27	7.47	7.28	7.56	7.36	7.43	7.42	7.53	7.15	7.53	7.23		7.43	0.15	7.15	7.64
	5	7.51	7.64	7.35	7.22	7.23	7.15	7.23	7.21	7.06	7.16	7.23	6.94	7.26	6.98		7.23	0.19	6.94	7.64
Temp. (o C)	C	25	25	25	25	25	25	25	25	25	25	25	25	24	25		25	0.3	24	25
	1	25	25	25	25	25	25	25	25	25	25	25	25	24	25		25	0.3	24	25
	2	25	25	25	25	25	25	25	25	25	25	25	25	24	25		25	0.3	24	25
	3	25	25	25	25	25	25	24	25	25	25	25	25	25	25		25	0.3	24	25
	4	25	25	25	25	25	25	24	25	25	25	25	25	25	25		25	0.3	24	25
	5	25	25	25	25	25	25	24	25	25	25	25	25	25	25		25	0.3	24	25
Diss. Oxygen (mg/l)	C	8.2	7.9	8.1	7.6	7.8	7.1	7.8	6.9	7.9	7.0	7.7	7.2	8.0	6.8		7.6	0.5	6.8	8.2
	1	8.2	7.5	8.1	7.3	7.8	7.0	7.8	6.9	7.8	7.0	7.7	7.2	8.0	6.8		7.5	0.5	6.8	8.2
	2	8.2	7.5	8.1	7.2	7.8	6.9	7.7	6.8	7.8	6.9	7.7	7.1	8.0	6.9		7.5	0.5	6.8	8.2
	3	8.2	7.4	8.1	7.2	7.8	6.7	7.7	6.8	7.8	6.9	7.7	7.2	8.0	6.9		7.5	0.5	6.7	8.2
	4	8.2	7.4	8.2	7.2	7.8	6.6	7.7	6.7	7.8	6.8	7.7	7.3	8.0	7.0		7.5	0.5	6.6	8.2
	5	8.2	7.4	8.2	7.6	7.8	6.7	7.7	6.9	7.9	6.8	7.9	7.4	8.0	7.1		7.5	0.5	6.7	8.2
Cond. (uS/cm)	C	293		301		298		290		298		303		299			297	4.5	290	303
	1	339		310		302		290		293		292		291			302	17.7	290	339
	2	383		315		297		288		284		282		282			304	36.6	282	383
	3	462		331		290		271		267		264		262			307	72.6	262	462
	4	643		343		278		238		229		224		221			311	152.8	221	643
	5	985		407		250		160		143		137		136			317	310.6	136	985
	Replicate measured	B	D	C	B	C	A	D	C	B	D	A	C	D	B					
	Initials	RCD	AG	BJA	GB	RCD	RCD	GB	RCD	RCD	GB	AG	GB	BJA	GB					
Changes & Notes (Initials, date, specific change or notes)																				

	Test Aerated?	No	D.O. Highest conc. @ aeration:		TRT ID:	1	2	3	4	5	
MICR1410CPP	Date & Time Air Start:		Total live highest conc.@ aeration		CONC(%):	6.25%	12.5%	25.0%	50.0%	100%	

Fathead minnow daily biological measurements bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

TRTMNT	Rep	#Live Day 0	#Live Day 1	#Live Day 2	#Live Day 3	#Live Day 4	#Live Day 5	#Live Day 6	#Live Day 7	Total Dry Wt (mg)	Tare Wt (mg)	Wt Count	Pan Number
C	A	10	10	10	10	10	10	10	10	14.27	9.67	10	49
	B	10	10	10	10	10	10	10	10	15.09	9.52	10	50
Lab	C	10	10	10	10	10	10	10	10	16.06	9.65	10	51
Control	D	10	10	10	10	10	10	10	10	18.27	10.89	10	52
#1	A	10	10	10	10	10	10	10	10	15.55	9.82	10	53
6.25%	B	10	10	10	10	10	10	10	10	14.93	8.91	10	54
Vol. Effl:	C	10	10	10	10	10	10	10	10	15.33	9.06	10	55
100 ml	D	10	10	10	10	10	10	10	10	16.09	9.78	10	56
# 2	A	10	10	10	10	9	9	9	9	15.41	9.88	10	57
12.5%	B	10	10	10	10	10	10	10	10	15.12	11.72	10	58
Vol. Effl:	C	10	10	10	10	10	10	10	10	17.00	10.77	10	59
200 ml	D	10	10	10	10	10	10	10	10	16.13	9.90	10	60
# 3	A	10	10	10	10	10	10	10	10	14.90	9.13	10	61
25.0%	B	10	10	10	8	8	8	8	8	14.54	9.47	10	62
Vol. Effl:	C	10	10	10	10	10	10	10	10	16.02	9.48	10	63
400 ml	D	10	10	10	10	10	10	10	10	14.98	9.58	10	64
# 4	A	10	10	10	9	9	9	9	9	14.50	9.10	10	65
50.0%	B	10	10	10	10	10	10	10	10	13.72	9.43	10	66
Vol. Effl:	C	10	10	10	10	10	10	10	10	14.53	9.31	10	67
800 ml	D	10	10	10	10	10	9	9	9	16.51	11.08	10	68
# 5	A	10	10	10	10	10	10	9	9	13.94	10.24	10	69
100%	B	10	10	10	10	10	10	10	10	13.41	9.44	10	70
Vol. Effl:	C	10	10	10	10	10	9	8	8	12.57	9.34	10	71
1600 ml	D	10	10	10	8	8	8	8	8	12.40	9.21	10	72
INITIALS:		RCD	BJA	RCD	GB	RCD	AG	BJA	BJA	PB	GB	See ToxCalc printout for summary survival & biomass data	
DATE & TIME:		8/20/14 11:53	8/21/14 12:56	8/22/14 12:05	8/23/14 11:44	8/24/14 10:48	8/25/14 11:24	8/26/14 11:32	8/27/14 12:29	8/28/14 10:12	8/23/14 12:26		
SAMPLE USED:		A	B	B	C	C	C	C	100 mg wt ck:	100.00	99.99	Test Duration:	7d 0h 36m

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE	Fuzzy dead fish Day 5 5-C.

MEAN % CONTROL SURVIVAL (TAC 80% MIN): 100

AVG. DRY WT. PER SURV. CONTROL (TAC 0.25 mg): 0.599

SAMPLE	COLLECTION DATE/TIME	1st USE DATE & TIME	LAST USE DATE & TIME	TIME COLLECT-1ST USE (TAC MAX 36h)	TIME 1st TO LAST USE (TAC MAX 72 h)
A	8/19/14 9:17	8/20/14 11:53	8/20/14 11:53	26h 36m	0h 0m
B	8/20/14 10:00	8/21/14 12:56	8/22/14 12:05	26h 56m	23h 10m
C	8/22/14 9:30	8/23/14 11:44	8/26/14 11:32	26h 15m	71h 48m
				0	0
				0	0

MICR1410CPP

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:	Test ID: MICR1410PP	Sample ID:	
End Date:	Lab ID: CBI	Sample Type:	
Sample Date:	Protocol: EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments: DATA ENTERED BY PB			

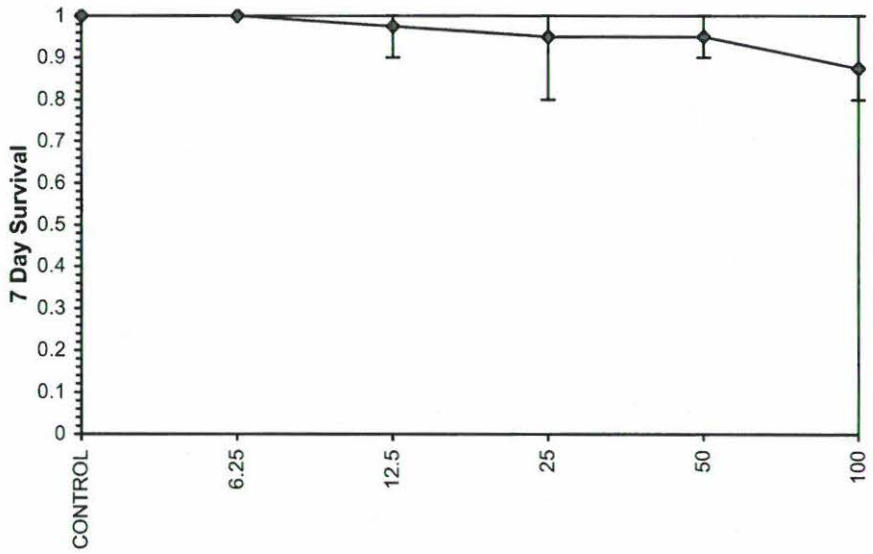
Conc-%	1	2	3	4
CONTROL	1.0000	1.0000	1.0000	1.0000
6.25	1.0000	1.0000	1.0000	1.0000
12.5	0.9000	1.0000	1.0000	1.0000
25	1.0000	0.8000	1.0000	1.0000
50	0.9000	1.0000	1.0000	0.9000
100	0.9000	1.0000	0.8000	0.8000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
CONTROL	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4		
6.25	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4	18.00	10.00
12.5	0.9750	0.9750	1.3713	1.2490	1.4120	5.942	4	16.00	10.00
25	0.9500	0.9500	1.3358	1.1071	1.4120	11.411	4	16.00	10.00
50	0.9500	0.9500	1.3305	1.2490	1.4120	7.072	4	14.00	10.00
100	0.8750	0.8750	1.2188	1.1071	1.4120	11.906	4	12.00	10.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.93033	0.884	-0.5372	1.15794
Equality of variance cannot be confirmed				

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

Dose-Response Plot



Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:		Test ID:	MICR1410PP	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	DATA ENTERED BY PB				

Conc-%	1	2	3	4
CONTROL	0.4600	0.5570	0.6410	0.7380
6.25	0.5730	0.6020	0.6270	0.6310
12.5	0.5530	0.3400	0.6230	0.6230
25	0.5770	0.5070	0.6540	0.5400
50	0.5400	0.4290	0.5220	0.5430
100	0.3700	0.3970	0.3230	0.3190

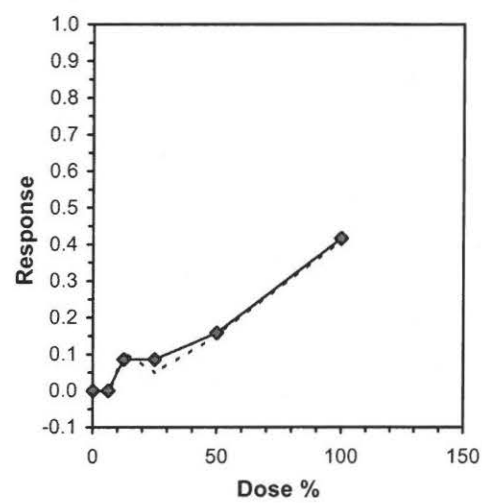
			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
CONTROL	0.5990	1.0000	0.5990	0.4600	0.7380	19.793	4				0.6036	1.0000
6.25	0.6083	1.0154	0.6083	0.5730	0.6310	4.402	4	-0.158	2.410	0.1409	0.6036	1.0000
12.5	0.5348	0.8927	0.5348	0.3400	0.6230	25.051	4	1.099	2.410	0.1409	0.5521	0.9147
25	0.5695	0.9508	0.5695	0.5070	0.6540	11.093	4	0.504	2.410	0.1409	0.5521	0.9147
50	0.5085	0.8489	0.5085	0.4290	0.5430	10.581	4	1.548	2.410	0.1409	0.5085	0.8424
*100	0.3523	0.5881	0.3523	0.3190	0.3970	10.721	4	4.220	2.410	0.1409	0.3523	0.5836

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.95195	0.884	-0.738	1.35554
Bartlett's Test indicates equal variances (p = 0.09)	9.39003	15.0863		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	[illegible]	100	7[illegible]07	2	0.14092	0[illegible]7	0.03561	0.00684	0.00395	5, 18

Linear Interpolation (200 Resamples)

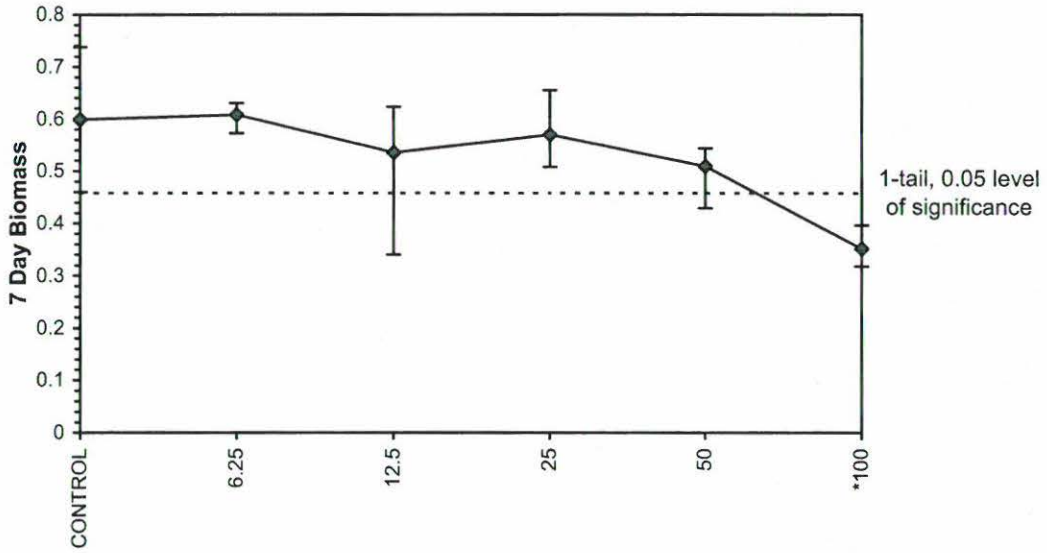
Point	%	SD	95% CL(Exp)		Skew
IC05	9.913	11.265	0.000	58.453	1.1890
IC10	30.079	16.564	0.000	70.355	0.3576
IC15	47.375	17.847	0.000	72.972	-0.5565
IC20	58.192	14.761	0.000	80.446	-1.4713
IC25	6[illegible]	12.211	7.649	88.872	-1.6169
IC40	96.824				
IC50	>100				



Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:	Test ID:	MICR1410PP	Sample ID:	
End Date:	Lab ID:	CBI	Sample Type:	
Sample Date:	Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	DATA ENTERED BY PB			

Dose-Response Plot



Effluent and Dilution Water Log (Freshwater Tests). FWEFFL061013

											SUMMARY WATER QUALITY DATA				
Initial sample charac-terization	Bottle(1):	A1	B1	C1							MEAN	S.D.	MIN.	MAX.	PARAMETER
	Arrival Temp. (oC, from CoC):	1	2	1							1	0.6	1	2	Arrival Temp.
	TRC (mg/l)(2):	<DL	<DL	<DL											
	TRC Corrected(2):														
	Hardness (mg/l):	112	56	46							71	35.6	46	112	Hardness (mg/l)
	Alkalinity (mg/l):	66	37	38							47	16.5	37	66	Alkalinity (mg/l)
	NH3-N (mg/l):	<1.0	<1.0	<1.0											
	Color/Appearance(3):	C	C	C											
	Obvious odor?	NO	NO	NO											
	Date & Time:	8/20/14 11:04	8/21/14 11:07	8/23/14 10:55											
	Initials:	GB	AG	GB											
Sample prep measure-ments	Test Day:	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7		MEAN	S.D.	MIN.	MAX.	
	Bottle(s):	A1	B-1,2	B-1,2	C1,2	C1,2	C1,2	C1,2							
	Prep. Temp. (oC):	25	24	25	24	25	25	25			25	0.5	24	25	Temp. (oC)
	D.O. (mg/l) After Warming:	10.3	10.3	10.5	11.1	10.7	10.4	11.0							
	Aeration Time (min):	4	4	4	4.5	4	4	4.5							
	Adjusted D.O. (mg/l):	8.2	8.3	8.2	8.3	8.2	8.2	8.2			8.2	0.0	8.2	8.3	D.O. (mg/l)
	Final pH (S.U.):	7.50	7.16	7.23	7.25	7.00	7.22	7.15			7.22	0.15	7.00	7.50	pH (S.U.)
	Conductivity (uS/cm)(4):	968	222	NA	136	NA	NA	NA			442	457.6	136	968	Cond. (uS/cm)
	Final TRC (mg/l)(5):	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.							
	Sample Filtered (60 um)?	✓	✓	✓	✓	✓	✓	✓							
	Date & Time:	8/20/14 11:28	8/21/14 11:36	8/22/14 11:06	8/23/14 11:17	8/24/14 9:59	8/25/14 11:10	8/26/14 11:18							
	Initials:	AG	BJA	RCD	GB	RCD	AG	BJA							
Dilution water	Test Day:	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7		MEAN	S.D.	MIN.	MAX.	
	Vat Number:	1	2	2	3	3	1	1							
	Temperature (oC):	25	25	25	25	25	25	25			25	0.0	25	25	Temp. (oC)
	Conductivity (uS/cm):	296	303	301	298	295	295	304			299	3.8	295	304	Cond. (uS/cm)
	D.O. (mg/l):	8.2	8.2	8.2	8.2	8.2	8.2	8.2			8.2	0.0	8.2	8.2	D.O. (mg/l)
	pH (S.U.):	7.74	7.74	7.70	7.88	7.90	7.84	7.72			7.79	0.08	7.70	7.90	pH (S.U.)
	Hardness (mg/l):	100	92	92	98	98	90	90			94	4.2	90	100	Hardness (mg/l)
	Alkalinity (mg/l):	57	57	57	58	58	59	59			58	0.9	57	59	Alkalinity (mg/l)
	Date & Time:	8/20/14 8:25	8/21/14 8:30	8/22/14 8:30	8/23/14 9:00	8/24/14 8:30	8/25/14 8:55	8/26/14 8:20							
	Initials:	GB	AG	GB	RCD	RCD	GB	GB							
	Changes & Notes (Initials, date, specific change or notes)														
	Peer review Initial/Date:	PB	8/27/14 11:09	DILUTION WATER TYPE:	Mod. Hard Synthetic Freshwater (EPA)										
PROJECT ID:	MICR1410	ADDITIONAL EFFLUENT TREATMENT:													

ND=Not Determined/Measured, NA=Not Applicable. 1) Ninth character of lab sample ID on chain of custody AND bottle number in collection series. Together with Project ID constitutes entire sample bottle ID. 2) TRC MDL 0.02 mg/l; QL 0.22 mg/l. Corrected value if Mn, Cr potential positive interference. Corrected using KI and NaAsO2. 3) C-clear, O-opaque, T-turbid, S-solids (Sl-slight, M-moderate, H-heavy), Y-yellow, B-brown, Bl-black, G-green, P-pink, Gr-grey, Or-orange. 4) Measured on first use of sample only. 5) Final TRC measured only if chlorine present in initial characterization.

Coastal Bioanalysts
6400 Enterprise Court, Gloucester, VA 23061
PH: 804-694-8285, FAX: 804-695-1129
www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): M I C R I 4 1 0 - A

A A A A Y Y N N (Project ID) — A (Spl)

CBI Login # 14-040604

FACILITY INFORMATION

CLIENT/FACILITY NAME	LBB/National Archives II	CONTACT & PHONE #	Bob Gentry LBB
NPDES PERMIT NO		OUTFALL # OR LOCATION	001
SAMPLE CHLORINATED?	SAMPLE DECHLORINATED?	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?	

TESTS REQUESTED:	SPECIES OR EPA METH #		ACUTE	CHRONIC
		C. dubia	☐	☑
		P. promelas	☐	☑

OTHER TESTS:

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	8/18/14 0917	SAMPLE END DATE & TIME	8/19/14 0917	AUTOSAMPLER TEMP. (°C)	5.8°
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION	NUMBER SUBSAMPLES 97	VOL (ml) SUBSAMPLES 100 mls		TIME INCREMENT 15 min	
	SET VOLUME SUBSAMPLE —	SET VOLUME FLOW —		TOTAL VOLUME 10L	

FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
24.2	6.9	5.8°	7.6	0.10	8/19/14 0920	JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeffrey Duszynski (PRINTED NAME/AFFILIATION SAMPLER/ANALYST) — [signature] (SIGNATURE) — 8/19/14 (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
[signature]	8/19/14	1600	UPS
	8/20/14	1050	[signature]

SHIPPING METHOD: UPS Y FEDEX ___ HAND DELIVERY ___

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER ___

SAMPLE TEMP: (°C) 1 ARRIVED ON ICE? Y ✓ N ___ CUSTODY SEAL: INTACT ✓ BROKEN ___ ABSENT ___

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

Coastal Bioanalysts
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PH: 804-694-8285, FAX: 804-695-1129
www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): M I C R 1 4 1 0 - B
A A A A Y Y N N (Project ID) — A (Spl)

CBI Login # 14-0669

FACILITY INFORMATION

CLIENT/FACILITY NAME	LBB/National Archives II	CONTACT & PHONE #	Bob Gentry (LBB)
NPDES PERMIT NO		OUTFALL # OR LOCATION	001
SAMPLE CHLORINATED? N	SAMPLE DECHLORINATED?	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?	

TESTS REQUESTED:	SPECIES OR EPA METH #	ACUTE	CHRONIC
	C. dubia	☐	☑
	P. promelas	☐	☑

OTHER TESTS:

*A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	8/19/14 1000	SAMPLE END DATE & TIME	8/20/14 1000	AUTOSAMPLER TEMP. (°C)	9.2°
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION*	NUMBER SUBSAMPLES 97	VOL (ml) SUBSAMPLES 100 ml/s		TIME INCREMENT 15 min	
	SET VOLUME SUBSAMPLE —	SET VOLUME FLOW —		TOTAL VOLUME 9-10 L	

*FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
22.8°	6.4	9.2	6.75	<0.03	8/20/14 1005	JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeffrey Duszynski — (PRINTED NAME/AFFILIATION SAMPLER/ANALYST)
[signature] — (SIGNATURE)
8/20/14 — (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
[signature]	8/20/14	1500	UPS
	8/21/14	1100	[signature]

SHIPPING METHOD: UPS ✓ FEDEX____ HAND DELIVERY____

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER____

SAMPLE TEMP: (°C) 2 ARRIVED ON ICE? Y ✓ N___ CUSTODY SEAL: INTACT ✓ BROKEN___ ABSENT___

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

Coastal Bioanalysts
6400 Enterprise Court, Gloucester, VA 23061
PH: 804-694-8285, FAX: 804-695-1129
www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): M I C R 1 4 1 0 - C
A A A A Y Y N N (Project ID) — A (Spl)

CBI Login # 14-0625

FACILITY INFORMATION

CLIENT/FACILITY NAME	LBB/National Archives II	CONTACT & PHONE #	Bob Gentry (LBB)
NPDES PERMIT NO		OUTFALL # OR LOCATION	001
SAMPLE CHLORINATED? N	SAMPLE DECHLORINATED?	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?	

TESTS REQUESTED:	SPECIES OR EPA METH #		ACUTE	CHRONIC
		C. dubia	ACUTE ☐	CHRONIC ☑
		P. promelas	ACUTE ☐	CHRONIC ☑

OTHER TESTS:

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	8/21/14 0930	SAMPLE END DATE & TIME	8/22/14 0930	AUTOSAMPLER TEMP. (°C)	
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION	NUMBER SUBSAMPLES 97	VOL (ml) SUBSAMPLES 200mls		TIME INCREMENT 15 min	
	SET VOLUME SUBSAMPLE —	SET VOLUME FLOW —		TOTAL VOLUME 19L	

FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
24.6	6.75	12.3	6.8	<0.03	8/22/14 0935	JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeffrey J Dvszynsk (PRINTED NAME/AFFILIATION SAMPLER/ANALYST) — Jeffrey J Dvszynsk (SIGNATURE) — 8/22/14 (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
Jeffrey Dvszynsk	8/22/14	1600	UPS
	8/23/14	1050	JB

SHIPPING METHOD: UPS ✓ FEDEX____ HAND DELIVERY____

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER____

SAMPLE TEMP: (°C) 1 ARRIVED ON ICE? Y ✓ N___ CUSTODY SEAL: INTACT ✓ BROKEN___ ABSENT___

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

MICROBAC®

Microbac Laboratories, Inc.

Baltimore Division

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COVER LETTER

Bob Gentry
LB&B Associates
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740

November 20, 2014
Report No.: 14K1086

RE: Toxic Chemical Bioassay (4 Quarters)

The report of analyses contains test results for samples received at Microbac Laboratories, Inc., Baltimore Division on 11/07/2014 16:00. The samples were subcontracted to .

The enclosed results were obtained from and applicable to the sample(s) as received at the laboratory. All sample results are reported on an "as received" basis unless otherwise noted.

All data included in this report has been reviewed and meet the applicable project and certification specific requirements, unless otherwise noted.

ıis report has been paginated in its entirety and shall not be reproduced except in full, without the written approval of Microbac Laboratories, Inc.

We appreciate the opportunity to service your analytical needs. If you have any questions, please feel free to contact us.

This Data Package contains the following:

- This Cover Page
- Cooler Receipt Log
- Chain of Custody
- Subcontract Report/Data

Final report reviewed by:	Michael M. Gallion/Project Manager	11/20/2014 Report issue date

All samples received in proper condition and results conform to ISO 17025 standards unless otherwise noted.

If we have not met or exceeded your expectations, please contact Michael M. Gallion/Project Manager at 410-633-1800. You may also contact Trevor Boyce, President at trevor.boyce@microbac.com

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Baltimore Division

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CERTIFICATE OF ANALYSIS

LB&B Associates	Project: Toxic Chemical Bioassay (4 Quarters)	Report: 14K1086
Fac. Ops & Maint., 8601 Adelphi Road	Project Number: Toxic Chemical Bioassay (4 Quarters)	Reported: 11/20/2014 17:17
College Park, MD 20740	Project Manager: Bob Gentry	

SAMPLE SUMMARY

Sample ID	Laboratory ID	Matrix	Type	Date Sampled	Date Received
001	14K1086-01	Wastewater	Composite	11/7/14 0:00	11/7/14 16:00

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Michael M. Gallion, Project Manager

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Baltimore Division

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CERTIFICATE OF ANALYSIS

LB&B Associates	Project: Toxic Chemical Bioassay (4 Quarters)	Report: 14K1086
Fac. Ops & Maint., 8601 Adelphi Road	Project Number: Toxic Chemical Bioassay (4 Quarters)	Reported: 11/20/2014 17:17
College Park, MD 20740	Project Manager: Bob Gentry	

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Cooler Receipt Log

Cooler ID: Default Cooler **Cooler Temp:** **Work Order:** 14K1086

Custody Seals Intact:	Yes	COC/Containers Agree:	Yes
Containers Intact:	Yes	Correct Preservation:	Yes
Received On Ice:	Yes	Correct Number of Containers Received:	Yes
Radiation Scan Acceptable:	Yes	Sufficient Sample Volume for Testing:	Yes
COC Present:	Yes	Samples Received in Proper Condition:	Yes

Comments:

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Phone: 410-633-1800
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14K1086

Tenatively Scheduled Date: **11/11/2014**

Client: **LB&B Associates**
Project: **Toxic Chemical Bioassay (4 Quarters)**
Project Number: **Toxic Chemical Bioassay (4 Quarters)**

Report To:
Bob Gentry
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone: (301) 837-3247

Invoice To:
Bob Gentry
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone :(301) 837-3247

TAT 21 days

Sample ID: 001

Lab Sample ID: **14K1086-01**
Matrix: Wastewater
Type: Composite

Sample Start Date & Time:
Sampled Date & Time:
Volume:

		Hold
SUBCONTRACT	Subout	120

Total Containers: 0

Sampled by: Jeff Duszynski	Date/Time: 11/7/14 1600	Received by:
Printed Name: Jeff J. Duszynski		Printed Name: Michael Gallion
Relinquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:
Relinquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:

As Received at Laboratory: On Ice: Yes / No Cooler Temp — Rad Scan Acceptable: Yes / No Total Bottles 0

Notes:

Client: Microbac Laboratories, Inc.
Project ID: MICR1412
Client Sample ID: LBB/National Archives II Outfall 001
Permit No.: MD0065871
Sample Period: 11/4/14 to 11/7/14

Coastal Bioanalysts, Inc.

Report of Analysis: Whole Effluent Toxicity (WET)

Submitted To:	**Prepared By:**
Mr. Michael Arbaugh Sr. Microbac Laboratories, Inc. Baltimore Division 2101 Van Deman Street Baltimore, MD 21224	Coastal Bioanalysts, Inc. 6400 Enterprise Court Gloucester, VA 23061 (804) 694-8285 www.coastalbio.com Contact: Peter F. De Lisle, Technical Director

Chronic Test Results*

Species-Test Method	Endpoint	NOEC	LOEC	ChrV	PMSD	$T.U._C$	IC25	48-h LC50	LC50 95% C.L.	$T.U._{Ac}$
C. dubia	Survival	100	>100	>100	N/A	N/A	N/A	>100	N/A	<1.00
EPA 1002.0	Reproduction	50	100	70.7	22	**<1.00**	>100	N/A	N/A	N/A
P. promelas	Survival	100	>100	>100	N/A	N/A	N/A	>100	N/A	<1.00
EPA 1000.0	Biomass	100	>100	>100	12	**<1.00**	>100	N/A	N/A	N/A

*Note: Details regarding test conduct and data analysis provided in attached bench sheets and printouts as applicable.

Chronic Test QA/QC Reference Toxicant: KCl Units: mg/l Test Organism Source: CBI Stock Cultures

Species-Method (Ref. Test Date)	Data Source	% Survival		Reproduction (# Young) or Biomass (mg)					RTT in Control?
		Cont.	NOEC	Cont.	NOEC	PMSD	IC25	IC25 A.L.	
C. dubia 1002.0	RTT	100	500	27.7	250	21	420	N/A	Yes
(11/1/14-11/7/14)	CC	99	500	27.3	250	19	339	265-413	
P. promelas 1000.0	RTT	98	500	0.60	500	20	614	N/A	Yes
(11/3/14-11/10/14)	CC	99	500	0.61	500	13	627	600-655	

Note: RTT = Reference Toxicant Test, CC = Control Chart, Cont. = Control group.

The results of analysis contained within this report relate only to the sample as received in the laboratory. This report shall not be reproduced except in full without written approval from the laboratory. Unless noted below, these test results meet all requirements of NELAP.

APPROVED:

Peter F. De Lisle, Ph.D.
Technical Director

11/13/14
Date

Deviations from, additions to, or exclusions from the test method, non-standard conditions or data qualifiers and, as appropriate, a statement of compliance/non-compliance: **NONE**

VELAP# 460030
EPA# VA01116

GLOSSARY OF TERMS AND ABBREVIATIONS

A.L. (Acceptance Limits): The results of a given reference toxicant test are compared to the control chart mean value ± 2 standard deviations. These limits approximate the 95% probability limits for the "true" reference toxicant value.

Chronic Value (ChrV): The geometric mean of the NOEC and LOEC. Units are same as test concentration units.

C.L. (Confidence Limits): These are the probability limits, based on the data set and statistical model employed, that the "true value" lies within the limits specified. Typically limits are based on 95% or 99% probabilities.

Control chart: A cumulative summary chart of results from QC tests with reference toxicants. The results of a given reference toxicant test are compared to the control chart mean value and 95% Acceptance Limits (A.L.) (mean ± 2 standard deviations).

IC25: The concentration of sample or chemical, calculated from the data set using statistical models, causing a 25% reduction in test organism growth, reproduction, etc. The lower the IC25, the more toxic the chemical or sample. Units are same as test concentration units.

LC50: The concentration of sample or chemical, calculated from the data set using statistical models, causing a 50% reduction in test organism survival. The lower the LC50, the more toxic the chemical or sample. Units are same as test concentration units. Note: The LC50 value must always be associated with the duration of exposure. Thus 48-h LC50, 96-h LC50, etc. are calculated.

LOEC: Lowest-observable-effect-concentration. The lowest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit a statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Units are same as test concentration units.

PMSD: Percent Minimum Significant Difference: The minimum difference which can exist between a test treatment and the controls in a particular test and be statistically significant; a measure of test sensitivity. The lower the PMSD the more sensitive the test.

N/A: Not applicable.

N/D: Not determined or measured.

NOAEC: No-observable-acute-effect-concentration. The highest concentration of sample or chemical in an acute test dilution series in which the test organisms exhibit no statistically significant reduction in the test end point (e.g. survival) compared to control organisms. Units are same as test concentration units.

NOEC: No-observable-effect-concentration. The highest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit no statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Some regulatory definitions also require that the NOEC be less than the LOEC. Units are same as test concentration units.

Q.L.: Quantitation Limit. Level, concentration, or quantity of a target variable (analyte) that can be reported at a specified degree of confidence.

T.U.: Toxic units. Expresses the relative toxicity of an effluent in such a manner that the larger the toxic unit value the more toxic the effluent. $T.U._{Ac} = 100/LC50$. $T.U._{Chr} = 100/NOEC$. A dimensionless unit.

Ceriodaphnia test set up bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

Test chamber:	~30 ml glass vial:	✓	Illumination & photoperiod:	50-100 ft-c 16L:8D
	Other:		Number of replicates/treatment:	10
Test solution volume:	15 ml:	✓	Initial number animals/replicate:	1
	Other (ml):		Template #:	4

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE	

SPECIES:	Ceriodaphnia dubia	
ACCLIMATION WATER:	Mod. Hard Synthetic Freshwater	
FEEDING (Culture &Test):	YCT + Selenastrum capricornutum mix	
SOURCE:	CBI Stock cultures	
ACCLIMATION TEMP (o C):	25	
BROOD RELEASE FROM:	11/4/14 22:00	
BROOD RELEASE TO:	11/5/14 6:00	
DATE/TIME WATER ADDED:	11/5/14 14:30	
DATE/TIME ANIMALS ADDED:	11/5/14 14:46	
ANIMAL AGE WINDOW (TAC 8 h):	8h 0m	
MAX AGE AT TEST START (TAC 24 h):	16h 46m	
TEST SET UP BY:	BJA	
TEST ID:	**MICR1412CCD**	
PEER REVIEW BY (Initial/Date):	**PB**	11/12/14 16:21
MICR1412CCD		

Ceriodaphnia daily water quality bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

		Day 0	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7	SUMMARY WATER QUALITY DATA			
	TRTMNT	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	MEAN	S.D.	MIN.	MAX.
pH (S.U.)	C	7.73	8.20	7.73	8.18	7.75	8.20	7.69	8.35	7.67	8.22	7.70	8.02			7.95	0.26	7.67	8.35
	1	7.73	8.40	7.73	8.33	7.75	8.35	7.69	8.37	7.69	8.34	7.70	8.13			8.02	0.32	7.69	8.40
	2	7.73	8.40	7.73	8.39	7.75	8.34	7.68	8.47	7.70	8.32	7.72	8.13			8.03	0.34	7.68	8.47
	3	7.72	8.39	7.70	8.32	7.75	8.33	7.63	8.42	7.66	8.29	7.71	8.10			8.00	0.33	7.63	8.42
	4	7.69	8.30	7.65	8.32	7.75	8.29	7.55	8.45	7.61	8.35	7.67	8.18			7.98	0.35	7.55	8.45
	5	7.63	7.90	7.58	8.31	7.76	8.27	7.42	8.44	7.49	8.31	7.61	8.24			7.91	0.38	7.42	8.44
Temp. (o C)	C	25	25	25	25	25	26	25	25	25	25	25	25			25	0.3	25	26
	1	25	25	25	25	25	26	25	25	25	25	25	25			25	0.3	25	26
	2	25	25	25	25	25	26	25	25	25	25	25	25			25	0.3	25	26
	3	25	25	25	25	25	26	25	25	25	25	25	25			25	0.3	25	26
	4	25	25	25	25	25	26	25	25	25	25	25	25			25	0.3	25	26
	5	25	25	25	25	25	26	25	25	25	25	25	25			25	0.3	25	26
Diss. Oxygen (mg/l)	C	8.2	8.2	8.2	8.4	8.2	8.1	7.6	8.5	8.2	8.5	8.1	8.4			8.2	0.2	7.6	8.5
	1	8.2	8.5	8.2	8.5	8.2	7.9	7.6	8.6	8.1	8.6	8.1	8.4			8.2	0.3	7.6	8.6
	2	8.2	8.5	8.2	8.7	8.2	8.5	7.5	8.8	8.0	8.7	8.1	8.5			8.3	0.4	7.5	8.8
	3	8.2	8.6	8.2	8.8	8.2	8.7	7.6	9.1	7.9	8.7	8.1	8.5			8.4	0.4	7.6	9.1
	4	8.2	8.6	8.2	8.9	8.2	8.8	7.7	9.1	7.9	8.9	8.1	8.5			8.4	0.4	7.7	9.1
	5	8.2	7.7	8.2	9.0	8.2	8.4	7.9	9.3	7.9	8.9	8.1	8.7			8.4	0.5	7.7	9.3
Cond. (uS/cm)	C	302		301		305		303		303		306				303	1.9	301	306
	1	344		344		345		329		330		329				337	8.2	329	345
	2	387		387		389		350		348		349				368	21.2	348	389
	3	469		470		474		393		395		393				432	42.4	393	474
	4	639		639		641		482		480		483				561	86.5	480	641
	5	969		964		965		640		642		643				804	177.7	640	969
Replicate measured		S	H	S	F	S	A	S	C	S	J	S	E			NOTE: Final D.O. Values >8.3 mg/l (saturation) may occur due to photosynthetic activity of algal food.			
Initials		BJA	BJA		BJA		KK		RCD		AG		BJA						
Changes & Notes (Initials, date, specific change or notes)																			
												TRT ID:	1	2	3	4	5		
MICR1412CCD												CONC:	6.25%	12.5%	25.0%	50.0%	100%		

Ceriodaphnia daily reproduction count bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

TMNT	Rep	Repro Day 0	Repro Day 1	Repro Day 2	Repro Day 3	Repro Day 4	Repro Day 5	Repro Day 6	Repro Day 7	4th Broods Removed	TOTAL REPRO
	A	0	0	0	0	4	12	16			32
C	B	0	0	0	0	6	6	14			26
	C	0	0	0	0	6	10	18			34
Lab	D	0	0	0	0	0	10	20			30
Control	E	0	0	0	0	0	10	20			30
	F	0	0	0	0	6	8	18			32
	G	0	0	0	0	6	18	20			44
	H	0	0	0	0	0	10	22			32
	I	0	0	0	0	4	10	20			34
	J	0	0	0	0	4	8	20			32
	A	0	0	0	0	4	12	24			40
#1	B	0	0	0	0	6	12	20			38
	C	0	0	0	0	4	12	20			36
6.25%	D	0	0	0	0	4	8	14			26
	E	0	0	0	0	2	12	18			32
Vol. Effl:	F	0	0	0	0	6	12	22			40
12.5 ml	G	0	0	0	0	6	16	20			42
	H	0	0	0	0	2	10	20			32
	I	0	0	0	0	4	8	12			24
	J	0	0	0	0	2	10	16			28
	A	0	0	0	0	4	12	18			34
# 2	B	0	0	0	0	4	12	18			34
	C	0	0	0	0	6	12	22			40
12.5%	D	0	0	0	0	6	10	20			36
	E	0	0	0	0	6	10	18			34
Vol. Effl:	F	0	0	0	0	2	10	20			32
25 ml	G	0	0	0	0	2	12	24			38
	H	0	0	0	0	4	12	22			38
	I	0	0	0	0	4	10	20			34
	J	0	0	0	0	0	6	20			26
	A	0	0	0	0	4	10	14			28
# 3	B	0	0	0	0	4	8	16			28
	C	0	0	0	0	6	10	22			38
25.0%	D	0	0	0	0	0	12	18			30
	E	0	0	0	0	4	12	18			34
Vol. Effl:	F	0	0	0	0	4	10	16			30
50 ml	G	0	0	0	0	6	12	18			36
	H	0	0	0	0	0	10	16			26
	I	0	0	0	0	6	14	12			32
	J	0	0	0	0	0	0	0			0
	A	0	0	0	0	4	10	18			32
# 4	B	0	0	0	0	0	8	14			22
	C	0	0	0	0	0	12	14			26
50.0%	D	0	0	0	0	6	10	18			34
	E	0	0	0	1	0	12	20			33
Vol. Effl:	F	0	0	0	0	4	10	22			36
100 ml	G	0	0	0	0	4	12	12			28
	H	0	0	0	3	0	10	16			29
	I	0	0	0	0	6	10	12			28
	J	0	0	0	0	0	0	0			0
	A	0	0	0	0	4	10	14			28
# 5	B	0	0	0	0	2	10	12			24
	C	0	0	0	0	0	8	16			24
100%	D	0	0	0	0	0	12	18			30
	E	0	0	0	0	0	12	14			26
Vol. Effl:	F	0	0	0	0	6	10	14			30
200 ml	G	0	0	0	0	4	10	16			30
	H	0	0	0	0	0	12	12			24
	I	0	0	0	0	6	10	16			32
	J	0	0	0	0	4	8	16			28
INITIALS:		BJA	BJA	BJA	KK	RCD	AG	BJA			
DATE & TIME:		11/5/14 14:46	11/6/14 14:05	11/7/14 15:26	11/8/14 14:56	11/9/14 15:24	11/10/14 14:04	11/11/14 15:17			
SAMPLE USED:		A	B	B	C	C	C				
CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE		Vial 4J adult is faded white. bja 11/11/14									

MICR1412CCD | Avg. young/surviving control (TAC 15 min): 32.6 | Surv. controls with 3 broods: 7

SAMPLE COLLECTION

SAMPLE	COLLECTION DATE & TIME
A	11/4/14 10:43
B	11/5/14 10:30
C	11/7/14 7:30
D	
E	

SAMPLE AGING

SAMPLE:	A
1st USE DATE/TIME:	11/5/14 14:46
LAST USE DATE/TIME:	11/5/14 14:46
TIME COLLECT TO 1st USE:	28h 3m
	(TAC 36 h max)
TIME 1st TO LAST USE:	0h 0m
	(TAC MAX 72 h)
SAMPLE:	B
1st USE DATE/TIME:	11/6/14 14:05
LAST USE DATE/TIME:	11/7/14 15:26
TIME COLLECT TO 1st USE:	27h 35m
	(TAC 36 h max)
TIME 1st TO LAST USE:	25h 22m
	(TAC MAX 72 h)
SAMPLE:	C
1st USE DATE/TIME:	11/8/14 14:56
LAST USE DATE/TIME:	11/10/14 14:04
TIME COLLECT TO 1st USE:	31h 28m
	(TAC 36 h max)
TIME 1st TO LAST USE:	47h 8m
	(TAC MAX 72 h)
SAMPLE:	D
1st USE DATE/TIME:	
LAST USE DATE/TIME:	
TIME COLLECT TO 1st USE:	0
	(TAC 36 h max)
TIME 1st TO LAST USE:	0
	(TAC MAX 72 h)
SAMPLE:	E
1st USE DATE/TIME:	
LAST USE DATE/TIME:	
TIME COLLECT TO 1st USE:	0
	(TAC 36 h max)
TIME 1st TO LAST USE:	0
	(TAC MAX 72 h)

Ceriodaphnia daily survival count bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

TRTMNT	Rep	#Live Day 0	#Live Day 1	#Live Day 2	#Live Day 3	#Live Day 4	#Live Day 5	#Live Day 6	#Live FINAL	MALE OR FEMALE	TOTAL REPRO	REPRO/ SURV FEM
	A	1	1	1	1	1	1	1	1	F	32	32
C	B	1	1	1	1	1	1	1	1	F	26	26
	C	1	1	1	1	1	1	1	1	F	34	34
Lab	D	1	1	1	1	1	1	1	1	F	30	30
Control	E	1	1	1	1	1	1	1	1	F	30	30
	F	1	1	1	1	1	1	1	1	F	32	32
	G	1	1	1	1	1	1	1	1	F	44	44
	H	1	1	1	1	1	1	1	1	F	32	32
	I	1	1	1	1	1	1	1	1	F	34	34
	J	1	1	1	1	1	1	1	1	F	32	32
	A	1	1	1	1	1	1	1	1	F	40	
#1	B	1	1	1	1	1	1	1	1	F	38	
	C	1	1	1	1	1	1	1	1	F	36	
6.25%	D	1	1	1	1	1	1	1	1	F	26	
	E	1	1	1	1	1	1	1	1	F	32	
	F	1	1	1	1	1	1	1	1	F	40	
	G	1	1	1	1	1	1	1	1	F	42	
	H	1	1	1	1	1	1	1	1	F	32	
	I	1	1	1	1	1	1	1	1	F	24	
	J	1	1	1	1	1	1	1	1	F	28	
	A	1	1	1	1	1	1	1	1	F	34	
# 2	B	1	1	1	1	1	1	1	1	F	34	
	C	1	1	1	1	1	1	1	1	F	40	
12.5%	D	1	1	1	1	1	1	1	1	F	36	
	E	1	1	1	1	1	1	1	1	F	34	
	F	1	1	1	1	1	1	1	1	F	32	
	G	1	1	1	1	1	1	1	1	F	38	
	H	1	1	1	1	1	1	1	1	F	38	
	I	1	1	1	1	1	1	1	1	F	34	
	J	1	1	1	1	1	1	1	1	F	26	
	A	1	1	1	1	1	1	1	1	F	28	
# 3	B	1	1	1	1	1	1	1	1	F	28	
	C	1	1	1	1	1	1	1	1	F	38	
25.0%	D	1	1	1	1	1	1	1	1	F	30	
	E	1	1	1	1	1	1	1	1	F	34	
	F	1	1	1	1	1	1	1	1	F	30	
	G	1	1	1	1	1	1	1	1	F	36	
	H	1	1	1	1	1	1	1	1	F	26	
	I	1	1	1	1	1	1	1	1	F	32	
	J	1	1	1	1	1	0	0	0	F	0	
	A	1	1	1	1	1	1	1	1	F	32	
# 4	B	1	1	1	1	1	1	1	1	F	22	
	C	1	1	1	1	1	1	1	1	F	26	
50.0%	D	1	1	1	1	1	1	1	1	F	34	
	E	1	1	1	1	1	1	1	1	F	33	
	F	1	1	1	1	1	1	1	1	F	36	
	G	1	1	1	1	1	1	1	1	F	28	
	H	1	1	1	1	1	1	1	1	F	29	
	I	1	1	1	1	1	1	1	1	F	28	
	J	1	1	1	1	1	1	1	1	F	0	
	A	1	1	1	1	1	1	1	1	F	28	
# 5	B	1	1	1	1	1	1	1	1	F	24	
	C	1	1	1	1	1	1	1	1	F	24	
100%	D	1	1	1	1	1	1	1	1	F	30	
	E	1	1	1	1	1	1	1	1	F	26	
	F	1	1	1	1	1	1	1	1	F	30	
	G	1	1	1	1	1	1	1	1	F	30	
	H	1	1	1	1	1	1	1	1	F	24	
	I	1	1	1	1	1	1	1	1	F	32	
	J	1	1	1	1	1	1	1	1	F	28	

See Reproduction Sheet for Renewal Information

See ToxCalc printout for summary survival & reproduction data

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE	
MICR1412CCD	% Control survival (TAC 80% min): 100 % Surviving controls with 3 broods (TAC 60% min): 70

Ceriodaphnia Survival and Reproduction Test-6 Day Survival

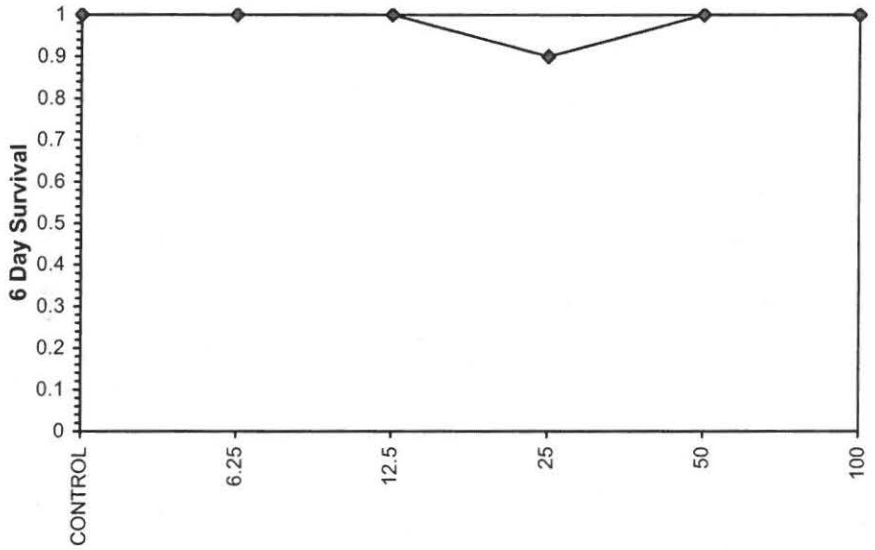
Start Date:		Test ID:	MICR1412CD	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	DATA ENTERED BY PB				

Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
50	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Conc-%	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's Exact P	1-Tailed Critical
CONTROL	1.0000	1.0000	0	10	10	10		
6.25	1.0000	1.0000	0	10	10	10	1.0000	0.0500
12.5	1.0000	1.0000	0	10	10	10	1.0000	0.0500
25	0.9000	0.9000	1	9	10	10	0.5000	0.0500
50	1.0000	1.0000	0	10	10	10	1.0000	0.0500
100	1.0000	1.0000	0	10	10	10	1.0000	0.0500

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Fisher's Exact Test		>100		1

Dose-Response Plot



Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:		Test ID:	MICR1412CD	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	DATA ENTERED BY PB				

Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	32.000	26.000	34.000	30.000	30.000	32.000	44.000	32.000	34.000	32.000
6.25	40.000	38.000	36.000	26.000	32.000	40.000	42.000	32.000	24.000	28.000
12.5	34.000	34.000	40.000	36.000	34.000	32.000	38.000	38.000	34.000	26.000
25	28.000	28.000	38.000	30.000	34.000	30.000	36.000	26.000	32.000	0.000
50	32.000	22.000	26.000	34.000	33.000	36.000	28.000	29.000	28.000	0.000
100	28.000	24.000	24.000	30.000	26.000	30.000	30.000	24.000	32.000	28.000

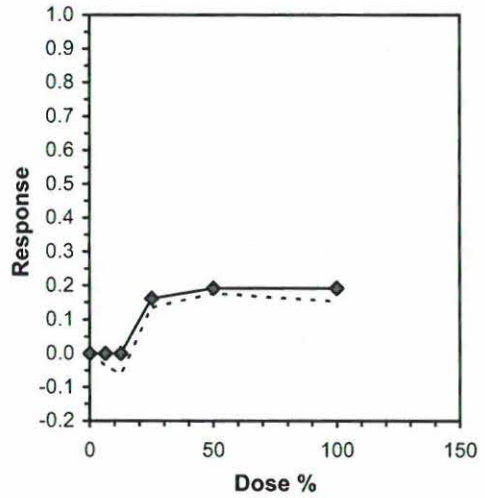
			Transform: Untransformed					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
CONTROL	32.600	1.0000	32.600	26.000	44.000	14.183	10			33.667	1.0000
6.25	33.800	1.0368	33.800	24.000	42.000	18.805	10	111.50	75.00	33.667	1.0000
12.5	34.600	1.0613	34.600	26.000	40.000	11.251	10	128.50	75.00	33.667	1.0000
25	28.200	0.8650	28.200	0.000	38.000	37.595	10	92.50	75.00	28.200	0.8376
50	26.800	0.8221	26.800	0.000	36.000	38.368	10	87.50	75.00	27.200	0.8079
*100	27.600	0.8466	27.600	24.000	32.000	10.694	10	68.50	75.00	27.200	0.8079

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.01)	1.31743	1.035	-2.1318	7.53356
Bartlett's Test indicates unequal variances (p = 5.86E-04)	21.7414	15.0863		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	[illegible]	100	70.7107	2

Linear Interpolation (200 Resamples)

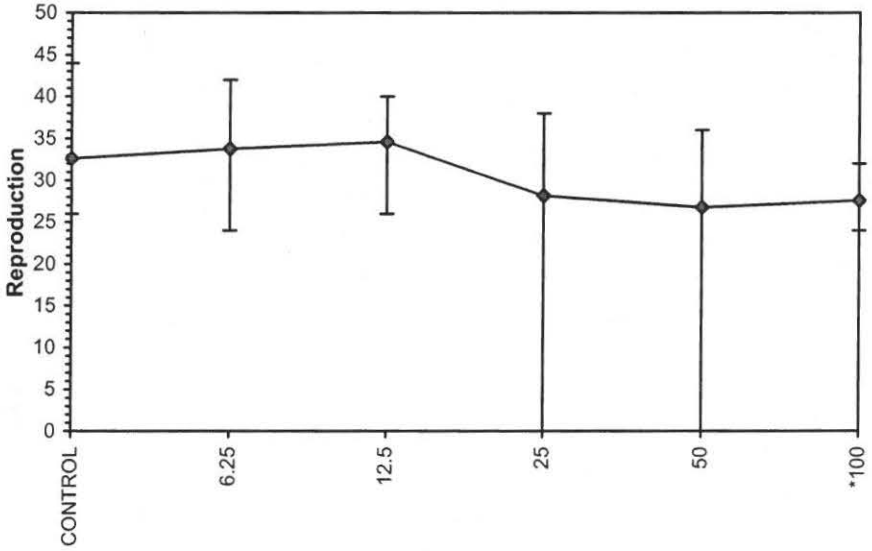
Point	%	SD	95% CL		Skew
IC05	16.349	4.945	10.318	30.608	0.9735
IC10	20.198				
IC15	24.047				
IC20	>100				
IC25	[illegible]				
IC40	>100				
IC50	>100				



Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	Test ID:	MICR1412CD	Sample ID:	
End Date:	Lab ID:	CBI	Sample Type:	
Sample Date:	Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	DATA ENTERED BY PB			

Dose-Response Plot



Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:		Test ID:	MICR1412CD	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	DATA ENTERED BY PB				

Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	32.000	26.000	34.000	30.000	30.000	32.000	44.000	32.000	34.000	32.000
6.25	40.000	38.000	36.000	26.000	32.000	40.000	42.000	32.000	24.000	28.000
12.5	34.000	34.000	40.000	36.000	34.000	32.000	38.000	38.000	34.000	26.000
25	28.000	28.000	38.000	30.000	34.000	30.000	36.000	26.000	32.000	0.000
50	32.000	22.000	26.000	34.000	33.000	36.000	28.000	29.000	28.000	0.000
100	28.000	24.000	24.000	30.000	26.000	30.000	30.000	24.000	32.000	28.000

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
CONTROL	32.600	1.0000	32.600	26.000	44.000	14.183	10			
6.25	33.800	1.0368	33.800	24.000	42.000	18.805	10	-0.377	2.287	7.276
12.5	34.600	1.0613	34.600	26.000	40.000	11.251	10	-0.629	2.287	7.276
25	28.200	0.8650	28.200	0.000	38.000	37.595	10	1.383	2.287	7.276
50	26.800	0.8221	26.800	0.000	36.000	38.368	10	1.823	2.287	7.276
100	27.600	0.8466	27.600	24.000	32.000	10.694	10	1.571	2.287	7.276

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.01)	1.31743	1.035	-2.1318	7.53356
Bartlett's Test indicates unequal variances (p = 5.86E-04)	21.7414	15.0863		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	7.27646		118.88	50.6296	0.05319	5, 54

Dunnett's test for PMSD only.

Fathead minnow test set up bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

Test chamber:	1000 ml Poly Beaker	✓	Illumination & photoperiod:	50-100 ft-c 16L:8D
	Other:		Number of replicates/treatment:	4
Test solution vol. (250 ml min):	500 ml:	✓	Initial number animals/replicate:	10
	Other (ml):			

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE	

SPECIES:	Pimephales promelas	
ACCLIMATION WATER:	Mod. Hard Synthetic Freshwater	
FEEDING PRIOR TO TEST:	Artemia nauplii (<24 h old) ad libitum	
FEEDING DURING TEST:	Artemia nauplii (<24 h old, ~0.15 ml) 2x/day	
SOURCE:	CBI Stock cultures	
ACCLIMATION TEMP (o C):	25	
HATCH START DATE & TIME:	11/4/14 17:00	
HATCH END DATE & TIME:	11/5/14 9:30	
DATE/TIME WATER ADDED:	11/5/14 15:35	
DATE/TIME ANIMALS ADDED:	11/5/14 15:56	
ANIMAL AGE WINDOW:	16h 30m	
MAX AGE AT TEST START (TAC 24 h MAX):	22h 57m	
TEST SET UP BY:		BJA
TEST ID:	MICR1412CPP	
PEER REVIEW BY (Initial/Date):	PB. RCD	11/13/14 10:20
MICR1412CPP		

Fathead minnow daily water quality bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

		Day 0		Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7	SUMMARY WATER QUALITY DATA			
	TRTMNT	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Final	MEAN	S.D.	MIN.	MAX.
pH (S.U.)	C	7.70	7.52	7.70	7.68	7.66	7.47	7.66	7.38	7.72	7.41	7.71	7.40	7.62	7.55	7.58	0.13	7.38	7.72
	1	7.70	7.56	7.70	7.60	7.66	7.41	7.68	7.30	7.73	7.41	7.72	7.33	7.62	7.51	7.57	0.15	7.30	7.73
	2	7.70	7.56	7.70	7.53	7.68	7.41	7.65	7.27	7.75	7.39	7.72	7.30	7.62	7.48	7.55	0.16	7.27	7.75
	3	7.69	7.58	7.70	7.49	7.70	7.43	7.60	7.27	7.72	7.42	7.71	7.28	7.60	7.47	7.55	0.16	7.27	7.72
	4	7.67	7.60	7.68	7.50	7.70	7.45	7.54	7.27	7.69	7.43	7.69	7.30	7.57	7.46	7.54	0.14	7.27	7.70
	5	7.62	7.66	7.62	7.58	7.71	7.58	7.42	7.35	7.56	7.51	7.61	7.43	7.49	7.50	7.55	0.10	7.35	7.71
Temp. (o C)	C	25	25	25	25	25	25	25	25	25	24	25	24	25	24	25	0.4	24	25
	1	25	25	25	25	25	25	25	25	25	24	25	24	25	24	25	0.4	24	25
	2	25	25	25	25	25	25	25	25	25	24	25	24	25	24	25	0.4	24	25
	3	25	25	25	25	25	25	25	25	25	24	25	24	25	24	25	0.4	24	25
	4	25	25	25	25	25	25	25	25	25	24	25	24	25	24	25	0.4	24	25
	5	25	25	25	25	25	25	25	25	25	24	25	24	25	24	25	0.4	24	25
Diss. Oxygen (mg/l)	C	8.2	7.7	8.1	8.0	8.2	7.3	7.6	7.2	8.0	7.3	7.9	7.3	8.0	7.0	7.7	0.4	7.0	8.2
	1	8.2	7.8	8.1	7.8	8.2	7.1	7.6	7.2	7.9	7.4	7.9	7.2	8.0	6.9	7.7	0.4	6.9	8.2
	2	8.2	7.7	8.1	7.5	8.2	7.0	7.5	7.0	7.8	7.4	7.9	7.0	7.9	6.8	7.6	0.5	6.8	8.2
	3	8.2	7.6	8.0	7.5	8.2	7.3	7.5	6.9	7.7	7.5	7.8	7.2	8.0	6.8	7.6	0.4	6.8	8.2
	4	8.2	7.8	8.0	7.4	8.1	7.1	7.6	6.8	7.7	7.5	7.9	7.3	8.0	6.8	7.6	0.5	6.8	8.2
	5	8.2	7.7	8.0	7.3	8.1	7.1	7.8	6.8	7.8	7.5	7.9	7.3	8.0	6.9	7.6	0.5	6.8	8.2
Cond. (uS/cm)	C	300		301		302		293		300		304		303		300	3.6	293	304
	1	342		342		344		328		327		327		325		334	8.6	325	344
	2	386		386		387		354		348		349		347		365	19.8	347	387
	3	474		474		471		408		398		392		391		430	40.9	391	474
	4	639		639		634		505		488		479		476		551	80.9	476	639
	5	979		974		978		670		661		655		652		796	169.8	652	979
Replicate measured		D	A	C	D	B	C	A	B	D	C	B	A	C	C				
Initials		BJA	AG	BJA	GB	BJA	RCD	KK	RCD	RCD	GB	AG	GB	BJA	GB				
Changes & Notes (Initials, date, specific change or notes)																			

	Test Aerated?	No		D.O. Highest conc. @ aeration:		TRT ID:	1	2	3	4	5		
MICR1412CPP	Date & Time Air Start:			Total live highest conc.@ aeration		CONC(%):	6.25%	12.5%	25.0%	50.0%	100%		

Fathead minnow daily biological measurements bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

TRTMNT	Rep	#Live Day 0	#Live Day 1	#Live Day 2	#Live Day 3	#Live Day 4	#Live Day 5	#Live Day 6	#Live Day 7	Total Dry Wt (mg)	Tare Wt (mg)	Wt Count	Pan Number
C	A	10	10	10	10	10	10	10	10	14.11	8.74	10	49
	B	10	10	10	10	10	10	10	10	15.49	10.14	10	50
Lab	C	10	10	10	10	10	10	10	10	15.96	10.43	10	51
Control	D	10	10	10	10	9	9	9	9	14.90	10.39	10	52
#1	A	10	10	10	10	10	10	10	10	14.68	8.52	10	53
6.25%	B	10	10	10	10	10	10	10	10	15.66	9.68	10	54
Vol. Effl:	C	10	10	10	10	10	9	9	9	14.69	8.81	10	55
100 ml	D	10	10	10	10	10	10	10	10	17.03	10.55	10	56
# 2	A	10	10	10	10	10	10	10	10	15.68	9.74	10	57
12.5%	B	10	10	10	10	10	10	10	10	16.10	10.43	10	58
Vol. Effl:	C	10	10	10	10	10	10	10	10	16.56	11.30	10	59
200 ml	D	10	10	10	10	10	10	10	10	15.99	9.69	10	60
# 3	A	10	10	10	10	10	10	10	10	16.89	11.10	10	61
25.0%	B	10	10	10	10	10	10	10	10	15.97	9.61	10	62
Vol. Effl:	C	10	10	10	10	10	10	10	10	14.53	8.84	10	63
400 ml	D	10	10	10	10	10	10	10	10	15.63	9.80	10	64
# 4	A	10	10	10	10	10	10	10	10	16.39	10.00	10	65
50.0%	B	10	10	10	10	10	10	10	10	15.90	9.89	10	66
Vol. Effl:	C	10	10	10	10	10	10	10	10	14.65	8.80	10	67
800 ml	D	10	10	10	10	10	10	10	10	17.20	10.94	10	68
# 5	A	10	10	10	10	9	9	9	9	14.55	9.32	10	69
100%	B	10	10	10	10	10	10	10	10	14.30	8.27	10	70
Vol. Effl:	C	10	10	10	10	9	9	9	9	13.36	8.15	10	71
1600 ml	D	10	10	10	10	10	10	9	9	13.71	8.45	10	72
INITIALS:		BJA	BJA	BJA	KK	RCD	AG	BJA	BJA	PB	GB	See ToxCalc printout for summary survival & biomass data	
DATE & TIME:		11/5/14 15:56	11/6/14 15:03	11/7/14 16:45	11/8/14 15:49	11/9/14 14:36	11/10/14 11:58	11/11/14 14:34	11/12/14 15:35	11/13/14 10:16	11/8/14 13:09		
SAMPLE USED:		A	B	B	C	C	C	C	100 mg wt ck:	99.99	99.99	Test Duration:	6d 23h 39m
CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE													

MEAN % CONTROL SURVIVAL (TAC 80% MIN): 97.5

AVG. DRY WT. PER SURV. CONTROL (TAC 0.25 mg): 0.532

SAMPLE	COLLECTION DATE/TIME	1st USE DATE & TIME	LAST USE DATE & TIME	TIME COLLECT-1ST USE (TAC MAX 36h)	TIME 1st TO LAST USE (TAC MAX 72 h)
A	11/4/14 10:43	11/5/14 15:56	11/5/14 15:56	29h 14m	0h 0m
B	11/5/14 10:30	11/6/14 15:03	11/7/14 16:45	28h 33m	25h 42m
C	11/7/14 7:30	11/8/14 15:49	11/11/14 14:34	32h 19m	70h 46m
				0	0
				0	0

MICR1412CPP

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:		Test ID:	MICR1412PP	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	DATA ENTERED BY PB				

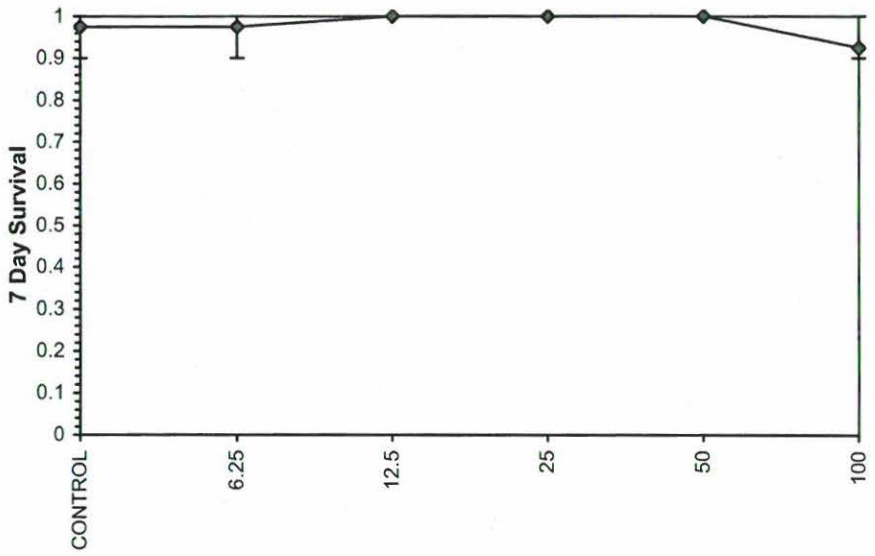
Conc-%	1	2	3	4
CONTROL	1.0000	1.0000	1.0000	0.9000
6.25	1.0000	1.0000	0.9000	1.0000
12.5	1.0000	1.0000	1.0000	1.0000
25	1.0000	1.0000	1.0000	1.0000
50	1.0000	1.0000	1.0000	1.0000
100	0.9000	1.0000	0.9000	0.9000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
CONTROL	0.9750	1.0000	1.3713	1.2490	1.4120	5.942	4		
6.25	0.9750	1.0000	1.3713	1.2490	1.4120	5.942	4	18.00	10.00
12.5	1.0000	1.0256	1.4120	1.4120	1.4120	0.000	4	20.00	10.00
25	1.0000	1.0256	1.4120	1.4120	1.4120	0.000	4	20.00	10.00
50	1.0000	1.0256	1.4120	1.4120	1.4120	0.000	4	20.00	10.00
100	0.9250	0.9487	1.2898	1.2490	1.4120	6.318	4	14.00	10.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.84392	0.884	-0.5813	2.37302
Equality of variance cannot be confirmed				

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

Dose-Response Plot



Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:		Test ID:	MICR1412PP	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	DATA ENTERED BY PB				

Conc-%	1	2	3	4
CONTROL	0.5370	0.5350	0.5530	0.4510
6.25	0.6160	0.5980	0.5880	0.6480
12.5	0.5940	0.5670	0.5260	0.6300
25	0.5790	0.6360	0.5690	0.5830
50	0.6390	0.6010	0.5850	0.6260
100	0.5230	0.6030	0.5210	0.5260

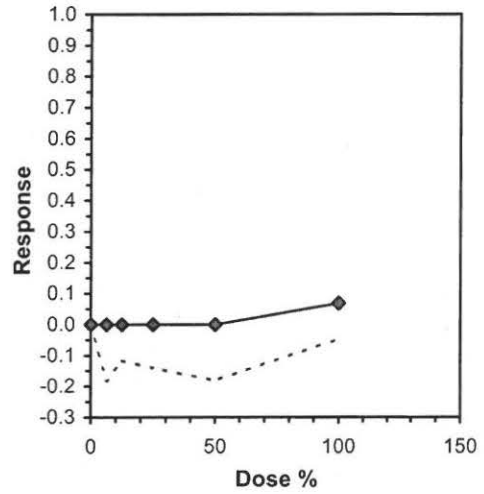
			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
CONTROL	0.5190	1.0000	0.5190	0.4510	0.5530	8.872	4				0.5831	1.0000
6.25	0.6125	1.1802	0.6125	0.5880	0.6480	4.302	4	-3.661	2.410	0.0616	0.5831	1.0000
12.5	0.5793	1.1161	0.5793	0.5260	0.6300	7.577	4	-2.359	2.410	0.0616	0.5831	1.0000
25	0.5918	1.1402	0.5918	0.5690	0.6360	5.084	4	-2.849	2.410	0.0616	0.5831	1.0000
50	0.6128	1.1806	0.6128	0.5850	0.6390	3.967	4	-3.671	2.410	0.0616	0.5831	1.0000
100	0.5433	1.0467	0.5433	0.5210	0.6030	7.342	4	-0.950	2.410	0.0616	0.5433	0.9317

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.96734	0.884	0.00192	-0.2864
Bartlett's Test indicates equal variances (p = 0.86)	1.89797	15.0863		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	1	>100		1	0.06155	[illegible]	0.00581	0.0013	0.00814	5, 18

Linear Interpolation (200 Resamples)

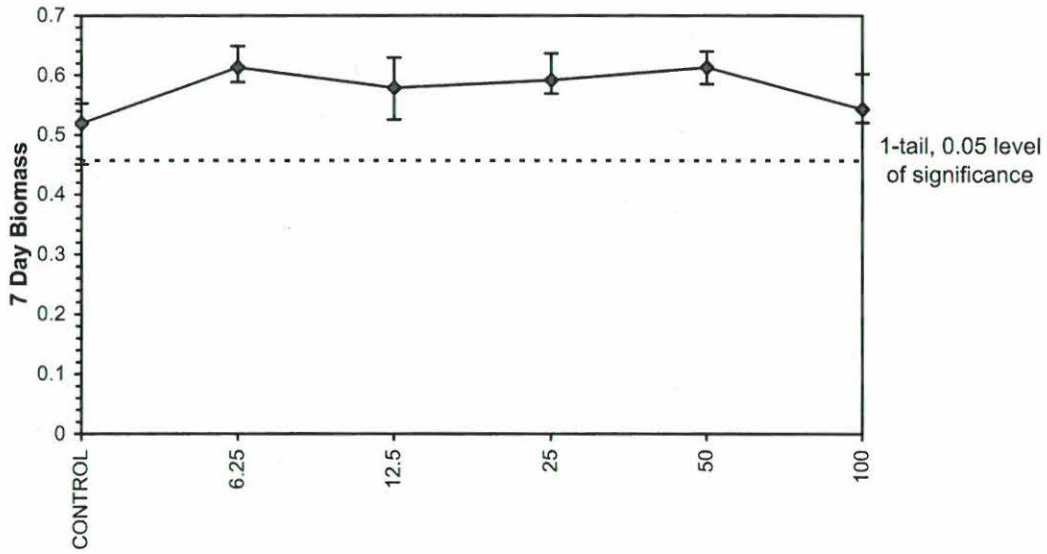
Point	%	SD	95% CL(Exp)	Skew
IC05	86.624			
IC10	>100			
IC15	>100			
IC20	>100			
IC25				
IC40	>100			
IC50	>100			



Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:	Test ID:	MICR1412PP	Sample ID:		
End Date:	Lab ID:	CBI	Sample Type:		
Sample Date:	Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas	
Comments:	DATA ENTERED BY PB				

Dose-Response Plot



Effluent and Dilution Water Log (Freshwater Tests). FWEFFL061013

											SUMMARY WATER QUALITY DATA				
Initial sample characterization	Bottle(1):	A1	B1	C1							MEAN	S.D.	MIN.	MAX.	PARAMETER
	Arrival Temp. (oC, from CoC):	0	1	2							1	1.0	0	2	Arrival Temp.
	TRC (mg/l)(2):	<DL	<DL	<DL											
	TRC Corrected(2):														
	Hardness (mg/l):	142	130	112							128	15.1	112	142	Hardness (mg/l)
	Alkalinity (mg/l):	82	80	74							79	4.2	74	82	Alkalinity (mg/l)
	NH3-N (mg/l):	<1.0	<1.0	<1.0											
	Color/Appearance(3):	C	C	C											
	Obvious odor?	NO	NO	NO											
	Date & Time:	11/5/14 11:39	11/6/14 10:35	11/8/14 13:25											
	Initials:	AG	AG	RCD											
Sample prep measurements	Test Day:	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7		MEAN	S.D.	MIN.	MAX.	
	Bottle(s):	A1	B1,2	B1,2	C-1,2	C-1,2	C-1,2	C-1,2							
	Prep. Temp. (oC):	25	25	25	25	25	25	25			25	0.0	25	25	Temp. (oC)
	D.O. (mg/l) After Warming:	9.7	10.2	9.9	10.2	10.4	10.4	10.2							
	Aeration Time (min):	4	4	4	4	4	5	4							
	Adjusted D.O. (mg/l):	8.2	8.2	8.2	8.2	8.2	8.2	8.2			8.2	0.0	8.2	8.2	D.O. (mg/l)
	Final pH (S.U.):	7.56	7.54	7.76	7.75	7.44	7.58	7.38			7.57	0.14	7.38	7.76	pH (S.U.)
	Conductivity (uS/cm)(4):	975	961	NA	640	NA	NA	NA			859	189.5	640	975	Cond. (uS/cm)
	Final TRC (mg/l)(5):	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.							
	Sample Filtered (60 um)?	✓	✓	✓	✓	✓	✓	✓							
	Date & Time:	11/5/14 14:16	11/6/14 13:28	11/7/14 14:53	11/8/14 14:25	11/9/14 14:25	11/10/14 11:41	11/11/14 14:17							
	Initials:	BJA	BJA	BJA	KK	RCD	AG	BJA							
Dilution water	Test Day:	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7		MEAN	S.D.	MIN.	MAX.	
	Vat Number:	3	3	3	2	2	2	3							
	Temperature (oC):	25	25	25	25	25	25	25			25	0.0	25	25	Temp. (oC)
	Conductivity (uS/cm):	302	301	300	298	299	306	302			301	2.6	298	306	Cond. (uS/cm)
	D.O. (mg/l):	8.2	8.2	8.2	8.2	8.2	8.2	8.2			8.2	0.0	8.2	8.2	D.O. (mg/l)
	pH (S.U.):	7.72	7.70	7.70	7.73	7.72	7.73	7.71			7.72	0.01	7.70	7.73	pH (S.U.)
	Hardness (mg/l):	92	92	92	84	84	84	84			87	4.3	84	92	Hardness (mg/l)
	Alkalinity (mg/l):	58	58	58	57	57	57	57			57	0.5	57	58	Alkalinity (mg/l)
	Date & Time:	11/5/14 8:10	11/6/14 8:25	11/7/14 8:25	11/8/14 8:30	11/9/14 8:20	11/10/14 8:35	11/11/14 8:25							
	Initials:	GB	AG	GB	RCD	RCD	GB	GB							
	Changes & Notes (Initials, date, specific change or notes)	"A" sample partially frozen upon arrival													
	Peer review Initial/Date:	PB	11/12/14 16:20	DILUTION WATER TYPE:	Mod. Hard Synthetic Freshwater (EPA)	ND=Not Determined/Measured, NA=Not Applicable. 1) Ninth character of lab sample ID on chain of custody AND bottle number in collection series. Together with Project ID constitutes entire sample bottle ID. 2) TRC MDL 0.02 mg/l; QL 0.22 mg/l. Corrected value if Mn, Cr potential positive interference. Corrected using KI and NaAsO2. 3) C-clear, O-opaque, T-turbid, S-solids (Sl-slight, M-moderate, H-heavy), Y-yellow, B-brown, Bl-black, G-green, P-pink, Gr-grey, Or-orange. 4) Measured on first use of sample only. 5) Final TRC measured only if chlorine present in initial characterization.												
PROJECT ID:	MICR1412	ADDITIONAL EFFLUENT TREATMENT:													

Coastal Bioanalysts
6400 Enterprise Court, Gloucester, VA 23061
PH: 804-694-8285, FAX: 804-695-1129
www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): M I C R 1 4 1 2 - A
(A A A A Y Y N N — Project ID; A — Spl)

CBI Login # 14-0923

FACILITY INFORMATION

CLIENT/FACILITY NAME: LBB / National Archives II		CONTACT & PHONE #: Bob Gentry	
NPDES PERMIT NO		OUTFALL # OR LOCATION: 001	
SAMPLE CHLORINATED?	SAMPLE DECHLORINATED?	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?	
TESTS REQUESTED:	SPECIES OR EPA METH #: C. dubia	ACUTE ☐	CHRONIC ☑
	SPECIES OR EPA METH #: P. promelas	ACUTE ☐	CHRONIC ☑
OTHER TESTS:			

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME
N/A		

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME: 11/3/14 1058	SAMPLE END DATE & TIME: 11/4/14 1043	AUTOSAMPLER TEMP. (°C): 5.2°	
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION	NUMBER SUBSAMPLES: 96	VOL (ml) SUBSAMPLES: 100 ml/s	TIME INCREMENT: 15 min
	SET VOLUME SUBSAMPLE: —	SET VOLUME FLOW: —	TOTAL VOLUME:

FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
22.7	7.8	5.2	7.8	0.03	11/4/14 1045	JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeffrey Duszynski / Mundbeer — (PRINTED NAME/AFFILIATION SAMPLER/ANALYST)
[signature] — (SIGNATURE)
11/4/14 — (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
[signature]	11/4/14	1600	UPS
	11/5/14	1100	[signature]

SHIPPING METHOD: UPS ✓ FEDEX ____ HAND DELIVERY ____

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER Sample partially frozen

SAMPLE TEMP: (°C) 0 ARRIVED ON ICE? Y ✓ N ___ CUSTODY SEAL: INTACT ___ BROKEN ___ ABSENT ✓

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

Coastal Bioanalysis
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PH: 804-694-8285, FAX: 804-695-1129
www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): M I C R 1 4 1 2 - B

A A A A Y Y N N (Project ID) — A (Spl)

CBI Login # 14-0926

FACILITY INFORMATION

CLIENT/FACILITY NAME	LBB/National Archives II	CONTACT & PHONE #	Bob Gentry
NPDES PERMIT NO		OUTFALL # OR LOCATION	001
SAMPLE CHLORINATED?	N	SAMPLE DECHLORINATED?	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?

TESTS REQUESTED:	SPECIES OR EPA METH #			
		C. dubia	ACUTE ☐	CHRONIC ☑
		P. promelas	ACUTE ☐	CHRONIC ☑
OTHER TESTS:				

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME
N/A		

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	11/4/14 1045	SAMPLE END DATE & TIME	11/5/14 1030	AUTOSAMPLER TEMP. (°C)	5.7°
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION*	NUMBER SUBSAMPLES 96	VOL (ml) SUBSAMPLES 100 ml		TIME INCREMENT 15 min	
	SET VOLUME SUBSAMPLE —	SET VOLUME FLOW —		TOTAL VOLUME 9 L	

*FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
22.2	7.5	5.7	7.8	<0.03	11/5/14 1035	~~TO~~ JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeffrey Duszynski / Microbac — [signature] — (DATE)
(PRINTED NAME/AFFILIATION SAMPLER/ANALYST) (SIGNATURE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
[signature]	11/5/14	1800	Fed Ex
	11/6/14	0930	[signature]

SHIPPING METHOD: UPS____ FEDEX ✓ HAND DELIVERY____

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER____

SAMPLE TEMP: (°C) 1 ARRIVED ON ICE? Y ✓ N___ CUSTODY SEAL: INTACT___ BROKEN___ ABSENT ✓

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

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SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): M I C R 1 4 1 2 - C

A A A A Y Y N N (Project ID) — A (Spl)

CBI Login # 14-0932

FACILITY INFORMATION

CLIENT/FACILITY NAME	CBB/National Archives II	CONTACT & PHONE #	Bob Gentry
NPDES PERMIT NO		OUTFALL # OR LOCATION	001
SAMPLE CHLORINATED? N	SAMPLE DECHLORINATED?	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?	

TESTS REQUESTED:	SPECIES OR EPA METH #		ACUTE	CHRONIC
		C. dubia	☐	☑
		P. promelas	☐	☑

OTHER TESTS:

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME
NA		

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	11/6/14 0730	SAMPLE END DATE & TIME	11/7/14 0730	AUTOSAMPLER TEMP. (°C)	4.8°
☑ TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION*	NUMBER SUBSAMPLES 97	VOL (ml) SUBSAMPLES 200 ml/s		TIME INCREMENT 15 min	
	SET VOLUME SUBSAMPLE —	SET VOLUME FLOW —		TOTAL VOLUME 17 L	

*FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
13.8	7.3	4.8	7.4	<0.03	11/7/14 0745	JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeff Dwszynski / microbac — [signature] — 11/7/14
(PRINTED NAME/AFFILIATION SAMPLER/ANALYST) (SIGNATURE) (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
[signature]	11/7/14	1500	UPS
	11/8/14	1325	[signature]

SHIPPING METHOD: UPS ✓ FEDEX____ HAND DELIVERY____

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER____

SAMPLE TEMP: (°C) 2 ARRIVED ON ICE? Y ✓ N___ CUSTODY SEAL: INTACT ✓ BROKEN___ ABSENT___

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

Client: Microbac Laboratories, Inc.
Project ID: MICR1503
Client Sample ID: LBB/National Archives II Outfall 001
Permit No.: MD0065871
Sample Period: 2/3/15 to 2/6/15

Coastal Bioanalysts, Inc.

Report of Analysis: Whole Effluent Toxicity (WET)

Submitted To:	**Prepared By:**
Mr. Michael Arbaugh Sr. Microbac Laboratories, Inc. Baltimore Division 2101 Van Deman Street Baltimore, MD 21224	Coastal Bioanalysts, Inc. 6400 Enterprise Court Gloucester, VA 23061 (804) 694-8285 www.coastalbio.com Contact: Peter F. De Lisle, Technical Director

Chronic Test Results*

Species-Test Method	Endpoint	NOEC	LOEC	ChrV	PMSD	$T.U._C$	IC25	48-h LC50	LC50 95% C.L.	$T.U._{Ac}$
C. dubia	Survival	100	>100	>100	N/A	N/A	N/A	>100	N/A	<1.00
EPA 1002.0	Reproduction	50	100	70.7	22	**1.37**	73.1	N/A	N/A	N/A
P. promelas	Survival	100	>100	>100	N/A	N/A	N/A	>100	N/A	<1.00
EPA 1000.0	Biomass	100	>100	>100	17	**<1.00**	>100	N/A	N/A	N/A

*Note: Details regarding test conduct and data analysis provided in attached bench sheets and printouts as applicable.

Chronic Test QA/QC Reference Toxicant: KCl Units: mg/l Test Organism Source: CBI Stock Cultures

Species-Method (Ref. Test Date)	Data Source	% Survival		Reproduction (# Young) or Biomass (mg)					RTT in Control?
		Cont.	NOEC	Cont.	NOEC	PMSD	IC25	IC25 A.L.	
C. dubia 1002.0	RTT	100	500	27.4	250	15	335	N/A	Yes
(2/1/15-2/7/15)	CC	99	500	28.2	250	19	341	263-419	
P. promelas 1000.0	RTT	100	500	0.67	500	14	625	N/A	Yes
(1/2/15-1/9/15)	CC	99	500	0.61	500	13	625	598-652	

Note: RTT = Reference Toxicant Test, CC = Control Chart, Cont. = Control group.

The results of analysis contained within this report relate only to the sample as received in the laboratory. This report shall not be reproduced except in full without written approval from the laboratory. Unless noted below, these test results meet all requirements of NELAP.

APPROVED:

Peter F. De Lisle, Ph.D.
Technical Director

2/17/15
Date

Deviations from, additions to, or exclusions from the test method, non-standard conditions or data qualifiers and, as appropriate, a statement of compliance/non-compliance: **NONE**

VELAP# 460030
EPA# VA01116

GLOSSARY OF TERMS AND ABBREVIATIONS

A.L. (Acceptance Limits): The results of a given reference toxicant test are compared to the control chart mean value ± 2 standard deviations. These limits approximate the 95% probability limits for the "true" reference toxicant value.

Chronic Value (ChrV): The geometric mean of the NOEC and LOEC. Units are same as test concentration units.

C.L. (Confidence Limits): These are the probability limits, based on the data set and statistical model employed, that the "true value" lies within the limits specified. Typically limits are based on 95% or 99% probabilities.

Control chart: A cumulative summary chart of results from QC tests with reference toxicants. The results of a given reference toxicant test are compared to the control chart mean value and 95% Acceptance Limits (A.L.) (mean ± 2 standard deviations).

IC25: The concentration of sample or chemical, calculated from the data set using statistical models, causing a 25% reduction in test organism growth, reproduction, etc. The lower the IC25, the more toxic the chemical or sample. Units are same as test concentration units.

LC50: The concentration of sample or chemical, calculated from the data set using statistical models, causing a 50% reduction in test organism survival. The lower the LC50, the more toxic the chemical or sample. Units are same as test concentration units. Note: The LC50 value must always be associated with the duration of exposure. Thus 48-h LC50, 96-h LC50, etc. are calculated.

LOEC: Lowest-observable-effect-concentration. The lowest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit a statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Units are same as test concentration units.

PMSD: Percent Minimum Significant Difference: The minimum difference which can exist between a test treatment and the controls in a particular test and be statistically significant; a measure of test sensitivity. The lower the PMSD the more sensitive the test.

N/A: Not applicable.

N/D: Not determined or measured.

NOAEC: No-observable-acute-effect-concentration. The highest concentration of sample or chemical in an acute test dilution series in which the test organisms exhibit no statistically significant reduction in the test end point (e.g. survival) compared to control organisms. Units are same as test concentration units.

NOEC: No-observable-effect-concentration. The highest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit no statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Some regulatory definitions also require that the NOEC be less than the LOEC. Units are same as test concentration units.

Q.L.: Quantitation Limit. Level, concentration, or quantity of a target variable (analyte) that can be reported at a specified degree of confidence.

T.U.: Toxic units. Expresses the relative toxicity of an effluent in such a manner that the larger the toxic unit value the more toxic the effluent. $T.U._{Ac} = 100/LC50$. $T.U._{Chr} = 100/NOEC$. A dimensionless unit.

VELAP# 460030
EPA# VA01116

Ceriodaphnia test set up bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

Test chamber:	~30 ml glass vial:	✓	Illumination & photoperiod:	50-100 ft-c 16L:8D
	Other:		Number of replicates/treatment:	10
Test solution volume:	15 ml:	✓	Initial number animals/replicate:	1
	Other (ml):		Template #:	15

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE	

SPECIES:	Ceriodaphnia dubia	
ACCLIMATION WATER:	Mod. Hard Synthetic Freshwater	
FEEDING (Culture &Test):	YCT + Selenastrum capricornutum mix	
SOURCE:	CBI Stock cultures	
ACCLIMATION TEMP (o C):	25	
BROOD RELEASE FROM:	2/3/15 16:30	
BROOD RELEASE TO:	2/3/15 21:00	
DATE/TIME WATER ADDED:	2/4/15 14:30	
DATE/TIME ANIMALS ADDED:	2/4/15 14:41	
ANIMAL AGE WINDOW (TAC 8 h):	4h 30m	
MAX AGE AT TEST START (TAC 24 h):	22h 11m	
TEST SET UP BY:	AG	
TEST ID:	**MICR1503CCD**	
PEER REVIEW BY (Initial/Date):	**AG. PB**	2/10/15 16:06
MICR1503CCD		

Ceriodaphnia daily water quality bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

		Day 0	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7	SUMMARY WATER QUALITY DATA			
	TRTMNT	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	MEAN	S.D.	MIN.	MAX.
pH (S.U.)	C	7.70	8.26	7.70	8.18	7.65	8.22	7.71	8.11	7.66	8.18	7.90	8.13			7.95	0.25	7.65	8.26
	1	7.70	8.32	7.70	8.32	7.70	8.31	7.73	8.28	7.66	8.35	7.86	8.19			8.01	0.30	7.66	8.35
	2	7.70	8.36	7.70	8.37	7.73	8.39	7.74	8.31	7.66	8.38	7.83	8.25			8.03	0.33	7.66	8.39
	3	7.69	8.40	7.70	8.45	7.71	8.50	7.75	8.38	7.66	8.44	7.80	8.26			8.06	0.36	7.66	8.50
	4	7.65	8.39	7.70	8.42	7.68	8.39	7.73	8.37	7.63	8.43	7.76	8.32			8.04	0.37	7.63	8.43
	5	7.59	8.33	7.70	8.32	7.61	8.33	7.67	8.39	7.56	8.45	7.70	8.42			8.01	0.39	7.56	8.45
Temp. (o C)	C	25	25	24	25	25	25	25	25	25	25	25	25			25	0.3	24	25
	1	25	25	24	25	25	25	25	25	25	25	25	25			25	0.3	24	25
	2	25	25	24	25	25	25	25	25	25	25	25	25			25	0.3	24	25
	3	25	25	24	25	25	25	25	25	25	25	25	25			25	0.3	24	25
	4	25	25	24	25	25	25	25	25	25	25	25	25			25	0.3	24	25
	5	25	25	24	25	25	25	25	25	25	25	25	25			25	0.3	24	25
Diss. Oxygen (mg/l)	C	8.2	8.2	8.3	8.0	8.0	8.2	7.7	8.7	7.9	9.0	8.2	8.7			8.3	0.4	7.7	9.0
	1	8.2	8.4	8.3	8.1	8.0	8.3	7.5	8.6	7.9	9.0	8.2	8.9			8.3	0.4	7.5	9.0
	2	8.2	8.5	8.3	8.4	8.0	8.6	7.5	8.9	8.0	9.1	8.2	8.7			8.4	0.4	7.5	9.1
	3	8.2	8.5	8.3	8.4	8.0	8.7	7.6	8.9	8.0	9.3	8.2	8.9			8.4	0.5	7.6	9.3
	4	8.2	8.6	8.3	8.5	8.0	8.4	7.6	9.2	8.1	9.5	8.2	8.8			8.5	0.5	7.6	9.5
	5	8.2	8.7	8.3	8.5	8.0	8.3	7.6	9.2	8.2	9.5	8.2	9.1			8.5	0.5	7.6	9.5
Cond. (uS/cm)	C	307		304		305		294		303		302				303	4.5	294	307
	1	373		363		372		376		383		377				374	6.6	363	383
	2	435		412		417		455		448		435				434	16.8	412	455
	3	563		518		526		605		590		584				564	35.5	518	605
	4	816		729		732		905		875		885				824	78.0	729	905
	5	1308		1122		1133		1441		1427		1400				1305	145.2	1122	1441
Replicate measured		S	F	S	A	S	J	S	B	S	E	S	G			NOTE: Final D.O. Values >8.3 mg/l (saturation) may occur due to photosynthetic activity of algal food.			
Initials		AG	BJA		RCD		KK		AG		GB		AG						
Changes & Notes (Initials, date, specific change or notes)																			
												TRT ID:	1	2	3	4	5		
MICR1503CCD												CONC:	6.25%	12.5%	25.0%	50.0%	100%		

Ceriodaphnia daily reproduction count bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

TMNT	Rep	Repro Day 0	Repro Day 1	Repro Day 2	Repro Day 3	Repro Day 4	Repro Day 5	Repro Day 6	Repro Day 7	4th Broods Removed	TOTAL REPRO
	A	0	0	0	3	0	0	0			3
C	B	0	0	0	1	12	0	16			29
	C	0	0	0	1	12	0	14			27
Lab	D	0	0	0	0	8	0	20			28
Control	E	0	0	0	4	10	0	20			34
	F	0	0	0	4	8	0	10			22
	G	0	0	0	5	12	0	14			31
	H	0	0	0	1	3	0	16			20
	I	0	0	0	4	8	0	20			32
	J	0	0	0	1	0	12	16			29
	A	0	0	0	4	8	0	18			30
#1	B	0	0	0	2	10	0	18			30
	C	0	0	0	3	12	0	16			31
6.25%	D	0	0	0	2	14	0	18			34
	E	0	0	0	3	12	0	16			31
Vol. Effl:	F	0	0	0	3	12	0	14			29
12.5 ml	G	0	0	0	2	14	0	14			30
	H	0	0	0	4	0	10	12			26
	I	0	0	0	3	10	0	16			29
	J	0	0	0	3	0	12	16			31
	A	0	0	0	2	16	0	18			36
# 2	B	0	0	0	4	12	0	18			34
	C	0	0	0	2	12	0	18			32
12.5%	D	0	0	0	2	10	0	20			32
	E	0	0	0	2	12	0	16			30
Vol. Effl:	F	0	0	0	4	12	0	18			34
25 ml	G	0	0	0	3	12	0	14			29
	H	0	0	0	1	0	10	16			27
	I	0	0	0	1	10	0	22			33
	J	0	0	0	2	0	12	16			30
	A	0	0	0	3	14	0	16			33
# 3	B	0	0	0	3	14	0	16			33
	C	0	0	0	3	14	0	16			33
25.0%	D	0	0	0	1	12	0	12			25
	E	0	0	0	1	14	0	16			31
Vol. Effl:	F	0	0	0	4	8	0	20			32
50 ml	G	0	0	0	4	16	0	18			38
	H	0	0	0	3	0	12	14			29
	I	0	0	0	4	12	0	16			32
	J	0	0	0	3	0	10	18			31
	A	0	0	0	2	12	0	10			24
# 4	B	0	0	0	2	10	0	16			28
	C	0	0	0	4	10	0	10			24
50.0%	D	0	0	0	2	12	0	16			30
	E	0	0	0	4	8	0	16			28
Vol. Effl:	F	0	0	0	3	12	0	16			31
100 ml	G	0	0	0	2	8	0	16			26
	H	0	0	0	3	0	10	16			29
	I	0	0	0	1	16	0	18			35
	J	0	0	0	2	0	12	16			30
	A	0	0	0	4	6	0	10			20
# 5	B	0	0	0	2	10	0	10			22
	C	0	0	0	3	12	0	14			29
100%	D	0	0	0	2	0	0	3			5
	E	0	0	0	2	12	0	10			24
Vol. Effl:	F	0	0	0	0	10	0	6			16
200 ml	G	0	0	0	1	10	0	0			11
	H	0	0	0	3	3	0	0			6
	I	0	0	0	4	0	0	4			8
	J	0	0	0	2	0	8	0			10
INITIALS:		AG	BJA	RCD	KK	AG	GB	AG			
DATE & TIME:		2/4/15 14:41	2/5/15 12:16	2/6/15 13:39	2/7/15 14:18	2/8/15 15:10	2/9/15 16:20	2/10/15 16:01			
SAMPLE USED:		A	B	B	C	C	C				

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE

MICR1503CCD | Avg. young/surviving control (TAC 15 min): 28.0 | Surv. controls with 3 broods: 8

SAMPLE COLLECTION

SAMPLE	COLLECTION DATE & TIME
A	2/3/15 7:17
B	2/4/15 9:15
C	2/6/15 10:15
D	
E	

SAMPLE AGING

SAMPLE:	A
1st USE DATE/TIME:	2/4/15 14:41
LAST USE DATE/TIME:	2/4/15 14:41
TIME COLLECT TO 1st USE:	31h 24m
	(TAC 36 h max)
TIME 1st TO LAST USE:	0h 0m
	(TAC MAX 72 h)
SAMPLE:	B
1st USE DATE/TIME:	2/5/15 12:16
LAST USE DATE/TIME:	2/6/15 13:39
TIME COLLECT TO 1st USE:	27h 2m
	(TAC 36 h max)
TIME 1st TO LAST USE:	25h 23m
	(TAC MAX 72 h)
SAMPLE:	C
1st USE DATE/TIME:	2/7/15 14:18
LAST USE DATE/TIME:	2/9/15 16:20
TIME COLLECT TO 1st USE:	28h 4m
	(TAC 36 h max)
TIME 1st TO LAST USE:	50h 1m
	(TAC MAX 72 h)
SAMPLE:	D
1st USE DATE/TIME:	
LAST USE DATE/TIME:	
TIME COLLECT TO 1st USE:	0
	(TAC 36 h max)
TIME 1st TO LAST USE:	0
	(TAC MAX 72 h)
SAMPLE:	E
1st USE DATE/TIME:	
LAST USE DATE/TIME:	
TIME COLLECT TO 1st USE:	0
	(TAC 36 h max)
TIME 1st TO LAST USE:	0
	(TAC MAX 72 h)

Ceriodaphnia daily survival count bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

TRTMNT	Rep	#Live Day 0	#Live Day 1	#Live Day 2	#Live Day 3	#Live Day 4	#Live Day 5	#Live Day 6	#Live FINAL	MALE OR FEMALE	TOTAL REPRO	REPRO/ SURV FEM
	A	1	1	1	1	0	0	0	0	F	3	0
C	B	1	1	1	1	1	1	1	1	F	29	29
	C	1	1	1	1	1	1	1	1	F	27	27
Lab	D	1	1	1	1	1	1	1	1	F	28	28
Control	E	1	1	1	1	1	1	1	1	F	34	34
	F	1	1	1	1	1	1	1	1	F	22	22
	G	1	1	1	1	1	1	1	1	F	31	31
	H	1	1	1	1	1	1	1	1	F	20	20
	I	1	1	1	1	1	1	1	1	F	32	32
	J	1	1	1	1	1	1	1	1	F	29	29
	A	1	1	1	1	1	1	1	1	F	30	
#1	B	1	1	1	1	1	1	1	1	F	30	
	C	1	1	1	1	1	1	1	1	F	31	
6.25%	D	1	1	1	1	1	1	1	1	F	34	
	E	1	1	1	1	1	1	1	1	F	31	
	F	1	1	1	1	1	1	1	1	F	29	
	G	1	1	1	1	1	1	1	1	F	30	
	H	1	1	1	1	1	1	1	1	F	26	
	I	1	1	1	1	1	1	1	1	F	29	
	J	1	1	1	1	1	1	1	1	F	31	
	A	1	1	1	1	1	1	1	1	F	36	
# 2	B	1	1	1	1	1	1	1	1	F	34	
	C	1	1	1	1	1	1	1	1	F	32	
12.5%	D	1	1	1	1	1	1	1	1	F	32	
	E	1	1	1	1	1	1	1	1	F	30	
	F	1	1	1	1	1	1	1	1	F	34	
	G	1	1	1	1	1	1	1	1	F	29	
	H	1	1	1	1	1	1	1	1	F	27	
	I	1	1	1	1	1	1	1	1	F	33	
	J	1	1	1	1	1	1	1	1	F	30	
	A	1	1	1	1	1	1	1	1	F	33	
# 3	B	1	1	1	1	1	1	1	1	F	33	
	C	1	1	1	1	1	1	1	1	F	33	
25.0%	D	1	1	1	1	1	1	1	1	F	25	
	E	1	1	1	1	1	1	1	1	F	31	
	F	1	1	1	1	1	1	1	1	F	32	
	G	1	1	1	1	1	1	1	1	F	38	
	H	1	1	1	1	1	1	1	1	F	29	
	I	1	1	1	1	1	1	1	1	F	32	
	J	1	1	1	1	1	1	1	1	F	31	
	A	1	1	1	1	1	1	1	1	F	24	
# 4	B	1	1	1	1	1	1	1	1	F	28	
	C	1	1	1	1	1	1	1	1	F	24	
50.0%	D	1	1	1	1	1	1	1	1	F	30	
	E	1	1	1	1	1	1	1	1	F	28	
	F	1	1	1	1	1	1	1	1	F	31	
	G	1	1	1	1	1	1	1	1	F	26	
	H	1	1	1	1	1	1	1	1	F	29	
	I	1	1	1	1	1	1	1	1	F	35	
	J	1	1	1	1	1	1	1	1	F	30	
	A	1	1	1	1	1	1	1	1	F	20	
# 5	B	1	1	1	1	1	1	1	1	F	22	
	C	1	1	1	1	1	1	1	1	F	29	
100%	D	1	1	1	1	1	1	1	1	F	5	
	E	1	1	1	1	1	1	1	1	F	24	
	F	1	1	1	1	1	1	1	1	F	16	
	G	1	1	1	1	1	1	1	1	F	11	
	H	1	1	1	1	1	1	1	1	F	6	
	I	1	1	1	1	1	1	0	0	F	8	
	J	1	1	1	1	1	1	1	1	F	10	
		See Reproduction Sheet for Renewal Information					See ToxCalc printout for summary survival & reproduction data					
CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE												
MICR1503CCD		% Control survival (TAC 80% min):			90		% Surviving controls with 3 broods (TAC 60% min):			89		

Ceriodaphnia Survival and Reproduction Test-6 Day Survival

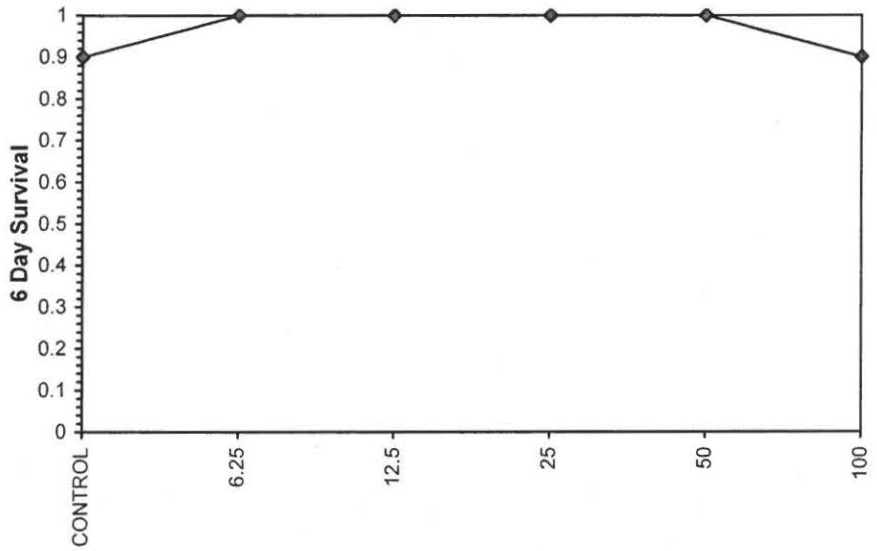
Start Date:		Test ID:	MICR1503CD	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	DATA ENTERED BY PB				

Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000

Conc-%	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's Exact P	1-Tailed Critical
CONTROL	0.9000	1.0000	1	9	10	10		
6.25	1.0000	1.1111	0	10	10	10	0.5000	0.0500
12.5	1.0000	1.1111	0	10	10	10	0.5000	0.0500
25	1.0000	1.1111	0	10	10	10	0.5000	0.0500
50	1.0000	1.1111	0	10	10	10	0.5000	0.0500
100	0.9000	1.0000	1	9	10	10	0.7632	0.0500

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Fisher's Exact Test	100	>100		1

Dose-Response Plot



 ToxCalc v5.0.23 Reviewed by: pd

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:		Test ID:	MICR1503CD	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	DATA ENTERED BY PB				

Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	3.000	29.000	27.000	28.000	34.000	22.000	31.000	20.000	32.000	29.000
6.25	30.000	30.000	31.000	34.000	31.000	29.000	30.000	26.000	29.000	31.000
12.5	36.000	34.000	32.000	32.000	30.000	34.000	29.000	27.000	33.000	30.000
25	33.000	33.000	33.000	25.000	31.000	32.000	38.000	29.000	32.000	31.000
50	24.000	28.000	24.000	30.000	28.000	31.000	26.000	29.000	35.000	30.000
100	20.000	22.000	29.000	5.000	24.000	16.000	11.000	6.000	8.000	10.000

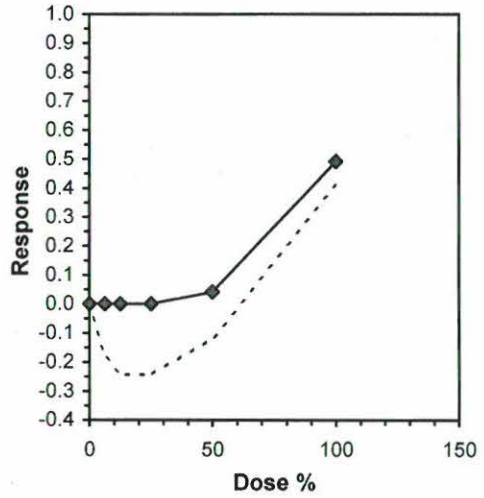
			Transform: Untransformed					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
CONTROL	25.500	1.0000	25.500	3.000	34.000	35.234	10			29.750	1.0000
6.25	30.100	1.1804	30.100	26.000	34.000	6.727	10	123.00	75.00	29.750	1.0000
12.5	31.700	1.2431	31.700	27.000	36.000	8.549	10	133.50	75.00	29.750	1.0000
25	31.700	1.2431	31.700	25.000	38.000	10.415	10	133.00	75.00	29.750	1.0000
50	28.500	1.1176	28.500	24.000	35.000	11.725	10	110.50	75.00	28.500	0.9580
*100	15.100	0.5922	15.100	5.000	29.000	55.095	10	74.00	75.00	15.100	0.5076

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.92294	1.035	-1.06	5.0042
Bartlett's Test indicates unequal variances (p = 6.51E-06)	31.8009	15.0863		

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

Linear Interpolation (200 Resamples)

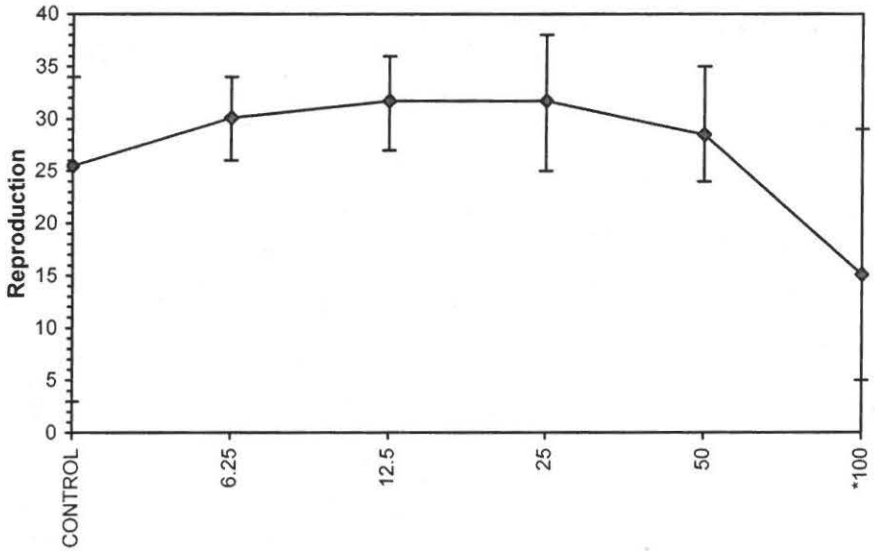
Point	%	SD	95% CL		Skew
IC05	50.886	6.416	35.740	55.608	-0.4527
IC10	56.437	4.287	46.479	62.888	0.1613
IC15	61.987	4.486	53.731	71.666	1.4993
IC20	67.537				
IC25	73.088				
IC40	89.739				
IC50	>100				



Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	Test ID:	MICR1503CD	Sample ID:	
End Date:	Lab ID:	CBI	Sample Type:	
Sample Date:	Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	DATA ENTERED BY PB			

Dose-Response Plot



Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:		Test ID:	MICR1503CD	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	DATA ENTERED BY PB				

Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	3.000	29.000	27.000	28.000	34.000	22.000	31.000	20.000	32.000	29.000
6.25	30.000	30.000	31.000	34.000	31.000	29.000	30.000	26.000	29.000	31.000
12.5	36.000	34.000	32.000	32.000	30.000	34.000	29.000	27.000	33.000	30.000
25	33.000	33.000	33.000	25.000	31.000	32.000	38.000	29.000	32.000	31.000
50	24.000	28.000	24.000	30.000	28.000	31.000	26.000	29.000	35.000	30.000
100	20.000	22.000	29.000	5.000	24.000	16.000	11.000	6.000	8.000	10.000

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
CONTROL	25.500	1.0000	25.500	3.000	34.000	35.234	10			
6.25	30.100	1.1804	30.100	26.000	34.000	6.727	10	-1.860	2.287	5.655
12.5	31.700	1.2431	31.700	27.000	36.000	8.549	10	-2.507	2.287	5.655
25	31.700	1.2431	31.700	25.000	38.000	10.415	10	-2.507	2.287	5.655
50	28.500	1.1176	28.500	24.000	35.000	11.725	10	-1.213	2.287	5.655
*100	15.100	0.5922	15.100	5.000	29.000	55.095	10	4.206	2.287	5.655

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.92294	1.035	-1.06	5.0042
Bartlett's Test indicates unequal variances (p = 6.51E-06)	31.8009	15.0863		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	50	100	70.7107	2	5.6545	0.22175	399.68	30.5741	2.4E-08	5, 54

Dunnett's test for PMSD only.

Fathead minnow test set up bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

Test chamber:	1000 ml Poly Beaker	✓	Illumination & photoperiod:	50-100 ft-c 16L:8D
	Other:		Number of replicates/treatment:	4
Test solution vol. (250 ml min):	500 ml:	✓	Initial number animals/replicate:	10
	Other (ml):			
CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE				

SPECIES:	Pimephales promelas	
ACCLIMATION WATER:	Mod. Hard Synthetic Freshwater	
FEEDING PRIOR TO TEST:	Artemia nauplii (<24 h old) ad libitum	
FEEDING DURING TEST:	Artemia nauplii (<24 h old, ~0.15 ml) 2x/day	
SOURCE:	CBI Stock cultures	
ACCLIMATION TEMP (o C):	25	
HATCH START DATE & TIME:	2/3/15 17:00	
HATCH END DATE & TIME:	2/4/15 10:00	
DATE/TIME WATER ADDED:	2/4/15 14:58	
DATE/TIME ANIMALS ADDED:	2/4/15 15:10	
ANIMAL AGE WINDOW:	17h 0m	
MAX AGE AT TEST START (TAC 24 h MAX):	22h 10m	
TEST SET UP BY:		AG
TEST ID:	MICR1503CPP	
PEER REVIEW BY (Initial/Date):	PB. GB	2/12/15 9:38
MICR1503CPP		

Fathead minnow daily water quality bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

		Day 0		Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7	SUMMARY WATER QUALITY DATA			
	TRTMNT	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Final	MEAN	S.D.	MIN.	MAX.
pH (S.U.)	C	7.78	7.60	7.72	7.56	7.70	7.62	7.69	7.60	7.71	7.50	7.68	7.43	7.71	7.49		7.63	0.10	7.43	7.78
	1	7.78	7.60	7.73	7.47	7.79	7.58	7.73	7.57	7.74	7.48	7.70	7.43	7.73	7.46		7.63	0.13	7.43	7.79
	2	7.78	7.62	7.73	7.45	7.77	7.58	7.77	7.57	7.75	7.46	7.70	7.43	7.75	7.46		7.63	0.14	7.43	7.78
	3	7.75	7.64	7.74	7.49	7.75	7.56	7.78	7.56	7.75	7.45	7.70	7.42	7.77	7.46		7.63	0.14	7.42	7.78
	4	7.71	7.63	7.74	7.52	7.72	7.55	7.75	7.60	7.72	7.47	7.70	7.52	7.77	7.49		7.64	0.11	7.47	7.77
	5	7.63	7.64	7.72	7.62	7.64	7.64	7.67	7.69	7.63	7.52	7.65	7.57	7.77	7.58		7.64	0.06	7.52	7.77
Temp. (o C)	C	25	25	24	24	25	24	25	25	25	24	25	25	25	25		25	0.5	24	25
	1	25	25	24	24	25	24	25	25	25	24	25	25	25	25		25	0.5	24	25
	2	25	25	24	24	25	24	25	25	25	24	25	25	25	25		25	0.5	24	25
	3	25	25	24	24	25	24	25	25	25	24	25	25	25	25		25	0.5	24	25
	4	25	25	24	24	25	24	25	25	25	24	25	25	25	25		25	0.5	24	25
	5	25	25	24	24	25	24	25	25	25	24	25	25	25	25		25	0.5	24	25
Diss. Oxygen (mg/l)	C	8.2	7.6	8.1	7.6	8.1	7.3	7.4	7.5	7.7	7.0	7.9	6.9	7.8	6.8		7.6	0.4	6.8	8.2
	1	8.2	7.5	8.1	7.5	8.1	7.3	7.6	7.4	7.8	7.1	7.9	6.9	7.8	6.8		7.6	0.4	6.8	8.2
	2	8.2	7.7	8.1	7.3	8.1	7.3	7.5	7.4	7.8	7.2	7.8	6.9	7.8	6.7		7.6	0.5	6.7	8.2
	3	8.2	7.7	8.1	7.3	8.1	7.3	7.6	7.3	7.8	7.1	7.8	7.0	7.7	6.8		7.6	0.4	6.8	8.2
	4	8.2	7.7	8.1	7.3	8.1	7.4	7.7	7.4	7.8	7.2	7.8	7.1	7.7	6.8		7.6	0.4	6.8	8.2
	5	8.2	7.6	8.1	7.4	8.1	7.4	7.7	7.5	8.2	7.2	7.8	7.2	7.7	6.8		7.6	0.4	6.8	8.2
Cond. (uS/cm)	C	306		304		307		301		300		297		302			302	3.5	297	307
	1	370		357		363		367		375		369		372			368	6.0	357	375
	2	434		413		414		440		446		439		445			433	13.9	413	446
	3	564		525		526		584		589		581		590			566	28.7	525	590
	4	818		741		738		843		875		839		881			819	58.6	738	881
	5	1327		1165		1176		1389		1437		1417		1435			1335	118.5	1165	1437
Replicate measured		A	C	D	B	A	D	C	A	B	D	C	B	D	A					
Initials		AG	AG	BJA	GB	RCD	GB	KK	AG	AG	GB	GB	GB	AG	GB					
Changes & Notes (Initials, date, specific change or notes)																				

MICR1503CPP	Test Aerated?	No	D.O. Highest conc. @ aeration:		TRT ID:	1	2	3	4	5	
	Date & Time Air Start:		Total live highest conc.@ aeration		CONC(%):	6.25%	12.5%	25.0%	50.0%	100%	

Fathead minnow daily biological measurements bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

TRTMNT	Rep	#Live Day 0	#Live Day 1	#Live Day 2	#Live Day 3	#Live Day 4	#Live Day 5	#Live Day 6	#Live Day 7	Total Dry Wt (mg)	Tare Wt (mg)	Wt Count	Pan Number
C	A	10	10	10	10	10	10	10	10	17.73	11.57	10	73
	B	10	10	10	10	10	10	10	10	17.99	11.50	10	74
Lab	C	10	10	10	10	10	10	10	10	18.60	11.37	10	75
Control	D	10	10	10	10	10	10	10	10	17.71	11.84	10	76
#1	A	10	10	10	10	10	10	10	10	16.50	10.34	10	77
6.25%	B	10	10	10	10	10	10	10	10	17.87	11.40	10	78
Vol. Effl:	C	10	10	10	10	10	10	10	10	18.35	12.05	10	79
100 ml	D	10	10	10	10	10	10	10	10	18.75	11.34	10	80
# 2	A	10	10	10	10	10	10	10	10	16.89	9.88	10	81
12.5%	B	10	10	10	10	10	10	10	10	18.49	10.63	10	82
Vol. Effl:	C	10	10	10	10	10	10	10	9	16.91	11.12	10	83
200 ml	D	10	10	10	10	10	10	10	10	18.57	11.37	10	84
# 3	A	10	10	10	10	10	10	10	10	16.70	9.88	10	85
25.0%	B	10	10	10	10	10	10	10	10	17.87	11.10	10	86
Vol. Effl:	C	10	10	10	10	10	10	10	10	15.21	9.26	10	87
400 ml	D	10	10	10	10	10	10	10	10	17.45	9.84	10	88
# 4	A	10	10	10	10	10	10	10	9	17.77	10.99	10	89
50.0%	B	10	10	10	10	10	10	10	9	18.15	11.97	10	90
Vol. Effl:	C	10	10	10	10	10	10	10	9	19.04	11.98	10	91
800 ml	D	10	10	10	10	10	10	10	10	19.96	12.25	10	92
# 5	A	10	10	10	10	10	10	10	10	19.51	12.19	10	93
100%	B	10	10	10	10	10	10	10	10	17.82	10.60	10	94
Vol. Effl:	C	10	10	9	9	9	9	8	8	16.88	10.26	10	95
1600 ml	D	10	10	10	10	10	10	9	9	16.44	10.09	10	96
INITIALS:		AG	BJA	RCD	KK	AG	GB	AG	GB	PB	GB	See ToxCalc printout for summary survival & biomass data	
DATE & TIME:		2/4/15 15:10	2/5/15 13:07	2/6/15 14:21	2/7/15 15:33	2/8/15 15:53	2/9/15 15:29	2/10/15 12:52	2/11/15 15:48	2/12/15 9:31	2/6/15 12:26		
SAMPLE USED:		A	B	B	C	C	C	C	100 mg wt ck:	100.00	99.99	Test Duration:	7d 0h 38m
CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE													

MEAN % CONTROL SURVIVAL (TAC 80% MIN): 100

AVG. DRY WT. PER SURV. CONTROL (TAC 0.25 mg): 0.644

SAMPLE	COLLECTION DATE/TIME	1st USE DATE & TIME	LAST USE DATE & TIME	TIME COLLECT-1ST USE (TAC MAX 36h)	TIME 1st TO LAST USE (TAC MAX 72 h)
A	2/3/15 7:17	2/4/15 15:10	2/4/15 15:10	31h 53m	0h 0m
B	2/4/15 9:15	2/5/15 13:07	2/6/15 14:21	27h 53m	25h 13m
C	2/6/15 10:15	2/7/15 15:33	2/10/15 12:52	29h 18m	69h 20m
				0	0
				0	0

MICR1503CPP

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:		Test ID:	MICR1403PP	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	DATA ENTERED BY PB				

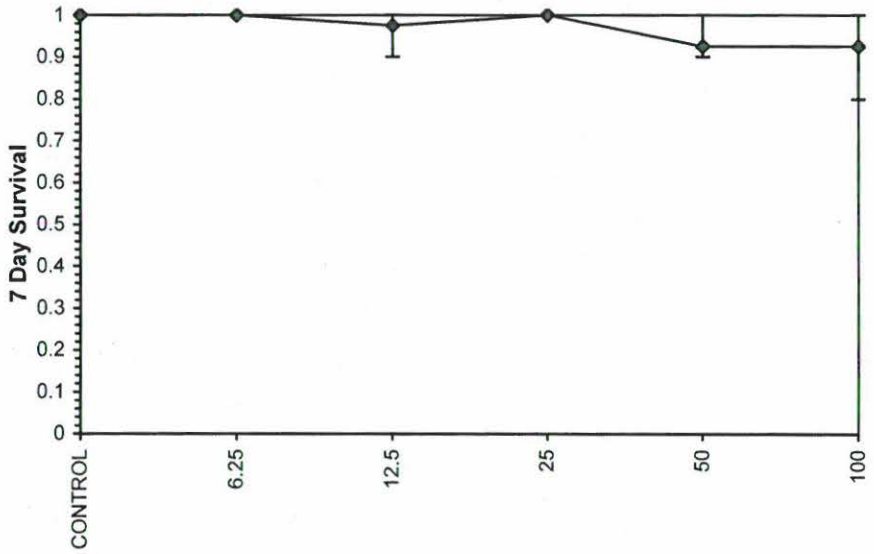
Conc-%	1	2	3	4
CONTROL	1.0000	1.0000	1.0000	1.0000
6.25	1.0000	1.0000	1.0000	1.0000
12.5	1.0000	1.0000	0.9000	1.0000
25	1.0000	1.0000	1.0000	1.0000
50	0.9000	0.9000	0.9000	1.0000
100	1.0000	1.0000	0.8000	0.9000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
CONTROL	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4		
6.25	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4	18.00	10.00
12.5	0.9750	0.9750	1.3713	1.2490	1.4120	5.942	4	16.00	10.00
25	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4	18.00	10.00
50	0.9250	0.9250	1.2898	1.2490	1.4120	6.318	4	12.00	10.00
100	0.9250	0.9250	1.2951	1.1071	1.4120	11.347	4	14.00	10.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.85787	0.884	-0.5461	2.26378
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

Dose-Response Plot



 ToxCalc v5.0.23 Reviewed by: pd

Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:		Test ID:	MICR1403PP	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	DATA ENTERED BY PB				

Conc-%	1	2	3	4
CONTROL	0.6160	0.6490	0.7230	0.5870
6.25	0.6160	0.6470	0.6300	0.7410
12.5	0.7010	0.7860	0.5790	0.7200
25	0.6820	0.6770	0.5950	0.7610
50	0.6780	0.6180	0.7060	0.7710
100	0.7320	0.7220	0.6620	0.6350

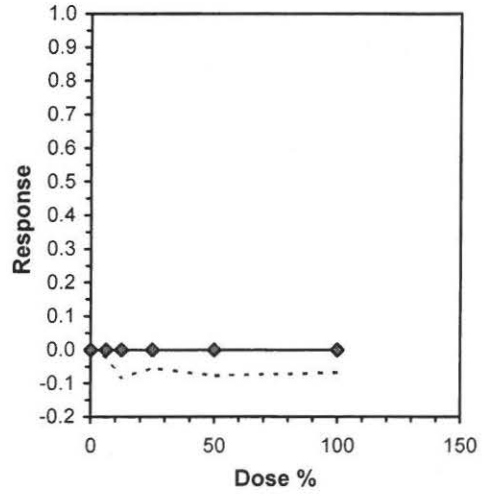
			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
CONTROL	0.6438	1.0000	0.6438	0.5870	0.7230	9.102	4				0.6764	1.0000
6.25	0.6585	1.0229	0.6585	0.6160	0.7410	8.571	4	-0.324	2.410	0.1098	0.6764	1.0000
12.5	0.6965	1.0819	0.6965	0.5790	0.7860	12.403	4	-1.158	2.410	0.1098	0.6764	1.0000
25	0.6788	1.0544	0.6788	0.5950	0.7610	9.990	4	-0.768	2.410	0.1098	0.6764	1.0000
50	0.6933	1.0769	0.6933	0.6180	0.7710	9.162	4	-1.087	2.410	0.1098	0.6764	1.0000
100	0.6878	1.0683	0.6878	0.6350	0.7320	6.808	4	-0.966	2.410	0.1098	0.6764	1.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.96229	0.884	-0.042	-0.5843
Bartlett's Test indicates equal variances (p = 0.95)	1.14915	15.0863		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	0.10979	0.17055	0.00177	0.00415	0.82477	5, 18

Linear Interpolation (200 Resamples)

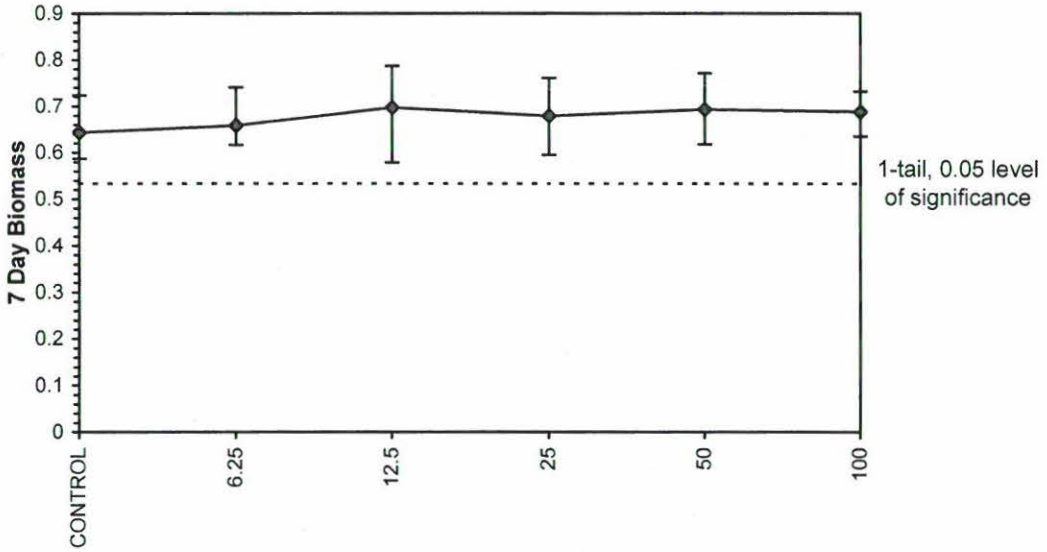
Point	%	SD	95% CL(Exp)	Skew
IC05	>100			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			



Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:		Test ID:	MICR1403PP	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	DATA ENTERED BY PB				

Dose-Response Plot



Effluent and Dilution Water Log (Freshwater Tests). FWEFFL061013

											SUMMARY WATER QUALITY DATA				
Initial sample charac-terization	Bottle(1):	A1	B1	C1							MEAN	S.D.	MIN.	MAX.	PARAMETER
	Arrival Temp. (oC, from CoC):	1	3	1							2	1.2	1	3	Arrival Temp.
	TRC (mg/l)(2):	<DL	<DL	<DL											
	TRC Corrected(2):														
	Hardness (mg/l):	156	154	162							157	4.2	154	162	Hardness (mg/l)
	Alkalinity (mg/l):	77	73	77							76	2.3	73	77	Alkalinity (mg/l)
	NH3-N (mg/l):	<1.0	<1.0	<1.0											
	Color/Appearance(3):	CY	CY	CY											
	Obvious odor?	NO	NO	NO											
	Date & Time:	2/4/15 10:51	2/5/15 10:50	2/7/15 10:38											
	Initials:	GB	RCD	GB											
Sample prep measure-ments	Test Day:	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7		MEAN	S.D.	MIN.	MAX.	
	Bottle(s):	A1	B1,2	B1,2	C1,2	C1,2	C1,2	C1,2							
	Prep. Temp. (oC):	25	24	25	25	25	25	25			25	0.4	24	25	Temp. (oC)
	D.O. (mg/l) After Warming:	9.9	11.3	9.6	11.1	10.1	10.4	10.4							
	Aeration Time (min):	2.5	4	2.5	4	2	2	3							
	Adjusted D.O. (mg/l):	8.2	8.3	8.2	8.0	8.2	8.2	8.1			8.2	0.1	8.0	8.3	D.O. (mg/l)
	Final pH (S.U.):	7.60	7.69	7.62	7.64	7.55	7.64	7.78			7.65	0.07	7.55	7.78	pH (S.U.)
	Conductivity (uS/cm)(4):	1301	1111	NA	1430	NA	NA	NA			1281	160.5	1111	1430	Cond. (uS/cm)
	Final TRC (mg/l)(5):	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.							
	Sample Filtered (60 um)?	✓	✓	✓	✓	✓	✓	✓							
	Date & Time:	2/4/15 14:21	2/5/15 11:50	2/6/15 13:19	2/7/15 13:30	2/8/15 14:28	2/9/15 15:02	2/10/15 12:35							
	Initials:	AG	BJA	RCD	KK	AG	GB	AG							
Dilution water	Test Day:	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7		MEAN	S.D.	MIN.	MAX.	
	Vat Number:	2	2	3	3	3	1	1							
	Temperature (oC):	25	25	25	25	25	25	25			25	0.0	25	25	Temp. (oC)
	Conductivity (uS/cm):	301	303	305	302	301	304	302			303	1.5	301	305	Cond. (uS/cm)
	D.O. (mg/l):	8.2	8.2	8.2	8.2	8.2	8.5	8.2			8.2	0.1	8.2	8.5	D.O. (mg/l)
	pH (S.U.):	7.70	7.70	7.70	7.71	7.71	7.71	7.72			7.71	0.01	7.70	7.72	pH (S.U.)
	Hardness (mg/l):	94	94	98	98	98	84	84			93	6.3	84	98	Hardness (mg/l)
	Alkalinity (mg/l):	57	57	58	58	58	58	58			58	0.5	57	58	Alkalinity (mg/l)
	Date & Time:	2/4/15 8:15	2/5/15 8:20	2/6/15 8:25	2/7/15 8:45	2/8/15 9:00	2/9/15 8:30	2/10/15 8:45							
	Initials:	GB	AG	GB	GB	AG	GB	GB							
	Changes & Notes (Initials, date, specific change or notes)														
	Peer review Initial/Date:	AG. PB	2/10/15 12:51	DILUTION WATER TYPE:	Mod. Hard Synthetic Freshwater (EPA)										
PROJECT ID:	MICR1503	ADDITIONAL EFFLUENT TREATMENT:													

ND=Not Determined/Measured, NA=Not Applicable 1) Ninth character of lab sample ID on chain of custody AND bottle number in collection series. Together with Project ID constitutes entire sample bottle ID. 2) TRC MDL 0.02 mg/l; QL 0.22 mg/l Corrected value if Mn, Cr potential positive interference. Corrected using KI and NaAsO2. 3) C-clear, O-opaque, T-turbid, S-solids (Sl-slight, M-moderate, H-heavy), Y-yellow, B-brown, Bl-black, G-green, P-pink, Gr-grey, Or-orange. 4) Measured on first use of sample only. 5) Final TRC measured only if chlorine present in initial characterization.

Coastal Bioanalysts
6400 Enterprise Court, Gloucester, VA 23061
PH: 804-694-8285, FAX: 804-695-1129
www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): M I C R I S D 3 - A
A A A A Y Y N N (Project ID) — A (Spl)

CBI Login # 15-0082

FACILITY INFORMATION

CLIENT/FACILITY NAME	LBB/National Archives	CONTACT & PHONE #	Bob Gentry
NPDES PERMIT NO		OUTFALL # OR LOCATION	001
SAMPLE CHLORINATED?	N	SAMPLE DECHLORINATED?	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?

TESTS REQUESTED:	SPECIES OR EPA METH #		ACUTE	CHRONIC
		C. dubia	☐	☑
		P. promelas	☐	☑

OTHER TESTS:

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	2/2/15 0717	SAMPLE END DATE & TIME	2/3/15 0717	AUTOSAMPLER TEMP. (°C)	0.0
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION	NUMBER SUBSAMPLES 97	VOL (ml) SUBSAMPLES 100 ml/s		TIME INCREMENT 15 min	
	SET VOLUME SUBSAMPLE NA	SET VOLUME FLOW NA		TOTAL VOLUME 10L	

FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
4.9	7.5	0.0	7.6	<0.03	2/3/15 0720	JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeffrey Duszynski / Microbac — [signature] — 2/3/15
(PRINTED NAME/AFFILIATION SAMPLER/ANALYST) (SIGNATURE) (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
[signature]	2/3/15	1500	UPS
	2/4/15	1030	J.B.

SHIPPING METHOD: UPS ✓ FEDEX____ HAND DELIVERY____

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER____

SAMPLE TEMP: (°C) 1 ARRIVED ON ICE? Y ✓ N___ CUSTODY SEAL: INTACT___ BROKEN___ ABSENT ✓

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

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SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): M I C R 1 5 0 3 - B
A A A A Y Y N N (Project ID) — A (Spl)

CBI Login # 15-0087

FACILITY INFORMATION

CLIENT/FACILITY NAME	LBB/National Archives II	CONTACT & PHONE #	Bob Gentry
NPDES PERMIT NO		OUTFALL # OR LOCATION	001
SAMPLE CHLORINATED? N	SAMPLE DECHLORINATED?	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?	

TESTS REQUESTED:	SPECIES OR EPA METH #			
		C. dubia	ACUTE ☐	CHRONIC ☑
		P. promelas	ACUTE ☐	CHRONIC ☑

OTHER TESTS:

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	2/3/15 0915	SAMPLE END DATE & TIME	2/4/15 0915	AUTOSAMPLER TEMP. (°C)	0.5
(TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION)	NUMBER SUBSAMPLES 97	VOL (ml) SUBSAMPLES 100 ml		TIME INCREMENT 15 min	
	SET VOLUME SUBSAMPLE N/A	SET VOLUME FLOW N/A		TOTAL VOLUME 10L	

FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
3.1	6.7	0.5	7.4	<0.03	2/4/15 0920	JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeffrey Duszynski / Microbac — [signature] — 2/4/15
(PRINTED NAME/AFFILIATION SAMPLER/ANALYST) (SIGNATURE) (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
[signature]	2/4/15	1530	UPS
	2/5/15	1050	[signature]

SHIPPING METHOD: UPS ✓ FEDEX____ HAND DELIVERY____

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER____

SAMPLE TEMP: (°C) 3 ARRIVED ON ICE? Y ✓ N__ CUSTODY SEAL: INTACT ✓ BROKEN__ ABSENT__

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

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www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): M I C R I 5 0 3 - C
A A A A Y Y N N (Project ID) — A (Spl)

CBI Login # 15-0091

FACILITY INFORMATION

CLIENT/FACILITY NAME	LBB/National Archives	CONTACT & PHONE #	Bob Gentry
NPDES PERMIT NO		OUTFALL # OR LOCATION	001
SAMPLE CHLORINATED? N	SAMPLE DECHLORINATED?	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?	

TESTS REQUESTED:	SPECIES OR EPA METH #			
		C. dubia	ACUTE ☐	CHRONIC ☑
		P. promelas	ACUTE ☐	CHRONIC ☑
OTHER TESTS:				

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	2/5/15 1015	SAMPLE END DATE & TIME	2/6/15 1015	AUTOSAMPLER TEMP. (°C)	
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION*	NUMBER SUBSAMPLES 97	VOL (ml) SUBSAMPLES 200ml/s		TIME INCREMENT 15 min	
	SET VOLUME SUBSAMPLE —	SET VOLUME FLOW —		TOTAL VOLUME 15-16L	

*FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
0.8	7.2	-0.1	7.4	<0.03	2/6/15 1020	JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeffrey Duszynski / Microbac — [signature] — 2/6/15
(PRINTED NAME/AFFILIATION SAMPLER/ANALYST) (SIGNATURE) (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
[signature]	2/6/15	1500	UPS
	2/7/15	1030	[signature]

SHIPPING METHOD: UPS ✓ FEDEX____ HAND DELIVERY____

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER____

SAMPLE TEMP: (°C) 1 ARRIVED ON ICE? Y ✓ N___ CUSTODY SEAL: INTACT ✓ BROKEN___ ABSENT___

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

MICROBAC

Microbac Laboratories, Inc.

Baltimore Division

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Phone: 410-633-1800
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www.microbac.com

COVER LETTER

April 29, 2015
Report No.: 15E0061

Bob Gentry
LB&B Associates
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740

RE: Toxic Chemical Bioassay (4 Quarters)

The report of analyses contains test results for samples received at Microbac Laboratories, Inc., Baltimore Division on 04/15/2015 16:00. The samples/analysis were subcontracted to:

SpecificMethod	Description	Subcontract Laboratory
Subout	SUBCONTRACT	Coastal Bioanalyst

The enclosed results were obtained from and applicable to the sample(s) as received at the laboratory. All sample results are reported on an "as received" basis unless otherwise noted.

All data included in this report has been reviewed and meet the applicable project and certification specific requirements, unless otherwise noted.

This report has been paginated in its entirety and shall not be reproduced except in full, without the written approval of Microbac Laboratories, Inc.

We appreciate the opportunity to service your analytical needs. If you have any questions, please feel free to contact us.

This Data Package contains the following:

- This Cover Page
- Cooler Receipt Log
- Chain of Custody
- Subcontract Report/Data

4/29/2015

Final report reviewed by: Michael M. Gallion/Project Manager Report issue date

All samples received in proper condition and results conform to ISO 17025 standards unless otherwise noted.

If we have not met or exceeded your expectations, please contact Michael M. Gallion/Project Manager at 410-633-1800. You may also contact Trevor Boyce, President at trevor.boyce@microbac.com

MICROBAC

Microbac Laboratories, Inc.

Baltimore Division

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CERTIFICATE OF ANALYSIS

LB&B Associates	Project: Toxic Chemical Bioassay (4 Quarters)	Report: 15E0061
Fac. Ops & Maint., 8601 Adelphi Road	Project Number: Toxic Chemical Bioassay (4 Quarters)	Reported: 04/29/2015 08:05
College Park, MD 20740	Project Manager: Bob Gentry	

SAMPLE SUMMARY

Sample ID	Laboratory ID	Matrix	Type	Date Sampled	Date Received
Outfall 001	15E0061-01	Wastewater	Composite	4/17/15 0:00	4/15/15 16:00

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Michael M. Gallion, Project Manager

MICROBAC

Microbac Laboratories, Inc.

Baltimore Division

2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800
Fax: 410-633-6553
www.microbac.com

CERTIFICATE OF ANALYSIS

LB&B Associates	Project: Toxic Chemical Bioassay (4 Quarters)	Report: 15E0061
Fac. Ops & Maint., 8601 Adelphi Road	Project Number: Toxic Chemical Bioassay (4 Quarters)	Reported: 04/29/2015 08:05
College Park, MD 20740	Project Manager: Bob Gentry	

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Cooler Receipt Log

Cooler ID: Default Cooler **Cooler Temp:** **Work Order:** 15E0061

stody Seals Intact:	Yes	COC/Containers Agree:	Yes
Containers Intact:	Yes	Correct Preservation:	Yes
Received On Ice:	Yes	Correct Number of Containers Received:	Yes
Radiation Scan Acceptable:	Yes	Sufficient Sample Volume for Testing:	Yes
COC Present:	Yes	Samples Received in Proper Condition:	Yes

Comments:

MICROBAC **Microbac Laboratories, Inc., Baltimore Division**
2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800
Fax: 410-633-6553
www.microbac.com

15E0061

Tentatively Scheduled Date: **5/4/2015**

Client: **LB&B Associates**
Project: **Toxic Chemical Bioassay (4 Quarters)**
Project Number: **Toxic Chemical Bioassay (4 Quarters)**

Report To:
Bob Gentry
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone: (301) 837-3247

Invoice To:
Bob Gentry
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone :(301) 837-3247

TAT 21 days

Sample ID: outfall 001

Lab Sample ID: **15E0061-01**
Matrix: Wastewater
Type: Composite

Sample Start Date & Time: 4/13 - 4/17/15
Sampled Date & Time:
Volume:

Analyte	Method	Container	Hold
SUBCONTRACT	Subout		120

Total Containers: 0

Sampled by: [signature]	Date/Time: 4/15/15 1600	Received by: [signature]
Printed Name: Jeff J. Duszynski		Printed Name: [signature]
Relinquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:
Relinquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:

As Received at Laboratory: On Ice: Yes / No Cooler Temp _____ Rad Scan Acceptable: Yes / No Total Bottles 0

Notes:

all samples sent to CBI

Client: Microbac Laboratories, Inc.
Project ID: MICR1504
Client Sample ID: LBB/National Archives II Outfall 001
Permit No.: MD0065871
Sample Period: 4/14/15 to 4/17/15

Coastal Bioanalysts, Inc.

Report of Analysis: Whole Effluent Toxicity (WET)

Submitted To:	**Prepared By:**
Mr. Michael Arbaugh Sr. Microbac Laboratories, Inc. Baltimore Division 2101 Van Deman Street Baltimore, MD 21224	Coastal Bioanalysts, Inc. 6400 Enterprise Court Gloucester, VA 23061 (804) 694-8285 www.coastalbio.com Contact: Peter F. De Lisle, Technical Director

Chronic Test Results*

Species-Test Method	Endpoint	NOEC	LOEC	ChrV	PMSD	$T.U._C$	IC25	48-h LC50	LC50 95% C.L.	$T.U._{Ac}$
C. dubia	Survival	100	>100	>100	N/A	N/A	N/A	>100	N/A	<1.00
EPA 1002.0	Reproduction	100	>100	>100	12	**<1.00**	>100	N/A	N/A	N/A
P. promelas	Survival	100	>100	>100	N/A	N/A	N/A	>100	N/A	<1.00
EPA 1000.0	Biomass	100	>100	>100	21	**<1.00**	>100	N/A	N/A	N/A

*Note: Details regarding test conduct and data analysis provided in attached bench sheets and printouts as applicable.

Chronic Test QA/QC Reference Toxicant: KCl Units: mg/l Test Organism Source: CBI Stock Cultures

Species-Method (Ref. Test Date)	Data Source	% Survival		Reproduction (# Young) or Biomass (mg)					RTT in Control?
		Cont.	NOEC	Cont.	NOEC	PMSD	IC25	IC25 A.L.	
C. dubia 1002.0	RTT	100	500	23.2	250	25	350	N/A	Yes
(4/14/15-4/19/15)	CC	99	500	27.8	250	18	340	267-414	
P. promelas 1000.0	RTT	100	500	0.67	500	11	624	N/A	Yes
(4/1/15-4/8/15)	CC	99	500	0.62	500	13	622	589-655	

Note: RTT = Reference Toxicant Test, CC = Control Chart, Cont. = Control group.

The results of analysis contained within this report relate only to the sample as received in the laboratory. This report shall not be reproduced except in full without written approval from the laboratory. Unless noted below, these test results meet all requirements of NELAP.

APPROVED:

Peter F. De Lisle, Ph.D.
Technical Director

4/23/15
Date

Deviations from, additions to, or exclusions from the test method, non-standard conditions or data qualifiers and, as appropriate, a statement of compliance/non-compliance: **NONE**

VELAP# 460030
EPA# VA01116

Coastal Bioanalysts, Inc.

GLOSSARY OF TERMS AND ABBREVIATIONS

A.L. (Acceptance Limits): The results of a given reference toxicant test are compared to the control chart mean value ± 2 standard deviations. These limits approximate the 95% probability limits for the "true" reference toxicant value.

Chronic Value (ChrV): The geometric mean of the NOEC and LOEC. Units are same as test concentration units.

C.L. (Confidence Limits): These are the probability limits, based on the data set and statistical model employed, that the "true value" lies within the limits specified. Typically limits are based on 95% or 99% probabilities.

Control chart: A cumulative summary chart of results from QC tests with reference toxicants. The results of a given reference toxicant test are compared to the control chart mean value and 95% Acceptance Limits (A.L.) (mean ± 2 standard deviations).

IC25: The concentration of sample or chemical, calculated from the data set using statistical models, causing a 25% reduction in test organism growth, reproduction, etc. The lower the IC25, the more toxic the chemical or sample. Units are same as test concentration units.

LC50: The concentration of sample or chemical, calculated from the data set using statistical models, causing a 50% reduction in test organism survival. The lower the LC50, the more toxic the chemical or sample. Units are same as test concentration units. Note: The LC50 value must always be associated with the duration of exposure. Thus 48-h LC50, 96-h LC50, etc. are calculated.

LOEC: Lowest-observable-effect-concentration. The lowest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit a statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Units are same as test concentration units.

PMSD: Percent Minimum Significant Difference: The minimum difference which can exist between a test treatment and the controls in a particular test and be statistically significant; a measure of test sensitivity. The lower the PMSD the more sensitive the test.

N/A: Not applicable.

N/D: Not determined or measured.

NOAEC: No-observable-acute-effect-concentration. The highest concentration of sample or chemical in an acute test dilution series in which the test organisms exhibit no statistically significant reduction in the test end point (e.g. survival) compared to control organisms. Units are same as test concentration units.

NOEC: No-observable-effect-concentration. The highest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit no statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Some regulatory definitions also require that the NOEC be less than the LOEC. Units are same as test concentration units.

Q.L.: Quantitation Limit. Level, concentration, or quantity of a target variable (analyte) that can be reported at a specified degree of confidence.

T.U.: Toxic units. Expresses the relative toxicity of an effluent in such a manner that the larger the toxic unit value the more toxic the effluent. $T.U._{Ac}$ = 100/LC50. $T.U._{Chr}$ = 100/NOEC. A dimensionless unit.

VELAP# 460030
EPA# VA01116

Ceriodaphnia test set up bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

Test chamber:	~30 ml glass vial:	✓	Illumination & photoperiod:	50-100 ft-c 16L:8D
	Other:		Number of replicates/treatment:	10
Test solution volume:	15 ml:	✓	Initial number animals/replicate:	1
	Other (ml):		Template #:	10

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE	

SPECIES:	Ceriodaphnia dubia	
ACCLIMATION WATER:	Mod. Hard Synthetic Freshwater	
FEEDING (Culture &Test):	YCT + Selenastrum capricornutum mix	
SOURCE:	CBI Stock cultures	
ACCLIMATION TEMP (o C):	25	
BROOD RELEASE FROM:	4/14/15 14:20	
BROOD RELEASE TO:	4/14/15 16:35	
DATE/TIME WATER ADDED:	4/15/15 13:09	
DATE/TIME ANIMALS ADDED:	4/15/15 13:22	
ANIMAL AGE WINDOW (TAC 8 h):	2h 15m	
MAX AGE AT TEST START (TAC 24 h):	23h 3m	
TEST SET UP BY:	RCD	
TEST ID:	**MICR1504CCD**	
PEER REVIEW BY (Initial/Date):	**PB**	4/22/15 10:24
MICR1504CCD		

Ceriodaphnia daily water quality bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

		Day 0	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7	SUMMARY WATER QUALITY DATA			
	TRTMNT	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	MEAN	S.D.	MIN.	MAX.
pH (S.U.)	C	7.67	7.95	7.60	8.06	7.84	7.97	7.41	8.12	7.61	8.05	7.70	8.03			7.83	0.23	7.41	8.12
	1	7.65	8.12	7.60	8.13	7.79	8.07	7.45	8.14	7.63	8.09	7.70	8.10			7.87	0.26	7.45	8.14
	2	7.62	8.13	7.59	8.23	7.77	8.11	7.48	8.19	7.65	8.13	7.70	8.15			7.90	0.28	7.48	8.23
	3	7.59	8.15	7.58	8.25	7.74	8.12	7.50	8.19	7.64	8.16	7.69	8.15			7.90	0.29	7.50	8.25
	4	7.52	8.14	7.55	8.22	7.69	8.13	7.49	8.13	7.59	8.16	7.65	8.15			7.87	0.30	7.49	8.22
	5	7.41	8.11	7.48	8.21	7.59	8.15	7.47	8.11	7.50	8.17	7.55	8.17			7.83	0.34	7.41	8.21
Temp. (o C)	C	25	25	25	25	25	25	25	25	25	25	25	25			25	0.0	25	25
	1	25	25	25	25	25	25	25	25	25	25	25	25			25	0.0	25	25
	2	25	25	25	25	25	25	25	25	25	25	26	25			25	0.3	25	26
	3	25	25	25	25	25	25	25	25	25	25	26	25			25	0.3	25	26
	4	25	25	25	25	25	25	25	25	25	25	26	25			25	0.3	25	26
	5	25	25	25	25	25	25	25	25	25	25	26	25			25	0.3	25	26
Diss. Oxygen (mg/l)	C	8.2	8.4	8.2	8.5	8.2	8.5	8.2	8.7	8.1	8.8	8.1	8.6			8.4	0.2	8.1	8.8
	1	8.2	8.5	8.2	8.6	8.2	8.6	8.2	8.7	8.1	8.6	8.1	8.6			8.4	0.2	8.1	8.7
	2	8.2	8.6	8.2	8.8	8.2	8.6	8.2	8.9	8.1	8.6	8.1	8.6			8.4	0.3	8.1	8.9
	3	8.2	8.8	8.2	8.8	8.2	8.7	8.2	9.1	8.1	8.7	8.1	8.7			8.5	0.3	8.1	9.1
	4	8.2	9.0	8.2	8.9	8.2	8.8	8.2	9.3	8.1	8.9	8.1	8.7			8.6	0.4	8.1	9.3
	5	8.2	9.1	8.2	8.8	8.2	8.9	8.2	9.4	8.1	9.0	8.1	8.8			8.6	0.5	8.1	9.4
Cond. (uS/cm)	C	301		307		300		296		297		299				300	3.9	296	307
	1	335		336		330		324		321		321				328	6.8	321	336
	2	369		355		355		340		346		336				350	12.0	336	369
	3	429		409		394		372		360		370				389	26.5	360	429
	4	551		510		505		443		437		438				481	48.1	437	551
	5	783		699		692		567		562		574				646	91.8	562	783
Replicate measured		S	I	S	E	S	B	S	J	S	G	S	A			NOTE: Final D.O. Values >8.3 mg/l (saturation) may occur due to photosynthetic activity of algal food.			
Initials		RCD	RCD		GB		RCD		RCD		AG		GB						
Changes & Notes (Initials, date, specific change or notes)																			
												TRT ID:	1	2	3	4	5		
MICR1504CCD												CONC:	6.25%	12.5%	25.0%	50.0%	100%		

Ceriodaphnia daily reproduction count bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

TREATMENT	Rep	Repro Day 0	Repro Day 1	Repro Day 2	Repro Day 3	Repro Day 4	Repro Day 5	Repro Day 6	Repro Day 7	4th Broods Removed	TOTAL REPRO
C	A	0	0	0	4	0	12	14			30
	B	0	0	0	6	6	0	12			24
	C	0	0	0	2	8	0	10			20
Lab	D	0	0	0	4	10	0	12			26
Control	E	0	0	0	4	6	0	14			24
	F	0	0	0	2	10	0	14			26
	G	0	0	0	4	8	0	12			24
	H	0	0	0	6	12	0	12			30
	I	0	0	0	4	6	0	12			22
	J	0	0	0	4	10	0	12			26
#1	A	0	0	0	4	0	6	14			24
	B	0	0	0	6	12	0	12			30
	C	0	0	0	4	12	0	12			28
6.25%	D	0	0	0	4	10	0	12			26
	E	0	0	0	4	12	0	12			28
Vol. Effl:	F	0	0	0	4	12	0	10			26
12.5 ml	G	0	0	0	2	12	0	14			28
	H	0	0	0	2	12	0	12			26
	I	0	0	0	4	12	0	14			30
	J	0	0	0	6	8	0	12			26
#2	A	0	0	0	4	0	12	14			30
	B	0	0	0	4	16	0	14			34
	C	0	0	0	4	10	0	14			28
12.5%	D	0	0	0	4	12	0	14			30
	E	0	0	0	4	12	0	12			28
Vol. Effl:	F	0	0	0	2	12	0	12			26
25 ml	G	0	0	0	6	12	0	12			30
	H	0	0	0	4	12	0	12			28
	I	0	0	0	4	12	0	12			28
	J	0	0	0	4	12	0	10			26
#3	A	0	0	0	2	6	0	8			16
	B	0	0	0	4	10	0	14			28
	C	0	0	0	0	2	12	10			24
25.0%	D	0	0	0	4	6	0	10			20
	E	0	0	0	6	12	0	12			30
Vol. Effl:	F	0	0	0	2	8	0	12			22
50 ml	G	0	0	0	2	6	0	14			22
	H	0	0	0	4	8	0	12			24
	I	0	0	0	4	14	0	12			30
	J	0	0	0	4	8	0	12			24
#4	A	0	0	0	2	0	6	14			22
	B	0	0	0	6	10	0	14			30
	C	0	0	0	6	12	0	14			32
50.0%	D	0	0	0	2	0	8	14			24
	E	0	0	0	6	8	0	10			24
Vol. Effl:	F	0	0	0	2	10	0	12			24
100 ml	G	0	0	0	4	12	0	14			30
	H	0	0	0	6	12	0	12			30
	I	0	0	0	6	12	0	10			28
	J	0	0	0	4	12	0	12			28
#5	A	0	0	0	0	6	8	10			24
	B	0	0	0	2	6	0	14			22
	C	0	0	0	2	12	0	14			28
100%	D	0	0	0	4	12	0	12			28
	E	0	0	0	4	10	0	14			28
Vol. Effl:	F	0	0	0	0	6	10	14			30
200 ml	G	0	0	0	4	12	0	12			28
	H	0	0	0	4	12	0	12			28
	I	0	0	0	4	12	0	12			28
	J	0	0	0	6	12	0	10			28
INITIALS:		RCD	RCD	GB	RCD	RCD	AG	GB			
DATE & TIME:		4/15/15 13:22	4/16/15 14:01	4/17/15 14:37	4/18/15 14:15	4/19/15 13:11	4/20/15 13:18	4/21/15 14:27			
SAMPLE USED:		A	B	B	C	C	C				
CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE											

MICR1504CCD Avg. young/surviving control (TAC 15 min): [illegible] Surv. controls with 3 broods: 10

SAMPLE COLLECTION

SAMPLE	COLLECTION DATE & TIME
A	4/14/15 7:06
B	4/15/15 9:00
C	4/17/15 10:00
D	
E	

SAMPLE AGING

SAMPLE:	A
1st USE DATE/TIME:	4/15/15 13:22
LAST USE DATE/TIME:	4/15/15 13:22
TIME COLLECT TO 1st USE:	[illegible]
	(TAC 36 h max)
TIME 1st TO LAST USE:	[illegible]
	(TAC MAX 72 h)
SAMPLE:	B
1st USE DATE/TIME:	4/16/15 14:01
LAST USE DATE/TIME:	4/17/15 14:37
TIME COLLECT TO 1st USE:	[illegible]
	(TAC 36 h max)
TIME 1st TO LAST USE:	[illegible]
	(TAC MAX 72 h)
SAMPLE:	C
1st USE DATE/TIME:	4/18/15 14:15
LAST USE DATE/TIME:	4/20/15 13:18
TIME COLLECT TO 1st USE:	[illegible]
	(TAC 36 h max)
TIME 1st TO LAST USE:	[illegible]
	(TAC MAX 72 h)
SAMPLE:	D
1st USE DATE/TIME:	
LAST USE DATE/TIME:	
TIME COLLECT TO 1st USE:	[illegible]
	(TAC 36 h max)
TIME 1st TO LAST USE:	[illegible]
	(TAC MAX 72 h)
SAMPLE:	E
1st USE DATE/TIME:	
LAST USE DATE/TIME:	
TIME COLLECT TO 1st USE:	[illegible]
	(TAC 36 h max)
TIME 1st TO LAST USE:	[illegible]
	(TAC MAX 72 h)

Ceriodaphnia daily survival count bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

TRTMNT	Rep	#Live Day 0	#Live Day 1	#Live Day 2	#Live Day 3	#Live Day 4	#Live Day 5	#Live Day 6	#Live FINAL	MALE OR FEMALE	TOTAL REPRO	REPRO/ SURV FEM
	A	1	1	1	1	1	1	1	1	F	30	30
C	B	1	1	1	1	1	1	1	1	F	24	24
	C	1	1	1	1	1	1	1	1	F	20	20
Lab	D	1	1	1	1	1	1	1	1	F	26	26
Control	E	1	1	1	1	1	1	1	1	F	24	24
	F	1	1	1	1	1	1	1	1	F	26	26
	G	1	1	1	1	1	1	1	1	F	24	24
	H	1	1	1	1	1	1	1	1	F	30	30
	I	1	1	1	1	1	1	1	1	F	22	22
	J	1	1	1	1	1	1	1	1	F	26	26
	A	1	1	1	1	1	1	1	1	F	24	
#1	B	1	1	1	1	1	1	1	1	F	30	
	C	1	1	1	1	1	1	1	1	F	28	
6.25%	D	1	1	1	1	1	1	1	1	F	26	
	E	1	1	1	1	1	1	1	1	F	28	
	F	1	1	1	1	1	1	1	1	F	26	
	G	1	1	1	1	1	1	1	1	F	28	
	H	1	1	1	1	1	1	1	1	F	26	
	I	1	1	1	1	1	1	1	1	F	30	
	J	1	1	1	1	1	1	1	1	F	26	
	A	1	1	1	1	1	1	1	1	F	30	
#2	B	1	1	1	1	1	1	1	1	F	34	
	C	1	1	1	1	1	1	1	1	F	28	
12.5%	D	1	1	1	1	1	1	1	1	F	30	
	E	1	1	1	1	1	1	1	1	F	28	
	F	1	1	1	1	1	1	1	1	F	26	
	G	1	1	1	1	1	1	1	1	F	30	
	H	1	1	1	1	1	1	1	1	F	28	
	I	1	1	1	1	1	1	1	1	F	28	
	J	1	1	1	1	1	1	1	1	F	26	
	A	1	1	1	1	1	1	1	1	F	16	
#3	B	1	1	1	1	1	1	1	1	F	28	
	C	1	1	1	1	1	1	1	1	F	24	
25.0%	D	1	1	1	1	1	1	1	1	F	20	
	E	1	1	1	1	1	1	1	1	F	30	
	F	1	1	1	1	1	1	1	1	F	22	
	G	1	1	1	1	1	1	1	1	F	22	
	H	1	1	1	1	1	1	1	1	F	24	
	I	1	1	1	1	1	1	1	1	F	30	
	J	1	1	1	1	1	1	1	1	F	24	
	A	1	1	1	1	1	1	1	1	F	22	
#4	B	1	1	1	1	1	1	1	1	F	30	
	C	1	1	1	1	1	1	1	1	F	32	
50.0%	D	1	1	1	1	1	1	1	1	F	24	
	E	1	1	1	1	1	1	1	1	F	24	
	F	1	1	1	1	1	1	1	1	F	24	
	G	1	1	1	1	1	1	1	1	F	30	
	H	1	1	1	1	1	1	1	1	F	30	
	I	1	1	1	1	1	1	1	1	F	28	
	J	1	1	1	1	1	1	1	1	F	28	
	A	1	1	1	1	1	1	1	1	F	24	
#5	B	1	1	1	1	1	1	1	1	F	22	
	C	1	1	1	1	1	1	1	1	F	28	
100%	D	1	1	1	1	1	1	1	1	F	28	
	E	1	1	1	1	1	1	1	1	F	28	
	F	1	1	1	1	1	1	1	1	F	30	
	G	1	1	1	1	1	1	1	1	F	28	
	H	1	1	1	1	1	1	1	1	F	28	
	I	1	1	1	1	1	1	1	1	F	28	
	J	1	1	1	1	1	1	1	1	F	28	

See Reproduction Sheet for Renewal Information

See ToxCalc printout for summary survival & reproduction data

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE	
MICR1504CCD	% Control survival (TAC 80% min): 100 % Surviving controls with 3 broods (TAC 60% min): 100

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:		Test ID:	MICR1504CD	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	DATA ENTERED BY PB				

Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	30.000	24.000	20.000	26.000	24.000	26.000	24.000	30.000	22.000	26.000
6.25	24.000	30.000	28.000	26.000	28.000	26.000	28.000	26.000	30.000	26.000
12.5	30.000	34.000	28.000	30.000	28.000	26.000	30.000	28.000	28.000	26.000
25	16.000	28.000	24.000	20.000	30.000	22.000	22.000	24.000	30.000	24.000
50	22.000	30.000	32.000	24.000	24.000	24.000	30.000	30.000	28.000	28.000
100	24.000	22.000	28.000	28.000	28.000	30.000	28.000	28.000	28.000	28.000

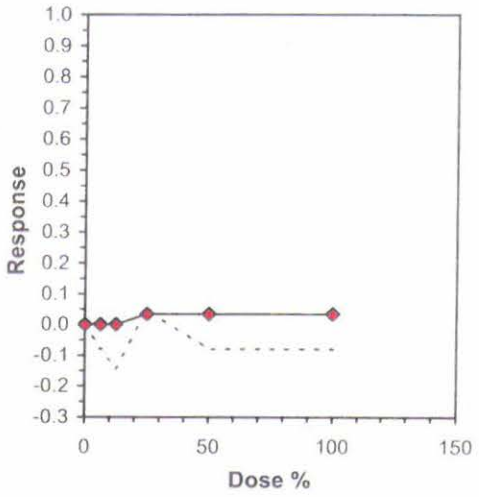
			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
CONTROL	25.200	1.0000	25.200	20.000	30.000	12.521	10				27.067	1.0000
6.25	27.200	1.0794	27.200	24.000	30.000	7.104	10	-1.464	2.287	3.124	27.067	1.0000
12.5	28.800	1.1429	28.800	26.000	34.000	8.151	10	-2.635	2.287	3.124	27.067	1.0000
25	24.000	0.9524	24.000	16.000	30.000	18.426	10	0.878	2.287	3.124	26.133	0.9655
50	27.200	1.0794	27.200	22.000	32.000	12.593	10	-1.464	2.287	3.124	26.133	0.9655
100	27.200	1.0794	27.200	22.000	30.000	8.631	10	-1.464	2.287	3.124	26.133	0.9655

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.98452	1.035	-0.1092	0.15793
Bartlett's Test indicates equal variances (p = 0.15)	8.0828	15.0863		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	3.12418	0.12398	29.28	9.33333	0.01474	5, 54

Linear Interpolation (200 Resamples)

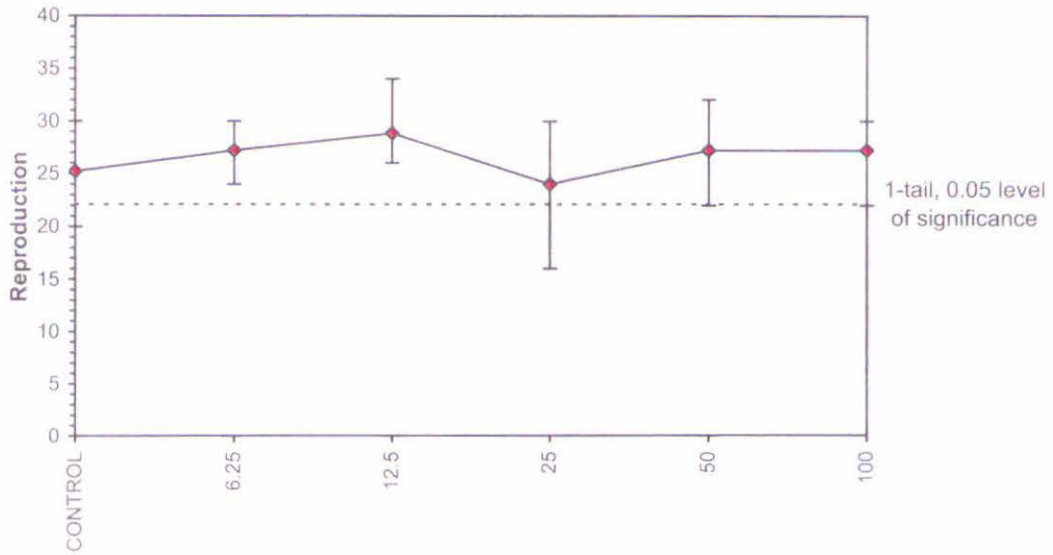
Point	%	SD	95% CL	Skew
IC05	>100			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			



Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	Test ID:	MICR1504CD	Sample ID:	
End Date:	Lab ID:	CBI	Sample Type:	
Sample Date:	Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	DATA ENTERED BY PB			

Dose-Response Plot



Fathead minnow test set up bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

Test chamber:	1000 ml Poly Beaker	✓	Illumination & photoperiod:	50-100 ft-c 16L:8D
	Other:		Number of replicates/treatment:	4
Test solution vol. (250 ml min):	500 ml:	✓	Initial number animals/replicate:	10
	Other (ml):			

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE

SPECIES:	Pimephales promelas	
ACCLIMATION WATER:	Mod. Hard Synthetic Freshwater	
FEEDING PRIOR TO TEST:	Artemia nauplii (<24 h old) ad libitum	
FEEDING DURING TEST:	Artemia nauplii (<24 h old, ~0.15 ml) 2x/day	
SOURCE:	CBI Stock cultures	
ACCLIMATION TEMP (o C):	25	
HATCH START DATE & TIME:	4/14/15 17:00	
HATCH END DATE & TIME:	4/15/15 10:00	
DATE/TIME WATER ADDED:	4/15/15 13:08	
DATE/TIME ANIMALS ADDED:	4/15/15 13:29	
ANIMAL AGE WINDOW:	17h 0m	
MAX AGE AT TEST START (TAC 24 h MAX):	20h 29m	
TEST SET UP BY:	BJA	
TEST ID:	MICR1504CPP	
PEER REVIEW BY (Initial/Date):	PB. RCD	4/23/15 8:49
MICR1504CPP		

Fathead minnow daily water quality bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

		Day 0	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7	SUMMARY WATER QUALITY DATA			
	TRTMNT	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	MEAN	S.D.	MIN.	MAX.
pH (S.U.)	C	7.67	7.30	7.57	7.36	7.59	7.37	7.55	7.18	7.56	7.22	7.70	7.18	7.61	7.25	7.44	0.19	7.18	7.70
	1	7.69	7.32	7.59	7.34	7.61	7.33	7.62	7.17	7.62	7.22	7.70	7.18	7.61	7.23	7.45	0.20	7.17	7.70
	2	7.69	7.33	7.59	7.34	7.62	7.30	7.64	7.17	7.64	7.22	7.69	7.18	7.61	7.22	7.45	0.21	7.17	7.69
	3	7.65	7.32	7.57	7.33	7.61	7.31	7.64	7.17	7.61	7.22	7.69	7.18	7.61	7.22	7.44	0.20	7.17	7.69
	4	7.58	7.33	7.55	7.34	7.62	7.32	7.64	7.17	7.59	7.23	7.66	7.20	7.60	7.22	7.43	0.19	7.17	7.66
	5	7.45	7.32	7.51	7.36	7.57	7.35	7.60	7.16	7.49	7.20	7.57	7.21	7.53	7.22	7.40	0.16	7.16	7.60
Temp. (o C)	C	25	25	25	25	25	24	25	25	25	24	25	25	25	24	25	0.4	24	25
	1	25	25	25	25	25	24	25	25	25	24	25	25	25	24	25	0.4	24	25
	2	25	25	25	25	25	24	25	25	25	24	25	25	25	24	25	0.4	24	25
	3	25	25	25	25	25	24	25	25	25	24	25	25	25	24	25	0.4	24	25
	4	25	25	25	25	25	24	25	25	25	24	25	25	25	24	25	0.4	24	25
	5	25	25	25	25	25	24	25	25	25	25	25	25	25	24	25	0.4	24	25
Diss. Oxygen (mg/l)	C	8.2	7.5	8.2	7.5	8.0	7.4	8.1	7.2	8.0	7.3	8.0	7.1	8.0	7.2	7.7	0.4	7.1	8.2
	1	8.2	7.5	8.2	7.3	8.0	7.2	8.1	7.0	8.0	7.0	8.0	7.1	8.0	7.2	7.6	0.5	7.0	8.2
	2	8.2	7.4	8.2	7.1	8.0	7.0	8.0	6.9	7.9	7.3	8.0	7.0	8.0	7.1	7.6	0.5	6.9	8.2
	3	8.2	7.3	8.2	7.2	8.0	7.0	8.0	6.9	7.9	7.2	8.0	6.9	7.9	7.1	7.6	0.5	6.9	8.2
	4	8.2	7.3	8.2	7.2	7.9	7.0	7.9	6.8	7.9	7.0	7.9	6.8	7.9	7.0	7.5	0.5	6.8	8.2
	5	8.2	7.3	8.2	7.2	7.9	7.0	7.9	6.7	7.9	6.8	7.9	6.9	7.8	7.0	7.5	0.5	6.7	8.2
Cond. (uS/cm)	C	300		296		295		295		295		295		299		296	2.1	295	300
	1	336		328		328		318		318		314		320		323	7.7	314	336
	2	369		353		351		338		333		331		331		344	14.4	331	369
	3	427		403		399		372		369		365		367		386	23.9	365	427
	4	549		507		497		444		434		432		426		470	47.8	426	549
	5	812		718		709		602		578		564		559		649	97.9	559	812
Replicate measured		D	B	A	D	C	A	B	C	D	B	C	D	A	B				
Initials		BJA	AG	RCD	GB	GB	RCD	RCD	RCD	RCD	GB	GB	GB	GB	GB				

Changes & Notes (Initials, date, specific change or notes)

	Test Aerated?	No	D.O. Highest conc. @ aeration:		TRT ID:	1	2	3	4	5
MICR1504CPP	Date & Time Air Start:		Total live highest conc.@ aeration		CONC(%):	6.25%	12.5%	25.0%	50.0%	100%

Fathead minnow daily biological measurements bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

TRTMNT	Rep	#Live Day 0	#Live Day 1	#Live Day 2	#Live Day 3	#Live Day 4	#Live Day 5	#Live Day 6	#Live Day 7	Total Dry Wt (mg)	Tare Wt (mg)	Wt Count	Pan Number
C	A	10	10	10	10	10	10	10	10	19.02	12.67	10	49
	B	10	10	10	10	9	9	9	9	16.24	10.37	10	50
Lab	C	10	10	10	10	10	8	8	8	16.69	10.17	10	51
Control	D	10	10	10	10	10	10	10	10	18.62	11.18	10	52
#1	A	10	10	10	10	10	10	10	10	18.52	11.73	10	53
6.25%	B	10	10	10	10	10	10	10	10	18.91	12.22	10	54
Vol. Effl:	C	10	10	10	10	9	9	9	9	17.14	11.01	10	55
100 ml	D	10	10	10	10	10	10	10	10	19.25	11.99	10	56
# 2	A	10	10	10	10	10	10	9	9	16.00	10.63	10	57
12.5%	B	10	10	10	10	9	9	8	8	16.99	11.13	10	58
Vol. Effl:	C	10	10	10	10	10	10	10	10	17.68	11.18	10	59
200 ml	D	10	10	10	10	10	10	10	10	18.44	10.73	10	60
# 3	A	10	10	10	10	10	10	10	10	18.69	10.85	10	61
25.0%	B	10	10	10	10	10	10	10	10	19.43	13.10	10	62
Vol. Effl:	C	10	10	10	10	10	9	9	8	16.12	10.49	10	63
400 ml	D	10	10	10	10	10	10	10	10	18.68	12.14	10	64
# 4	A	10	10	10	10	10	10	10	10	17.80	11.40	10	65
50.0%	B	10	10	9	9	9	9	9	9	17.69	11.89	10	66
Vol. Effl:	C	10	10	10	10	10	10	10	10	18.15	10.80	10	67
800 ml	D	10	10	10	10	8	8	8	8	16.36	10.57	10	68
# 5	A	10	10	10	10	10	10	10	10	17.68	10.68	10	69
100%	B	10	10	10	10	10	10	10	10	18.07	11.08	10	70
Vol. Effl:	C	10	10	10	10	10	10	10	10	17.70	10.85	10	71
1600 ml	D	10	10	10	9	9	9	9	9	16.27	11.03	10	72
INITIALS:		BJA	RCD	GB	RCD	RCD	GB	GB	AG	PB	GB	See ToxCalc printout for summary survival & biomass data	
DATE & TIME:		4/15/15 13:29	4/16/15 14:44	4/17/15 15:06	4/18/15 14:48	4/19/15 13:45	4/20/15 14:20	4/21/15 13:22	4/22/15 14:00	4/23/15 8:44	4/17/15 13:00		
SAMPLE USED:		A	B	B	C	C	C	C	100 mg wt ck:	100.00	99.99	Test Duration:	7d 0h 31m

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE: Fuzzy dead fish Day 7 3-C. Corrected miscount Day 6 C-D from 9 to 10 4/22/15 AG

MEAN % CONTROL SURVIVAL (TAC 80% MIN): 92.5

AVG. DRY WT. PER SURV. CONTROL (TAC 0.25 mg): 0.708

SAMPLE	COLLECTION DATE/TIME	1st USE DATE & TIME	LAST USE DATE & TIME	TIME COLLECT-1ST USE (TAC MAX 36h)	TIME 1st TO LAST USE (TAC MAX 72 h)
A	4/14/15 7:06	4/15/15 13:29	4/15/15 13:29	30h 23m	0h 0m
B	4/15/15 9:00	4/16/15 14:44	4/17/15 15:06	29h 44m	24h 22m
C	4/17/15 10:00	4/18/15 14:48	4/21/15 13:22	28h 49m	70h 34m
				0	0
				0	0

MICR1504CPP

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:		Test ID:	MICR1504PP	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	DATA ENTERED BY PB				

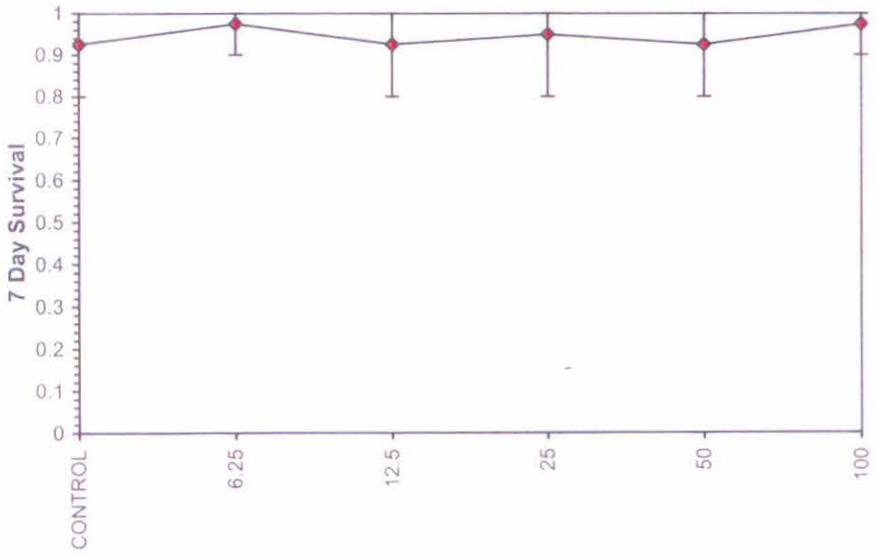
Conc-%	1	2	3	4
CONTROL	1.0000	0.9000	0.8000	1.0000
6.25	1.0000	1.0000	0.9000	1.0000
12.5	0.9000	0.8000	1.0000	1.0000
25	1.0000	1.0000	0.8000	1.0000
50	1.0000	0.9000	1.0000	0.8000
100	1.0000	1.0000	1.0000	0.9000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
CONTROL	0.9250	1.0000	1.2951	1.1071	1.4120	11.347	4		
6.25	0.9750	1.0541	1.3713	1.2490	1.4120	5.942	4	20.50	10.00
12.5	0.9250	1.0000	1.2951	1.1071	1.4120	11.347	4	18.00	10.00
25	0.9500	1.0270	1.3358	1.1071	1.4120	11.411	4	19.50	10.00
50	0.9250	1.0000	1.2951	1.1071	1.4120	11.347	4	18.00	10.00
100	0.9750	1.0541	1.3713	1.2490	1.4120	5.942	4	20.50	10.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.8529	0.884	-0.7641	-0.7915
Bartlett's Test indicates equal variances (p = 0.83)	2.14782	15.0863		

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

Dose-Response Plot



Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:		Test ID:	MICR1504PP	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	DATA ENTERED BY PB				

Conc-%	1	2	3	4
CONTROL	0.6350	0.5870	0.6520	0.7440
6.25	0.6790	0.6690	0.6130	0.7260
12.5	0.5370	0.5860	0.6500	0.7710
25	0.7840	0.6330	0.5630	0.6540
50	0.6400	0.5800	0.7350	0.5790
100	0.7000	0.6990	0.6850	0.5240

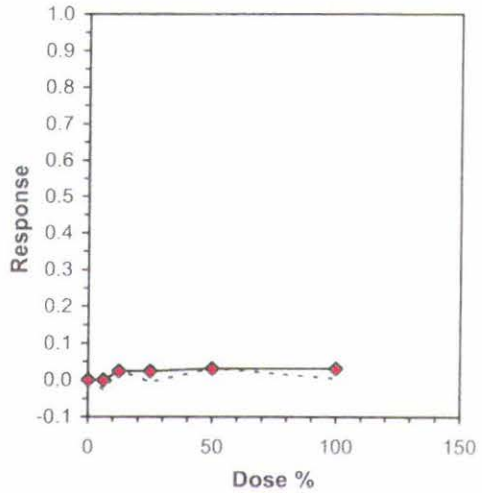
			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
CONTROL	0.6545	1.0000	0.6545	0.5870	0.7440	10.040	4				0.6631	1.0000
6.25	0.6718	1.0264	0.6718	0.6130	0.7260	6.905	4	-0.307	2.410	0.1355	0.6631	1.0000
12.5	0.6360	0.9717	0.6360	0.5370	0.7710	15.911	4	0.329	2.410	0.1355	0.6473	0.9761
25	0.6585	1.0061	0.6585	0.5630	0.7840	14.012	4	-0.071	2.410	0.1355	0.6473	0.9761
50	0.6335	0.9679	0.6335	0.5790	0.7350	11.592	4	0.373	2.410	0.1355	0.6428	0.9693
100	0.6520	0.9962	0.6520	0.5240	0.7000	13.130	4	0.044	2.410	0.1355	0.6428	0.9693

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.97545	0.884	0.2316	-0.4965
Bartlett's Test indicates equal variances (p = 0.87)	1.83903	15.0863		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	0.13552	0.20706	0.00083	0.00632	0.98338	5, 18

Linear Interpolation (200 Resamples)

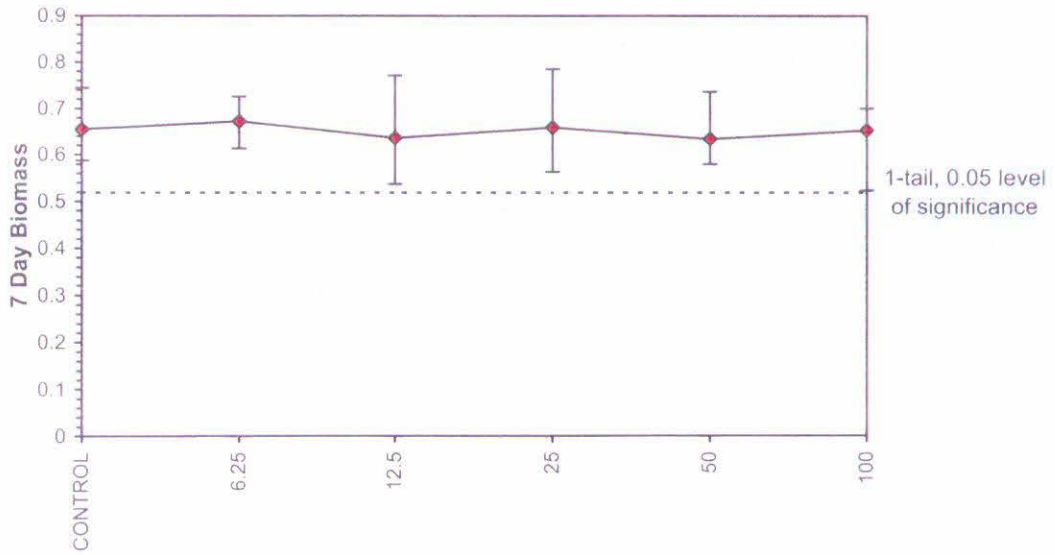
Point	%	SD	95% CL(Exp)	Skew
IC05	>100			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			



Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:	Test ID:	MICR1504PP	Sample ID:	
End Date:	Lab ID:	CBI	Sample Type:	
Sample Date:	Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	DATA ENTERED BY PB			

Dose-Response Plot



Effluent and Dilution Water Log (Freshwater Tests). FWEFFL061013

											SUMMARY WATER QUALITY DATA				
											MEAN	S.D.	MIN.	MAX.	PARAMETER
Initial sample charac-terization	Bottle(1):	A1	B1	C1											
	Arrival Temp. (oC, from CoC):	1	1	1							1	0.0	1	1	Arrival Temp.
	TRC (mg/l)(2):	<DL	<DL	<DL											
	TRC Corrected(2):														
	Hardness (mg/l):	112	96	84							97	14.0	84	112	Hardness (mg/l)
	Alkalinity (mg/l):	63	65	57							62	4.2	57	65	Alkalinity (mg/l)
	NH3-N (mg/l):	<1.0	<1.0	<1.0											
	Color/Appearance(3):	CY	CY	CY											
	Obvious odor?	NO	NO	NO											
	Date & Time:	4/15/15 11:11	4/16/15 11:03	4/18/15 11:31											
	Initials:	GB	AG	GB											
Sample prep measure-ments	Test Day:	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7		MEAN	S.D.	MIN.	MAX.	
	Bottle(s):	A1	B1,2	B1,2	C1,2	C1,2	C1,2	C1,2							
	Prep. Temp. (oC):	25	25	25	25	25	26	25			25	0.4	25	26	Temp. (oC)
	D.O. (mg/l) After Warming:	9.9	9.9	9.6	11.0	10.9	10.5	10.6							
	Aeration Time (min):	2	2	2	4	4	4	4							
	Adjusted D.O. (mg/l):	8.2	8.2	8.2	8.2	8.2	8.1	8.2			8.2	0.0	8.1	8.2	D.O. (mg/l)
	Final pH (S.U.):	7.37	7.54	7.49	7.55	7.48	7.52	7.54			7.50	0.06	7.37	7.55	pH (S.U.)
	Conductivity (uS/cm)(4):	815	696	NA	559	NA	NA	NA			690	128.1	559	815	Cond. (uS/cm)
	Final TRC (mg/l)(5):	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.							
	Sample Filtered (60 um)?	✓	✓	✓	✓	✓	✓	✓							
	Date & Time:	4/15/15 13:00	4/16/15 13:38	4/17/15 14:00	4/18/15 13:51	4/19/15 12:44	4/20/15 12:49	4/21/15 13:11							
	Initials:	BJA	RCD	GB	RCD	RCD	AG	GB							
Dilution water	Test Day:	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7		MEAN	S.D.	MIN.	MAX.	
	Vat Number:	1	2	2	3	3	3	1							
	Temperature (oC):	25	25	25	25	25	25	25			25	0.0	25	25	Temp. (oC)
	Conductivity (uS/cm):	302	299	306	298	297	301	304			301	3.3	297	306	Cond. (uS/cm)
	D.O. (mg/l):	8.2	8.2	8.2	8.2	8.2	8.2	8.2			8.2	0.0	8.2	8.2	D.O. (mg/l)
	pH (S.U.):	7.64	7.60	7.65	7.60	7.64	7.65	7.67			7.64	0.03	7.60	7.67	pH (S.U.)
	Hardness (mg/l):	84	84	84	84	84	84	84			84	0.0	84	84	Hardness (mg/l)
	Alkalinity (mg/l):	57	57	57	58	58	58	58			58	0.5	57	58	Alkalinity (mg/l)
	Date & Time:	4/15/15 8:30	4/16/15 8:40	4/17/15 8:20	4/18/15 8:40	4/19/15 8:30	4/20/15 8:30	4/21/15 8:40							
	Initials:	GB	AG	GB	RCD	RCD	AG	GB							
	Changes & Notes (Initials, date, specific change or notes)														
	Peer review Initial/Date:	PB	4/21/15 14:14	DILUTION WATER TYPE:	Mod. Hard Synthetic Freshwater (EPA)										
PROJECT ID:	MICR1504	ADDITIONAL EFFLUENT TREATMENT:													

ND=Not Determined/Measured, NA=Not Applicable. 1) Ninth character of lab sample ID on chain of custody AND bottle number in collection series. Together with Project ID constitutes entire sample bottle ID. 2) TRC MDL 0.02 mg/l; QL 0.22 mg/l. Corrected value if Mn, Cr potential positive interference. Corrected using KI and NaAsO2. 3) C-clear, O-opaque, T-turbid, S-solids (Sl-slight, M-moderate, H-heavy), Y-yellow, B-brown, Bl-black, G-green, P-pink, Gr-grey, Or-orange. 4) Measured on first use of sample only. 5) Final TRC measured only if chlorine present in initial characterization.

Coastal Bioanalysts
6400 Enterprise Court, Gloucester, VA 23061
PH: 804-694-8285, FAX: 804-695-1129
www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): M I C R 1 5 0 4 - A
A A A A Y Y N N (Project ID) — A (Spl)

CBI Login # 15-0247

FACILITY INFORMATION

CLIENT/FACILITY NAME	LBB/National Archives	CONTACT & PHONE #	Bob Gentry 240 678 0776
NPDES PERMIT NO		OUTFALL # OR LOCATION	001
SAMPLE CHLORINATED?	N	SAMPLE DECHLORINATED?	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?

TESTS REQUESTED:	SPECIES OR EPA METH #			
		C. dubia	ACUTE ☐	CHRONIC ☑
		P. promelas	ACUTE ☐	CHRONIC ☑

OTHER TESTS:

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	4/13/15 0706	SAMPLE END DATE & TIME	4/14/15 0706	AUTOSAMPLER TEMP. (°C)	3.0
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION	NUMBER SUBSAMPLES 97	VOL (ml) SUBSAMPLES 100ml/s		TIME INCREMENT 15 min	
	SET VOLUME SUBSAMPLE —	SET VOLUME FLOW —		TOTAL VOLUME 8.9L	

FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
15.0	7.07	3.0	7.02	<0.03	4/14/15 0715	JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeffrey Duszynski / Microbac — [signature] — 4/14/15
(PRINTED NAME/AFFILIATION SAMPLER/ANALYST) (SIGNATURE) (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
[signature]	4/14/15	1350	UPS
	4/15/15	1050	[signature]

SHIPPING METHOD: UPS ✓ FEDEX ___ HAND DELIVERY ___

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER ___

SAMPLE TEMP: (°C) 1 ARRIVED ON ICE? Y ✓ N ___ CUSTODY SEAL: INTACT ✓ BROKEN ___ ABSENT ___

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

Coastal Bioanalysts
6400 Enterprise Court, Gloucester, VA 23061
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www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): M I C R 1 5 0 4 - B
A A A A Y Y N N (Project ID) — A (Spl)

CBI Login # 15-0284

FACILITY INFORMATION

CLIENT/FACILITY NAME	LBB / National Archives	CONTACT & PHONE #	Bob Gentry
NPDES PERMIT NO		OUTFALL # OR LOCATION	outfall 001
SAMPLE CHLORINATED? N	SAMPLE DECHLORINATED?	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?	

TESTS REQUESTED:	SPECIES OR EPA METH #		ACUTE	CHRONIC
		C. dubia	☐	☑
		P. promelas	☐	☑

OTHER TESTS:

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	4/14/15 0900	SAMPLE END DATE & TIME 4/15/15 0900	AUTOSAMPLER TEMP. (°C) 7.1
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION	NUMBER SUBSAMPLES 97	VOL (ml) SUBSAMPLES 100ml	TIME INCREMENT 15 min
	SET VOLUME SUBSAMPLE —	SET VOLUME FLOW —	TOTAL VOLUME 9L

FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
11.9	7.0	7.1	7.1	<0.03	4/15/15 0715	JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeffrey Duszynski / Microbac — [signature] — 4/15/15
(PRINTED NAME/AFFILIATION SAMPLER/ANALYST) (SIGNATURE) (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
[signature]	4/15/15	1600	UPS
	4/16/15	1040	[signature]

SHIPPING METHOD: UPS ✓ FEDEX____ HAND DELIVERY____

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER____

SAMPLE TEMP: (°C) 1 ARRIVED ON ICE? Y ✓ N___ CUSTODY SEAL: INTACT___ BROKEN___ ABSENT ✓

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

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SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): M I C R 1 5 0 4 - C
A A A A Y Y N N (Project ID) — A (Spl)

CBI Login # 15-0292

FACILITY INFORMATION

CLIENT/FACILITY NAME: CBB/National Archives II		CONTACT & PHONE #: Bob Gentry	
NPDES PERMIT NO		OUTFALL # OR LOCATION: 001	
SAMPLE CHLORINATED? N	SAMPLE DECHLORINATED?	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?	
TESTS REQUESTED:	SPECIES OR EPA METH #: C. dubia	ACUTE ☐	CHRONIC ☑
	SPECIES OR EPA METH #: P. promelas	ACUTE ☐	CHRONIC ☑
OTHER TESTS:			

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME: 4/16/15 1000	SAMPLE END DATE & TIME: 4/17/15 1000	AUTOSAMPLER TEMP. (°C): 6.0	
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION	NUMBER SUBSAMPLES: 97	VOL (ml) SUBSAMPLES: 200 mls	TIME INCREMENT: 15 min
	SET VOLUME SUBSAMPLE: —	SET VOLUME FLOW: —	TOTAL VOLUME: 18 L

FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
12.4	6.8	6.0	7.1	<0.03	4/17/15 1010	JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeffrey Duszynski / microbac — [signature] — _____
(PRINTED NAME/AFFILIATION SAMPLER/ANALYST) (SIGNATURE) (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
[signature]	4/17/15	1530	UPS
	4/18/15	1120	J.B.

SHIPPING METHOD: UPS ✓ FEDEX ___ HAND DELIVERY ___

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER ___

SAMPLE TEMP: (°C) 1 ARRIVED ON ICE? Y ✓ N ___ CUSTODY SEAL: INTACT ___ BROKEN ___ ABSENT ✓

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

MICROBAC®

Microbac Laboratories, Inc.

Baltimore Division

2101 Van Deman Street • Baltimore, MD 21224

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Fax: 410-633-6553
www.microbac.com

COVER LETTER

Bob Gentry
LB&B Associates
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740

July 21, 2015
Report No.: 15G1033

RE: Toxic Chemical Bioassay (4 Quarters)

The report of analyses contains test results for samples received at Microbac Laboratories, Inc., Baltimore Division on 07/20/2015 09:00. The samples/analysis were subcontracted to:

SpecificMethod	Description	Subcontract Laboratory
Subout	SUBCONTRACT	Coastal Bioanalyst

The enclosed results were obtained from and applicable to the sample(s) as received at the laboratory. All sample results are reported on an "as received" basis unless otherwise noted.

All data included in this report has been reviewed and meet the applicable project and certification specific quirements, unless otherwise noted.

This report has been paginated in its entirety and shall not be reproduced except in full, without the written approval of Microbac Laboratories, Inc.

We appreciate the opportunity to service your analytical needs. If you have any questions, please feel free to contact us.

This Data Package contains the following:

- This Cover Page
- Cooler Receipt Log
- Chain of Custody
- Subcontract Report/Data

7/21/2015

Final report reviewed by: Michael M. Gallion/Project Manager Report issue date

All samples received in proper condition and results conform to ISO 17025 standards unless otherwise noted.

If we have not met or exceeded your expectations, please contact Michael M. Gallion/Project Manager at 410-633-1800. You may also contact Trevor Boyce, President at trevor.boyce@microbac.com

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CERTIFICATE OF ANALYSIS

LB&B Associates	Project: Toxic Chemical Bioassay (4 Quarters)	Report: 15G1033
Fac. Ops & Maint., 8601 Adelphi Road	Project Number: Toxic Chemical Bioassay (4 Quarters)	Reported: 07/21/2015 08:27
College Park, MD 20740	Project Manager: Bob Gentry	

SAMPLE SUMMARY

Sample ID	Laboratory ID	Matrix	Type	Date Sampled	Date Received
Outfall 001	15G1033-01	Wastewater	Composite	7/2/15 0:00	7/20/15 9:00

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Michael M. Gallion, Project Manager

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Baltimore Division

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CERTIFICATE OF ANALYSIS

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Fac. Ops & Maint., 8601 Adelphi Road	Project Number: Toxic Chemical Bioassay (4 Quarters)	Reported: 07/21/2015 08:27
College Park, MD 20740	Project Manager: Bob Gentry	

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Cooler Receipt Log

Cooler ID: Default Cooler **Cooler Temp:** **Work Order:** 15G1033

;tody Seals Intact:	Yes	COC/Containers Agree:	Yes
Containers Intact:	Yes	Correct Preservation:	Yes
Received On Ice:	Yes	Correct Number of Containers Received:	Yes
Radiation Scan Acceptable:	Yes	Sufficient Sample Volume for Testing:	Yes
COC Present:	Yes	Samples Received in Proper Condition:	Yes

Comments:

MICROBAC **Microbac Laboratories, Inc., Baltimore Division**
2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800
Fax: 410-633-6553
www.microbac.com

15G1033

Tenatively Scheduled Date: **7/1/2015**

Client: **LB&B Associates**
Project: **Toxic Chemical Bioassay (4 Quarters)**
Project Number: **Toxic Chemical Bioassay (4 Quarters)**

Report To:
Bob Gentry
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone: (301) 837-3247

Invoice To:
Bob Gentry
Fac. Ops & Maint., 8601 Adelphi Road
College Park, MD 20740
Phone :(301) 837-3247

TAT 21 days

Sample ID: Outfall 001

Lab Sample ID: **15G1033-01**
Matrix: Wastewater
Type: Composite

Sample Start Date & Time: 6/28/15
Sampled Date & Time: 7/2/15
Volume:

Analysis	Method	Container	Hold
SUBCONTRACT	Subout		120

Total Containers: 0

Sampled by: [signature]	Date/Time: 7/20/15 0700	Received by: [signature]
Printed Name: Jeff J. Duszynski		Printed Name: Michael Gallion
Relinquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:
Relinquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:

As Received at Laboratory: On Ice: Yes / No Cooler Temp N/A Rad Scan Acceptable: Yes / No Total Bottles 0

Notes: N/A N/A

3 day composite
chronic bioassay

Client: Microbac Laboratories, Inc.
Project ID: MICR1505
Client Sample ID: LBB/National Archives II Outfall 001
Permit No.: MD0065871
Sample Period: 6/29/15 to 7/2/15

Coastal Bioanalysts, Inc.

Report of Analysis: Whole Effluent Toxicity (WET)

Submitted To:	**Prepared By:**
Mr. Michael Arbaugh Sr. Microbac Laboratories, Inc. Baltimore Division 2101 Van Deman Street Baltimore, MD 21224	Coastal Bioanalysts, Inc. 6400 Enterprise Court Gloucester, VA 23061 (804) 694-8285 www.coastalbio.com Contact: Peter F. De Lisle, Technical Director

Chronic Test Results*

Species-Test Method	Endpoint	NOEC	LOEC	ChrV	PMSD	$T.U._C$	IC25	48-h LC50	LC50 95% C.L.	$T.U._{Ac}$
C. dubia	Survival	100	>100	>100	N/A	N/A	N/A	>100	N/A	<1.00
EPA 1002.0	Reproduction	100	>100	>100	34	**<1.00**	>100	N/A	N/A	N/A
P. promelas	Survival	6.25	12.5	8.84	N/A	N/A	N/A	>100	N/A	<1.00
EPA 1000.0	Biomass	6.25	12.5	8.84	23	**10.75**	9.3	N/A	N/A	N/A

*Note: Details regarding test conduct and data analysis provided in attached bench sheets and printouts as applicable.

Chronic Test QA/QC Reference Toxicant: KCl Units: mg/l Test Organism Source: CBI Stock Cultures

Species-Method (Ref. Test Date)	Data Source	% Survival Cont.	% Survival NOEC	Reproduction (# Young) or Biomass (mg) Cont.	NOEC	PMSD	IC25	IC25 A.L.	RTT in Control?
C. dubia 1002.0	RTT	100	500	23.0	250	21	363	N/A	Yes
(7/1/15-7/7/15)	CC	99	500	27.8	250	18	341	271-412	
P. promelas 1000.0	RTT	98	500	0.66	500	13	598	N/A	Yes
(7/1/15-7/8/15)	CC	99	500	0.62	500	14	620	585-655	

Note: RTT = Reference Toxicant Test, CC = Control Chart, Cont. = Control group.

The results of analysis contained within this report relate only to the sample as received in the laboratory. This report shall not be reproduced except in full without written approval from the laboratory. Unless noted below, these test results meet all requirements of NELAP.

APPROVED:

Peter F. De Lisle, Ph.D.
Technical Director

7/15/15
Date

Deviations from, additions to, or exclusions from the test method, non-standard conditions or data qualifiers and, as appropriate, a statement of compliance/non-compliance: **NONE**

VELAP# 460030
EPA# VA01116

GLOSSARY OF TERMS AND ABBREVIATIONS

A.L. (Acceptance Limits): The results of a given reference toxicant test are compared to the control chart mean value ± 2 standard deviations. These limits approximate the 95% probability limits for the "true" reference toxicant value.

Chronic Value (ChrV): The geometric mean of the NOEC and LOEC. Units are same as test concentration units.

C.L. (Confidence Limits): These are the probability limits, based on the data set and statistical model employed, that the "true value" lies within the limits specified. Typically limits are based on 95% or 99% probabilities.

Control chart: A cumulative summary chart of results from QC tests with reference toxicants. The results of a given reference toxicant test are compared to the control chart mean value and 95% Acceptance Limits (A.L.) (mean ± 2 standard deviations).

IC25: The concentration of sample or chemical, calculated from the data set using statistical models, causing a 25% reduction in test organism growth, reproduction, etc. The lower the IC25, the more toxic the chemical or sample. Units are same as test concentration units.

LC50: The concentration of sample or chemical, calculated from the data set using statistical models, causing a 50% reduction in test organism survival. The lower the LC50, the more toxic the chemical or sample. Units are same as test concentration units. Note: The LC50 value must always be associated with the duration of exposure. Thus 48-h LC50, 96-h LC50, etc. are calculated.

LOEC: Lowest-observable-effect-concentration. The lowest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit a statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Units are same as test concentration units.

PMSD: Percent Minimum Significant Difference: The minimum difference which can exist between a test treatment and the controls in a particular test and be statistically significant; a measure of test sensitivity. The lower the PMSD the more sensitive the test.

N/A: Not applicable.

N/D: Not determined or measured.

NOAEC: No-observable-acute-effect-concentration. The highest concentration of sample or chemical in an acute test dilution series in which the test organisms exhibit no statistically significant reduction in the test end point (e.g. survival) compared to control organisms. Units are same as test concentration units.

NOEC: No-observable-effect-concentration. The highest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit no statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Some regulatory definitions also require that the NOEC be less than the LOEC. Units are same as test concentration units.

Q.L.: Quantitation Limit. Level, concentration, or quantity of a target variable (analyte) that can be reported at a specified degree of confidence.

T.U.: Toxic units. Expresses the relative toxicity of an effluent in such a manner that the larger the toxic unit value the more toxic the effluent. $T.U._{Ac} = 100/LC50$. $T.U._{Chr} = 100/NOEC$. A dimensionless unit.

Ceriodaphnia test set up bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

Test chamber:	~30 ml glass vial:	✓	Illumination & photoperiod:	50-100 ft-c 16L:8D
	Other:		Number of replicates/treatment:	10
Test solution volume:	15 ml:	✓	Initial number animals/replicate:	1
	Other (ml):		Template #:	15

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE	

SPECIES:	Ceriodaphnia dubia	
ACCLIMATION WATER:	Mod. Hard Synthetic Freshwater	
FEEDING (Culture &Test):	YCT + Selenastrum capricornutum mix	
SOURCE:	CBI Stock cultures	
ACCLIMATION TEMP (o C):	25	
BROOD RELEASE FROM:	6/29/15 14:30	
BROOD RELEASE TO:	6/29/15 20:15	
DATE/TIME WATER ADDED:	6/30/15 13:51	
DATE/TIME ANIMALS ADDED:	6/30/15 14:05	
ANIMAL AGE WINDOW (TAC 8 h):	5h 45m	
MAX AGE AT TEST START (TAC 24 h):	23h 36m	
TEST SET UP BY:	AG	
TEST ID:	**MICR1505CCD**	
PEER REVIEW BY (Initial/Date):	**AG. PB**	7/6/15 16:36
MICR1505CCD		

Ceriodaphnia daily water quality bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

		Day 0	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7	SUMMARY WATER QUALITY DATA			
	TRTMNT	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	MEAN	S.D.	MIN.	MAX.
pH (S.U.)	C	7.99	8.48	7.96	8.32	7.88	8.28	8.00	8.18	8.00	8.47	7.94	8.59			8.17	0.25	7.88	8.59
	1	7.96	8.58	7.94	8.42	7.86	8.32	7.95	8.23	7.99	8.55	7.94	8.57			8.19	0.28	7.86	8.58
	2	7.93	8.67	7.92	8.44	7.84	8.44	7.95	8.29	7.96	8.59	7.92	8.61			8.21	0.32	7.84	8.67
	3	7.88	8.60	7.88	8.47	7.79	8.36	7.87	8.25	7.91	8.62	7.88	8.49			8.17	0.33	7.79	8.62
	4	7.77	8.60	7.82	8.39	7.71	8.38	7.77	8.18	7.83	8.42	7.81	8.45			8.09	0.34	7.71	8.60
	5	7.61	8.41	7.71	8.23	7.58	8.23	7.60	8.15	7.67	8.33	7.68	8.29			7.96	0.34	7.58	8.41
Temp. (o C)	C	25	25	25	25	25	25	25	25	25	25	25	25			25	0.0	25	25
	1	25	25	25	25	25	25	25	25	25	25	25	25			25	0.0	25	25
	2	25	25	25	25	25	25	25	25	25	25	25	25			25	0.0	25	25
	3	25	25	25	25	25	25	25	25	25	25	25	25			25	0.0	25	25
	4	25	25	25	25	25	25	25	25	25	25	25	25			25	0.0	25	25
	5	25	25	25	25	25	25	25	25	25	25	25	25			25	0.0	25	25
Diss. Oxygen (mg/l)	C	8.2	8.5	8.2	8.7	8.2	8.3	8.2	8.3	8.2	8.5	8.2	9.0			8.4	0.3	8.2	9.0
	1	8.2	8.9	8.2	8.9	8.2	8.4	8.2	8.4	8.2	8.7	8.2	9.0			8.5	0.3	8.2	9.0
	2	8.2	9.3	8.2	9.0	8.2	8.6	8.2	8.5	8.2	8.9	8.1	9.0			8.5	0.4	8.1	9.3
	3	8.2	9.3	8.2	9.1	8.2	8.6	8.2	8.5	8.2	9.1	8.1	9.2			8.6	0.5	8.1	9.3
	4	8.2	9.4	8.2	9.2	8.2	8.7	8.2	8.6	8.2	9.2	8.1	9.1			8.6	0.5	8.1	9.4
	5	8.2	9.5	8.2	8.8	8.2	8.8	8.2	8.6	8.2	9.1	8.1	8.9			8.6	0.5	8.1	9.5
Cond. (uS/cm)	C	298		295		298		296		304		300				299	3.2	295	304
	1	308		310		308		312		309		311				310	1.6	308	312
	2	313		313		314		320		316		320				316	3.3	313	320
	3	324		328		334		344		337		347				336	8.9	324	347
	4	351		351		353		383		372		383				366	15.7	351	383
	5	391		396		401		459		451		461				427	33.7	391	461
Replicate measured		S	H	S	B	S	D	S	E	S	A	S	J			NOTE: Final D.O. Values >8.3 mg/l (saturation) may occur due to photosynthetic activity of algal food.			
Initials		AG	RCD		AG		RCD		GB		RCD		AG						
Changes & Notes (Initials, date, specific change or notes)																			
												TRT ID:	1	2	3	4	5		
MICR1505CCD												CONC:	6.25%	12.5%	25.0%	50.0%	100%		

Ceriodaphnia daily reproduction count bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

RTMNT	Rep	Repro Day 0	Repro Day 1	Repro Day 2	Repro Day 3	Repro Day 4	Repro Day 5	Repro Day 6	Repro Day 7	4th Broods Removed	TOTAL REPRO
	A	0	0	0	4	4	0	8			16
C	B	0	0	0	4	0	6	12			22
	C	0	0	0	2	0	0	11			13
Lab	D	0	0	0	0	3	10	12			25
Control	E	0	0	0	6	0	2	10			18
	F	0	0	0	4	0	4	12			20
	G	0	0	0	2	0	6	14			22
	H	0	0	0	4	0	8	14			26
	I	0	0	0	4	0	6	14			24
	J	0	0	0	2	0	4	0			6
	A	0	0	0	4	4	0	16			24
#1	B	0	0	0	0	5	4	10			19
	C	0	0	0	0	1	4	5			10
6.25%	D	0	0	0	0	4	8	10			22
	E	0	0	0	6	0	4	14			24
Vol. Effl:	F	0	0	0	0	0	2	8			10
12.5 ml	G	0	0	0	0	3	12	10			25
	H	0	0	0	4	0	12	14			30
	I	0	0	0	0	5	10	0			15
	J	0	0	0	0	0	4	10			14
	A	0	0	0	6	4	0	14			24
# 2	B	0	0	0	0	6	0	10			16
	C	0	0	0	0	0	4	12			16
12.5%	D	0	0	0	0	3	0	12			15
	E	0	0	0	4	0	0	14			18
Vol. Effl:	F	0	0	0	4	0	8	12			24
25 ml	G	0	0	0	0	6	6	10			22
	H	0	0	0	4	0	4	14			22
	I	0	0	0	4	0	12	16			32
	J	0	0	0	0	5	0	10			15
	A	0	0	0	4	0	2	10			16
# 3	B	0	0	0	0	0	2	8			10
	C	0	0	0	4	0	8	10			22
25.0%	D	0	0	0	0	3	0	0			3
	E	0	0	0	2	0	10	12			24
Vol. Effl:	F	0	0	0	2	0	0	18			20
50 ml	G	0	0	0	4	0	4	16			24
	H	0	0	0	4	9	0	16			29
	I	0	0	0	4	0	10	14			28
	J	0	0	0	2	0	8	12			22
	A	0	0	0	4	3	0	12			19
# 4	B	0	0	0	0	0	0	12			12
	C	0	0	0	0	1	6	12			19
50.0%	D	0	0	0	2	0	3	16			21
	E	0	0	0	4	0	2	10			16
Vol. Effl:	F	0	0	0	4	0	6	10			20
100 ml	G	0	0	0	4	0	5	12			21
	H	0	0	0	0	0	10	18			28
	I	0	0	0	0	2	10	16			28
	J	0	0	0	0	0	4	12			16
	A	0	0	0	2	3	0	12			17
# 5	B	0	0	0	0	0	4	16			20
	C	0	0	0	2	0	4	12			18
100%	D	0	0	0	0	4	4	0			8
	E	0	0	0	6	4	0	12			22
Vol. Effl:	F	0	0	0	4	0	2	14			20
200 ml	G	0	0	0	4	0	2	12			18
	H	0	0	0	6	8	0	16			30
	I	0	0	0	4	0	8	16			28
	J	0	0	0	4	0	4	18			26
INITIALS:		AG	RCD	AG	RCD	GB	RCD	AG			
DATE & TIME:		6/30/15 14:05	7/1/15 14:29	7/2/15 14:14	7/3/15 13:07	7/4/15 12:07	7/5/15 15:52	7/6/15 16:31			
SAMPLE USED:		A	B	B	C	C	C				

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE: Cerio stuck to side of vial above water line Day 6 4-G

MICR1505CCD | Avg. young/surviving control (TAC 15 min): 19.2 | Surv. controls with 3 broods: 8

SAMPLE COLLECTION

SAMPLE	COLLECTION DATE & TIME
A	6/29/15 9:30
B	6/30/15 10:00
C	7/2/15 10:47
D	
E	

SAMPLE AGING

SAMPLE:	A
1st USE DATE/TIME:	6/30/15 14:05
LAST USE DATE/TIME:	6/30/15 14:05
TIME COLLECT TO 1st USE:	28h 36m
	(TAC 36 h max)
TIME 1st TO LAST USE:	0h 0m
	(TAC MAX 72 h)
SAMPLE:	B
1st USE DATE/TIME:	7/1/15 14:29
LAST USE DATE/TIME:	7/2/15 14:14
TIME COLLECT TO 1st USE:	28h 29m
	(TAC 36 h max)
TIME 1st TO LAST USE:	23h 45m
	(TAC MAX 72 h)
SAMPLE:	C
1st USE DATE/TIME:	7/3/15 13:07
LAST USE DATE/TIME:	7/5/15 15:52
TIME COLLECT TO 1st USE:	26h 20m
	(TAC 36 h max)
TIME 1st TO LAST USE:	50h 45m
	(TAC MAX 72 h)
SAMPLE:	D
1st USE DATE/TIME:	
LAST USE DATE/TIME:	
TIME COLLECT TO 1st USE:	0
	(TAC 36 h max)
TIME 1st TO LAST USE:	0
	(TAC MAX 72 h)
SAMPLE:	E
1st USE DATE/TIME:	
LAST USE DATE/TIME:	
TIME COLLECT TO 1st USE:	0
	(TAC 36 h max)
TIME 1st TO LAST USE:	0
	(TAC MAX 72 h)

Ceriodaphnia daily survival count bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

TRTMNT	Rep	#Live Day 0	#Live Day 1	#Live Day 2	#Live Day 3	#Live Day 4	#Live Day 5	#Live Day 6	#Live FINAL	MALE OR FEMALE	TOTAL REPRO	REPRO/ SURV FEM
	A	1	1	1	1	1	1	1	1	F	16	16
C	B	1	1	1	1	1	1	1	1	F	22	22
	C	1	1	1	1	1	1	1	1	F	13	13
Lab	D	1	1	1	1	1	1	1	1	F	25	25
Control	E	1	1	1	1	1	1	1	1	F	18	18
	F	1	1	1	1	1	1	1	1	F	20	20
	G	1	1	1	1	1	1	1	1	F	22	22
	H	1	1	1	1	1	1	1	1	F	26	26
	I	1	1	1	1	1	1	1	1	F	24	24
	J	1	1	1	1	1	1	1	1	F	6	6
	A	1	1	1	1	1	1	1	1	F	24	
#1	B	1	1	1	1	1	1	1	1	F	19	
	C	1	1	1	1	1	1	1	1	F	10	
6.25%	D	1	1	1	1	1	1	1	1	F	22	
	E	1	1	1	1	1	1	1	1	F	24	
	F	1	1	1	1	1	1	1	1	F	10	
	G	1	1	1	1	1	1	1	1	F	25	
	H	1	1	1	1	1	1	1	1	F	30	
	I	1	1	1	1	1	1	1	1	F	15	
	J	1	1	1	1	1	1	1	1	F	14	
	A	1	1	1	1	1	1	1	1	F	24	
# 2	B	1	1	1	1	1	1	1	1	F	16	
	C	1	1	1	1	1	1	1	1	F	16	
12.5%	D	1	1	1	1	1	1	1	1	F	15	
	E	1	1	1	1	1	1	1	1	F	18	
	F	1	1	1	1	1	1	1	1	F	24	
	G	1	1	1	1	1	1	1	1	F	22	
	H	1	1	1	1	1	1	1	1	F	22	
	I	1	1	1	1	1	1	1	1	F	32	
	J	1	1	1	1	1	1	1	1	F	15	
	A	1	1	1	1	1	1	1	1	F	16	
# 3	B	1	1	1	1	1	1	1	1	F	10	
	C	1	1	1	1	1	1	1	1	F	22	
25.0%	D	1	1	1	1	1	1	1	1	F	3	
	E	1	1	1	1	1	1	1	1	F	24	
	F	1	1	1	1	1	1	1	1	F	20	
	G	1	1	1	1	1	1	1	1	F	24	
	H	1	1	1	1	1	1	1	1	F	29	
	I	1	1	1	1	1	1	1	1	F	28	
	J	1	1	1	1	1	1	1	1	F	22	
	A	1	1	1	1	1	1	1	1	F	19	
# 4	B	1	1	1	1	1	1	1	1	F	12	
	C	1	1	1	1	1	1	1	1	F	19	
50.0%	D	1	1	1	1	1	1	1	1	F	21	
	E	1	1	1	1	1	1	1	1	F	16	
	F	1	1	1	1	1	1	1	1	F	20	
	G	1	1	1	1	1	1	0	0	F	21	
	H	1	1	1	1	1	1	1	1	F	28	
	I	1	1	1	1	1	1	1	1	F	28	
	J	1	1	1	1	1	1	1	1	F	16	
	A	1	1	1	1	1	1	1	1	F	17	
# 5	B	1	1	1	1	1	1	1	1	F	20	
	C	1	1	1	1	1	1	1	1	F	18	
100%	D	1	1	1	1	1	1	1	1	F	8	
	E	1	1	1	1	1	1	1	1	F	22	
	F	1	1	1	1	1	1	1	1	F	20	
	G	1	1	1	1	1	1	1	1	F	18	
	H	1	1	1	1	1	1	1	1	F	30	
	I	1	1	1	1	1	1	1	1	F	28	
	J	1	1	1	1	1	1	1	1	F	26	
		See Reproduction Sheet for Renewal Information					See ToxCalc printout for summary survival & reproduction data					

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE	
MICR1505CCD	% Control survival (TAC 80% min): 100 % Surviving controls with 3 broods (TAC 60% min): 80

Ceriodaphnia Survival and Reproduction Test-6 Day Survival

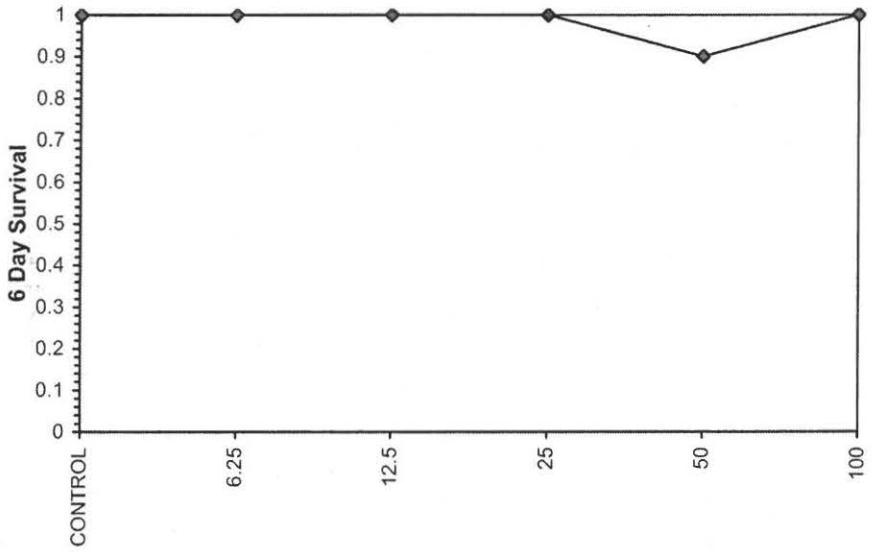
Start Date:		Test ID:	MICR1505CD	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	DATA ENTERED BY PB				

Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Conc-%	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's Exact P	1-Tailed Critical
CONTROL	1.0000	1.0000	0	10	10	10		
6.25	1.0000	1.0000	0	10	10	10	1.0000	0.0500
12.5	1.0000	1.0000	0	10	10	10	1.0000	0.0500
25	1.0000	1.0000	0	10	10	10	1.0000	0.0500
50	0.9000	0.9000	1	9	10	10	0.5000	0.0500
100	1.0000	1.0000	0	10	10	10	1.0000	0.0500

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Fisher's Exact Test	100	>100		1

Dose-Response Plot



Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	Test ID: MICR1505CD	Sample ID:	
End Date:	Lab ID: CBI	Sample Type:	
Sample Date:	Protocol: EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments: DATA ENTERED BY PB			

Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	16.000	22.000	13.000	25.000	18.000	20.000	22.000	26.000	24.000	6.000
6.25	24.000	19.000	10.000	22.000	24.000	10.000	25.000	30.000	15.000	14.000
12.5	24.000	16.000	16.000	15.000	18.000	24.000	22.000	22.000	32.000	15.000
25	16.000	10.000	22.000	3.000	24.000	20.000	24.000	29.000	28.000	22.000
50	19.000	12.000	19.000	21.000	16.000	20.000	21.000	28.000	28.000	16.000
100	17.000	20.000	18.000	8.000	22.000	20.000	18.000	30.000	28.000	26.000

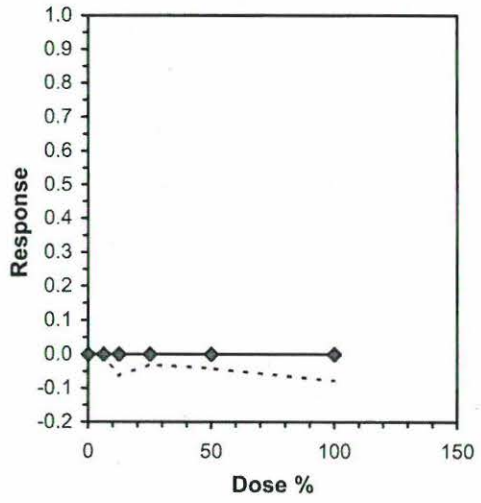
			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
CONTROL	19.200	1.0000	19.200	6.000	26.000	32.181	10				19.900	1.0000
6.25	19.300	1.0052	19.300	10.000	30.000	35.315	10	-0.035	2.287	6.539	19.900	1.0000
12.5	20.400	1.0625	20.400	15.000	32.000	26.769	10	-0.420	2.287	6.539	19.900	1.0000
25	19.800	1.0313	19.800	3.000	29.000	40.878	10	-0.210	2.287	6.539	19.900	1.0000
50	20.000	1.0417	20.000	12.000	28.000	25.166	10	-0.280	2.287	6.539	19.900	1.0000
100	20.700	1.0781	20.700	8.000	30.000	30.558	10	-0.525	2.287	6.539	19.900	1.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.43601	1.035	-0.4284	0.05406
Bartlett's Test indicates equal variances (p = 0.78)	2.45966	15.0863		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	6.53884	0.34056	3.52	40.8852	0.99414	5, 54

Linear Interpolation (200 Resamples)

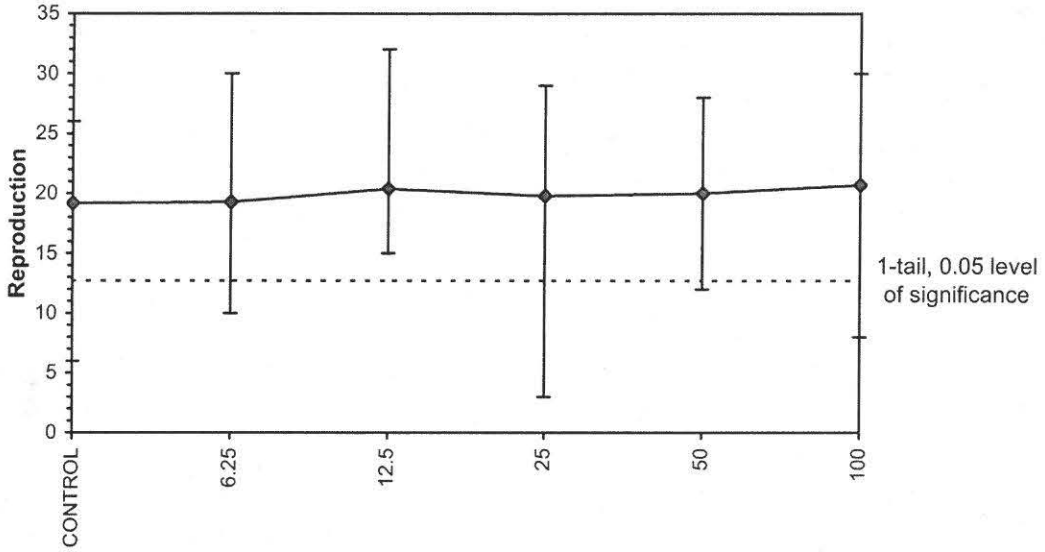
Point	%	SD	95% CL	Skew
IC05	>100			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			



Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	Test ID:	MICR1505CD	Sample ID:	
End Date:	Lab ID:	CBI	Sample Type:	
Sample Date:	Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	DATA ENTERED BY PB			

Dose-Response Plot



Fathead minnow test set up bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

Test chamber:	1000 ml Poly Beaker	✓	Illumination & photoperiod:	50-100 ft-c 16L:8D
	Other:		Number of replicates/treatment:	4
Test solution vol. (250 ml min):	500 ml:	✓	Initial number animals/replicate:	10
	Other (ml):			

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE	

SPECIES:	Pimephales promelas	
ACCLIMATION WATER:	Mod. Hard Synthetic Freshwater	
FEEDING PRIOR TO TEST:	Artemia nauplii (<24 h old) ad libitum	
FEEDING DURING TEST:	Artemia nauplii (<24 h old, ~0.15 ml) 2x/day	
SOURCE:	CBI Stock cultures	
ACCLIMATION TEMP (o C):	25	
HATCH START DATE & TIME:	6/29/15 17:00	
HATCH END DATE & TIME:	6/30/15 8:30	
DATE/TIME WATER ADDED:	6/30/15 14:25	
DATE/TIME ANIMALS ADDED:	6/30/15 14:38	
ANIMAL AGE WINDOW:	15h 30m	
MAX AGE AT TEST START (TAC 24 h MAX):	21h 39m	
TEST SET UP BY:		AG
TEST ID:	MICR1505CPP	
PEER REVIEW BY (Initial/Date):	PB	7/13/15 11:33
MICR1505CPP		

Fathead minnow daily water quality bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

		Day 0	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7	SUMMARY WATER QUALITY DATA			
TRTMNT		Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	MEAN	S.D.	MIN.	MAX.
pH (S.U.)	C	8.06	7.68	7.99	7.58	7.87	7.53	7.96	7.45	7.88	7.51	7.94	7.48	8.02	7.58	7.75	0.23	7.45	8.06
	1	8.06	7.61	7.97	7.35	7.85	7.43	7.93	7.34	7.88	7.41	7.94	7.42	8.02	7.52	7.70	0.28	7.34	8.06
	2	8.02	7.55	7.94	7.35	7.82	7.36	7.91	7.36	7.85	7.39	7.95	7.41	7.99	7.51	7.67	0.27	7.35	8.02
	3	7.94	7.53	7.89	7.37	7.74	7.32	7.88	7.29	7.82	7.33	7.89	7.41	7.97	7.51	7.64	0.26	7.29	7.97
	4	7.83	7.52	7.84	7.37	7.68	7.30	7.81	7.27	7.76	7.30	7.83	7.37	7.89	7.48	7.59	0.24	7.27	7.89
	5	7.60	7.45	7.71	7.35	7.55	7.31	7.63	7.27	7.59	7.28	7.70	7.27	7.72	7.43	7.49	0.17	7.27	7.72
Temp. (o C)	C	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	0.0	25	25
	1	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	0.0	25	25
	2	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	0.0	25	25
	3	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	0.0	25	25
	4	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	0.0	25	25
	5	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	0.0	25	25
Diss. Oxygen (mg/l)	C	8.2	7.8	8.2	7.4	7.8	7.5	8.2	7.0	8.0	7.0	8.1	7.3	7.8	7.4	7.7	0.4	7.0	8.2
	1	8.2	7.7	8.2	6.5	7.8	7.4	8.2	6.9	8.0	6.7	8.0	7.3	7.8	7.4	7.6	0.6	6.5	8.2
	2	8.2	7.6	8.2	6.6	7.8	7.3	8.1	6.8	8.0	6.7	7.9	7.2	7.8	7.4	7.5	0.6	6.6	8.2
	3	8.2	7.6	8.2	6.7	7.6	7.2	8.1	6.7	7.9	6.6	7.9	7.0	7.8	7.3	7.5	0.6	6.6	8.2
	4	8.2	7.5	8.2	6.8	7.5	7.0	8.0	6.5	7.9	6.5	7.9	6.8	7.8	7.3	7.4	0.6	6.5	8.2
	5	8.2	7.4	8.2	6.9	7.6	7.0	8.0	6.5	7.9	6.4	7.9	6.7	7.9	7.2	7.4	0.6	6.4	8.2
Cond. (uS/cm)	C	295		295		296		297		298		309		294		298	5.2	294	309
	1	305		306		305		308		304		314		300		306	4.3	300	314
	2	310		312		311		315		315		321		308		313	4.3	308	321
	3	323		323		325		335		335		342		341		332	8.3	323	342
	4	345		346		350		374		375		380		378		364	16.1	345	380
	5	391		394		401		429		453		461		459		427	31.4	391	461
Replicate measured		A	C	B	B	D	A	C	D	B	C	A	B	C	A				
Initials		AG	GB	RCD	AG	AG	GB	RCD	RCD	GB	RCD	RCD	GB	AG	GB				

Changes & Notes (Initials, date, specific change or notes)

	Test Aerated?	No		D.O. Highest conc. @ aeration:		TRT ID:	1	2	3	4	5		
MICR1505CPP	Date & Time Air Start:			Total live highest conc.@ aeratior		CONC(%):	6.25%	12.5%	25.0%	50.0%	100%		

Fathead minnow daily biological measurements bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

TRTMNT	Rep	#Live Day 0	#Live Day 1	#Live Day 2	#Live Day 3	#Live Day 4	#Live Day 5	#Live Day 6	#Live Day 7	Total Dry Wt (mg)	Tare Wt (mg)	Wt Count	Pan Number
C	A	10	10	10	10	10	10	10	10	16.12	10.08	10	25
	B	10	10	10	10	10	10	10	10	17.82	10.93	10	26
Lab	C	10	10	10	10	10	10	10	10	17.44	11.01	10	27
Control	D	10	10	10	10	10	10	10	10	16.56	9.50	10	28
#1	A	10	10	10	8	8	7	6	6	13.15	8.88	10	29
6.25%	B	10	10	10	10	10	10	10	10	17.03	11.02	10	30
Vol. Effl:	C	10	10	10	10	9	9	9	9	15.94	9.82	10	31
100 ml	D	10	10	10	10	10	10	10	10	20.77	12.76	10	32
# 2	A	10	10	10	9	7	4	4	4	14.11	10.72	10	33
12.5%	B	10	10	10	9	9	7	7	7	16.38	11.83	10	34
Vol. Effl:	C	10	10	10	10	8	8	7	7	15.77	10.76	10	35
200 ml	D	10	10	10	9	8	4	3	3	12.09	9.97	10	36
# 3	A	10	10	10	6	4	3	3	2	13.66	11.76	10	37
25.0%	B	10	10	10	9	5	4	4	4	13.85	10.56	10	38
Vol. Effl:	C	10	10	10	8	6	2	2	1	12.65	11.56	10	39
400 ml	D	10	10	10	8	7	7	6	6	14.34	9.85	10	40
# 4	A	10	10	10	10	6	5	4	3	14.07	11.78	10	41
50.0%	B	10	10	10	8	5	3	2	2	13.90	11.83	10	42
Vol. Effl:	C	10	10	10	8	4	4	4	4	13.17	10.36	10	43
800 ml	D	10	10	10	9	7	5	5	5	15.11	10.85	10	44
# 5	A	10	10	10	8	4	3	3	3	14.18	12.11	10	45
100%	B	10	10	10	8	5	5	5	5	13.34	9.75	10	46
Vol. Effl:	C	10	10	10	6	4	4	4	4	13.62	10.67	10	47
1600 ml	D	10	10	10	8	4	0	0	0		10.25	10	48
INITIALS:		AG	RCD	AG	RCD	GB	RCD	AG	AG	GB	GB	See ToxCalc printout for summary survival & biomass data	
DATE & TIME:		6/30/15 14:38	7/1/15 14:55	7/2/15 14:48	7/3/15 13:41	7/4/15 11:36	7/5/15 13:10	7/6/15 12:47	7/7/15 15:11	7/8/15 12:36	7/3/15 17:04		
SAMPLE USED:		A	B	B	C	C	C	C	50 mg wt ck:	50.00	50.00	Test Duration:	7d 0h 32m
CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE		Dead fuzzy fish: Day 3 1-C, 2-A, 2-C, 3-A, 3-B, 3-C, 3-D, 4-A, 4-B, 4-C,4-D, 5-A, 5-B, 5-C, 5-D; Day 6 1-A, 2-C, 2-D, 3-D, 4-B; Day 7 4-A, 3-C											

MEAN % CONTROL SURVIVAL (TAC 80% MIN): 100

AVG. DRY WT. PER SURV. CONTROL (TAC 0.25 mg): 0.661

SAMPLE	COLLECTION DATE/TIME	1st USE DATE & TIME	LAST USE DATE & TIME	TIME COLLECT-1ST USE (TAC MAX 36h)	TIME 1st TO LAST USE (TAC MAX 72 h)
A	6/29/15 9:30	6/30/15 14:38	6/30/15 14:38	29h 9m	0h 0m
B	6/30/15 10:00	7/1/15 14:55	7/2/15 14:48	28h 55m	23h 53m
C	7/2/15 10:47	7/3/15 13:41	7/6/15 12:47	26h 54m	71h 7m
				0	0
				0	0

MICR1505CPP

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:		Test ID:	MICR1505PP	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	DATA ENTERED BY PB				

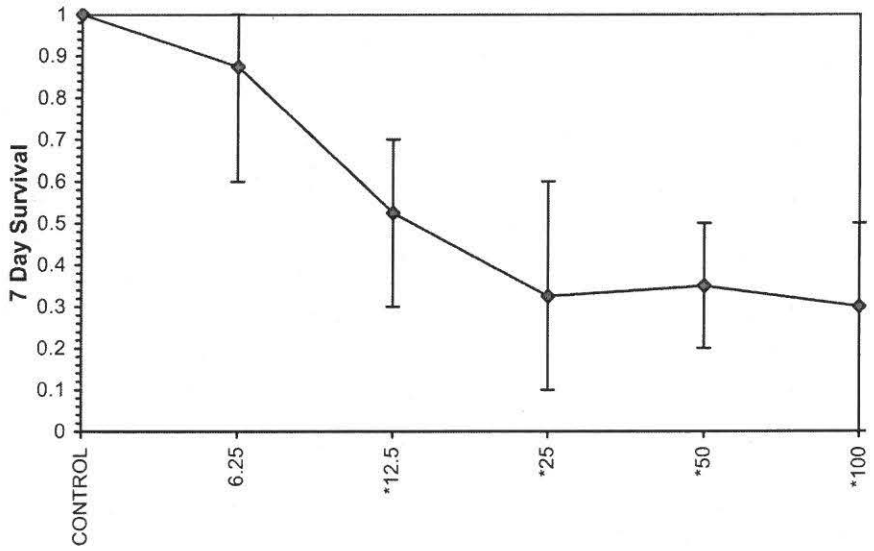
Conc-%	1	2	3	4
CONTROL	1.0000	1.0000	1.0000	1.0000
6.25	0.6000	1.0000	0.9000	1.0000
12.5	0.4000	0.7000	0.7000	0.3000
25	0.2000	0.4000	0.1000	0.6000
50	0.3000	0.2000	0.4000	0.5000
100	0.3000	0.5000	0.4000	0.0000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
CONTROL	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4		
6.25	0.8750	0.8750	1.2398	0.8861	1.4120	20.004	4	14.00	10.00
*12.5	0.5250	0.5250	0.8117	0.5796	0.9912	26.076	4	10.00	10.00
*25	0.3250	0.3250	0.5890	0.3218	0.8861	42.106	4	10.00	10.00
*50	0.3500	0.3500	0.6284	0.4636	0.7854	22.002	4	10.00	10.00
*100	0.3000	0.3000	0.5521	0.1588	0.7854	49.873	4	10.00	10.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.94942	0.884	-0.5782	-0.3375
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	6.25	12.5	8.83883	16

Dose-Response Plot



Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:		Test ID:	MICR1505PP	Sample ID:	
End Date:		Lab ID:	CBI	Sample Type:	
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	DATA ENTERED BY PB				

Conc-%	1	2	3	4
CONTROL	0.6040	0.6890	0.6430	0.7060
6.25	0.4270	0.6010	0.6120	0.8010
12.5	0.3390	0.4550	0.5010	0.2120
25	0.1900	0.3290	0.1090	0.4490
50	0.2290	0.2070	0.2810	0.4260
100	0.2070	0.3590	0.2950	0.0000

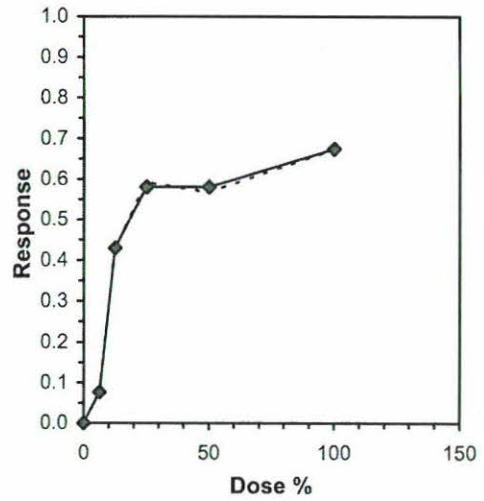
			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
CONTROL	0.6605	1.0000	0.6605	0.6040	0.7060	6.982	4				0.6605	1.0000
6.25	0.6103	0.9239	0.6103	0.4270	0.8010	25.041	4	0.630	1.943	0.1551	0.6103	0.9239
12.5	0.3768	0.5704	0.3768	0.2120	0.5010	34.311	4				0.3768	0.5704
25	0.2693	0.4076	0.2693	0.1090	0.4490	55.851	4				0.2775	0.4201
50	0.2858	0.4326	0.2858	0.2070	0.4260	34.475	4				0.2775	0.4201
100	0.2153	0.3259	0.2153	0.0000	0.3590	72.680	4				0.2153	0.3259

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.93443		0.749		0.11982	2.19333
F-Test indicates equal variances (p = 0.08)	10.9786		47.4672			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates no significant differences	0.15509	0.2348	0.00505	0.01274	0.55215	1, 6

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)		Skew
IC05*	4.108	2.202	0.000	9.035	-0.0419
IC10	6.673	1.795	0.000	9.042	-0.7909
IC15	7.557	1.511	1.163	10.066	-1.0097
IC20	8.441	1.366	2.532	11.070	-0.9095
IC25	9.325	1.317	3.901	12.654	-0.5233
IC40	11.977	3.328	8.899	25.142	2.2680
IC50	18.356	8.864	7.109	60.101	1.8710

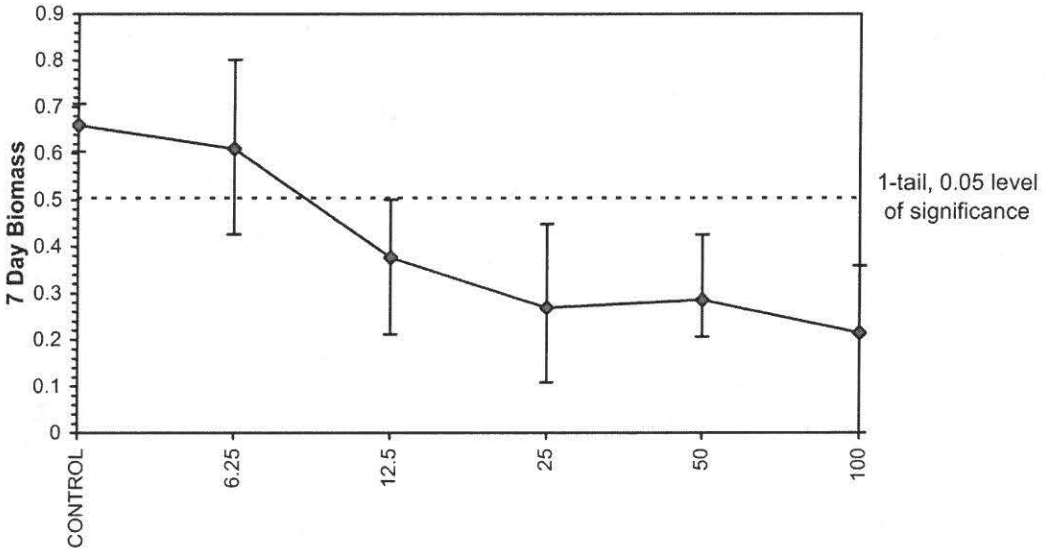
* indicates IC estimate less than the lowest concentration



Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:	Test ID:	MICR1505PP	Sample ID:	
End Date:	Lab ID:	CBI	Sample Type:	
Sample Date:	Protocol:	EPAF 94-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	DATA ENTERED BY PB			

Dose-Response Plot



Effluent and Dilution Water Log (Freshwater Tests). FWEFFL061013

											SUMMARY WATER QUALITY DATA				
											MEAN	S.D.	MIN.	MAX.	PARAMETER
Initial sample charac-terization	Bottle(1):	A1	B1	C1											
	Arrival Temp. (oC, from CoC):	1	1	1							1	0.0	1	1	Arrival Temp.
	TRC (mg/l)(2):	<DL	<DL	<DL											
	TRC Corrected(2):														
	Hardness (mg/l):	76	72	82							77	5.0	72	82	Hardness (mg/l)
	Alkalinity (mg/l):	59	60	58							59	1.0	58	60	Alkalinity (mg/l)
	NH3-N (mg/l):	<1.0	<1.0	<1.0											
	Color/Appearance(3):	OY	OY	OY											
	Obvious odor?	NO	NO	NO											
	Date & Time:	6/30/15 10:49	7/1/15 11:00	7/3/15 10:44											
	Initials:	GB	RCD	GB											
Sample prep measure-ments	Test Day:	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7		MEAN	S.D.	MIN.	MAX.	
	Bottle(s):	A1	B1-2	B1-2	C1,2	C1,2	C1,2	C1,2							
	Prep. Temp. (oC):	25	25	25	25	25	25	26			25	0.4	25	26	Temp. (oC)
	D.O. (mg/l) After Warming:	10.3	10.5	10.4	10.6	11.1	11.4	9.8							
	Aeration Time (min):	3	3	3	3	2.5	3.5	3.5							
	Adjusted D.O. (mg/l):	8.2	8.2	8.2	8.2	8.2	8.2	8.1			8.2	0.0	8.1	8.2	D.O. (mg/l)
	Final pH (S.U.):	7.59	7.69	7.57	7.59	7.65	7.73	7.69			7.64	0.06	7.57	7.73	pH (S.U.)
	Conductivity (uS/cm)(4):	393	395	NA	460	NA	NA	NA			416	38.1	393	460	Cond. (uS/cm)
	Final TRC (mg/l)(5):	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.							
	Sample Filtered (60 um)?	✓	✓	✓	✓	✓	✓	✓							
	Date & Time:	6/30/15 13:38	7/1/15 14:07	7/2/15 13:42	7/3/15 12:46	7/4/15 11:00	7/5/15 13:07	7/6/15 12:23							
	Initials:	AG	RCD	AG	RCD	GB	RCD	AG							
Dilution water	Test Day:	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7		MEAN	S.D.	MIN.	MAX.	
	Vat Number:	2	2	2	2	2	3	3							
	Temperature (oC):	25	25	25	25	25	25	25			25	0.0	25	25	Temp. (oC)
	Conductivity (uS/cm):	296	298	295	297	294	295	298			296	1.6	294	298	Cond. (uS/cm)
	D.O. (mg/l):	8.2	8.2	8.2	8.2	8.2	8.2	8.2			8.2	0.0	8.2	8.2	D.O. (mg/l)
	pH (S.U.):	7.84	7.87	7.89	7.91	7.89	7.94	7.93			7.90	0.03	7.84	7.94	pH (S.U.)
	Hardness (mg/l):	94	94	94	94	94	84	84			91	4.9	84	94	Hardness (mg/l)
	Alkalinity (mg/l):	58	58	58	58	58	58	58			58	0.0	58	58	Alkalinity (mg/l)
	Date & Time:	6/30/15 8:20	7/1/15 8:15	7/2/15 8:30	7/3/15 8:20	7/4/15 8:20	7/5/15 8:25	7/6/15 8:30							
	Initials:	GB	GB	AG	GB	RCD	RCD	GB							
	Changes & Notes (Initials, date, specific change or notes)														
	Peer review Initial/Date:	AG. PB	7/6/15 12:38	DILUTION WATER TYPE:	Mod. Hard Synthetic Freshwater (EPA)										
PROJECT ID:	MICR1505	ADDITIONAL EFFLUENT TREATMENT:													

ND=Not Determined/Measured, NA=Not Applicable. 1) Ninth character of lab sample ID on chain of custody AND bottle number in collection series. Together with Project ID constitutes entire sample bottle ID. 2) TRC MDL 0.02 mg/l; QL 0.22 mg/l. Corrected value if Mn, Cr potential positive interference. Corrected using KI and NaAsO2. 3) C-clear, O-opaque, T-turbid, S-solids (Sl-slight, M-moderate, H-heavy), Y-yellow, B-brown, Bl-black, G-green, P-pink, Gr-grey, Or-orange. 4) Measured on first use of sample only. 5) Final TRC measured only if chlorine present in initial characterization.

Coastal Bioanalysts
6400 Enterprise Court, Gloucester, VA 23061
PH: 804-694-8285, FAX: 804-695-1129
www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): M I C R 1 5 0 5 - A (A A A A Y Y N N — Project ID; A — Spl)

CBI Login # 15-0701

FACILITY INFORMATION

CLIENT/FACILITY NAME	LBG / National Archives II	CONTACT & PHONE #	Bob Gentry 240 678 0776
NPDES PERMIT NO		OUTFALL # OR LOCATION	
SAMPLE CHLORINATED? N	SAMPLE DECHLORINATED?	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?	

TESTS REQUESTED:	SPECIES OR EPA METH #	C dubia	ACUTE ☐	CHRONIC ☑
	SPECIES OR EPA METH #	P. promelas	ACUTE ☐	CHRONIC ☑
OTHER TESTS:				

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME
N/A		

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	6/28/15 0930	SAMPLE END DATE & TIME	6/29/15 0930	AUTOSAMPLER TEMP. (°C)	4.3°
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION	NUMBER SUBSAMPLES 97	VOL (ml) SUBSAMPLES 100 ml/s		TIME INCREMENT 15 min	
	SET VOLUME SUBSAMPLE N/A	SET VOLUME FLOW N/A		TOTAL VOLUME 9L	

FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
19.2	6.88	4.3°	7.28	<0.03	6/29/15 0945	JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeffrey Duszynski — (PRINTED NAME/AFFILIATION SAMPLER/ANALYST)
[signature] — (SIGNATURE)
6/29/15 — (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
[signature]	6/29/15	1500	UPS
	6/30/15	1040	D.B.

SHIPPING METHOD: UPS ✓ FEDEX____ HAND DELIVERY____

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER____

SAMPLE TEMP: (°C) 1 ARRIVED ON ICE? Y ✓ N___ CUSTODY SEAL: INTACT ✓ BROKEN___ ABSENT___

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

Coastal Bioanalysts
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www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): M I C R I 5 0 5 - B
A A A A Y Y N N (Project ID) — A (Spl)

CBI Login # 15-0703

FACILITY INFORMATION

CLIENT/FACILITY NAME	CBB/National Archives II	CONTACT & PHONE #	Rob Gentry
NPDES PERMIT NO		OUTFALL # OR LOCATION	
SAMPLE CHLORINATED? N	SAMPLE DECHLORINATED?	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?	

TESTS REQUESTED:	SPECIES OR EPA METH #			
		C. dubia	ACUTE ☐	CHRONIC ☑
		P. promelas	ACUTE ☐	CHRONIC ☑

OTHER TESTS:

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME
N/A		

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	6/29/15 1000	SAMPLE END DATE & TIME	6/30/15 1000	AUTOSAMPLER TEMP. (°C)	6.1
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION*	NUMBER SUBSAMPLES 97	VOL (ml) SUBSAMPLES 100ml's		TIME INCREMENT 15 min	
	SET VOLUME SUBSAMPLE —	SET VOLUME FLOW —		TOTAL VOLUME 8 L	

*FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
19.9	6.62	6.1°	6.98	<0.03	6/30/15 1010	JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeffrey Dzyzynski (PRINTED NAME/AFFILIATION SAMPLER/ANALYST) — [signature] (SIGNATURE) — 6/30/15 (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
[signature]	6/30/15	1500	UPS
	7/1/15	1100	[signature]

SHIPPING METHOD: UPS ✓ FEDEX____ HAND DELIVERY____

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER____

SAMPLE TEMP: (°C) 1 ARRIVED ON ICE? Y ✓ N__ CUSTODY SEAL: INTACT__ BROKEN__ ABSENT ✓

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

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PH: 804-694-8285, FAX: 804-695-1129
www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): M I C R 1 5 0 5 - C
A A A A Y Y N N (Project ID) — A (Spl)

CBI Login # 15-0712

FACILITY INFORMATION

CLIENT/FACILITY NAME	CBB / National Archives	CONTACT & PHONE #	Bob Gentry
NPDES PERMIT NO		OUTFALL # OR LOCATION	
SAMPLE CHLORINATED? N	SAMPLE DECHLORINATED?	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?	

TESTS REQUESTED:	SPECIES OR EPA METH #		ACUTE	CHRONIC
		C. dubia	☐	☑
		P. promelas	☐	☑

OTHER TESTS:

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	7/1/15 1047	SAMPLE END DATE & TIME	7/2/15 1047	AUTOSAMPLER TEMP. (°C)	7.0°
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION	NUMBER SUBSAMPLES 97	VOL (ml) SUBSAMPLES 200mls		TIME INCREMENT 15 min	
	SET VOLUME SUBSAMPLE —	SET VOLUME FLOW —		TOTAL VOLUME 16 L	

FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
20.8	6.76	7.0°	7.05	<0.03	7/2/15 1100	JD

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Jeffrey Duszynski — (PRINTED NAME/AFFILIATION SAMPLER/ANALYST)
[signature] — (SIGNATURE)
7/2/15 — (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
[signature]	7/2/15	1530	CPS
	7/3/15	1040	[signature]

SHIPPING METHOD: UPS ✓ FEDEX____ HAND DELIVERY____

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER____

SAMPLE TEMP: (°C) 1 ARRIVED ON ICE? Y ✓ N___ CUSTODY SEAL: INTACT ✓ BROKEN___ ABSENT___

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

Response to Paragraph 21

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

CLIENT: **NATIONAL ARCHIVES & RECORDS**
ADDRESS: 3301 METZEROTT ROAD
COLLEGE PARK, MD 20740

REPORT NO. **140874**
SAMPLE DATE: 4/23/2014
REPORT DATE: 4/29/2014

ATTENTION: Walt Hayes, Bob Gentry, Bill Santos

FIELD ENGINEER: Nicole Hartley

REFERENCE: WATER ANALYSIS

CONSTITUENTS	PREFILTER SAMPLE 75 G	AFTER FILTER 75 G	DEMIN #1 IN 60 G	DEMIN #1 IN 75 G	DEMIN #1 OUT 60 G
pH, Units	7.4	7.4	7.6	7.6	7.6
Conductivity, µmhos (µS)	990	1020	1060	1030	1040
Total Dissolved Solids, mg/L	644	664	691	672	679
M.O. Alkalinity as $CaCO_3$, mg/L	50	50	76	52	60
Chloride as Cl^-, mg/L	212	229	223	221	226
Sodium, mg/L	113	129	129	124	129
Potassium, mg/L	17.7	14.2	13.3	14.8	13.0
Total Hardness as $CaCO_3$, mg/L	120	105	131	127	112
Calcium as $CaCO_3$, mg/L	63.2	43.3	77.8	73.8	53.5
Magnesium as $CaCO_3$, mg/L	56.7	62.1	53.3	53.7	58.9
Silica as SiO_2, mg/L	35.8	24.3	23.0	26.6	22.8
Sulfur as SO_4, mg/L	25.9	27.2	30.4	28.7	29.0
Iron, Dissolved, mg/L	0.78	0.29	0.72	0.68	0.38
Iron, Total, mg/L	1.36	0.29	0.87	0.91	0.44
Copper, Dissolved, mg/L	0.30	0.05	0.18	0.21	0.06
Copper, Total, mg/L	0.49	0.05	0.23	0.28	0.06
Zinc, Dissolved, mg/L	0.09	<0.05	0.10	0.10	<0.05
Zinc, Total, mg/L	0.30	<0.05	0.17	0.18	<0.05
Aluminum, Dissolved, mg/L	0.31	0.34	0.80	0.53	0.28
Manganese, Dissolved, mg/L	0.10	<0.05	0.08	0.09	<0.05
Total Phosphorus as PO_4, mg/L	9.4	3.7	5.5	6.7	6.3

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

CLIENT: **NATIONAL ARCHIVES & RECORDS**
ADDRESS: 3301 METZEROTT ROAD
COLLEGE PARK, MD 20740

REPORT NO. **140874**
SAMPLE DATE: 4/23/2014
REPORT DATE: 4/29/2014

ATTENTION: Walt Hayes, Bob Gentry, Bill Santos

FIELD ENGINEER: Nicole Hartley

REFERENCE: WATER ANALYSIS

CONSTITUENTS	DEMIN #1 OUT 75 G	DEMIN #2 OUT 60 G	DEMIN #2 OUT 75 G		
pH, Units	7.5	7.7	7.6		
Conductivity, µmhos (µS)	1060	1030	1020		
Total Dissolved Solids, mg/L	686	668	666		
M.O. Alkalinity as $CaCO_3$, mg/L	62	50	48		
Chloride as Cl^-, mg/L	227	226	229		
Sodium, mg/L	130	128	127		
Potassium, mg/L	12.8	13.5	14.3		
Total Hardness as $CaCO_3$, mg/L	116	102	105		
Calcium as $CaCO_3$, mg/L	54.7	41.8	43.1		
Magnesium as $CaCO_3$, mg/L	61.4	60.6	62.2		
Silica as SiO_2, mg/L	22.2	23.6	25.5		
Sulfur as SO_4, mg/L	29.8	28.1	27.7		
Iron, Dissolved, mg/L	0.41	0.23	0.27		
Iron, Total, mg/L	0.43	0.27	0.28		
Copper, Dissolved, mg/L	0.08	0.07	<0.05		
Copper, Total, mg/L	0.08	0.16	0.08		
Zinc, Dissolved, mg/L	<0.05	<0.05	<0.05		
Zinc, Total, mg/L	<0.05	<0.05	<0.05		
Aluminum, Dissolved, mg/L	0.47	0.23	0.31		
Manganese, Dissolved, mg/L	<0.05	<0.05	<0.05		
Total Phosphorus as PO_4, mg/L	6.1	3.4	3.4		

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

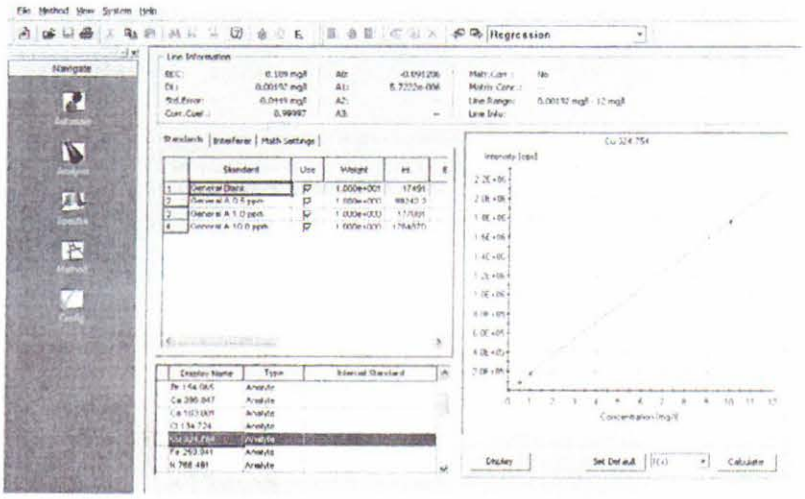
CLIENT:	**NATIONAL ARCHIVES & RECORDS**	**REPORT NO.**	**140874**
ADDRESS:	3301 METZEROTT ROAD	SAMPLE DATE:	4/23/2014
	COLLEGE PARK, MD 20740	REPORT DATE:	4/29/2014

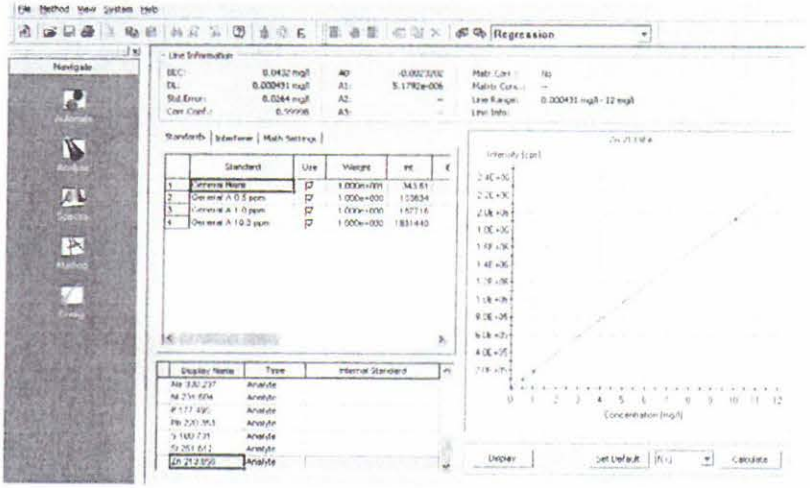
ATTENTION: Walt Hayes, Bob Gentry, Bill Santos

FIELD ENGINEER: Nicole Hartley

COMMENTS:

Below can be seen the Calibration Graphs and Detection Limits for Copper and Zinc for the calibration used to measure these samples. The Detection Limit for Copper is under 0.002 mg/L (2 ppb) and for Zinc under 0.001 mg/L (1 ppb).





Yours truly,

Mark Payton

Mark Payton, Chemist

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

REPORT NO.: **141122**

CLIENT: **NATIONAL ARCHIVES AND RECORDS**

ADDRESS: 3301 Metzerott Road
College Park, MD 20740

SAMPLE DATE: 05/22/14

REPORT DATE: 06/03/14

ATTENTION:

FIELD ENGINEER: Nicole Hartley

REFERENCE: COPPER AND ZINC ANALYSIS

COMMENTS:

According to the attached Laboratory Report from EMSL Analytical, Inc., samples drawn on May 22, 2014 had the following **Copper** and **Zinc** values:

Sample Name	Copper (µg/L)	Zinc (µg/L)
Demineralizer #1 Inlet	200	300
Demineralizer #2 Outlet	23	ND
Demineralizer #1 Outlet	130	210

Yours Truly,

Liz Kinderman

Liz Kinderman, Laboratory Technician

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone: (856) 303-2500 Fax: (856) 858-4571 Email: Env.Chemistry@emsl.com

Attn: **Nora Rothschild**
Barclay Water Management
55 Chapel Street
Newton, MA 02458
Phone: (603) 508-7001
Fax:

6/3/2014

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 5/23/2014. The results are tabulated on the attached data pages for the following client designated project:

National Archives II

The reference number for these samples is EMSL Order #011402538. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (856) 303-2500.

Reviewed and Approved By:

Julie Smith - Laboratory Director

The test results contained within this report meet the requirements of NELAC and/or the specific certification program that is applicable, unless otherwise noted.
NELAP Certifications: NJ 03036, NY 10872, PA 68-00367

Revised Report- Units have been changed to ug/l at the client's request.– Original Report 6/2/14

The samples associated with this report were received in good condition unless otherwise noted. This report relates only to those items tested as received by the laboratory. The QC data associated with the sample results meet the recovery and precision requirements established by the NELAP, unless specifically indicated. All results for soil samples are reported on a dry weight basis, unless otherwise noted. This report may not be reproduced except in full and without written approval by EMSL Analytical, Inc.

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (856) 303-2500 / (856) 858-4571
http://www.EMSL.com Env_Chemistry@emsl.com

EMSL Order:	011402538
CustomerID:	BAWM25
CustomerPO:	63985
ProjectID:	

Attn: **Nora Rothschild**
Barclay Water Management
55 Chapel Street
Newton, MA 02458

Phone: (603) 508-7001
Fax:
Received: 05/23/14 9:30 AM

Project: **National Archives II**

Analytical Results

Client Sample Description Demineralizer #1 Inlet — *Collected:* 5/22/2014 11:30:00 AM — *Lab ID:* 0001

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
200.7	Copper	200	20	µg/L	5/27/2014	JO	5/27/2014	BE
200.7	Zinc	300	20	µg/L	5/27/2014	JO	6/2/2014	BE

Client Sample Description Demineralizer #2 Outlet — *Collected:* 5/22/2014 11:30:00 AM — *Lab ID:* 0002

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
200.7	Copper	23	20	µg/L	5/27/2014	JO	5/27/2014	BE
200.7	Zinc	ND	20	µg/L	5/27/2014	JO	6/2/2014	BE

Client Sample Description Demineralizer #1 Outlet — *Collected:* 5/22/2014 11:30:00 AM — *Lab ID:* 0003

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
200.7	Copper	130	20	µg/L	5/27/2014	JO	5/27/2014	BE
200.7	Zinc	210	20	µg/L	5/27/2014	JO	6/2/2014	BE

Definitions:
ND - indicates that the analyte was not detected at the reporting limit
RL - Reporting Limit

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

CLIENT: **NATIONAL ARCHIVES & RECORDS**
ADDRESS: 3301 METZEROTT ROAD
COLLEGE PARK, MD 20740

REPORT NO. **141152**
SAMPLE DATE: 5/22/2014
REPORT DATE: 5/29/2014

ATTENTION: Walt Hayes

FIELD ENGINEER: Nicole Hartley

REFERENCE: Water Analysis

CONSTITUENTS	DEMINERALIZER #1 INLET	DEMINERILIZER #1 OUTLET	DEMINERALIZER #2 OUTLET		
pH, Units	7.2	7.2	7.3		
Conductivity, µmhos (µS)	800	785	748		
Total Dissolved Solids, mg/L	520	510	486		
Chloride as Cl^-, mg/L	176	171	164		
Sodium, mg/L	86.8	84.3	80.1		
Potassium, mg/L	11.3	11.7	11.6		
Total Hardness as $CaCO_3$, mg/L	116	111	98.7		
Calcium as $CaCO_3$, mg/L	67.8	60.8	44.7		
Magnesium as $CaCO_3$, mg/L	48.4	50.3	54.1		
Silica as SiO_2, mg/L	23.9	24.1	23.5		
Sulfur as SO_4, mg/L	22.1	21.0	20.8		
Iron, Dissolved, mg/L	0.25	0.21	0.16		
Iron, Total, mg/L	0.59	0.45	0.19		
Copper, Dissolved, mg/L	0.025	<0.010	<0.010		
Copper, Total, mg/L	0.264	0.201	0.020		
Zinc, Dissolved, mg/L	0.08	0.09	<0.05		
Zinc, Total, mg/L	0.34	0.23	<0.05		
Aluminum, Dissolved, mg/L	0.12	0.08	<0.05		
Manganese, Dissolved, mg/L	<0.05	<0.05	<0.05		
Total Phosphorus as PO_4, mg/L	5.4	5.8	6.4		

Yours truly,

Mark Payton

Mark Payton, Manager of Technical Services

BARCLAY

BETTER WORKING WATER

LABORATORY REPORT

CLIENT: **NATIONAL ARCHIVES AND RECORDS ADMINISTRATION**

ADDRESS: 3301 Metzerott Road
College Park, MD 20740

REPORT NO. **141544**

SAMPLE DATE: 7/7/2014
REPORT DATE: 7/9/2014

ATTENTION: Walt Hayes, Bob Gentry, Bill Santos

FIELD ENGINEER: Nicole Hartley

REFERENCE: WATER ANALYSIS

CONSTITUENTS	DEMINERALIZER #1 INLET	DEMINERALIZER #1 OUTLET	DEMINERALIZER #2 OUTLET		
pH, Units	7.8	7.7	7.5		
Conductivity, µmhos (µS)	635	592	501		
Total Dissolved Solids, mg/L	413	385	326		
Chloride as Cl^-, mg/L	111	101	79.6		
Sodium, mg/L	64.2	60.7	49.4		
Potassium, mg/L	11.4	10.7	7.6		
Total Hardness as $CaCO_3$, mg/L	120	113	102		
Calcium as $CaCO_3$, mg/L	69.1	64.3	48.5		
Magnesium as $CaCO_3$, mg/L	50.9	48.8	53.6		
Silica as SiO_2, mg/L	22.0	21.8	17.4		
Sulfur as SO_4, mg/L	17.6	18.0	16.6		
Iron, Dissolved, mg/L	0.41	0.38	0.29		
Iron, Total, mg/L	0.75	0.50	0.29		
Copper, Dissolved, mg/L	0.106	0.086	0.037		
Copper, Total, mg/L	0.242	0.185	0.038		
Zinc, Dissolved, mg/L	<0.05	<0.05	<0.05		
Zinc, Total, mg/L	0.20	0.12	<0.05		
Aluminum, Dissolved, mg/L	0.56	0.51	0.34		
Manganese, Dissolved, mg/L	<0.05	<0.05	<0.05		
Total Phosphorus as PO_4, mg/L	4.7	5.0	5.0		

Yours truly,

Mark Payton

Mark Payton, Chemist

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

CLIENT: **NATIONAL ARCHIVES AND RECORDS ADMIN.**
ADDRESS: 3301 Metzerott Road
College Park, MD 20740

REPORT NO. **141738**
SAMPLE DATE: 8/1/2014
REPORT DATE: 8/12/2014

ATTENTION: Mr. Walt Hayes
Mr. Bob Gentry
Mr. Bill Santos

FIELD ENGINEER: Nicole Hartley

REFERENCE: Water Analysis

CONSTITUENTS	DEMINERA-LIZER #1 INLET	DEMINERA-LIZER #1 OUTLET	DEMINERA-LIZER #2 OUTLET		
pH, Units	7.6	7.3	7.3		
Conductivity, µmhos (µS)	1070	1040	1030		
Total Dissolved Solids, mg/L	693	675	671		
Chloride as Cl^-, mg/L	216	220	217		
Sodium, mg/L	115	118	115		
Potassium, mg/L	21.9	22.4	23.0		
Total Hardness as $CaCO_3$, mg/L	139	143	140		
Calcium as $CaCO_3$, mg/L	69.1	70.8	67.8		
Magnesium as $CaCO_3$, mg/L	69.9	71.8	72.7		
Silica as SiO_2, mg/L	53.7	54.3	55.1		
Sulfur as SO_4, mg/L	27.9	28.2	28.6		
Iron, Dissolved, mg/L	0.46	0.40	0.30		
Iron, Total, mg/L	0.62	0.48	0.35		
Copper, Dissolved, mg/L	0.19	0.17	0.09		
Copper, Total, mg/L	0.37	0.24	0.10		
Zinc, Dissolved, mg/L	0.07	0.08	0.06		
Zinc, Total, mg/L	0.14	0.12	<0.05		
Aluminum, Dissolved, mg/L	0.36	0.30	0.17		
Manganese, Dissolved, mg/L	<0.05	<0.05	<0.05		
Total Phosphorus as PO_4, mg/L	13.4	12.6	9.7		

Yours truly,

Mark Payton

Mark Payton, Manager of Technical Services

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

CLIENT: **NATIONAL ARCHIVES AND RECORDS ADMIN.**
ADDRESS: 3301 Metzerott Road
College Park, MD 20740

REPORT NO. **142383**
SAMPLE DATE: 10/10/2014
REPORT DATE: 10/17/2014

ATTENTION: Mr. Walt Hayes
Mr. Bob Gentry

FIELD ENGINEER: Nicole Hartley

REFERENCE: WATER ANALYSIS

CONSTITUENTS	WELL WATER				
pH, Units	5.2				
Conductivity, µmhos (µS)	148				
Total Dissolved Solids, mg/L	96				
M.O. Alkalinity as $CaCO_3$, mg/L	4				
Chloride as Cl^-, mg/L	30.1				
Sodium, mg/L	8.0				
Potassium, mg/L	1.6				
Total Hardness as $CaCO_3$, mg/L	14.6				
Calcium as $CaCO_3$, mg/L	6.0				
Magnesium as $CaCO_3$, mg/L	8.6				
Silica as SiO_2, mg/L	9.3				
Sulfur as SO_4, mg/L	1.5				
Iron, Dissolved, mg/L	<0.05				
Copper, Dissolved, mg/L	1.38				
Zinc, Dissolved, mg/L	3.48				
Aluminum, Dissolved, mg/L	<0.05				
Manganese, Dissolved, mg/L	0.08				
Total Phosphorus as PO_4, mg/L	<0.1				
Total Coliform, CFU/100mL	0				
Total Bacteria, CFU/mL	<1				

Yours truly,

Mark Payton

Mark Payton, Manager of Technical Services

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BETTER WORKING WATER.

LABORATORY REPORT

REPORT NO.: **142635**

CLIENT: **NATIONAL ARCHIVES AND RECORDS**

ADDRESS: 3301 Metzerott Road
College Park, MD 20740

SAMPLE DATE: 11/13/14

REPORT DATE: 11/26/14

ATTENTION:

FIELD ENGINEER: Nicole Hartley

REFERENCE: COPPER AND ZINC ANALYSIS

COMMENTS:

According to the attached Laboratory Report from EMSL Analytical, Inc., samples drawn on November 13, 2014 had the following **Copper** and **Zinc** values:

Sample Name	Copper (µg/L)	Zinc (µg/L)
Demin #1 Inlet	**260**	**170**
Demin #1 Outlet	**120**	**94**
Demin #2 Outlet	**41**	**62**

Yours Truly,

Liz Kinderman

Liz Kinderman, Laboratory Technician

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone: (856) 303-2500 Fax: (856) 858-4571 Email: EnvChemistry2@emsl.com

Attn: **Nora Rothschild**
Barclay Water Management
55 Chapel Street
Newton, MA 02458
Phone: (603) 508-7001
Fax:

11/25/2014

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 11/14/2014. The results are tabulated on the attached data pages for the following client designated project:

National Archives II / 38296

The reference number for these samples is EMSL Order #011406313. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (856) 303-2500.

Reviewed and Approved By:

Julie Smith - Laboratory Director

The test results contained within this report meet the requirements of NELAP and/or the specific certification program that is applicable, unless otherwise noted.
NELAP Certifications: NJ 03036, NY 10872, PA 68-00367

The Zinc CCV recoveries were outside of the method control limits (high), therefore the results may be biased high. The LCS recoveries for Zinc were outside the control limits (high), therefore the results may be biased high.

The samples associated with this report were received in good condition unless otherwise noted. This report relates only to those items tested as received by the laboratory. The QC data associated with the sample results meet the recovery and precision requirements established by the NELAP, unless specifically indicated. All results for soil samples are reported on a dry weight basis, unless otherwise noted. This report may not be reproduced except in full and without written approval by EMSL Analytical, Inc.

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (856) 303-2500 / (856) 858-4571
http://www.EMSL.com EnvChemistry2@emsl.com

EMSL Order:	011406313
CustomerID:	BAWM25
CustomerPO:	38296
ProjectID:	

Attn: **Nora Rothschild**
Barclay Water Management
55 Chapel Street
Newton, MA 02458

Phone: (603) 508-7001
Fax:
Received: 11/14/14 9:30 AM

Project: **National Archives II / 38296**

Analytical Results

Client Sample Description Demineralizer #1 Inlet ***Collected:*** 11/13/2014 ***Lab ID:*** *0001*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
200.8	Copper	260	50	µg/L	11/18/2014	KB	11/18/2014	KB
200.8	Zinc	170	25	µg/L	11/18/2014	KB	11/25/2014	KB

Client Sample Description Demineralizer #1 Outlet ***Collected:*** 11/13/2014 ***Lab ID:*** *0002*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
200.8	Copper	120	25	µg/L	11/18/2014	KB	11/18/2014	KB
200.8	Zinc	94	10	µg/L	11/18/2014	KB	11/25/2014	KB

Client Sample Description Demineralizer #2 Outlet ***Collected:*** 11/13/2014 ***Lab ID:*** *0003*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
200.8	Copper	41	5.0	µg/L	11/18/2014	KB	11/18/2014	KB
200.8	Zinc	62	10	µg/L	11/18/2014	KB	11/25/2014	KB

Definitions:
ND - indicates that the analyte was not detected at the reporting limit
RL - Reporting Limit

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BETTER WORKING WATER.

LABORATORY REPORT

CLIENT: **NATIONAL ARCHIVES AND RECORDS ADMINISTRATION**

ADDRESS: 3301 Metzerott Road
College Park, MD 20740

REPORT NO. **142681**

SAMPLE DATE: 11/21/2014
REPORT DATE: 11/24/2014

ATTENTION: Walt Hayes, Bob Gentry, Bill Santos

FIELD ENGINEER: Nicole Hartley

REFERENCE: WATER ANALYSIS

CONSTITUENTS	DEMINERAL -IZER #1 INLET	DEMINERILI -ZER #1 OUTLET	DEMINERAL -IZER #2 OUTLET		
pH, Units	8.0	7.9	7.7		
Conductivity, µmhos (µS)	1020	1010	995		
Total Dissolved Solids, mg/L	661	655	647		
Chloride as Cl^-, mg/L	194	190	191		
Sodium, mg/L	126	125	125		
Potassium, mg/L	25.8	25.6	25.3		
Total Hardness as $CaCO_3$, mg/L	148	142	133		
Calcium as $CaCO_3$, mg/L	81.8	76.4	66.3		
Magnesium as $CaCO_3$, mg/L	66.6	65.6	66.7		
Silica as SiO_2, mg/L	45.7	45.1	45.0		
Sulfur as SO_4, mg/L	51.5	50.8	50.0		
Iron, Dissolved, mg/L	0.67	0.63	0.52		
Iron, Total, mg/L	0.75	0.68	0.55		
Copper, Dissolved, mg/L	0.24	0.13	0.07		
Copper, Total, mg/L	0.33	0.17	0.07		
Zinc, Dissolved, mg/L	0.09	<0.05	<0.05		
Zinc, Total, mg/L	0.12	<0.05	<0.05		
Aluminum, Dissolved, mg/L	0.44	0.40	0.32		
Manganese, Dissolved, mg/L	0.07	<0.05	<0.05		
Total Phosphorus as PO_4, mg/L	16.4	14.7	8.6		

Yours truly,

Mark Payton

Mark Payton, Chemist

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

CLIENT: **NATIONAL ARCHIVES AND RECORDS ADMIN.**
ADDRESS: 3301 Metzerott Road
College Park, MD 20740

REPORT NO. **142905**
SAMPLE DATE: 12/10/2014
REPORT DATE: 12/17/2014

ATTENTION: Walt Hayes, Bob Gentry, Bill Santos

FIELD ENGINEER: Nicole Hartley

REFERENCE: WATER ANALYSIS

CONSTITUENTS	DEMINERAL -IZER #1 INLET	DEMINERAL -IZER #1 OUTLET	DEMINERAL -IZER #2 OUTLET		
pH, Units	8.2	7.9	7.8		
Conductivity, µmhos (µS)	525	530	536		
Total Dissolved Solids, mg/L	341	345	348		
M.O. Alkalinity as $CaCO_3$, mg/L	80	80	82		
Chloride as Cl^-, mg/L	69.7	73.6	78.8		
Sodium, mg/L	59.3	62.7	66.3		
Potassium, mg/L	9.2	10.7	12.0		
Total Hardness as $CaCO_3$, mg/L	102	92.2	81.1		
Calcium as $CaCO_3$, mg/L	66.0	51.6	43.9		
Magnesium as $CaCO_3$, mg/L	35.6	40.6	37.1		
Silica as SiO_2, mg/L	12.2	13.5	16.4		
Sulfur as SO_4, mg/L	41.5	41.4	40.9		
Iron, Dissolved, mg/L	0.74	0.44	0.30		
Iron, Total, mg/L	0.82	0.46	0.30		
Copper, Dissolved, mg/L	0.071	0.052	<0.050		
Copper, Total, mg/L	0.092	0.080	0.066		
Zinc, Dissolved, mg/L	0.08	<0.05	<0.05		
Zinc, Total, mg/L	0.10	0.06	<0.05		
Aluminum, Dissolved, mg/L	1.89	0.89	0.49		
Manganese, Dissolved, mg/L	<0.05	<0.05	<0.05		
Total Phosphorus as PO_4, mg/L	1.7	4.5	5.0		

Yours truly,

Mark Payton

Mark Payton, Chemist

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

CLIENT: **NATIONAL ARCHIVES AND RECORDS ADMINISTRATION**

ADDRESS: 3301 Metzerott Road
College Park, MD 20740

REPORT NO. **150150**

SAMPLE DATE: 1/21/2015
REPORT DATE: 1/26/2015

ATTENTION: Walt Hayes, Bob Gentry, Bill Santos

FIELD ENGINEER: Nicole Hartley

REFERENCE: WATER ANALYSIS

CONSTITUENTS	DEMINERALIZER #1 INLET	DEMINERALIZER #1 OUTLET	DEMINERALIZER #2 OUTLET		
pH, Units	7.5	7.2	7.2		
Conductivity, µmhos (µS)	1040	1040	1050		
Total Dissolved Solids, mg/L	677	678	680		
M.O. Alkalinity as $CaCO_3$, mg/L	36	36	36		
Chloride as Cl^-, mg/L	242	242	238		
Sodium, mg/L	137	136	134		
Potassium, mg/L	24.3	24.1	24.2		
Total Hardness as $CaCO_3$, mg/L	135	135	130		
Calcium as $CaCO_3$, mg/L	67.3	71.1	71.4		
Magnesium as $CaCO_3$, mg/L	67.8	63.7	59.0		
Silica as SiO_2, mg/L	51.1	51.2	51.5		
Sulfur as SO_4, mg/L	54.6	55.2	53.9		
Iron, Dissolved, mg/L	0.75	0.62	0.38		
Iron, Total, mg/L	0.78	0.65	0.42		
Copper, Dissolved, mg/L	0.28	0.12	0.05		
Copper, Total, mg/L	0.29	0.13	0.06		
Zinc, Dissolved, mg/L	0.10	0.07	<0.05		
Zinc, Total, mg/L	0.14	0.07	<0.05		
Aluminum, Dissolved, mg/L	0.38	0.25	0.16		
Manganese, Dissolved, mg/L	0.08	<0.05	<0.05		
Total Phosphorus as PO_4, mg/L	13.6	10.4	5.5		

Yours truly,

Mark Payton

Mark Payton, Chemist

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

CLIENT: **NATIONAL ARCHIVES AND RECORDS ADMINISTRATION**

ADDRESS: 3301 Metzerott Road
College Park, MD 20740

REPORT NO. **150405**

SAMPLE DATE: 2/18/2015
REPORT DATE: 2/26/2015

ATTENTION: Walt Hayes, Bob Gentry, Bill Santos

FIELD ENGINEER: Nicole Hartley

REFERENCE: WATER ANALYSIS

CONSTITUENTS	DEMINERAL -IZER #1 INLET	DEMINERAL -IZER #1 OUTLET	DEMINERAL -IZER #2 OUTLET		
pH, Units	7.7	7.6	7.5		
Conductivity, µmhos (µS)	991	1020	1030		
Total Dissolved Solids, mg/L	644	665	670		
M.O. Alkalinity as $CaCO_3$, mg/L	40	58	58		
Chloride as Cl^-, mg/L	229	239	236		
Sodium, mg/L	132	138	140		
Potassium, mg/L	21.0	22.3	22.5		
Total Hardness as $CaCO_3$, mg/L	130	129	120		
Calcium as $CaCO_3$, mg/L	64.2	69.3	62.4		
Magnesium as $CaCO_3$, mg/L	65.6	59.7	58.0		
Silica as SiO_2, mg/L	44.4	44.1	44.5		
Sulfur as SO_4, mg/L	54.4	58.0	58.1		
Iron, Dissolved, mg/L	1.82	1.38	0.93		
Iron, Total, mg/L	2.01	1.41	0.96		
Copper, Dissolved, mg/L	0.47	0.22	0.11		
Copper, Total, mg/L	0.52	0.26	0.14		
Zinc, Dissolved, mg/L	0.28	0.12	0.06		
Zinc, Total, mg/L	0.40	0.13	0.07		
Aluminum, Dissolved, mg/L	0.29	0.21	0.19		
Manganese, Dissolved, mg/L	0.08	<0.05	<0.05		
Total Phosphorus as PO_4, mg/L	12.8	9.8	6.8		

Yours truly,

Mark Payton

Mark Payton, Chemist

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

CLIENT: **NATIONAL ARCHIVES AND RECORDS ADMINISTRATION**

ADDRESS: 3301 Metzerott Road
College Park, MD 20740

REPORT NO. 150699

SAMPLE DATE: 3/11/2015
REPORT DATE: 3/31/2015

ATTENTION: Walt Hayes, Bob Gentry, Bill Santos

FIELD ENGINEER: Nicole Hartley

REFERENCE: WATER ANALYSIS

CONSTITUENTS	DEMINERALIZER #1 INLET	DEMINERILIZER #1 OUTLET	DEMINERALIZER #2 OUTLET		
pH, Units	9.1	7.9	7.7		
Conductivity, µmhos (µS)	3550	3380	3340		
Total Dissolved Solids, mg/L	2310	2200	2170		
M.O. Alkalinity as $CaCO_3$, mg/L	86	66	82		
Chloride as Cl^-, mg/L	960	930	919		
Sodium, mg/L	607	590	580		
Potassium, mg/L	30.0	24.0	20.7		
Total Hardness as $CaCO_3$, mg/L	152	146	155		
Calcium as $CaCO_3$, mg/L	105	83.3	57.4		
Magnesium as $CaCO_3$, mg/L	46.5	62.2	98.0		
Silica as SiO_2, mg/L	17.4	15.8	13.0		
Sulfur as SO_4, mg/L	67.9	64.0	60.7		
Iron, Dissolved, mg/L	1.33	1.14	0.75		
Iron, Total, mg/L	1.42	1.18	0.79		
Copper, Dissolved, mg/L	0.077	0.044	0.022		
Copper, Total, mg/L	0.095	0.045	0.030		
Zinc, Dissolved, mg/L	0.18	0.06	<0.05		
Zinc, Total, mg/L	0.16	0.14	0.10		
Aluminum, Dissolved, mg/L	3.03	2.44	1.30		
Aluminum, Total, mg/L	3.13	2.47	1.30		
Manganese, Dissolved, mg/L	<0.05	<0.05	<0.05		
Manganese, Total, mg/L	<0.05	<0.05	<0.05		
Total Phosphorus as PO_4, mg/L	1.8	4.9	4.0		

Yours truly,

Mark Payton

Mark Payton, Chemist

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

CLIENT: **NATIONAL ARCHIVES AND RECORDS ADMINISTRATION**

ADDRESS: 3301 Metzerott Road
College Park, MD 20740

REPORT NO. **150845**

SAMPLE DATE: 4/09/2015
REPORT DATE: 4/21/2015

ATTENTION: Walt Hayes, Bob Gentry, Bill Santos

FIELD ENGINEER: Nicole Hartley

REFERENCE: WATER ANALYSIS

CONSTITUENTS	DEMINERAL -IZER #1 INLET	DEMINERAL -IZER #1 OUTLET	DEMINERAL -IZER #2 OUTLET	RETENTION OUTFALL	
pH, Units	8.2	7.8	7.7	7.1	
Conductivity, µmhos (µS)	1610	1650	1610	660	
Total Dissolved Solids, mg/L	1050	1070	1050	429	
M.O. Alkalinity as $CaCO_3$, mg/L	72	80	76	58	
Chloride as Cl^-, mg/L	417	422	415	139	
Sodium, mg/L	262	262	254	88.3	
Potassium, mg/L	7.1	8.3	9.3	3.4	
Total Hardness as $CaCO_3$, mg/L	125	127	131	81.0	
Calcium as $CaCO_3$, mg/L	81.7	66.8	61.8	57.1	
Magnesium as $CaCO_3$, mg/L	43.7	60.2	68.8	23.9	
Silica as SiO_2, mg/L	10.3	10.5	11.5	9.0	
Sulfur as SO_4, mg/L	37.9	37.8	36.7	19.6	
Iron, Dissolved, mg/L	0.64	0.50	0.46	0.43	
Iron, Total, mg/L	0.83	0.51	0.55	0.71	
Copper, Dissolved, mg/L	0.045	0.020	0.020	0.022	
Copper, Total, mg/L	0.096	0.031	0.049	0.042	
Zinc, Dissolved, mg/L	<0.05	<0.05	<0.05	<0.05	
Zinc, Total, mg/L	0.13	<0.05	<0.05	<0.05	
Aluminum, Dissolved, mg/L	0.98	0.65	0.57	0.41	
Aluminum, Total, mg/L	1.03	0.70	0.64	0.42	
Manganese, Dissolved, mg/L	<0.05	<0.05	<0.05	0.08	
Manganese, Total, mg/L	<0.05	<0.05	<0.05	0.12	
Total Phosphorus as PO_4, mg/L	1.5	3.6	3.2	0.3	
Chlorine, Total, mg/L	0.10	0.07	<0.05	<0.05	

Yours truly,

Mark Payton

Mark Payton, Chemist

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

REPORT NO.: **150894**

CLIENT: **NATIONAL ARCHIVES AND RECORDS**

ADDRESS: 3301 Metzerott Road
College Park, MD 20740

SAMPLE DATE: 04/09/15

REPORT DATE: 04/24/15

ATTENTION:

FIELD ENGINEER: Nicole Hartley

REFERENCE: ANALYTICAL ANALYSIS

COMMENTS:

According to the attached Laboratory Report from EMSL Analytical, Inc., samples drawn on April 9, 2015 had the following Copper, Zinc, and Chlorine values:

Sample Name	Copper (mg/L)	Zinc (mg/L)	Chlorine (ppm)
Cooling Tower Blowdown	0.35	0.19	0.21
Demineralizer Inlet #1	0.035	0.13	ND
Demineralizer Outlet #1	0.030	0.12	ND
Demineralizer Outlet #2	0.014	0.026	ND
Retention Outfall	0.016	0.044	ND

Yours Truly,

Liz Kinderman

Liz Kinderman, Microbiology Project Manager

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone: (856) 303-2500 Fax: (856) 858-4571 Email: EnvChemistry2@emsl.com

Attn: **Nora Rothschild**
Barclay Water Management
55 Chapel Street
Newton, MA 02458
Phone: (603) 508-7001
Fax:

4/23/2015

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 4/10/2015. The results are tabulated on the attached data pages for the following client designated project:

National Archives II (LB+B) / PO#65576

The reference number for these samples is EMSL Order #011501761. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (856) 303-2500.

Reviewed and Approved By:

Julie Smith - Laboratory Director

The test results contained within this report meet the requirements of NELAP and/or the specific certification program that is applicable, unless otherwise noted.
NELAP Certifications: NJ 03036, NY 10872, PA 68-00367

The LCS and ICV recoveries for Copper analysis by ICP were outside of the method control limits (high). The CCV recovery for Zinc was outside of the method control limits (low). Therefore, the results may be biased.

Revised Report- Samples analyzed for Copper by ICP-MS at client's request. Original Report- 4/20/15.

The samples associated with this report were received in good condition unless otherwise noted. This report relates only to those items tested as received by the laboratory. The QC data associated with the sample results meet the recovery and precision requirements established by the NELAP, unless specifically indicated. All results for soil samples are reported on a dry weight basis, unless otherwise noted. This report may not be reproduced except in full and without written approval by EMSL Analytical, Inc.

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (856) 303-2500 / (856) 858-4571
http://www.EMSL.com EnvChemistry2@emsl.com

EMSL Order:	011501761
CustomerID:	BAWM25
CustomerPO:	65576
ProjectID:	

Attn: **Nora Rothschild**
Barclay Water Management
55 Chapel Street
Newton, MA 02458

Phone: (603) 508-7001
Fax:
Received: 04/10/15 9:15 AM

Project: **National Archives II (LB+B) / PO#65576**

Analytical Results

Client Sample Description 1 Cooling Tower Blowdown — ***Collected:*** 4/9/2015 4:00:00 PM — ***Lab ID:*** *0001*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
200.7	Copper	0.35	0.020	mg/L	4/14/2015	CM	4/20/2015	BE
200.7	Zinc	0.19	0.020	mg/L	4/14/2015	CM	4/20/2015	BE
SM 4500-Cl G	Chlorine	0.21	0.10	ppm	4/15/2015	MM	4/15/2015	MM

The sample was received outside of the regulatory hold time. Time Analyzed: 15:14.

Client Sample Description 2 Demineralizer Inlet #1 — ***Collected:*** 4/9/2015 4:00:00 PM — ***Lab ID:*** *0002*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
[illegible] 7	Copper	0.035	0.020	mg/L	4/14/2015	CM	4/20/2015	BE
	Zinc	0.13	0.020	mg/L	4/14/2015	CM	4/20/2015	BE
[illegible] 4500-Cl G	Chlorine	ND	0.10	ppm	4/15/2015	MM	4/15/2015	MM

The sample was received outside of the regulatory hold time. Time Analyzed: 15:14.

Client Sample Description 3 Demineralizer Outlet #1 — ***Collected:*** 4/9/2015 4:00:00 PM — ***Lab ID:*** *0003*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
200.7	Copper	0.030	0.020	mg/L	4/14/2015	CM	4/20/2015	BE
200.7	Zinc	0.12	0.020	mg/L	4/14/2015	CM	4/20/2015	BE
SM 4500-Cl G	Chlorine	ND	0.10	ppm	4/15/2015	MM	4/15/2015	MM

The sample was received outside of the regulatory hold time. Time Analyzed: 15:15.

Client Sample Description 4 Demineralizer Outlet #2 — ***Collected:*** 4/9/2015 4:00:00 PM — ***Lab ID:*** *0004*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
200.7	Zinc	0.026	0.020	mg/L	4/14/2015	CM	4/20/2015	BE
200.8	Copper	0.014	0.0050	mg/L	4/14/2015	CM	4/23/2015	BE
SM 4500-Cl G	Chlorine	ND	0.10	ppm	4/15/2015	MM	4/15/2015	MM

The sample was received outside of the regulatory hold time. Time Analyzed: 15:15.

Client Sample Description 5 Retention Outlet — ***Collected:*** 4/9/2015 4:00:00 PM — ***Lab ID:*** *0005*

[illegible]od	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
	Zinc	0.044	0.020	mg/L	4/14/2015	CM	4/20/2015	BE
200.8	Copper	0.016	0.0050	mg/L	4/14/2015	CM	4/23/2015	BE

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
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http://www.EMSL.com EnvChemistry2@emsl.com

EMSL Order:	011501761
CustomerID:	BAWM25
CustomerPO:	65576
ProjectID:	

Attn: **Nora Rothschild**
Barclay Water Management
55 Chapel Street
Newton, MA 02458

Phone: (603) 508-7001
Fax:
Received: 04/10/15 9:15 AM

Project: **National Archives II (LB+B) / PO#65576**

Analytical Results

Client Sample Description 5 Retention Outlet — *Collected:* 4/9/2015 4:00:00 PM — *Lab ID:* *0005*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
SM 4500-Cl G	Chlorine	ND	0.10	ppm	4/15/2015	MM	4/15/2015	MM

The sample was received outside of the regulatory hold time. Time Analyzed: 15:16.

Definitions:

ND - indicates that the analyte was not detected at the reporting limit
RL - Reporting Limit

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

REPORT NO.: **151102**

CLIENT: **NATIONAL ARCHIVES AND RECORDS**

ADDRESS: 3301 Metzerott Road
College Park, MD 20740

SAMPLE DATE: 05/06/15

REPORT DATE: 05/15/15

ATTENTION:

FIELD ENGINEER: Nicole Hartley

REFERENCE: ANALYTICAL ANALYSIS

COMMENTS:

According to the attached Laboratory Report from EMSL Analytical, Inc., samples drawn on May 6, 2015 had the following Copper, Zinc, and Total Chlorine values:

Sample Name	Copper (mg/L)	Zinc (mg/L)	Chlorine (ppm)
Cooling Tower Blowdown	0.59	0.30	8.2
Demineralizer Inlet #1	0.30	0.25	0.13
Demineralizer Outlet #1	0.095	0.080	ND
Demineralizer Outlet #2	0.065	0.063	ND
Retention Outfall	0.018	0.093	0.29

Yours Truly,

Liz Kinderman

Liz Kinderman, Microbiology Project Manager

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone: (856) 303-2500 Fax: (856) 858-4571 Email: EnvChemistry2@emsl.com

Attn: **Nora Rothschild**
Barclay Water Management
55 Chapel Street
Newton, MA 02458
Phone: (603) 508-7001
Fax:

5/14/2015

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 5/7/2015. The results are tabulated on the attached data pages for the following client designated project:

NARA II/PO#65687

The reference number for these samples is EMSL Order #011502375. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (856) 303-2500.

Reviewed and Approved By:

Julie Smith - Laboratory Director

The test results contained within this report meet the requirements of NELAP and/or the specific certification program that is applicable, unless otherwise noted.
NELAP Certifications: NJ 03036, NY 10872, PA 68-00367

The samples associated with this report were received in good condition unless otherwise noted. This report relates only to those items tested as received by the laboratory. The QC data associated with the sample results meet the recovery and precision requirements established by the NELAP, unless specifically indicated. All results for soil samples are reported on a dry weight basis, unless otherwise noted. This report may not be reproduced except in full and without written approval by EMSL Analytical, Inc.

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (856) 303-2500 / (856) 858-4571
http://www.EMSL.com EnvChemistry2@emsl.com

EMSL Order:	011502375
CustomerID:	BAWM25
CustomerPO:	65687
ProjectID:	

Attn: **Nora Rothschild**
Barclay Water Management
55 Chapel Street
Newton, MA 02458

Phone: (603) 508-7001
Fax:
Received: 05/07/15 9:20 AM

Project: **NARA II/PO#65687**

Analytical Results

Client Sample Description 1 Cooling Tower Blowdown — ***Collected:*** 5/6/2015 1:00:00 PM — ***Lab ID:*** *0001*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
200.8	Copper	0.59	0.10	mg/L	5/13/2015	CM	5/14/2015	KB
200.8	Zinc	0.30	0.10	mg/L	5/13/2015	CM	5/14/2015	KB
SM 4500-Cl G	Chlorine	8.2	1.0	ppm	5/13/2015	TD	5/13/2015	TD

Sample received outside of the regulatory hold time. Time Analyzed: 14:57

Client Sample Description 2 Demineralizer #1 Inlet — ***Collected:*** 5/6/2015 1:00:00 PM — ***Lab ID:*** *0002*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
[illegible]	Copper	0.30	0.050	mg/L	5/13/2015	CM	5/14/2015	KB
[illegible]	Zinc	0.25	0.050	mg/L	5/13/2015	CM	5/14/2015	KB
[illegible]4500-Cl G	Chlorine	0.13	0.10	ppm	5/13/2015	TD	5/13/2015	TD

Sample received outside of the regulatory hold time. Time Analyzed: 14:24

Client Sample Description 3 Demineralizer #1 Outlet — ***Collected:*** 5/6/2015 1:00:00 PM — ***Lab ID:*** *0003*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
200.8	Copper	0.095	0.010	mg/L	5/13/2015	CM	5/14/2015	KB
200.8	Zinc	0.080	0.010	mg/L	5/13/2015	CM	5/14/2015	KB
SM 4500-Cl G	Chlorine	ND	0.10	ppm	5/13/2015	TD	5/13/2015	TD

Sample received outside of the regulatory hold time. Time Analyzed: 14:24

Client Sample Description 4 Demineralizer #2 Outlet — ***Collected:*** 5/6/2015 1:00:00 PM — ***Lab ID:*** *0004*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
200.8	Copper	0.065	0.010	mg/L	5/13/2015	CM	5/14/2015	KB
200.8	Zinc	0.063	0.010	mg/L	5/13/2015	CM	5/14/2015	KB
SM 4500-Cl G	Chlorine	ND	0.10	ppm	5/13/2015	TD	5/13/2015	TD

Sample received outside of the regulatory hold time. Time Analyzed: 14:25

Client Sample Description 5 Retention Outfall — ***Collected:*** 5/6/2015 1:00:00 PM — ***Lab ID:*** *0005*

[illegible]od	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
[illegible]	Copper	0.018	0.0050	mg/L	5/13/2015	CM	5/13/2015	KB
200.8	Zinc	0.093	0.010	mg/L	5/13/2015	CM	5/14/2015	KB

EMSL Analytical, Inc.
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EMSL Order:	011502375
CustomerID:	BAWM25
CustomerPO:	65687
ProjectID:	

Attn: **Nora Rothschild**
Barclay Water Management
55 Chapel Street
Newton, MA 02458

Phone: (603) 508-7001
Fax:
Received: 05/07/15 9:20 AM

Project: **NARA II/PO#65687**

Analytical Results

Client Sample Description 5 Retention Outfall — *Collected:* 5/6/2015 1:00:00 PM — *Lab ID:* *0005*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
SM 4500-Cl G	Chlorine	0.29	0.10	ppm	5/13/2015	TD	5/13/2015	TD

Sample received outside of the regulatory hold time. Time Analyzed: 14:26

Definitions:

ND - indicates that the analyte was not detected at the reporting limit
RL - Reporting Limit

BARCLAY

BETTER WORKING WATER

LABORATORY REPORT

CLIENT: NATIONAL ARCHIVES AND RECORDS ADMIN.
ADDRESS: 3301 Metzerott Road
College Park, MD 20740

REPORT NO.: 151137
SAMPLE DATE: 5/06/2015
REPORT DATE: 5/15/2015

ATTENTION: Walt Hayes, Bob Gentry, Bill Santos

FIELD ENGINEER: Nicole Hartley

REFERENCE: WATER ANALYSIS

CONSTITUENTS	DEMINERAL -IZER #1 INLET	DEMINERAL -ZER #1 OUTLET	DEMINERAL -IZER #2 OUTLET	RETENTION OUTFALL	
pH, Units	7.3	7.3	6.9	6.8	
Conductivity, µmhos (µS)	817	870	972	404	
Total Dissolved Solids, mg/L	531	566	632	263	
M.O. Alkalinity as $CaCO_3$, mg/L	40	52	50	70	
Chloride as Cl, mg/L	181	188	211	65.4	
Sodium, mg/L	110	119	132	46.4	
Potassium, mg/L	16.8	20.2	22.8	5.7	
Total Hardness as $CaCO_3$, mg/L	104	107	109	72.5	
Calcium as $CaCO_3$, mg/L	53.1	49.1	50.5	47.0	
Magnesium as $CaCO_3$, mg/L	50.8	57.9	58.5	25.5	
Silica as SiO_2, mg/L	27.7	32.5	41.2	11.0	
Sulfur as SO_4, mg/L	37.8	40.7	48.4	12.2	
Iron, Dissolved, mg/L	0.88	0.77	0.62	0.31	
Iron, Total, mg/L	1.14	0.79	0.67	1.62	
Copper, Dissolved, mg/L	0.290	0.100	0.091	0.053	
Copper, Total, mg/L	0.374	0.148	0.123	0.143	
Zinc, Dissolved, mg/L	0.17	0.05	<0.05	0.05	
Zinc, Total, mg/L	0.24	0.09	0.08	0.08	
Aluminum, Dissolved, mg/L	0.14	0.10	0.08	0.06	
Manganese, Dissolved, mg/L	0.09	<0.05	<0.05	<0.05	
Total Phosphorus as PO_4, mg/L	8.3	7.6	5.3	0.5	
Chlorine, Total, mg/L	<0.1	<0.1	<0.1	<0.1	

Yours truly,

Mark Payton

Mark Payton, Chemist

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

CLIENT: **NATIONAL ARCHIVES AND RECORDS ADMIN.**
ADDRESS: 3301 Metzerott Road
College Park, MD 20740

REPORT NO. **151491**
SAMPLE DATE: 6/22/2015
REPORT DATE: 6/30/2015

ATTENTION: Walt Hayes, Bob Gentry, Bill Santos

FIELD ENGINEER: Nicole Hartley

REFERENCE: WATER ANALYSIS

CONSTITUENTS	DEMINERAL -IZER #1 A OUTLET	DEMINERAL -IZER #2 A OUTLET	DEMINERAL -IZER #1 B OUTLET	DEMINERAL -IZER #2 B OUTLET	FINAL DEMINERAL -IZER SAMPLE
pH, Units	7.7	7.7	7.6	7.5	7.5
Conductivity, µmhos (µS)	1070	1050	1070	1080	1070
Total Dissolved Solids, mg/L	697	684	694	703	696
M.O. Alkalinity as $CaCO_3$, mg/L	32	32	32	32	32
Chloride as Cl^-, mg/L	234	235	236	233	233
Sodium, mg/L	147	148	147	147	147
Potassium, mg/L	27.8	28.2	27.9	27.9	28.0
Total Hardness as $CaCO_3$, mg/L	107	106	111	107	106
Calcium as $CaCO_3$, mg/L	46.0	44.9	49.6	46.5	45.2
Magnesium as $CaCO_3$, mg/L	60.6	60.9	61.4	60.8	60.9
Silica as SiO_2, mg/L	54.0	54.2	54.0	54.3	54.3
Sulfur as SO_4, mg/L	46.9	47.0	47.3	46.5	46.5
Iron, Dissolved, mg/L	0.35	0.27	0.48	0.35	0.34
Iron, Total, mg/L	0.36	0.35	0.49	0.37	0.35
Copper, Dissolved, mg/L	0.076	0.054	0.144	0.056	0.058
Copper, Total, mg/L	0.114	0.055	0.144	0.082	0.059
Zinc, Dissolved, mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Zinc, Total, mg/L	0.07	<0.05	0.05	<0.05	<0.05
Aluminum, Dissolved, mg/L	0.19	0.15	0.31	0.19	0.19
Aluminum, Total, mg/L	0.21	0.15	0.33	0.19	0.19
Manganese, Dissolved, mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Manganese, Total, mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Total Phosphorus as PO_4, mg/L	7.9	5.7	10.5	7.3	6.6
Bromide as Br, mg/L	12.4	12.4	12.5	12.2	12.1
Chlorine, Total as Cl_2, mg/L	<0.05	<0.05	<0.05	<0.05	<0.05

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

CLIENT: **NATIONAL ARCHIVES AND RECORDS ADMIN.**
ADDRESS: 3301 Metzerott Road
College Park, MD 20740

REPORT NO. **151491**
SAMPLE DATE: 6/22/2015
REPORT DATE: 6/30/2015

ATTENTION: Walt Hayes, Bob Gentry, Bill Santos

FIELD ENGINEER: Nicole Hartley

REFERENCE: WATER ANALYSIS

CONSTITUENTS	RETENTION OUTFALL				
pH, Units	7.2				
Conductivity, µmhos (µS)	898				
Total Dissolved Solids, mg/L	584				
M.O. Alkalinity as $CaCO_3$, mg/L	38				
Chloride as Cl^-, mg/L	185				
Sodium, mg/L	116				
Potassium, mg/L	19.1				
Total Hardness as $CaCO_3$, mg/L	95.3				
Calcium as $CaCO_3$, mg/L	52.7				
Magnesium as $CaCO_3$, mg/L	42.6				
Silica as SiO_2, mg/L	41.9				
Sulfur as SO_4, mg/L	36.9				
Iron, Dissolved, mg/L	0.65				
Iron, Total, mg/L	0.67				
Copper, Dissolved, mg/L	0.036				
Copper, Total, mg/L	0.040				
Zinc, Dissolved, mg/L	<0.05				
Zinc, Total, mg/L	<0.05				
Aluminum, Dissolved, mg/L	0.78				
Aluminum, Total, mg/L	0.80				
Manganese, Dissolved, mg/L	0.08				
Manganese, Total, mg/L	0.08				
Total Phosphorus as PO_4, mg/L	3.6				
Bromide as Br, mg/L	8.8				
Chlorine, Total as Cl_2, mg/L	<0.05				

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

CLIENT: **NATIONAL ARCHIVES AND RECORDS ADMIN.**
ADDRESS: 3301 Metzerott Road
College Park, MD 20740

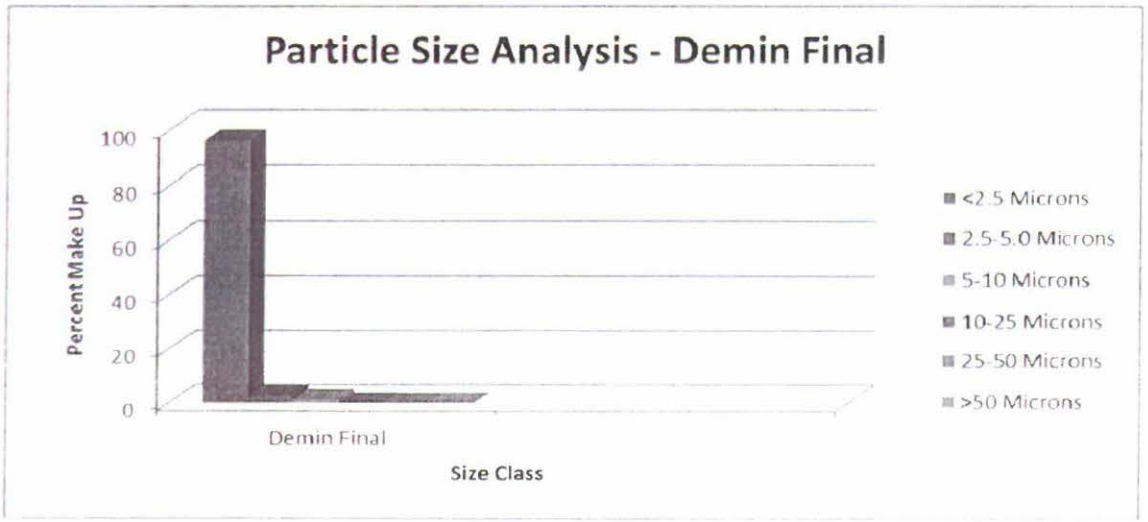
REPORT NO. **151491**
SAMPLE DATE: 6/22/2015
REPORT DATE: 6/30/2015

ATTENTION: Walt Hayes, Bob Gentry, Bill Santos

FIELD ENGINEER: Nicole Hartley

REFERENCE: PARTICLE SIZE ANALYSIS – FINAL DEMIN

Particle Size Range (μ)	Field 1	Field 2	Field 3	Total	Relative %
< 2.5	42	49	56	147	96.0784314
2.5 - 5.0	1	0	3	4	2.61437908
5.0 - 10.0	0	1	1	2	1.30718954
10.0 - 25.0				0	0
25.0 - 50.0				0	0
>50				0	0
Total				153	100



COMMENTS:

Particles were counted for 3 fields of view and averaged. From the average a Relative % for each size range was calculated. There were very few particles over 2.5 microns. Most were significantly less.

Yours truly,

Mark Payton

Mark Payton, Manager of Technical Services

Evoqua Water Technologies LLC
2430 Rose Place
Roseville, Minnesota 55113
Telephone: (651) 638-1300
Facsimile: (651) 633-5074

ION EXCHANGE ANALYTICAL REPORT

CLIENT: **LB&B/National Archives (College Park, MD** **June 26, 2015**
SAMPLE: WWIX Feed and Effluent
DATE SAMPLED: June 25, 2015

Parameter	Units	Cooling Tower Blowdown		SCU #2 Effluent	
		Total	Dissolved	Total	Dissolved
pH	S.U.	6.85	NA	6.60	NA
TOC	mg/L	14.2	NA	9.1	NA
Conductivity	µS/cm	1,040	NA	1,071	NA
Aluminum (Al)	mg/L	0.49	0.36	BDL	BDL
Antimony(Sb)	mg/L	BDL	BDL	BDL	BDL
Arsenic (As)	mg/L	BDL	BDL	BDL	BDL
Barium (Ba)	mg/L	BDL	BDL	BDL	BDL
Beryllium (Be)	mg/L	BDL	BDL	BDL	BDL
Cadmium (Cd)	mg/L	BDL	BDL	BDL	BDL
Calcium (Ca)	mg/L	19.5	19.5	20.3	19.7
Chromium (Cr)	mg/L	BDL	BDL	BDL	BDL
Cobalt (Co)	mg/L	0.018	0.017	BDL	BDL
Copper (Cu)	mg/L	0.582	0.256	0.005	0.004
Iron (Fe)	mg/L	0.56	0.41	BDL	BDL
Lead (Pb)	mg/L	BDL	BDL	BDL	BDL
Magnesium (Mg)	mg/L	14.2	14.2	15.7	15.3
Manganese (Mn)	mg/L	0.11	BDL	BDL	BDL
Molybdenum (Mo)	mg/L	BDL	BDL	BDL	BDL
Nickel (Ni)	mg/L	0.077	0.076	0.004	0.004
Potassium (K)	mg/L	20.3	20.3	21.6	20.9
Selenium (Se)	mg/L	BDL	BDL	BDL	BDL
Silicon (Si)	mg/L	24.8	24.8	26.1	26.1
Silver (Ag)	mg/L	BDL	BDL	BDL	BDL
Sodium (Na)	mg/L	136	136	142	138
Titanium (Ti)	mg/L	BDL	BDL	BDL	BDL
Tin (Sn)	mg/L	BDL	BDL	BDL	BDL
Thallium (Tl)	mg/L	BDL	BDL	BDL	BDL
Vanadium (V)	mg/L	BDL	BDL	BDL	BDL
Zinc (Zn)	mg/L	0.134	0.116	0.007	0.007

NOTES:
BDL = Below Detection Limit
NA = Not Analyzed

Justin Tomlinson
Evoqua Water Technologies LLC
Roseville, MN

Evoqua Water Technologies, LLC.
2430 Rose Place
Roseville, Minnesota 55113
Telephone: (651) 638-1300
Facsimile: (651) 633-5074

ION EXCHANGE ANALYTICAL REPORT

CLIENT: **LB & B / National Archives (College Park, MD)** **June 26, 2015**
SAMPLE: WWIX Feed - Filter Study
DATE SAMPLED: June 25, 2015

Parameter	Units	Total	11µm Filtered	5µm Filtered	1µm Filtered	0.45µm Filtered
pH	S.U.	6.85	NA	NA	NA	NA
Conductivity	mS/cm	1,040	NA	NA	NA	NA
Copper (Cu)	mg/L	0.582	0.231	0.216	0.216	0.216
Nickel (Ni)	mg/L	0.077	0.076	0.076	0.076	0.076
Zinc (Zn)	mg/L	0.134	0.134	0.116	0.116	0.116

NOTES:
BDL = Below Detection Limit
NA = Not Analyzed

Christopher T. Riley, P.E.
Evoqua Water Technologies, LLC.

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

REPORT NO.: **151508**

CLIENT: **NATIONAL ARCHIVES AND RECORDS**

ADDRESS: 3301 Metzerott Road
College Park, MD 20740

SAMPLE DATE: 06/22/15

REPORT DATE: 06/30/15

ATTENTION:

FIELD ENGINEER: Nicole Hartley

REFERENCE: ANALYTICAL ANALYSIS

COMMENTS:

According to the attached Laboratory Report from EMSL Analytical, Inc., samples drawn on June 22, 2015 had the following Copper, Zinc, and Chlorine values:

Sample Name	Copper (mg/L)	Zinc (mg/L)	Chlorine (ppm)
Demineralizer #1A outlet	0.058	0.041	ND
Demineralizer #2A outlet	0.038	0.035	ND
Demineralizer #1B outlet	0.13	0.061	ND
Demineralizer #2B outlet	0.041	0.042	ND
Final Demineralizer Sample	0.045	0.034	ND
Outfall Retention	0.024	0.053	0.15

Yours Truly,

Liz Kinderman

Liz Kinderman, Microbiology Project Manager

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone: (856) 303-2500 Fax: (856) 858-4571 Email: EnvChemistry2@emsl.com

Attn: **Nora Rothschild**
Barclay Water Management
55 Chapel Street
Newton, MA 02458
Phone: (603) 508-7001
Fax:

6/29/2015

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 6/23/2015. The results are tabulated on the attached data pages for the following client designated project:

National Archives II/PO#65934

The reference number for these samples is EMSL Order #011503510. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (856) 303-2500.

Reviewed and Approved By:

Julie Smith - Laboratory Director

The test results contained within this report meet the requirements of NELAP and/or the specific certification program that is applicable, unless otherwise noted.
NELAP Certifications: NJ 03036, NY 10872, PA 68-00367

The samples associated with this report were received in good condition unless otherwise noted. This report relates only to those items tested as received by the laboratory. The QC data associated with the sample results meet the recovery and precision requirements established by the NELAP, unless specifically indicated. All results for soil samples are reported on a dry weight basis, unless otherwise noted. This report may not be reproduced except in full and without written approval by EMSL Analytical, Inc.

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (856) 303-2500 / (856) 858-4571
http://www.EMSL.com EnvChemistry2@emsl.com

EMSL Order:	011503510
CustomerID:	BAWM25
CustomerPO:	65934
ProjectID:	

Attn: **Nora Rothschild**
Barclay Water Management
55 Chapel Street
Newton, MA 02458

Phone: (603) 508-7001
Fax:
Received: 06/23/15 8:00 AM

Project: **National Archives II/PO#65934**

Analytical Results

Client Sample Description 1 — Demineralizer #1A outlet — *Collected:* 6/22/2015 3:00:00 PM — *Lab ID:* 0001

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
200.8	Copper	0.058	0.025	mg/L	6/26/2015	JS	6/26/2015	KB
200.8	Zinc	0.041	0.0050	mg/L	6/26/2015	JS	6/26/2015	KB
SM 4500-Cl G	Chlorine	ND	0.10	ppm	6/23/2015	TD	6/23/2015	TD

Sample received outside of the regulatory hold time. Time Analyzed: 11:58

Client Sample Description 2 — Demineralizer #2A outlet — *Collected:* 6/22/2015 3:00:00 PM — *Lab ID:* 0002

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
[illegible]3	Copper	0.038	0.0050	mg/L	6/26/2015	JS	6/26/2015	KB
[illegible]	Zinc	0.035	0.0050	mg/L	6/26/2015	JS	6/26/2015	KB
[illegible] 4500-Cl G	Chlorine	ND	0.10	ppm	6/23/2015	TD	6/23/2015	TD

Sample received outside of the regulatory hold time. Time Analyzed: 11:58

Client Sample Description 3 — Demineralizer #1B outlet — *Collected:* 6/22/2015 3:00:00 PM — *Lab ID:* 0003

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
200.8	Copper	0.13	0.020	mg/L	6/26/2015	JS	6/26/2015	KB
200.8	Zinc	0.061	0.020	mg/L	6/26/2015	JS	6/26/2015	KB
SM 4500-Cl G	Chlorine	ND	0.10	ppm	6/23/2015	TD	6/23/2015	TD

Sample received outside of the regulatory hold time. Time Analyzed: 11:59

Client Sample Description 4 — Demineralizer #2B outlet — *Collected:* 6/22/2015 3:00:00 PM — *Lab ID:* 0004

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
200.8	Copper	0.041	0.0050	mg/L	6/26/2015	JS	6/26/2015	KB
200.8	Zinc	0.042	0.0050	mg/L	6/26/2015	JS	6/26/2015	KB
SM 4500-Cl G	Chlorine	ND	0.10	ppm	6/23/2015	TD	6/23/2015	TD

Sample received outside of the regulatory hold time. Time Analyzed: 12:00

Client Sample Description 5 — Final Demineralizer Sample — *Collected:* 6/22/2015 3:00:00 PM — *Lab ID:* 0005

[illegible]od	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
[illegible]	Copper	0.045	0.0050	mg/L	6/26/2015	JS	6/26/2015	KB
200.8	Zinc	0.034	0.0050	mg/L	6/26/2015	JS	6/26/2015	KB

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (856) 303-2500 / (856) 858-4571
http://www.EMSL.com EnvChemistry2@emsl.com

EMSL Order:	011503510
CustomerID:	BAWM25
CustomerPO:	65934
ProjectID:	

Attn: **Nora Rothschild**
Barclay Water Management
55 Chapel Street
Newton, MA 02458

Phone: (603) 508-7001
Fax:
Received: 06/23/15 8:00 AM

Project: **National Archives II/PO#65934**

Analytical Results

Client Sample Description 5 Final Demineralizer Sample — *Collected:* 6/22/2015 3:00:00 PM — *Lab ID:* *0005*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
SM 4500-Cl G	Chlorine	ND	0.10	ppm	6/23/2015	TD	6/23/2015	TD

Sample received outside of the regulatory hold time. Time Analyzed: 12:01

Client Sample Description 6 Outfall Retention — *Collected:* 6/22/2015 3:00:00 PM — *Lab ID:* *0006*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
200.8	Copper	0.024	0.0050	mg/L	6/26/2015	JS	6/26/2015	KB
200.8	Zinc	0.053	0.010	mg/L	6/26/2015	JS	6/26/2015	KB
'500-Cl G	Chlorine	0.15	0.10	ppm	6/23/2015	TD	6/23/2015	TD

: received outside of the regulatory hold
ime Analyzed: 12:01

Definitions:

ND - indicates that the analyte was not detected at the reporting limit
RL - Reporting Limit

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

CLIENT: **NATIONAL ARCHIVES AND RECORDS ADMIN.**
ADDRESS: 3301 Metzerott Road
College Park, MD 20740

REPORT NO. **151728**
SAMPLE DATE: 7/14/2015
REPORT DATE: 7/22/2015

ATTENTION: Walt Hayes, Bob Gentry, Bill Santos

FIELD ENGINEER: Nicole Hartley

REFERENCE: DEMINS AT REDUCED pH

CONSTITUENTS	IN-FLUENT	#1 WORKER TANK	#2 WORKER TANK	#1 POLISHER TANK	#2 POLISHER TANK	FINAL SAMPLE
pH, Units	6.6	7.3	7.2	7.5	7.6	7.5
Conductivity, µmhos (µS)	983	974	966	957	955	956
Total Dissolved Solids, mg/L	639	633	628	622	621	621
M.O. Alkalinity as $CaCO_3$, mg/L	6	14	14	20	20	20
Chloride as Cl^-, mg/L	209	205	205	208	205	206
Sodium, mg/L	127	126	126	125	125	125
Potassium, mg/L	23.8	23.7	23.6	23.7	23.5	23.4
Total Hardness as $CaCO_3$, mg/L	108	103	99.7	94.7	95.3	96.4
Calcium as $CaCO_3$, mg/L	50.7	46.1	44.0	41.6	41.4	42.2
Magnesium as $CaCO_3$, mg/L	56.9	57.4	55.6	53.1	53.9	54.2
Silica as SiO_2, mg/L	50.9	50.2	50.1	50.0	50.0	49.8
Sulfur as SO_4, mg/L	53.4	43.6	39.4	31.5	32.1	31.4
Iron, Dissolved, mg/L	0.46	0.28	0.24	0.12	0.15	0.17
Iron, Total, mg/L	0.55	0.31	0.26	0.14	0.16	0.17
Copper, Dissolved, mg/L	0.380	0.041	0.027	0.011	0.014	0.018
Copper, Total, mg/L	0.456	0.054	0.053	0.015	0.017	0.021
Zinc, Dissolved, mg/L	0.16	<0.05	<0.05	<0.05	<0.05	<0.05
Zinc, Total, mg/L	0.25	<0.05	<0.05	<0.05	<0.05	<0.05
Aluminum, Dissolved, mg/L	0.50	0.25	0.21	0.10	0.11	0.14
Manganese, Dissolved, mg/L	0.17	<0.05	<0.05	<0.05	<0.05	<0.05
Total Phosphorus as PO_4, mg/L	11.7	8.2	7.7	3.7	3.0	3.6
Molybdenum as Mo, mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Bromide as Br, mg/L	8.1	7.7	7.8	7.7	7.8	7.8
Chlorine, Total as Cl_2, mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Yours truly,

Mark Payton

Mark Payton, Chemist

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

REPORT NO.: **151730**

CLIENT: **NATIONAL ARCHIVES AND RECORDS**

ADDRESS: 3301 Metzerott Road
College Park, MD 20740

SAMPLE DATE: 07/14/15

REPORT DATE: 07/23/15

ATTENTION:

FIELD ENGINEER: Nicole Hartley

REFERENCE: ANALYTICAL ANALYSIS

COMMENTS:

According to the attached Laboratory Report from EMSL Analytical, Inc., samples drawn on July 14, 2015 had the following Copper, Zinc, and Chlorine values:

Sample Name	Copper (mg/L)	Zinc (mg/L)	Chlorine (ppm)
Final Sample	0.018	0.029	ND
#2 Polisher Sample	0.014	0.025	ND
#1 Polisher Sample	0.014	0.026	ND
#2 Worker Sample	0.028	0.025	ND
#1 Worker Sample	0.039	0.032	ND
Influent Sample	0.41	0.26	0.13

Yours Truly,

Liz Kinderman

Liz Kinderman, Microbiology Project Manager

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone: (856) 303-2500 Fax: (856) 858-4571 Email: EnvChemistry2@emsl.com

Attn: **Nora Rothschild**
Barclay Water Management
55 Chapel Street
Newton, MA 02458
Phone: (603) 508-7001
Fax:

7/22/2015

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 7/15/2015. The results are tabulated on the attached data pages for the following client designated project:

National Archives II/PO#66036

The reference number for these samples is EMSL Order #011504022. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (856) 303-2500.

Reviewed and Approved By:

Julie Smith - Laboratory Director

The test results contained within this report meet the requirements of NELAP and/or the specific certification program that is applicable, unless otherwise noted.
NELAP Certifications: NJ 03036, NY 10872, PA 68-00367

The LFM/LFMD recovery for Zinc was outside of the method control limits (low), therefore the results may be biased low.

The samples associated with this report were received in good condition unless otherwise noted. This report relates only to those items tested as received by the laboratory. The QC data associated with the sample results meet the recovery and precision requirements established by the NELAP, unless specifically indicated. All results for soil samples are reported on a dry weight basis, unless otherwise noted. This report may not be reproduced except in full and without written approval by EMSL Analytical, Inc.

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
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http://www.EMSL.com EnvChemistry2@emsl.com

EMSL Order:	011504022
CustomerID:	BAWM25
CustomerPO:	66036
ProjectID:	

Attn: **Nora Rothschild**
Barclay Water Management
55 Chapel Street
Newton, MA 02458

Phone: (603) 508-7001
Fax:
Received: 07/15/15 9:30 AM

Project: **National Archives II/PO#66036**

Analytical Results

Client Sample Description 1 Final Sample — *Collected:* 7/14/2015 4:00:00 PM — *Lab ID:* 0001

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
200.8	Copper	0.018	0.0050	mg/L	7/20/2015	JS	7/22/2015	KB
200.8	Zinc	0.029	0.0050	mg/L	7/20/2015	JS	7/22/2015	KB
SM 4500-Cl G	Chlorine	ND	0.10	ppm	7/17/2015	TD	7/17/2015	TD

Sample received outside of the regulatory hold time. Time Analyzed: 14:34

Client Sample Description 2 #2 Polisher Sample — *Collected:* 7/14/2015 4:00:00 PM — *Lab ID:* 0002

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
200.8	Copper	0.014	0.0050	mg/L	7/20/2015	JS	7/22/2015	KB
	Zinc	0.025	0.0050	mg/L	7/20/2015	JS	7/22/2015	KB
4500-Cl G	Chlorine	ND	0.10	ppm	7/17/2015	TD	7/17/2015	TD

Sample received outside of the regulatory hold time. Time Analyzed: 14:35

Client Sample Description 3 #1 Polisher Sample — *Collected:* 7/14/2015 4:00:00 PM — *Lab ID:* 0003

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
200.8	Copper	0.014	0.0050	mg/L	7/20/2015	JS	7/22/2015	KB
200.8	Zinc	0.026	0.0050	mg/L	7/20/2015	JS	7/22/2015	KB
SM 4500-Cl G	Chlorine	ND	0.10	ppm	7/17/2015	TD	7/17/2015	TD

Sample received outside of the regulatory hold time. Time Analyzed: 14:35

Client Sample Description 4 #2 Worker Sample — *Collected:* 7/14/2015 4:00:00 PM — *Lab ID:* 0004

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
200.8	Copper	0.028	0.0050	mg/L	7/20/2015	JS	7/22/2015	KB
200.8	Zinc	0.025	0.0050	mg/L	7/20/2015	JS	7/22/2015	KB
SM 4500-Cl G	Chlorine	ND	0.10	ppm	7/17/2015	TD	7/17/2015	TD

Sample received outside of the regulatory hold time. Time Analyzed: 14:36

Client Sample Description 5 #1 Worker Sample — *Collected:* 7/14/2015 4:00:00 PM — *Lab ID:* 0005

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
	Copper	0.039	0.0050	mg/L	7/20/2015	JS	7/22/2015	KB
200.8	Zinc	0.032	0.0050	mg/L	7/20/2015	JS	7/22/2015	KB

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (856) 303-2500 / (856) 858-4571
http://www.EMSL.com EnvChemistry2@emsl.com

EMSL Order:	011504022
CustomerID:	BAWM25
CustomerPO:	66036
ProjectID:	

Attn: **Nora Rothschild**
Barclay Water Management
55 Chapel Street
Newton, MA 02458

Phone: (603) 508-7001
Fax:
Received: 07/15/15 9:30 AM

Project: **National Archives II/PO#66036**

Analytical Results

Client Sample Description 5 #1 Worker Sample — *Collected:* 7/14/2015 4:00:00 PM — *Lab ID:* 0005

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
SM 4500-Cl G	Chlorine	ND	0.10	ppm	7/17/2015	TD	7/17/2015	TD

Sample received outside of the regulatory hold time. Time Analyzed: 14:36

Client Sample Description 6 Influent Sample — *Collected:* 7/14/2015 4:00:00 PM — *Lab ID:* 0006

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
200.8	Copper	0.41	0.050	mg/L	7/20/2015	JS	7/22/2015	KB
200.8	Zinc	0.26	0.050	mg/L	7/20/2015	JS	7/22/2015	KB
[illegible] 4500-Cl G	Chlorine	0.13	0.10	ppm	7/17/2015	TD	7/17/2015	TD

[illegible]e received outside of the regulatory hold [illegible]ime Analyzed: 14:36

Definitions:

ND - indicates that the analyte was not detected at the reporting limit
RL - Reporting Limit

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

CLIENT: **NATIONAL ARCHIVES AND RECORDS ADMINISTRATION**

ADDRESS: 3301 Metzerott Road
College Park, MD 20740

REPORT NO. **152133**

SAMPLE DATE: 8/20/2015
REPORT DATE: 8/25/2015

ATTENTION: Walt Hayes

FIELD ENGINEER: Nicole Hartley

REFERENCE: WATER ANALYSIS

CONSTITUENTS	INLET WATER	#1 WORKER TANK	#2 WORKER TANK	FINAL SAMPLE	
pH, Units	7.1	7.2	7.3	7.1	
Conductivity, µmhos (µS)	1000	1050	1040	1010	
Total Dissolved Solids, mg/L	651	684	677	656	
M.O. Alkalinity as $CaCO_3$, mg/L	8	12	12	8	
Chloride as Cl^-, mg/L	223	240	236	232	
Sodium, mg/L	133	140	137	137	
Potassium, mg/L	25.3	27.8	26.3	25.6	
Total Hardness as $CaCO_3$, mg/L	106	103	104	94.4	
Calcium as $CaCO_3$, mg/L	49.6	43.7	44.2	43.5	
Magnesium as $CaCO_3$, mg/L	56.7	59.1	60.1	50.9	
Silica as SiO_2, mg/L	56.3	59.6	54.0	55.2	
Sulfur as SO_4, mg/L	46.5	45.8	44.4	44.9	
Iron, Dissolved, mg/L	0.61	0.30	0.31	0.20	
Iron, Total, mg/L	1.11	0.37	0.32	0.21	
Copper, Dissolved, mg/L	0.506	0.062	0.050	0.026	
Copper, Total, mg/L	0.583	0.065	0.052	0.027	
Zinc, Dissolved, mg/L	0.21	0.06	0.05	<0.05	
Zinc, Total, mg/L	0.30	0.06	0.05	<0.05	
Aluminum, Dissolved, mg/L	0.90	0.48	0.50	0.27	
Manganese, Dissolved, mg/L	0.19	<0.05	<0.05	<0.05	
Total Phosphorus as PO_4, mg/L	12.7	9.0	9.2	9.6	
Bromide as Br, mg/L	13.6	13.6	13.4	12.1	
Chlorine, Total as Cl_2, mg/L	0.14	<0.1	<0.1	<0.1	

Yours truly,

Mark Payton

Mark Payton, Chemist

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

CLIENT: **NATIONAL ARCHIVES AND RECORDS ADMIN.**
ADDRESS: 3301 Metzerott Road
College Park, MD 20740

REPORT NO. **152134**
SAMPLE DATE: 8/20/2015
REPORT DATE: 8/25/2015

ATTENTION: Walt Hayes

FIELD ENGINEER: Nicole Hartley

REFERENCE: Monthly MDE Water Analysis

CONSTITUENTS	MDE DISCHARGE POINT (filtered)	MDE DISCHARGE POINT (total)		
pH, Units	7.2			
Conductivity, µmhos (µS)	1010			
Total Dissolved Solids, mg/L	658			
Aluminum, Dissolved, mg/L	0.90	0.99		
Calcium as $CaCO_3$, mg/L	49.0	49.1		
Copper, as Cu, mg/L	0.45	0.48		
Iron, as Fe, mg/L	0.59	0.77		
Lead, as Pb, mg/L	<0.05	<0.05		
Magnesium, as $CaCO_3$, mg/L	56.3	60.0		
Manganese, as Mn, mg/L	0.20	0.26		
Phosphorus, as P, mg/L	4.2	4.3		
Potassium, as K, mg/L	25.6	25.7		
Silica as SiO_2, mg/L	56.3	56.5		
Sulfur as SO_4, mg/L	47.3	47.3		
Sodium, as Na, mg/L	134	134		
Zinc, Dissolved, mg/L	0.22	0.25		
Total Hardness as $CaCO_3$, mg/L	105	109		
Chloride as Cl^-, mg/L	224			
Chlorine, Total, as Cl_2, mg/L	0.15			
Dissolved Oxygen, mg/L	8.6			
Nitrogen, Total as N, mg/L	8.3			
Temperature, °C	23			

pH by Glass Electrode
TDS by Conductivity
Metals and Minerals by ICP
Chlorine by DPD
Total Nitrogen by Persulfate Digestion Method
Temperature measured on-site from recirculating water

Yours truly,

Mark Payton

Mark Payton, Chemist

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

REPORT NO.: **152150**

CLIENT: **NATIONAL ARCHIVES AND RECORDS**

ADDRESS: 3301 Metzerott Road
College Park, MD 20740

SAMPLE DATE: 08/20/15

REPORT DATE: 08/31/15

ATTENTION:

FIELD ENGINEER: Nicole Hartley

REFERENCE: ANALYTICAL ANALYSIS

COMMENTS:

According to the attached Laboratory Report from EMSL Analytical, Inc., samples drawn on August 20, 2015 had the following Copper, Zinc, and Total Chlorine values:

Sample Name	Copper (mg/L)	Zinc (mg/L)	Chlorine (ppm)
Inlet Sample	0.45	0.28	ND
Worker #1 Tank	0.028	0.059	ND
Worker #2 Tank	0.032	0.057	ND
Final Sample	0.015	0.033	ND

Yours Truly,

Liz Kinderman

Liz Kinderman, Microbiology Project Manager

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

CLIENT: **NATIONAL ARCHIVES AND RECORDS ADMIN.**
ADDRESS: 3301 Metzerott Road
College Park, MD 20740

REPORT NO. **152156**
SAMPLE DATE: 8/20/2015
REPORT DATE: 8/25/2015

ATTENTION: Walt Hayes

FIELD ENGINEER: Nicole Hartley

REFERENCE: WATER ANALYSIS

CONSTITUENTS	WELL WATER				
pH, Units	5.3				
Conductivity, µmhos (µS)	152				
Total Dissolved Solids, mg/L	99				
M.O. Alkalinity as $CaCO_3$, mg/L	6				
Chloride as Cl^-, mg/L	32.6				
Sodium, mg/L	9.5				
Potassium, mg/L	1.5				
Total Hardness as $CaCO_3$, mg/L	15.2				
Calcium as $CaCO_3$, mg/L	6.2				
Magnesium as $CaCO_3$, mg/L	9.0				
Silica as SiO_2, mg/L	9.6				
Sulfur as SO_4, mg/L	1.6				
Iron, Dissolved, mg/L	<0.05				
Copper, Dissolved, mg/L	2.37				
Zinc, Dissolved, mg/L	3.35				
Aluminum, Dissolved, mg/L	<0.05				
Manganese, Dissolved, mg/L	0.09				
Total Phosphorus as PO_4, mg/L	<0.1				

Yours truly,

Mark Payton

Mark Payton, Chemist

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

REPORT NO.: **152214**

CLIENT: **NATIONAL ARCHIVES AND RECORDS**

ADDRESS: 3301 Metzerott Road
College Park, MD 20740

SAMPLE DATE: 08/26/15

REPORT DATE: 09/04/15

ATTENTION:

FIELD ENGINEER: Nicole Hartley

REFERENCE: ANALYTICAL ANALYSIS

COMMENTS:

According to the attached Laboratory Report from EMSL Analytical, Inc., samples drawn on August 20, 2015 had the following Copper values:

Sample Name	Copper (mg/L)	Zinc (mg/L)
Untreated Tower	0.44	0.28
Pre-Filter	0.44	0.29
Tank 1 A	0.032	0.065
Tank 1 B	0.017	0.039
Post-Filter	0.020	0.047

Yours Truly,

Liz Kinderman

Liz Kinderman, Microbiology Project Manager

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

CLIENT: **NATIONAL ARCHIVES AND RECORDS ADMINISTRATION**

ADDRESS: 3301 Metzerott Road
College Park, MD 20740

REPORT NO. **152251**

SAMPLE DATE: 8/26/2015
REPORT DATE: 9/01/2015

ATTENTION: Walt Hayes

FIELD ENGINEER: Nicole Hartley

REFERENCE: DISCHARGE TESTING

CONSTITUENTS	TOWER UNTREATED	PREFILTER SAMPLE	TANK 1 A	TANK 1 B	POSTFILTER SAMPLE
pH, Units	6.5	6.7	7.1	7.0	6.9
Conductivity, µmhos (µS)	1060	1040	1070	1050	1050
Total Dissolved Solids, mg/L	689	675	698	684	683
M.O. Alkalinity as $CaCO_3$, mg/L	12	12	16	14	14
Chloride as Cl^-, mg/L	238	234	247	241	243
Sodium, mg/L	144	142	145	144	144
Potassium, mg/L	33.1	32.4	34.2	33.2	33.1
Total Hardness as $CaCO_3$, mg/L	112	112	117	105	106
Calcium as $CaCO_3$, mg/L	49.3	48.9	46.9	42.0	42.7
Magnesium as $CaCO_3$, mg/L	62.7	63.1	69.9	63.3	63.7
Silica as SiO_2, mg/L	57.4	57.0	62.2	60.7	60.5
Sulfur as SO_4, mg/L	66.2	60.9	52.5	52.0	51.8
Iron, Dissolved, mg/L	0.60	0.62	0.36	0.26	0.28
Iron, Total, mg/L	0.66	0.68	0.39	0.27	0.31
Copper, Dissolved, mg/L	0.430	0.468	0.052	0.028	0.036
Copper, Total, mg/L	0.476	0.474	0.061	0.031	0.036
Zinc, Dissolved, mg/L	0.21	0.19	0.07	<0.05	<0.05
Zinc, Total, mg/L	0.26	0.26	0.06	<0.05	<0.05
Aluminum, Dissolved, mg/L	1.00	0.97	0.58	0.36	0.44
Manganese, Dissolved, mg/L	0.23	0.21	<0.05	<0.05	<0.05
Total Phosphorus as PO_4, mg/L	16.9	16.2	10.7	9.8	10.2
Bromide as Br, mg/L	18.3	17.8	17.4	16.9	17.0
Chlorine, Total, mg/L	<0.1	<0.1	<0.1	<0.1	<0.1

Yours truly,

Mark Payton

Mark Payton, Chemist

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone: (856) 303-2500 Fax: (856) 858-4571 Email: EnvChemistry2@emsl.com

Attn: **Nora Rothschild**
Barclay Water Management
55 Chapel Street
Newton, MA 02458
Phone: (603) 508-7001
Fax:

8/31/2015

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 8/24/2015. The results are tabulated on the attached data pages for the following client designated project:

National Archives II / PO#66527

The reference number for these samples is EMSL Order #011504879. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (856) 303-2500.

Reviewed and Approved By:

Julie Smith - Laboratory Director

The test results contained within this report meet the requirements of NELAP and/or the specific certification program that is applicable, unless otherwise noted.
NELAP Certifications: NJ 03036, NY 10872, PA 68-00367

The samples associated with this report were received in good condition unless otherwise noted. This report relates only to those items tested as received by the laboratory. The QC data associated with the sample results meet the recovery and precision requirements established by the NELAP, unless specifically indicated. All results for soil samples are reported on a dry weight basis, unless otherwise noted. This report may not be reproduced except in full and without written approval by EMSL Analytical, Inc.

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (856) 303-2500 / (856) 858-4571
http://www.EMSL.com EnvChemistry2@emsl.com

EMSL Order:	011504879
CustomerID:	BAWM25
CustomerPO:	66527
ProjectID:	

Attn: **Nora Rothschild**
Barclay Water Management
55 Chapel Street
Newton, MA 02458

Phone: (603) 508-7001
Fax:
Received: 08/24/15 9:00 AM

Project: **National Archives II / PO#66527**

Analytical Results

Client Sample Description 1 Inlet Sample — ***Collected:*** 8/20/2015 3:00:00 PM — ***Lab ID:*** *0001*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
200.8	Copper	0.45	0.050	mg/L	8/25/2015	CM	8/26/2015	KB
200.8	Zinc	0.28	0.050	mg/L	8/25/2015	CM	8/26/2015	KB
SM 4500-Cl G	Chlorine	ND	0.10	ppm	8/28/2015	JR	8/28/2015	JR

Sample received outside of the regulatory hold time. Time Analyzed 13:58

Client Sample Description 2 Worker #1 Tank — ***Collected:*** 8/20/2015 3:00:00 PM — ***Lab ID:*** *0002*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
200.8	Copper	0.028	0.0050	mg/L	8/25/2015	CM	8/26/2015	KB
	Zinc	0.059	0.0050	mg/L	8/25/2015	CM	8/26/2015	KB
500-Cl G	Chlorine	ND	0.10	ppm	8/28/2015	JR	8/28/2015	JR

Sample received outside of the regulatory hold time. Time Analyzed 13:58

Client Sample Description 3 Worker #2 Tank — ***Collected:*** 8/20/2015 3:00:00 PM — ***Lab ID:*** *0003*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
200.8	Copper	0.032	0.0050	mg/L	8/25/2015	CM	8/26/2015	KB
200.8	Zinc	0.057	0.0050	mg/L	8/25/2015	CM	8/26/2015	KB
SM 4500-Cl G	Chlorine	ND	0.10	ppm	8/28/2015	JR	8/28/2015	JR

Sample received outside of the regulatory hold time. Time Analyzed 13:59

Client Sample Description 4 Final Sample — ***Collected:*** 8/20/2015 3:00:00 PM — ***Lab ID:*** *0004*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
200.8	Copper	0.015	0.0050	mg/L	8/25/2015	CM	8/26/2015	KB
200.8	Zinc	0.033	0.0050	mg/L	8/25/2015	CM	8/26/2015	KB
SM 4500-Cl G	Chlorine	ND	0.10	ppm	8/28/2015	JR	8/28/2015	JR

Sample received outside of the regulatory hold time. Time Analyzed 14:00

Definitions:

ND - indicates that the analyte was not detected at the reporting limit
RL - Reporting Limit

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone: (856) 303-2500 Fax: (856) 858-4571 Email: EnvChemistry2@emsl.com

Attn: **Nora Rothschild**
Barclay Water Management
55 Chapel Street
Newton, MA 02458
Phone: (603) 508-7001
Fax:

9/3/2015

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 8/27/2015. The results are tabulated on the attached data pages for the following client designated project:

National Archives II / PO#66596

The reference number for these samples is EMSL Order #011505020. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (856) 303-2500.

Reviewed and Approved By:

Julie Smith - Laboratory Director

The test results contained within this report meet the requirements of NELAP and/or the specific certification program that is applicable, unless otherwise noted.
NELAP Certifications: NJ 03036, NY 10872, PA 68-00367

The samples associated with this report were received in good condition unless otherwise noted. This report relates only to those items tested as received by the laboratory. The QC data associated with the sample results meet the recovery and precision requirements established by the NELAP, unless specifically indicated. All results for soil samples are reported on a dry weight basis, unless otherwise noted. This report may not be reproduced except in full and without written approval by EMSL Analytical, Inc.

EMSL Analytical, Inc.
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http://www.EMSL.com EnvChemistry2@emsl.com

EMSL Order: 011505020
CustomerID: BAWM25
CustomerPO: 66595
ProjectID:

Attn: **Nora Rothschild**
Barclay Water Management
55 Chapel Street
Newton, MA 02458

Phone: (603) 508-7001
Fax:
Received: 08/27/15 9:20 AM

Project: **National Archives II / PO#66596**

Analytical Results

Client Sample Description 1 Untreated Tower — *Collected:* 8/26/2015 — *Lab ID:* 0001

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
200.8	Copper	0.44	0.050	mg/L	9/2/2015	CM	9/3/2015	KB
200.8	Zinc	0.28	0.050	mg/L	9/2/2015	CM	9/3/2015	KB

Client Sample Description 2 Pre-filter — *Collected:* 8/26/2015 — *Lab ID:* 0002

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
200.8	Copper	0.44	0.050	mg/L	9/2/2015	CM	9/3/2015	KB
200.8	Zinc	0.29	0.050	mg/L	9/2/2015	CM	9/3/2015	KB

Client Sample Description 3 Tank 1A — *Collected:* 8/26/2015 — *Lab ID:* 0003

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
200.8	Copper	0.032	0.0050	mg/L	9/2/2015	CM	9/3/2015	KB
200.8	Zinc	0.065	0.0050	mg/L	9/2/2015	CM	9/3/2015	KB

Client Sample Description 4 Tank 1B — *Collected:* 8/26/2015 — *Lab ID:* 0004

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
200.8	Copper	0.017	0.0050	mg/L	9/2/2015	CM	9/3/2015	KB
200.8	Zinc	0.039	0.0050	mg/L	9/2/2015	CM	9/3/2015	KB

Client Sample Description 5 Post-Filter — *Collected:* 8/26/2015 — *Lab ID:* 0005

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
200.8	Copper	0.020	0.0050	mg/L	9/2/2015	CM	9/3/2015	KB
200.8	Zinc	0.047	0.0050	mg/L	9/2/2015	CM	9/3/2015	KB

Definitions:
ND - indicates that the analyte was not detected at the reporting limit
RL - Reporting Limit

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

CLIENT: **NATIONAL ARCHIVES AND RECORDS ADMIN.**
ADDRESS: 3301 Metzerott Road
College Park, MD 20740

REPORT NO. **152378**
SAMPLE DATE: 9/10/2015
REPORT DATE: 9/21/2015

ATTENTION: Walt Hayes

FIELD ENGINEER: Nicole Hartley

REFERENCE: WATER ANALYSIS

CONSTITUENTS	POLISHER TANK #1B	POLISHER TANK #2B	PRE-CARBON FILTER INLET #1	CARBON FILTER OUTLET #1	CARBON FILTER OUTLET #2
pH, Units	7.0	7.0	6.8	6.6	7.0
Conductivity, µmhos (µS)	1100	1050	968	1010	993
Total Dissolved Solids, mg/L	712	681	629	658	645
M.O. Alkalinity as $CaCO_3$, mg/L	24	24	16	12	22
Chloride as Cl^-, mg/L	246	234	224	223	222
Sodium, mg/L	138	132	128	128	128
Potassium, mg/L	27.2	23.8	22.4	22.7	22.5
Total Hardness as $CaCO_3$, mg/L	132	130	105	120	114
Calcium as $CaCO_3$, mg/L	58.1	56.5	48.5	61.6	58.8
Magnesium as $CaCO_3$, mg/L	73.7	73.1	56.4	58.5	55.7
Silica as SiO_2, mg/L	66.9	62.0	56.6	59.9	58.1
Sulfur as SO_4, mg/L	48.0	46.2	45.9	45.7	44.9
Iron, Dissolved, mg/L	0.13	0.17	0.50	0.50	0.49
Iron, Total, mg/L	0.24	0.24	0.71	0.50	0.52
Copper, Dissolved, mg/L	0.055	0.043	0.460	0.083	0.085
Copper, Total, mg/L	0.059	0.045	0.461	0.084	0.088
Zinc, Dissolved, mg/L	<0.05	<0.05	0.17	0.25	0.26
Zinc, Total, mg/L	<0.05	<0.05	0.27	0.30	0.27
Aluminum, Dissolved, mg/L	0.22	0.27	0.89	0.89	0.97
Manganese, Dissolved, mg/L	<0.05	<0.05	0.21	0.44	0.39
Total Phosphorus as PO_4, mg/L	5.6	5.3	12.2	14.3	13.9
Molybdenum as Mo, mg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Bromide as Br, mg/L	14.8	14.8	13.1	13.6	13.3
Chlorine, Total, mg/L	0.05	<0.05	0.16	0.05	0.08

BARCLAY

BETTER WORKING WATER.

LABORATORY REPORT

CLIENT: **NATIONAL ARCHIVES AND RECORDS ADMIN.**
ADDRESS: 3301 Metzerott Road
College Park, MD 20740

REPORT NO. **152378**
SAMPLE DATE: 9/10/2015
REPORT DATE: 9/21/2015

ATTENTION: Walt Hayes

FIELD ENGINEER: Nicole Hartley

REFERENCE: WATER ANALYSIS

CONSTITUENTS	WORKER TANK #1A	WORKER TANK #2A	POST FILTER - FINAL SAMPLE		
pH, Units	6.9	7.0	7.0		
Conductivity, µmhos (µS)	1040	1030	1060		
Total Dissolved Solids, mg/L	673	668	691		
M.O. Alkalinity as $CaCO_3$, mg/L	18	24	24		
Chloride as Cl^-, mg/L	235	226	240		
Sodium, mg/L	130	128	132		
Potassium, mg/L	23.6	22.8	24.7		
Total Hardness as $CaCO_3$, mg/L	128	124	130		
Calcium as $CaCO_3$, mg/L	58.0	55.6	56.9		
Magnesium as $CaCO_3$, mg/L	70.0	68.0	72.7		
Silica as SiO_2, mg/L	64.4	60.8	63.5		
Sulfur as SO_4, mg/L	47.4	46.2	46.7		
Iron, Dissolved, mg/L	0.31	0.33	0.22		
Iron, Total, mg/L	0.32	0.35	0.23		
Copper, Dissolved, mg/L	0.032	0.033	0.015		
Copper, Total, mg/L	0.034	0.036	0.018		
Zinc, Dissolved, mg/L	0.12	0.08	<0.05		
Zinc, Total, mg/L	0.06	0.05	<0.05		
Aluminum, Dissolved, mg/L	0.57	0.65	0.38		
Manganese, Dissolved, mg/L	<0.05	<0.05	<0.05		
Total Phosphorus as PO_4, mg/L	10.9	11.2	5.8		
Molybdenum as Mo, mg/L	<0.1	<0.1	<0.1		
Bromide as Br, mg/L	14.2	13.9	14.9		
Chlorine, Total, mg/L	<0.05	<0.05	0.05		

Yours truly,

Mark Payton

Mark Payton, Chemist

Response to Paragraph 22

Response to Paragraph 22 of EPA Letter

During an initial evaluation of water discharged from the National Archives II facility, a flow study was conducted on the Central Plant Sump #6. At the time, Sump #6 received water from two sources: area drains exterior to the building and the cooling tower blowdown water. The sump collects the water and discharges through a force main to the building outfall via two sump pumps. The pumps are arranged to operate in a lead/lag configuration. During normal operation, the lead pump starts when the sump level reaches the "high level' setpoint. The pump operates until sump level reaches the "low level" setpoint. In the event the water entering the sump exceeds the capacity of the lead sump pump, the lag sump pump starts when sump level reaches the "high-high level setpoint." Both pumps stop when the "low level" setpoint is reached.

The purpose of the flow study was to determine the flow rate associated with cooling tower blowdown operation in preparation of an RFQ associated with removing copper and zinc from the cooling tower blowdown water. This study was conducted in late September 2012. One of the results of the flow study was that the water discharged from the sump did not match the water entering the sump. After careful evaluation of all possible causes of the flow mismatch, it was determined that the piping from the sump to the force main may be compromised. This section of piping was located approximately 4' below the Central Plant concrete deck. The piping was investigated using a remote camera assembly during the 1st week of October 2012. Once the extent of the damage was found, a contractor was brought in and repairs were made to the pipe by October 17, 2012.

In the Spring of 2015, the cooling tower discharge water was directly piped to the Evoqua System (see discussion, Paragraph 17 EPA letter response). Today, Sump #6 only receives water from the drains exterior to the building.

Response to Paragraph 23

Volume of water discharged from the cooling tower system is measured at the discharge point via a water meter. Collection and testing procedures are described in prior sections of this response.