

DATE: September 23, 2010

TO: Bob Masnado – WT/3

FROM: Kari Fleming - Biomonitoring Coordinator, Bureau of Watershed Management

SUBJECT: **SLH Biomonitoring Results for Silver Lake Ambient Sites**

Attached is a copy of the "Ambient Toxicity Test Report Form", which summarizes the toxicity tests completed by the University of Wisconsin-Madison's State Laboratory of Hygiene (SLH) with samples collected in August, 2010 from Silver Lake (Waushara County).

#### **Acute Toxicity Tests**

No toxicity was observed. No statistical difference was noted between ambient lake samples and lab water controls. Please see the attached report for more details.

#### **Chronic Toxicity Tests**

No toxicity was observed to *Pimephales promelas* (fathead minnow) or *Selenastrum capricornutum* (algae). No statistical difference was noted between ambient lake samples and lab water controls. The *Ceriodaphnia dubia* (water flea) chronic test was inconclusive due to poor performance of the lab organisms. Please see the attached report for more details.

If you have any questions concerning this report or biomonitoring in general, please call me at (608) 267-7663 or email to: [Kari.Fleming@dnr.state.wi.us](mailto:Kari.Fleming@dnr.state.wi.us).

# AMBIENT TOXICITY TEST REPORT FORM

GENERAL INFORMATION									
PROJECT NAME: <b>Silver Lake ambient sites</b>				LABORATORY NAME: Wisconsin State Laboratory of Hygiene					
				REPORT NUMBER: FV000150-151					
REPORT TYPE: <input checked="" type="checkbox"/> Original <input type="checkbox"/> Amended		If amended, original report number: _____							
SAMPLE INFORMATION									
SAMPLE NO.	LAB NO.	FIELD NO.	SITE DESCRIPTION				STATION NO. (SWIMS, STORET or LAT/LONG)		
1	FV000150	A	Sample Location A						
2	FV000151	B	Sample Location B						
3									
4									
5									
6									
SAMPLE NO.	SAMPLE COLLECTION			SAMPLE TEMP. °C		pH at LAB	HAND DELIVER? (If Yes, ≤ 4 hr?)	HOLD TIME ≤ 36 HR?	SAMPLE ACCEP- TABLE?
	SAMPLE TYPE	SAMPLING DATE	DATE at LAB	COLLECTION	AT LAB				
1	GRAB	08/08/2010	08/10/2010	26.1	3.7	8.44	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2	GRAB	08/08/2010	08/10/2010	25.6	3.8	8.56	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3							<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
4							<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
5							<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
6							<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
<i>Describe any unusual conditions during sampling that may influence test results. (see Part 6.1.2 of the Methods Manual for examples.)</i>									
COMMENTS: _____									
TEST INFORMATION									
ACUTE					CHRONIC				
Date Test Initiated:		08/10/2010			08/10/2010				
QA/QC CONDITIONS									
						ACUTE		CHRONIC	
Temperatures maintained during test? (20 ± 1°C or 25 ± 1°C)						<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> No
Dissolved oxygen ≥ 4.0 mg/l throughout test?						<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> No
pH maintained within 6.0 - 9.0 s.u. throughout test?						<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> No
Concurrent or monthly reference tests within acceptable limits?						<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> No
Tests conducted in a carbon dioxide atmosphere throughout test?						<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> No
Light intensity for <i>Selenastrum</i> maintained throughout test? (4,300 ± 430 lux)							<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> No
Were samples modified prior to testing? (ex. filtration, aeration, chem addition)						<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> No
COMMENTS: _____									
WATER CHEMISTRY									
<small>(All values reported in mg/L, except pH and Conductivity)</small>									
SAMPLE TYPE	SAMPLE NO.	HARDNESS	ALKALINITY	TOTAL AMMONIA	DISSOLVED OXYGEN	pH (s.u.) After Warming	Conductivity (µS)		
SITES	1	112	120	<0.015	9.4	8.48	257		
	2	124	120	<0.015	9.3	8.61	273		
LAB WATER	MHW	84	65	NA	8.2	8.42	312		
	DC	172	280	NA	8.7	8.84	619		
COMMENTS: MHW = Moderately hard water is used as the lab control water for the <i>Ceriodaphnia dubia</i> & <i>Selenastrum</i> tests. DC = Dechlorinated Madison tap water is used as the lab control for the fathead minnow test. For ammonia analysis, limit of detection (LOD) is 0.015 mg/L.									

## ACUTE TEST CONTROL PERFORMANCE

### LAB WATER CONTROLS

Fathead Minnow	<i>Ceriodaphnia dubia</i>
Survival $\geq$ 90% <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Survival $\geq$ 90% <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

COMMENTS:

### ACUTE TEST DATA

SPECIES	SITE DESCRIPTION		Percent Survival By Replicate				Mean Percent Survival	Statistical Significance*
			1	2	3	4		
Fathead Minnow  Age of Organism: 4 Days	LC	LW Control	100	100	100	90	97.5	A
	1	A	100	90	90	100	95.0	A
	2	B	100	100	100	100	100.0	A

*Please describe any unusual behavior and/or appearance of organisms.(see Part 6.1.2 of the Methods Manual for ex.)*

COMMENTS: \* Samples with the same letter are not statistically different from each other.

SPECIES	SITE DESCRIPTION		Percent Survival By Replicate				Mean Percent Survival	Statistical Significance*
			1	2	3	4		
<i>Ceriodaphnia dubia</i>  Age of Organism: < 24 Hours Old	LC	LW Control	100	100	100	100	100.0	A
	1	A	100	100	100	100	100.0	A
	2	B	100	100	80	100	95.0	A

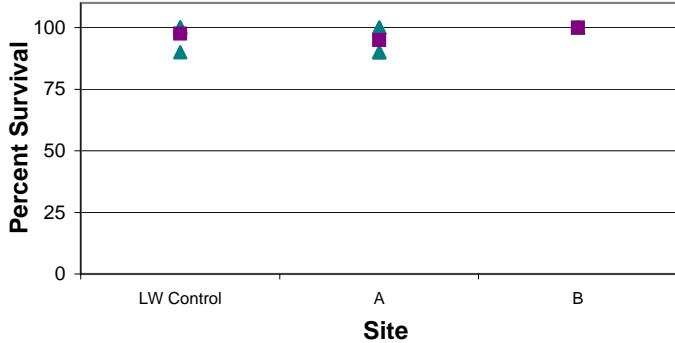
*Please describe any unusual behavior and/or appearance of organisms.(see Part 6.1.2 of the Methods Manual for ex.)*

COMMENTS: \* Samples with the same letter are not statistically different from each other.

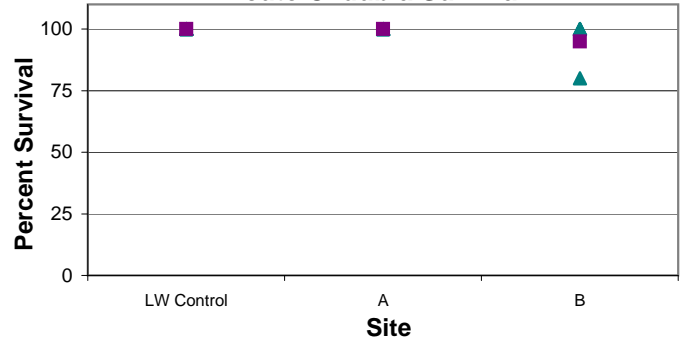
▲ = Individual Data

■ = Mean

**Acute Fathead Minnow Survival**



**Acute C. dubia Survival**



Project Name : Silver Lake ambient sites  
 Report # : FV000150-151  
 Acute Test Date : 08/10/2010

## CHRONIC TEST CONTROL PERFORMANCE

LAB WATER CONTROLS	
<b>Fathead Minnow</b> Survival > 80% <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  > 0.25 mg/fish <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  Survival Weight CV < 40% <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  Survival Weight % CV = 14	<b>Ceriodaphnia dubia</b> Survival > 80% <input type="checkbox"/> Yes <input type="checkbox"/> No  > 15 neonates/female <input type="checkbox"/> Yes <input type="checkbox"/> No  Reproduction CV < 40% <input type="checkbox"/> Yes <input type="checkbox"/> No  Reproduction %CV= #DIV/0! > 80% 3rd brood <input type="checkbox"/> Yes <input type="checkbox"/> No  < 20% males <input type="checkbox"/> Yes <input type="checkbox"/> No

COMMENTS:

## CHRONIC TEST DATA

SPECIES	SITE DESCRIPTION		MEAN % SURVIVAL	MEAN DRY BIOMASS PER REPLICATE PAIR (mg)					MEAN BIOMASS (mg)	Statistical Significance*
				1	2	3	4	5		
Fathead Minnow Growth & Survival Test	LC	LW Control	100	0.510	0.413	0.378	0.360	0.423	0.417	A
	<i>LW Survival Weight</i>			0.510	0.413	0.378	0.360	0.423		
	1	A	85	0.213	0.255	0.418	0.335	0.405	0.325	A
	2	B	95	0.413	0.373	0.448	0.383	0.318	0.387	A

*Please describe any unusual behavior and/or appearance of organisms.(see Part 6.1.2 of the Methods Manual for ex.)*

COMMENTS: \* **Samples with the same letter are not statistically different from each other.**

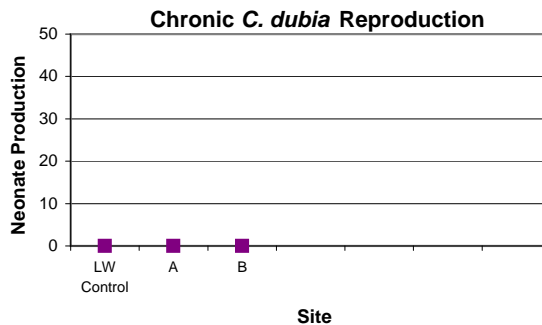
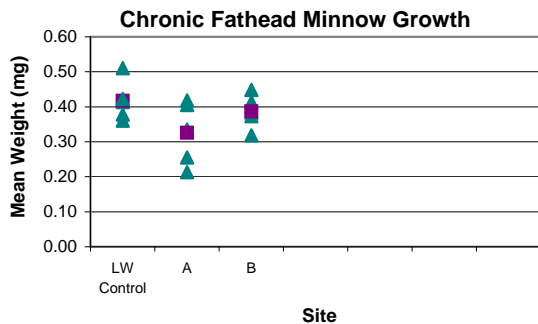
SPECIES	SITE	NEONATE PRODUCTION BY REPLICATE										MEAN NEONATES	% ADULT SURVIVAL	Statistical Significance*	
		1	2	3	4	5	6	7	8	9	10				
C. dubia Reproduction & Survival Test	LC												#DIV/0!		
	1												#DIV/0!		
	2												#DIV/0!		

Male Production ≤ 20% Over All Treatments?    Yes    No

*Please describe any unusual behavior and/or appearance of organisms.(see Part 6.1.2 of the Methods Manual for ex.)*

COMMENTS: **C. dubia chronic test was inconclusive due to poor performance of the organisms in control lab water. The poor performance is a result of problems we were experiencing with our C. dubia culture at the time of this test.**

▲ = Individual Data   ■ = Mean



**CHRONIC TEST CONTROL PERFORMANCE**

<b>LAB WATER CONTROLS</b>	
<i>Selenastrum</i>	
≥ 1x10 <sup>6</sup> cells/ml <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
CV < 20% <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
%CV = 4	

**GROWTH MEASUREMENT PER REPLICATE**

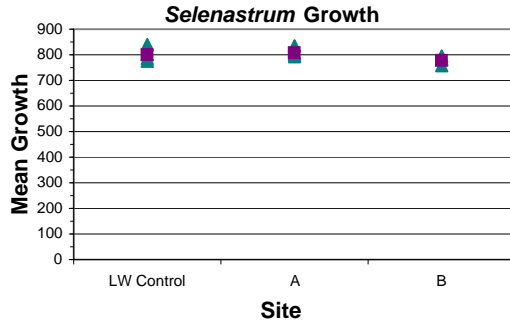
SPECIES	SITE DESCRIPTION		Blank	1		2		3		4		MEAN GROWTH	%CV	Statistical Significance*	
				Initial	Adjusted	Initial	Adjusted	Initial	Adjusted	Initial	Adjusted				
<i>Selenastrum capricornutum</i> GROWTH TEST	LC	LW Control	0	801	801	839	839	786	786	774	774	800	4	A	
	1	A	0	804	804	800	800	793	793	834	834	808	2	A	
	2	B	0	794	794	780	780	757	757	782	782	778	2	A	

**Test Type:**  flask  microplate      **Endpoint:**  count  spec.  fluor.

*Please describe any unusual appearance of organisms. (see Part 6.1.2 of the Methods Manual for ex.)*

**COMMENTS:** \* Samples with the same letter are not statistically different from each other.

▲ = Individual Data      ■ = Mean



Project Name : Silver Lake ambient sites

Report # : FV000150-151

Chronic Test Date : 08/10/2010

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, 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 also certify that these results relate only to these samples.

LAB REPRESENTATIVE:	Amy Mager	SIGNATURE:	
DATE:	9/15/2010		
PHONE:	(608) 224-6230	WDNR LAB CERT #:	113133790
LAB ADDRESS:	Wisconsin State Laboratory of Hygiene, 2601 Agriculture Drive, Madison, WI 53718		
REVIEWED BY:	Steve Geis	DATE:	09/21/2010
PERMITTEE		SIGNATURE:	
PHONE:		DATE:	

Send **all pages** of this form (plus any attachments or additional information which you believe to be relevant to the test) to: **Biomonitoring Coordinator, Bureau of Watershed Management, Department of Natural Resources, 101 South Webster St., P.O. Box 7921, Madison, WI 53707-7921.**

Copies of the State of Wisconsin Aquatic Life Toxicity Testing Methods Manual (Methods Manual) and the WET Guidance Document can be obtained from the WDNR Biomonitoring Coordinator at the address given above or at: <http://dnr.wi.gov/org/water/wm/ww/biomon/>

TO BE COMPLETED BY THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES	
Results Entered Into Database?	<input type="checkbox"/> Yes <input type="checkbox"/> No
COMMENTS:	
REVIEWED BY:	Kari Fleming
DATE:	September 23, 2010
CC:	Bob Masnado - WT/3

Project Name : Silver Lake ambient sites  
 Report # : FV000150-151  
 Test Date : 08/10/2010