

BIOASSAY REPORT
ACUTE AND CHRONIC TOXICITY TESTS
Conducted June 14 through 21, 1994

Prepared for
Onalaska Landfill
Onalaska, Wisconsin



Pinephales promelas

Acute

EC50
ACUTE

EC50
ACUTE

Acute



ACUTE AND CHRONIC TOXICITY TESTS

Conducted June 14 through 21, 1994

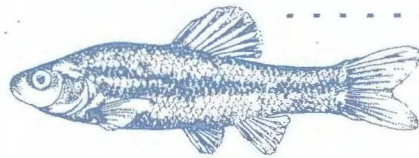
Prepared for
Onalaska Landfill
Onalaska, Wisconsin



Daphnia magna

EC50
ACUTE

Pinephales promelas



EC50
ACUTE

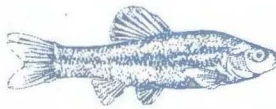
Chronic LC50
growth and reproduction

Chronic LC50



Daphnia magna

ACUTE



Pinephales promelas

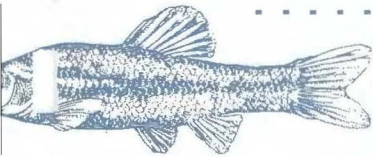
ACUTE



TRE

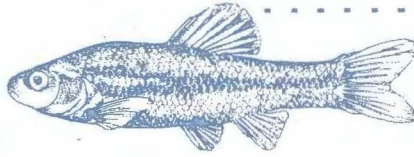
TRE

Pinephales promelas



EC50
ACUTE

Pinephales promelas



Chronic LC50

Chronic LC50

Chronic LC50
growth and reproduction

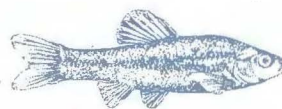
ACUTE



Daphnia magna

TRE

ACUTE



Pinephales promelas

Pinephales promelas

BIOASSAY REPORT
ACUTE AND CHRONIC
TOXICITY TESTS
Conducted June 14 through 21, 1994

Prepared for
Onalaska Landfill
Onalaska, Wisconsin

Prepared by
CH2M HILL
Bioassay Laboratory
15779 West Ryerson Road
New Berlin, Wisconsin 53151

July 1994

Summary

CH2M HILL conducted acute and chronic toxicity tests on groundwater samples (influent to the carbon unit and final effluent) provided by the Onalaska Landfill, Onalaska, Wisconsin. Aliquots of the influent and effluent were treated at the laboratory with zeolite (to remove ammonia) and concurrently tested for acute toxicity using the daphnids. The bioassays were conducted from June 14 through 21, 1994, as part of compliance biomonitoring for the State of Wisconsin. *Ceriodaphnia dubia*, *Daphnia magna*, and fathead minnows were used as the test organisms. The following is a summary of the test results:

Test Media	Acute Toxicity		
	<i>Ceriodaphnia dubia</i>	<i>Daphnia magna</i>	Fathead Minnow
Black River Control	Pass	Pass	Pass
100% Carbon Unit Influent	Pass	Pass	Pass
100% Final Effluent	Pass	Pass	Pass
100% Zeolite Treated Influent	Pass	Pass	---
100% Zeolite Treated Effluent	Pass	Pass	---
Laboratory Control	Pass	Pass	Pass

Test Media	<i>Ceriodaphnia dubia</i>		Fathead Minnow	
	Mean % Survival	Mean No. of Offspring	Mean % Survival	Mean Growth (mg)
Black River Control	70 ^a	21.5	80	0.315
3.7% Influent (IWC)	90	24.0	67.5	0.299
5% Influent	80	20.2	72.5	0.286
10% Influent	90	27.5	92.5	0.406
20% Influent	90	25.9	100	0.417
40% Influent	90	20.3	100	0.453
80% Influent	100	22.2	97.5	0.382
IC ₂₅		> 80%		> 80%
3.7% Effluent	100	29.0	97.5	0.429
Laboratory Control	100	26.3	100	0.452

^aIndicates data did not meet test acceptability criterion.

For compliance purposes, the test results show that:

- The carbon unit influent and final effluent samples were not acutely toxic to *Ceriodaphnia dubia*, *Daphnia magna*, or fathead minnows at 100 percent concentrations using the 50 percent lethality criteria.
- The carbon unit influent and final effluent samples were not chronically toxic to *Ceriodaphnia dubia* or larval fathead minnows at the 3.7 percent IWC or any of the concentrations tested using the 25 percent inhibition analysis for reproduction or biomass.
- Black River water data were acceptable as controls in all the acute tests and the chronic fathead minnow bioassay.
- Black River water data did not meet the survival criterion of 80 percent in the chronic *Ceriodaphnia* bioassay. However, the reproduction criterion was met. All groundwater concentrations had higher survival and growth values than the Black River water. Therefore, because the groundwater concentrations produced similar or better results than the river control, the *Ceriodaphnia* chronic bioassay should be considered a valid test for determining toxicity.
- Laboratory water data met test acceptability criteria in all acute and chronic bioassays.

MKE100147ED.WP5

Introduction

This report presents the results of the laboratory acute and chronic toxicity tests conducted by CH2M HILL on groundwater samples provided by the Onalaska Landfill, Onalaska, Wisconsin. The aliquots of the groundwater samples were treated with zeolite and tested for acute toxicity using the daphnids. The bioassays used *Ceriodaphnia dubia*, *Daphnia magna*, and fathead minnows as the test organisms and were performed from June 14 through 21, 1994, as part of compliance biomonitoring for the State of Wisconsin.

Methods

All laboratory methods, including organism culture, sample handling, test procedures, and data analyses, were in accordance with the recommendations of the U.S. Environmental Protection Agency (EPA) [1, 2, 3, 4], the CH2M HILL Milwaukee Bioassay Laboratory's Standard Operating Procedures, and the Wisconsin Department of Natural Resources (DNR) biomonitoring requirements as specified in the Onalaska Landfill discharge permit.

Sample Collection and Handling

Photocopies of the chain-of-custody forms are included in Appendix B. Three 24-hour composite groundwater samples and one receiving water grab sample were used as follows:

Description	Sample No.	Date Collected	Date Tested
Black River	434.01	6/12	6/14-21
Carbon Unit Influent	434.02 ^A	6/11-12	6/14-16
Carbon Unit Influent	434.02 ^B	6/14-15	6/16-18
Carbon Unit Influent	434.02 ^C	6/16-17	6/18-21
Effluent	434.03 ^A	6/11-12	6/14-16
Effluent	434.03 ^B	6/14-15	6/16-18
Effluent	434.03 ^C	6/16-17	6/18-21

All samples were collected by CH2M HILL personnel and delivered on ice to the CH2M HILL Milwaukee Bioassay Laboratory. Upon arrival, samples were logged in and physicochemical characterizations were conducted. Samples not immediately prepared for testing were refrigerated (4°C) for later use. All samples were initially used within 48 hours of collection.

Test Organisms

All test organisms were cultured at the CH2M HILL Milwaukee Bioassay Laboratory.

Test Procedures

Sample Treatment

An aliquot of the first influent and effluent sample was pumped through a column of clinoptilolite to reduce ammonia levels.

Bioassays

Bioassay test conditions are summarized in Tables 1 through 5. Additional tests on the zeolite-treated samples were performed to evaluate potential ammonia toxicity.

Physicochemical Monitoring

Total alkalinity, hardness, and total ammonia were measured initially on each new sample. Total residual chlorine was measured initially on each effluent sample. Total alkalinity and hardness were measured once in the laboratory control media. Total ammonia was also measured on the zeolite treated samples.

Dissolved oxygen (DO), pH, and conductivity were measured initially and daily thereafter in all test treatment renewals. DO and pH were measured in one test chamber or composite of each 24-hour-old test solution.

Bioassay incubator temperature was electronically monitored hourly by thermocouple and data logger, and a 24-hour summary of mean values was recorded.

Data Analysis

Pass/fail criteria were applied to acute toxicity data. A modified EPA mathematical analysis was used to estimate an IC₂₅ (the concentration that is inhibited 25 percent from the control data) on chronic toxicity data. The IC₂₅ value generated is the linear interpolation estimate.

Toxicity was defined according to the following DNR criteria:

Acute Toxicity

- Less than 50 percent survival of test organisms in 100 percent effluent at test termination (48 hours for *Ceriodaphnia dubia* and *Daphnia magna*, and 96 hours for fathead minnow).

Table 2
Summary of Test Conditions for the
Daphnia Acute Bioassay
Conducted for the Onalaska Landfill
Onalaska, Wisconsin
June 14 through 16, 1994

1. Test organism	<i>Daphnia magna</i> (Crustacea: Cladocera).
2. Test type	Static renewal.
3. Age of test organisms	Less than 24 hours.
4. Test chamber size	30 mL
5. Test solution volume	25 mL
6. Renewal of test solutions	Daily.
7. Replicate chambers per treatment	4
8. Test organisms per chamber	5
9. Primary control/dilution water	Receiving water: Black River.
10. Internal control water	Laboratory culture medium.
11. Test media	Carbon unit influent, final effluent, zeolite-treated influent, zeolite-treated effluent.
12. Sample concentrations	6.25, 12.5, 25, 50, and 100% influent; 100% effluent; 100% treated influent; 100% treated effluent.
13. Temperature	$20 \pm 1^{\circ}\text{C}$
14. Feeding regime	None.
15. Aeration	None.
16. Test duration	48 hours.
17. Sampling scheme	One 24-hour composite influent and effluent sample. Maximum holding time of 48 hours between completion of collection and initial test use. One receiving water grab sample collected within 48 hours of test initiation. Laboratory water used was collected daily.
18. Effects measured	Survival.
19. Test acceptability	90% or greater mean survival in the laboratory or receiving water control.

Table 3
Summary of Test Conditions for the
Fathead Minnow Acute Bioassay
Conducted for the Onalaska Landfill
Onalaska, Wisconsin
June 14 through 18, 1994

1. Test organism	<i>Pimephales promelas</i> (Osteichthyes: Cyprinidae).
2. Test type	Static renewal.
3. Age of test organisms	28 days old.
4. Test chamber size	500 mL
5. Test solution volume	400 mL
6. Renewal of test solutions	Daily.
7. Replicate chambers per treatment	2
8. Test organisms per chamber	10
9. Primary control/dilution water	Receiving water: Black River.
10. Internal control water	Laboratory culture medium.
11. Test media	Carbon unit influent and final effluent.
12. Sample concentrations	6.25, 12.5, 25, 50, and 100% influent; 100% effluent.
13. Temperature	20 ± 1°C
14. Feeding regime	None.
15. Aeration	None, unless DO concentration falls below 40% saturation (then, continuous at rate not exceeding 100 bubbles/min).
16. Test duration	96 hours.
17. Loading rate	Less than 0.65 g/L
18. Sampling scheme	Two separate 24-hour composite influent and effluent samples, each used for a 48-hour exposure. Maximum holding time of 48 hours between completion of collection and initial test use for each sample. One grab sample of receiving water collected within 48 hours of test initiation. Laboratory water used was collected daily.
19. Effects measured	Survival.
20. Test acceptability	90% or greater mean survival in the laboratory or receiving water control.

Table 4
Summary of Test Conditions for the
***Ceriodaphnia* Chronic Bioassay**
Conducted for the Onalaska Landfill
Onalaska, Wisconsin
June 14 through 21, 1994

1. Test organism	<i>Ceriodaphnia dubia</i> (Crustacea: Cladocera).
2. Test type	Static renewal.
3. Age of test organisms	Less than 24 hours, all released within an 8-hour period (same generation from even-aged parents).
4. Test chamber size	30 mL
5. Test solution volume	15 mL
6. Renewal of test solutions	Daily.
7. Replicate chambers per treatment	10
8. Test organisms per chamber	1
9. Primary control/dilution water	Receiving water: Black River.
10. Secondary control water	Laboratory culture medium.
11. Test media	Carbon unit influent and final effluent.
12. Sample concentrations	3.7, 5, 10, 20, 40, 80% influent; 3.7% effluent.
13. Temperature	25 ± 1°C
14. Feeding regime	0.1 mL each of YCT culture food and algae per test chamber daily.
15. Aeration	None.
16. Test duration	7 days.
17. Sampling scheme	Three 24-hour composite influent and effluent samples, each used a minimum of 48 consecutive exposure hours. Maximum holding time of 48 hours between completion of collection and initial test use. One receiving water grab sample collected within 48 hours of test initiation. Laboratory water used was collected as one batch.
18. Effects measured	Survival and reproduction.
19. Test acceptability	Laboratory or receiving water control with 80% or greater mean survival, an average of 15 or more young per surviving female, and at least 60% producing three broods.

Table 5
Summary of Test Conditions for the
Fathead Minnow Chronic Bioassay
Conducted for the Onalaska Landfill
Onalaska, Wisconsin
June 14 through 21, 1994

1. Test organism	<i>Pimephales promelas</i> (Osteichthyes: Cyprinidae).
2. Test type	Static renewal.
3. Age of test organisms	Larval, less than 24 hours.
4. Test chamber size	500 mL
5. Test solution volume	300 mL
6. Renewal of test solutions	Daily.
7. Replicate chambers per treatment	4
8. Test organisms per chamber	10
9. Primary control/dilution water	Receiving water: Black River.
10. Secondary control water	Laboratory culture medium.
11. Test media	Carbon unit influent and final effluent.
12. Sample concentrations	3.7, 5, 10, 20, 40, 80% influent; 3.7% effluent.
13. Temperature	25 ± 1°C
14. Feeding regime	0.15 mL brine shrimp nauplii (less than 24 hours old) twice daily.
15. Aeration	None, unless DO concentration falls below 40% saturation (then, continuous at rate not exceeding 100 bubbles/min).
16. Cleaning	Siphon daily, immediately before test solution renewal.
17. Test duration	7 days.
18. Sampling scheme	Three 24-hour composite influent and effluent samples, each used for a minimum of 48 consecutive exposure hours. Maximum holding time of 48 hours between completion of collection and initial test use of each sample. One receiving water grab sample collected within 48 hours of test initiation. Laboratory water used was collected daily.
19. Effects measured	Survival and growth (biomass).
20. Test acceptability	Laboratory or receiving water control with 80% or greater mean survival, and surviving fish with at least 0.25 mg average dry weight.

Chronic Toxicity

- IC₂₅ value for *Ceriodaphnia dubia* reproduction or fathead minnow biomass less than the IWC (3.7 percent) after a nominal 7-day exposure.

Quality Assurance

Part of the quality assurance and quality control (QA/QC) program at the CH2M HILL Milwaukee Bioassay Laboratory includes the performance of organisms concurrently tested in laboratory media. Tables 1 through 5 present the test acceptability criteria for laboratory control data. The results of the laboratory control tests are listed in Tables 6 and 7.

In addition, other QA/QC procedures include performing monthly reference toxicant tests using reagent-grade sodium chloride. The results of reference toxicant tests conducted during the past 12 months on the appropriate test organisms are summarized in Appendix C.

Results

Photocopies of the laboratory data and computer printouts of the statistical analyses are found in Appendix A. There were no excursions from the protocols and all test conditions were within the limits required by the DNR. The test results are summarized below.

Acute Bioassays

Table 6 presents the acute bioassay results. No acute toxicity was demonstrated to *Ceriodaphnia dubia*, *Daphnia magna*, or fathead minnows in the 100 percent influent and effluent concentrations. Black River and laboratory control data were acceptable in all tests.

Table 7
Summary of Results of Chronic Bioassays
Conducted for the Onalaska Landfill
Onalaska, Wisconsin
June 14 through 21, 1994

Test Media	<i>Ceriodaphnia dubia</i>		Fathead Minnow	
	Mean % Survival	Mean No. of Offspring	Mean % Survival	Mean Growth (mg)
Black River Control	70 ^a	21.5	80	0.315
3.7% Influent (IWC)	90	24.0	67.5	0.299
5% Influent	80	20.2	72.5	0.286
10% Influent	90	27.5	92.5	0.406
20% Influent	90	25.9	100	0.417
40% Influent	90	20.3	100	0.453
80% Influent	100	22.2	97.5	0.382
IC ₂₅		> 80%		> 80%
3.7% Effluent	100	29.0	97.5	0.429
Laboratory Control	100	26.3	100	0.452

^aIndicates data did not meet test acceptability criterion.

Physicochemical Data

All physicochemical parameters measured satisfied the bioassay requirements (see Appendix A). Relatively high total ammonia levels were measured in the influent and effluent samples; however, ammonia did not cause observed toxicity.

Conclusions

The results of the laboratory bioassays conducted on groundwater samples collected by CH2M HILL from the Onalaska Landfill on June 12, 15, and 17, 1994, show:

- The carbon unit influent and final effluent samples were not acutely toxic to *Ceriodaphnia dubia*, *Daphnia magna*, or fathead minnows at 100 percent concentrations using the 50 percent lethality criteria.

- The carbon unit influent and final effluent samples were not chronically toxic to *Ceriodaphnia dubia* or larval fathead minnows at the 3.7 percent IWC or any of the concentrations tested using the 25 percent inhibition analysis for reproduction or biomass.
- Black River water data were acceptable as controls in all the acute tests and the chronic fathead minnow bioassay.
- Black River water data did not meet the survival criterion of 80 percent in the chronic *Ceriodaphnia* bioassay. However, the reproduction criterion was met. All groundwater concentrations had higher survival and growth values than the Black River water. Therefore, because the groundwater concentrations produced similar or better results than the river control, the *Ceriodaphnia* chronic bioassay should be considered a valid test for determining toxicity.
- Laboratory water data met test acceptability criteria in all acute and chronic bioassays.

References

1. Weber, C. I. (ed.). 1993. *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms* (Fourth Edition). EPA/600/4-90/027F. U.S. EPA, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio. 293 p.
2. Denny, J.S. 1987. *Guidelines for the Culture of Fathead Minnows, Pimephales promelas, for Use in Toxicity Tests*. EPA/600/3-87/001. U.S. EPA, Environmental Research Laboratory, Duluth, Minnesota. 42 p.
3. Weber, C. I., et al. 1989. *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (Second Edition). EPA/600/4-89/001. U.S. EPA, Environmental Monitoring Systems Laboratory, Cincinnati, Ohio. 249 p.
4. Weber, C. I., et al. 1989. *Supplement to Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (Revision 1). EPA/600/4-89/001a. U.S. EPA, Environmental Monitoring Systems Laboratory, Cincinnati, Ohio. 42 p.

APPENDIX A
LABORATORY DATA SHEETS
AND STATISTICAL ANALYSES

CH2M HILL MILWAUKEE BIOASSAY LABORATORY

CLIENT: Onalaska Landfill

TEST DATE: 6-14-94

To the best of our knowledge, the laboratory data reported, is true and accurate.

~~Report and Data:~~

Reviewed by:

Wm. J. Wittmann Date: 7-19-94

Date: _____

Approved by:

James Stark Date: 7-19-94

RPTQA

48-HOUR ACUTE TEST INITIAL CHEMICAL DATA*

(1-7 TREATMENTS)

PROJECT No.: TSE 142.32 CLIENT: Onalaska Land Fill
 TEST ORGANISM: Caridodaphnia dubia LAB MEDIA /No.: Culture media /434. ADL
 SAMPLE No.(s): 434.02A, 434.01 CONTROL/DILUENT: Black River
 SAMPLE DESCRIPTION: Influent
 TEST START DATE: 6-14-94 TIME: 1310 TEST END DATE: 6-16-94 TIME: 1215
 ANALYST(s): J. Cooke CODE: _____

INITIAL CHEMICAL MEASUREMENT

TREAT. NO.	TEST SOLN	PARAMETER	EXPOSURE PERIOD (HR)		COMMENTS
			0	24	
1	LAB	DO	8.0	8.0	
		pH	7.9	8.0	
		COND	.22	.22	
2	Black River	DO	9.0	9.0	
		pH	8.7	8.7	
		COND	.16	.17	
3	6.25%	DO	9.0	9.0	
		pH	8.6	8.7	
		COND	.19	.17	
4	12.5%	DO	9.0	9.0	
		pH	8.5	8.7	
		COND	.22	.20 <i>pk</i>	
5	25%	DO	9.0	9.0	
		pH	8.4	8.5	
		COND	.27	.26	
6	50%	DO	9.0	9.0	
		pH	8.3	8.3	
		COND	.38	.39	
7	100%	DO	9.0	8.9	
		pH	8.2	8.2	
		COND	.61	.61	
DATE			6-14	6-15	
SAMPLE No.			434.02A	434.02A	
DETERMINED BY			<i>pk</i>	<i>pk</i>	

*DO as mg/L COND as mmho

YMA

48-HOUR ACUTE TEST FINAL CHEMICAL DATA*

(1-7 TREATMENTS)

PROJECT No.: TSE 142.32 CLIENT: Onalaska Landfill
 TEST ORGANISM: Ceriodaphnia dubia LAB MEDIA /No.: Culture media /434.A
 SAMPLE No.(s): 434.02A, 434.01 CONTROL/DILUENT: Black River
 SAMPLE DESCRIPTION: Faf/unt
 TEST START DATE: 6-14-94 TIME: 1310 TEST END DATE: 6-16-94 TIME: 1215
 ANALYST(s): J. Cooke CODE: _____

FINAL MEASUREMENT

TREAT. NO.	TEST SOLN	PARAMETER	EXPOSURE PERIOD (HRS)		COMMENTS
			24	48	
1	LAB	DO	8.0	8.0	
		pH	8.2	8.1	
2	Black River	DO	8.7	8.7	
		pH	8.5	8.5	
3	6.25%	DO	8.8	8.8	
		pH	8.6	8.4	
4	12.5%	DO	8.7	8.9	
		pH	8.6	8.3	
5	25%	DO	8.6	8.7	
		pH	8.5	8.3	
6	50%	DO	8.3	8.5	
		pH	8.5	8.4	
7	100%	DO	7.8	8.3	
		pH	8.3	8.3	
DATE			6-15	6-16	
DETERMINED BY			<i>[Signature]</i>	<i>[Signature]</i>	

*DO as mg/L COND as mmho

WMA

48-HOUR ACUTE TEST CHEMICAL DATA*
(1-4 TREATMENTS)

PROJECT No.: TSE 142,32 CLIENT: Onalaska Landfill
 TEST ORGANISM: Ceriodaphnia dubia LAB MEDIA /No.: Culture media
 SAMPLE No.(s): 434,03A (Effluent) CONTROL/DILUENT: Black River
 SAMPLE DESCRIPTION: Effluent, Treated Influent + Effluent
 TEST START DATE: 6-14-94 TIME: 1310 TEST END DATE: 6-16-94 TIME: 1215
 ANALYST(s): J. Caple CODE: _____

INITIAL MEASUREMENT

TREAT. NO.	TEST SOLUTION	PARAMETER	EXPOSURE PERIOD (HRS)		COMMENTS
			0	24	
8	Effluent 100%	DO	8.6	8.6	
		pH	8.1	8.2	
		COND	.61	.61	
X	Treated Influent	DO	8.7	8.6	
		pH	8.3	8.3	
		COND	.62	.59	
X	Treated Effluent	DO	8.8	9.0	
		pH	8.3	8.3	
		COND	.60	.60	
X		DO			
		pH			
		COND			
DATE			6-14-94	6-15-94	
SAMPLE No.					
DETERMINED BY			<i>JC</i>	<i>JL</i>	

FINAL MEASUREMENT

A TREAT. NO.	TEST SOLUTION	PARAMETER	EXPOSURE PERIOD (HRS)		COMMENTS	
			24	48		
	Effluent 100%	DO	8.1	7.8		
		pH	8.4	8.4		
	Treated Influent	DO	7.5	7.9		
		pH	8.6	8.4		
	Treated Effluent	DO	7.4	8.0		
		pH	8.5	8.4		
X		DO				
		pH				
DATE			6-15	6-16		
DETERMINED BY			<i>JC</i>	<i>JL</i>		

*DO as mg/L COND as mmho

48-HOUR ACUTE BIOASSAY SURVIVAL DATA

(4 Reps. 1-7 Treatments)

PROJECT No.: TSE 142.32 CLIENT: Onalaska Landfill
 TEST ORGANISM: Caridophnia dubia AGE: 424 H LOT No.: 340-341
 SAMPLE DESCRIPTION: Influent
 SAMPLE No.(s): 434.02A, 434.01
 LAB MEDIA/No.: Culture media /434 ADL CONTROL/DILUENT: Black River
 TEST START DATE: 6-14-94 TIME: 1310 TEST END DATE: 6-16-94 TIME: 1215
 ANALYST(s): J. Cooke CODE: _____

TREAT. NO.	TEST SOLN	REP	FATALITIES PER EXPOSURE PERIOD (Hrs)		TOTAL FATAL.	MEAN SURV.	COMMENTS
			24	48			
1	LAB	A	0	0	0	100%	
		B	0	0	↓		
		C	0	0	↓		
		D	0	0	↓		
2	Black River	A	0	0	0	100%	
		B	0	0	↓		
		C	0	0	↓		
		D	0	0	↓		
3	6.25%	A	0	0	0	100%	
		B	0	0	↓		
		C	0	0	↓		
		D	0	0	↓		
4	12.5%	A	0	0	0	100%	
		B	0	0	↓		
		C	0	0	↓		
		D	0	0	↓		
5	25%	A	0	0	0	100%	
		B	0	0	↓		
		C	0	0	↓		
		D	0	0	↓		
6	50%	A	0	0	0	100%	
		B	0	0	↓		
		C	0	0	↓		
		D	0	0	↓		
7	100%	A	0	0 3	3	65%	
		B	0	0 2	2		
		C	0	0 1	1		
		D	0	0 1	1		

DATE	6-15	6-16
DETERMINED BY	<u>R</u>	<u>R</u>

WPK

48-HOUR ACUTE BIOASSAY SURVIVAL DATA

(4 Reps. 1-4 Treatments)

PROJECT No.: TSE 142.32 CLIENT: Onalaska Landfill
 TEST ORGANISM: Ceriodaphnia dubia AGE: < 24H LOT No.: 340-341
 SAMPLE DESCRIPTION: Effluent, Treated Influent + Effluent
 SAMPLE No.(s): 434.03A (Effluent)
 LAB MEDIA/No.: Culture media CONTROL/DILUENT: Black River
 TEST START DATE: 6-14-94 TIME: 1310 TEST END DATE: 6-16-94 TIME: 1215
 ANALYST(s): J. Cooke CODE: _____

TREAT. NO.	TEST SOLN	REP	FATALITIES PER EXPOSURE PERIOD (Hrs)		TOTAL FATAL	MEAN SURV.	COMMENTS
			24	48			
8	Effluent 100%	A	0	0	0	100%	
		B	0	0	↓		
		C	0	0	↓		
		D	0	0	↓		
8	Treated Influent	A	0	0	0	100%	
		B	0	0	↓		
		C	0	0	↓		
		D	0	0	↓		
8	Treated Effluent	A	0	0	0	100%	
		B	0	0	↓		
		C	0	0	↓		
		D	0	0	↓		
4	X	A					
		B					
		C					
		D					

DATE	6-15	6-16
DETERMINED BY		

COMMENTS:

48-HOUR ACUTE TEST INITIAL CHEMICAL DATA*
(1-7 TREATMENTS)

PROJECT No.: TSE 142.32 CLIENT: Opalaska Landfill
 TEST ORGANISM: Daphnia magna LAB MEDIA /No.: Culture media /434 ADL
 SAMPLE No.(s): 434.02A, 434.01 CONTROL/DILUENT: Black River
 SAMPLE DESCRIPTION: Influent
 TEST START DATE: 6-14-94 TIME: 1300 TEST END DATE: 6-16-94 TIME: 1230
 ANALYST(s): J. Cooke CODE: _____

INITIAL CHEMICAL MEASUREMENT

TREAT. NO.	TEST SOLN	PARAMETER	EXPOSURE PERIOD (HR)		COMMENTS
			0	24	
1	LAB	DO	8.0	8.0	
		pH	7.9	8.0	
		COND	.22	.22	
2	Black River	DO	9.0	9.0	
		pH	8.7	8.7	
		COND	.16	.17	
3	6.25%	DO	9.0	9.0	
		pH	8.6	8.7	
		COND	.19	.20	
4	12.5%	DO	9.0	9.0	
		pH	8.5	8.5	
		COND	.22	.26	
5	25%	DO	9.0	9.0	
		pH	8.4	8.5	
		COND	.27	.26	
6	50%	DO	9.0	9.0	
		pH	8.3	8.3	
		COND	.38	.39	
7	100%	DO	9.0	8.9	
		pH	8.2	8.2	
		COND	.61	.61	
DATE			6-14	6-15	
SAMPLE No.			434.02A	434.02A	
DETERMINED BY			<i>JC</i>	<i>JC</i>	

*DO as mg/L COND as mmho

unk

48-HOUR ACUTE TEST CHEMICAL DATA*
(1-4 TREATMENTS)

PROJECT No.: TSE 142.32 CLIENT: Onalaska Landfill
 TEST ORGANISM: Daphnia magna LAB MEDIA /No.: Culture media /434 ADL
 SAMPLE No.(s): 434.03A (Effluent) CONTROL/DILUENT: Black River
 SAMPLE DESCRIPTION: Effluent, Treated Influent & Effluent
 TEST START DATE: 6-14-94 TIME: 1300 TEST END DATE: 6-16-94 TIME: 1230
 ANALYST(S): J. Cook CODE: _____

INITIAL MEASUREMENT

TREAT. NO.	TEST SOLUTION	PARAMETER	EXPOSURE PERIOD (HRS)		COMMENTS
			0	24	
8	Effluent 100%	DO	8.6	8.6	
		pH	8.1	8.2	
		COND	0.61	0.61	
4	Treated Influent	DO	8.7	8.6	
		pH	8.3	8.3	
		COND	0.62	0.59	
4	Treated Effluent	DO	8.8	9.0	
		pH	8.3	8.3	
		COND	0.60	0.60	
4	X	DO			
		pH			
		COND			
DATE			6-14	6-15	
SAMPLE No.					
DETERMINED BY			<i>J. Cook</i>	<i>J. Cook</i>	

FINAL MEASUREMENT

TREAT. NO.	TEST SOLUTION	PARAMETER	EXPOSURE PERIOD (HRS)		COMMENTS
			24	48	
8	Effluent 100%	DO	8.0	7.6	
		pH	8.4	8.4	
4	Treated Influent	DO	7.4	8.0	
		pH	8.6	8.5	
4	Treated Effluent	DO	7.4	8.1	
		pH	8.6	8.5	
4	X	DO			
		pH			
DATE			6-15	6-16	
DETERMINED BY			<i>J. Cook</i>	<i>J. Cook</i>	

*DO as mg/L COND as mmho

48-HOUR ACUTE TEST FINAL CHEMICAL DATA*

(1-7 TREATMENTS)

PROJECT No.: TSE 142.32 CLIENT: Onalaska Landfill
 TEST ORGANISM: Daphnia magna LAB MEDIA /No.: Culture media 1434.ADL
 SAMPLE No.(s): 434.02A, 434.01 CONTROL/DILUENT: Black River
 SAMPLE DESCRIPTION: Influent
 TEST START DATE: 6-14-94 TIME: 1300 TEST END DATE: 6-16-94 TIME: 1230
 ANALYST(s): J. Coetzee CODE: _____

FINAL MEASUREMENT

TREAT. NO.	TEST SOLN	PARAMETER	EXPOSURE PERIOD (HRS)		COMMENTS
			24	48	
1	LAB	DO	8.1	8.1	
		pH	8.1	8.1	
2	Black River	DO	8.8	8.1	
		pH	8.3	8.0	
3	6.25%	DO	8.8	8.2	
		pH	8.4	7.9	
4	12.5%	DO	8.9	8.2	
		pH	8.3	7.9	
5	25%	DO	8.7	8.0	
		pH	8.3	8.1	
6	50%	DO	8.5	7.9	
		pH	8.4	8.3	
7	100%	DO	8.1	7.8	
		pH	8.3	8.3	
DATE			6-15	6-16	
DETERMINED BY			<i>JC</i>	<i>JC</i>	

*DO as mg/L COND as mmho

48-HOUR ACUTE BIOASSAY SURVIVAL DATA

(4 Reps. 1-7 Treatments)

PROJECT No.: TSE 142.32 CLIENT: Onalaska Landfill
 TEST ORGANISM: Daphnia magna AGE: < 24h LOT No.: 369-370
 SAMPLE DESCRIPTION: Influent
 SAMPLE No.(s): 434.02A, 434.01
 LAB MEDIA/No.: Culture media / 434 ADL CONTROL/DILUENT: Black River
 TEST START DATE: 6-15-94 TIME: 1300 TEST END DATE: 6-16-94 TIME: 1230
 ANALYST(s): J. Cooke CODE: _____

TREAT. NO.	TEST SOLN	REP	FATALITIES PER EXPOSURE PERIOD (Hrs)		TOTAL FATAL.	MEAN SURV.	COMMENTS
			24	48			
			1	LAB			
B	0	0			↓		
C	0	0			↓		
D	0	0			↓		
2	Black River	A	0	0	0	100%	
		B	0	0	↓		
		C	0	0	↓		
		D	0	0	↓		
3	6.25%	A	0	0	0	100%	
		B	0	0	↓		
		C	0	0	↓		
		D	0	0	↓		
4	12.5%	A	0	0	0	100%	
		B	0	0	↓		
		C	0	0	↓		
		D	0	0	↓		
5	25%	A	0	0	0	100%	
		B	0	0	↓		
		C	0	0	↓		
		D	0	0	↓		
6	50%	A	0	0	0	100%	
		B	0	0	↓		
		C	0	0	↓		
		D	0	0	↓		
7	100%	A	0	0	0	100%	
		B	0	0	↓		
		C	0	0	↓		
		D	0	0	↓		

DATE	6-15	6-16
DETERMINED BY	<i>JC</i>	<i>JC</i>

48-HOUR ACUTE BIOASSAY SURVIVAL DATA

(4 Reps. 1-4 Treatments)

PROJECT No.: TSE 14232 CLIENT: Onaska Landfill
 TEST ORGANISM: Daphnia magna ^{100%} AGE: 24H LOT No.: 369-370
 SAMPLE DESCRIPTION: Effluent, Treated Influent + Effluent
 SAMPLE No.(s): 434.03A (Effluent)
 LAB MEDIA/No.: Culture media/434.ADL CONTROL/DILUENT: Black River
 TEST START DATE: 6-14-94 TIME: 1300 TEST END DATE: 6-16-94 TIME: 1230
 ANALYST(s): J. Cackler CODE: _____

TREAT. NO.	TEST SOLN	REP	FATALITIES PER EXPOSURE PERIOD (Hrs)		TOTAL FATAL.	MEAN SURV.	COMMENTS
			24	48			
8	Effluent 100%	A	0	0	0	100%	
		B	0	0	↓		
		C	0	0	↓		
		D	0	0	↓		
4	Treated Influent	A	0	0	0	100%	
		B	0	0	↓		
		C	0	0	↓		
		D	0	0	↓		
4	Treated Effluent	A	0	0	0	100%	
		B	0	0	↓		
		C	0	0	↓		
		D	0	0	↓		
4	X	A					
		B					
		C					
		D					

DATE	6-15	6-16
DETERMINED BY	<i>JC</i>	<i>JC</i>

COMMENTS:

Handwritten mark

96-HOUR ACUTE TEST INITIAL CHEMICAL DATA*
(1-7 TREATMENTS)

PROJECT No.: ISE 142.32 CLIENT: Onalaska Landfill
 TEST ORGANISM: Fathead minnow LAB MEDIA /No.: Culture media /434 AFL
 SAMPLE No.(s): 434.02A, 434.02B, 434.01 CONTROL/DILUENT: Black River
 SAMPLE DESCRIPTION: Influent
 TEST START DATE: 6-14-94 TIME: 1330 TEST END DATE: 6-18-94 TIME: 1210
 ANALYST(s): J. Cooke CODE: _____

INITIAL CHEMICAL MEASUREMENT

TREATMENT NO.	TEST SOLN	PARAMETER	EXPOSURE PERIOD (HRS)				COMMENTS
			0	24	48	72	
LAB		DO	7.9	7.9	8.1	7.8	
		pH	7.6	7.6	7.7	7.6	
		COND	.22	.22	.22	.22	
Black River		DO	9.0	9.0	9.0	8.9	
		pH	8.7	8.7	8.8	8.7	
		COND	.16	.17	.17	.17	
6.25%		DO	9.0	9.0	9.0	8.9	
		pH	8.6	8.7	8.7	8.7	
		COND	.19	.17	.18	.18	
12.5%		DO	9.0	9.0	9.0	8.9	
		pH	8.5	8.7	8.6	8.7	
		COND	.22	.20	.23	.22	
25%		DO	9.0	9.0	9.0	9.0	
		pH	8.4	8.5	8.5	8.6	
		COND	.27	.26	.29	.28	
50%		DO	9.0	9.0	9.0	9.0	
		pH	8.3	8.3	8.4	8.5	
		COND	.38	.39	.38	.38	
70%		DO	9.0	8.9	9.0	9.0	
		pH	8.2	8.2	8.3	8.3	
		COND	.61	.61	.61	.61	
			6-14	6-15	6-16	6-17	
	SAMPLE No.		434.02A	434.02A	434.02B	434.02B	
	TESTED BY		<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	

*DO as mg/L COND as mmho

96-HOUR ACUTE TEST CHEMICAL DATA*

(1-4 TREATMENTS)

PROJECT No.: TSE 142.32 CLIENT: Onalaska Landfill
 TEST ORGANISM: Fathead minnow LAB MEDIA /No.: Culture media /434 AFU
 SAMPLE No.(s): 434.03A, 434.03B CONTROL/DILUENT: Black River
 SAMPLE DESCRIPTION: Effluent
 TEST START DATE: 6-14-94 TIME: 1330 TEST END DATE: 6-18-94 TIME: 1210
 ANALYST(s): J. Cooke CODE: _____

INITIAL MEASUREMENT

TREAT. NO.	TEST SOLN	PARAMETER	EXPOSURE PERIOD (HRS)				COMMENTS
			0	24	48	72	
8	Effluent 100%	DO	8.6	8.6	8.8	8.9	
		pH	8.1	8.2	8.2	8.3	
		COND	.61	.61	.61	.61	
2	X	DO					
		pH					
		COND					
3	X	DO					
		pH					
		COND					
4	X	DO					
		pH					
		COND					
DATE			6-14	6-15	6-16	6-17	
SAMPLE No.			434.03A	434.03A	434.03B	434.03B	
DETERMINED BY			<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	

FINAL MEASUREMENT

TREAT. NO.	TEST SOLN	PARAMETER	EXPOSURE PERIOD (HRS)				COMMENTS
			24	48	72	96	
8	Effluent 100%	DO	6.5	6.7	6.6	7.4	
		pH	8.1	8.2	8.1	8.2	
2	X	DO					
		pH					
3	X	DO					
		pH					
4	X	DO					
		pH					
DATE			6-15	6-16	6-17	6-18	
DETERMINED BY			<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	

*DO as mg/L COND as mmho

96-HOUR ACUTE TEST FINAL CHEMICAL DATA*
(1-7 TREATMENTS)

PROJECT No.: TSE 142.32 CLIENT: Pralaska Landfill
 TEST ORGANISM: Fathead minnow LAB MEDIA /No.: Culture media/434.AFL
 SAMPLE No.(s): 434.02A, 434.02B, 434.01 CONTROL/DILUENT: Black River
 SAMPLE DESCRIPTION: Influenza
 TEST START DATE: 6-14-94 TIME: 1330 TEST END DATE: 6-18-94 TIME: 1210
 ANALYST(s): J. Cooke CODE: _____

FINAL MEASUREMENT

TREAT. NO.	TEST SOLN	PARAMETER	EXPOSURE PERIOD (HRS)				COMMENTS
			24	48	72	96	
1	LAB	DO	6.9	6.8	6.7	6.9	
		pH	7.8	7.8	7.9	7.8	
2	Black River	DO	7.6	7.8	7.5	7.7	
		pH	8.5	8.7	8.6	8.0	
3	6.25%	DO	7.4	7.7	7.7	7.9	
		pH	8.4	8.7	8.6	8.0	
4	12.5%	DO	7.3	7.7	7.8	8.0	
		pH	8.2	8.3	8.2	8.0	
5	25%	DO	7.1	7.5	7.6	7.9	
		pH	8.2	8.4	8.2	8.1	
6	50%	DO	7.0	7.4	7.5	7.6	
		pH	8.2	8.2	8.3	8.2	
7	100%	DO	6.8	7.2	7.4	7.6	
		pH	8.1	8.2	8.2	8.2	
DATE			6-15	6-16	6-17	6-18	
DETERMINED BY			<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	

DO as mg/L

96-HOUR ACUTE BIOASSAY SURVIVAL DATA

(1 - 7 Treatments)

PROJECT No.: TSE 142.32 CLIENT: Onalaska Landfill
 TEST ORGANISM: Fathead minnow AGE: 28 days LOT No.: 1402
 SAMPLE DESCRIPTION: Influent
 SAMPLE No.(s): 434.01, 434.02A, 434.02B
 LAB MEDIA/No.: Culture media/434.AFL CONTROL/DILUENT: Black River
 TEST START DATE: 6-14-94 TIME: 1330 TEST END DATE: 6-18-94 TIME: 1216
 ANALYST(s): J. Cooke CODE: _____

TREAT. NO.	TEST SOLN	REP	FATALITIES PER EXPOSURE PERIOD (Hrs)				TOTAL FATALITIES	MEAN SURVIVAL
			24	48	72	96		
1	LAB	A	0	0	0	0	0	100%
		B	0	0	0	0		
2	Black River	A	0	0	0	0	0	100%
		B	0	0	0	0		
3	6.25%	A	0	0	0	0	0	100%
		B	0	0	0	0		
4	12.5%	A	0	0	0	0	0	100%
		B	0	0	0	0		
5	25%	A	0	0	0	0	0	100%
		B	0	0	0	0		
6	50%	A	0	0	0	0	0	100%
		B	0	0	0	0		
7	100%	A	0	0	0	0	0	100%
		B	0	0	0	0		

DATE	6-15	6-16	6-17	6-18
DETERMINED BY	<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>

COMMENTS:

96-HOUR ACUTE BIOASSAY SURVIVAL DATA

(1 - 4 Treatments)

PROJECT No.: TSE 142.32 CLIENT: Onalaska Landfill
 TEST ORGANISM: Festuca missou AGE: 28 days LOT No.: 1402
 SAMPLE DESCRIPTION: Effluent
 SAMPLE No.(s): 434.03A, 434.03B
 LAB MEDIA/No.: Culture media / 434. AFL CONTROL/DILUENT: Black River
 TEST START DATE: 6-14-94 TIME: 1330 TEST END DATE: 6-18-94 TIME: 1216
 ANALYST(s): J. Cooke CODE: _____

TREAT. NO.	TEST SOLN	REP	FATALITIES PER EXPOSURE PERIOD (Hrs)				TOTAL FATALITIES	MEAN SURVIVAL
			24	48	72	96		
8	<u>Effluent</u> <u>100%</u>	A	0	0	0	0	0	100%
		B	0	0	0	0		
2	 	A						
		B						
3	 	A						
		B						
4	 	A						
		B						
DATE			6-15	6-16	6-17	6-18		
DETERMINED BY			<u> </u>	<u> </u>	<u> </u>	<u> </u>		

COMMENTS:

**CHRONIC TEST
INITIAL CHEMICAL DATA***

PROJECT No.: TSE 142.32 CLIENT: Onalaska Landfill
 TEST ORGANISM: Ceriodaphnia dubia LAB MEDIA /No.: Culture media / 434.CCL
 SAMPLE No.(s): 434.02A, B, C, 434.01 CONTROL/DILUENT: Black River
 SAMPLE DESCRIPTION: Influent
 TEST START DATE: 6-14-94 TIME: 1145 TEST END DATE: 6-21-94 TIME: 0830
 ANALYST(s): J. Cook, K. Gillis CODE: _____

TREAT NO.	TEST SOLN	PARAMETER	EXPOSURE DAY							COMMENTS
			0	1	2	3	4	5	6	
1	LAB	DO	7.9	8.0	8.0	8.2	7.5	8.0	8.0	
		pH	7.9	7.9	8.0	8.1	8.0	8.0	8.1	
		COND	.22	.22	.22	.22	.23	.23	.23	
2	Black River	DO	8.2	8.0	8.0	8.3	7.9	8.4	8.4	
		pH	8.5	8.5	8.7	8.6	8.4	8.6	8.5	
		COND	.17	.19	.17	.17	.18	.20	.19	
3	3.7%	DO	8.2	8.0	8.0	8.3	7.9	8.4	8.4	
		pH	8.5	8.5	8.7	8.5	8.4	8.5	8.5	
		COND	.18	.20	.19	.19	.19	.19	.20	
4	5%	DO	8.1	8.0	8.0	8.3	8.0	8.4	8.4	
		pH	8.5	8.5	8.7	8.5	8.3	8.4	8.4	
		COND	.19	.20	.20	.20	.20	.20	.20	
5	10%	DO	8.1	8.0	8.0	8.3	8.4	8.4	8.4	
		pH	8.4	8.4	8.6	8.5	8.4	8.4	8.4	
		COND	.22	.21	.22	.22	.22	.22	.22	
6	20%	DO	8.1	8.0	8.0	8.3	8.5	8.4	8.4	
		pH	8.3	8.2	8.5	8.4	8.3	8.3	8.4	
		COND	.26	.27	.27	.26	.27	.27	.27	
7	40%	DO	8.1	8.0	8.1	8.3	8.4	8.4	8.4	
		pH	8.3	8.2	8.5	8.4	8.3	8.3	8.4	
		COND	.36	.37	.36	.36	.35	.36	.36	
DATE			6-14	6-15	6-16	6-17	6-18	6-19	6-20	
SAMPLE No.			434.02	434.02A	434.02B	434.02B	434.02C	434.02C	434.02C	
DETERMINED BY			JC	JG	JG	JG	JG	JG	JG	

*DO = DISSOLVED OXYGEN (mg/L) COND = CONDUCTIVITY (mmho)

CHRONIC TEST CHEMICAL DATA*
(1-4 TREATMENTS)

PROJECT No.: TSE 142.32 CLIENT: Onalaska Landfill
 TEST ORGANISM: Carlodephnia dubia LAB MEDIA (No.): Culture media, 434.CC
 SAMPLE No.(s): 434.02A,B,C, 434.03A,B,C CONTROL/DILUENT: Black River
 SAMPLE DESCRIPTION: Influent, Effluent
 TEST START DATE: 6-14-94 TIME: 1145 TEST END DATE: 6-21-94 TIME: 0830
 ANALYST(s): J. Cook, K. Gillis CODE: _____

INITIAL CHEMICAL MEASUREMENT

TREAT. NO.	TEST SOLN	PARAMETER	EXPOSURE DAY							COMMENTS
			0	1	2	3	4	5	6	
8	80%	DO	8.0	8.0	8.0	8.3	8.3	8.4	8.4	
		pH	8.3	8.2	8.4	8.3	8.2	8.3	8.3	
		COND	.53	.54	.53	.54	.55	.54	.52	
9	Effluent 3.7%	DO	8.1	8.0	8.6	8.2	8.0	8.4	8.4	
		pH	8.4	8.4	8.7	8.5	8.3	8.4	8.5	
		COND	.21	.20	.22	.21	.25	.23	.23	
3	X	DO								
		pH								
		COND								
4	X	DO								
		pH								
		COND								
DATE			6-14	6-15	6-16	6-17	6-18	6-19	6-20	
SAMPLE No.			434.02A	434.02A	434.02B	434.02B	434.02C	434.02C	434.02C	
DETERMINED BY			<i>JK</i>	<i>JK</i>	<i>JK</i>	<i>JK</i>	<i>JK</i>	<i>JK</i>	<i>JK</i>	

FINAL CHEMICAL MEASUREMENT

TREAT. NO.	TEST SOLN	PARAMETER	EXPOSURE DAY							COMMENTS
			1	2	3	4	5	6	7	
8	80%	DO	7.5	8.7	8.5	7.8	8.0	8.1	8.0	
		pH	8.6	8.6	8.4	8.4	8.5	8.5	8.4	
9	Effluent 3.7%	DO	7.5	8.7	8.5	7.9	7.9	8.1	8.0	
		pH	8.4	8.6	8.4	8.4	8.3	8.4	8.3	
3	X	DO								
		pH								
4	X	DO								
		pH								
DATE			6-15	6-16	6-17	6-18	6-19	6-20	6-21	
DETERMINED BY			<i>JK</i>	<i>JK</i>	<i>JK</i>	<i>JK</i>	<i>JK</i>	<i>JK</i>	<i>JK</i>	

*DO = Dissolved Oxygen (mg/L) COND = Conductivity (mmho)

**CHRONIC TEST
FINAL CHEMICAL DATA***

PROJECT No.: TSE 142.32 CLIENT: Onalaska Landfill
 TEST ORGANISM: Ceriodaphnia dubia LAB MEDIA /No.: Culture media /434.CCL
 SAMPLE No.(s): 434.02A,B,C ; 434.01 CONTROL/DILUENT: Black River
 SAMPLE DESCRIPTION: Influent
 TEST START DATE: 6-14-94 TIME: 1145 TEST END DATE: 6-21-94 TIME: 0830
 ANALYST(s): J. Cooke CODE: _____

TREAT. NO.	TEST SOLN	PARA-METER	EXPOSURE DAY						
			1	2	3	4	5	6	7
1	LAB	DO	7.8	8.0	8.2	7.9	8.0	8.0	8.1
		pH	8.3	8.4	8.1	8.1	8.2	8.2	8.1
2	Black River	DO	8.0	8.4	8.4	8.1	8.0	8.1	8.1
		pH	8.6	8.7	8.3	8.2	8.1	8.2	8.2
3	3.7%	DO	8.0	8.7	8.6	8.2	8.1	8.1	8.1
		pH	8.6	8.7	8.3	8.2	8.1	8.0	8.1
4	5%	DO	8.1	8.8	8.7	8.2	8.2	8.1	8.1
		pH	8.6	8.7	8.5	8.2	8.2	8.2	8.1
5	10%	DO	8.1	8.9	8.8	8.2	8.2	8.1	8.1
		pH	8.6	8.7	8.4	8.2	8.3	8.2	8.1
6	20%	DO	8.0	9.1	8.8	8.1	8.1	8.1	8.1
		pH	8.6	8.7	8.4	8.2	8.3	8.3	8.2
7	40%	DO	7.9	9.0	8.8	8.0	8.1	8.2	8.0
		pH	8.6	8.6	8.4	8.4	8.4	8.4	8.3
DATE			6-15	6-16	6-17	6-18	6-19	6-20	6-21
DETERMINED BY			<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>

*DO = Dissolved Oxygen (mg/L) COND = Conductivity (mmho)

COMMENTS:

CHRONIC BIOASSAY REPRODUCTION AND SURVIVAL DATA

PROJECT No.: ISE 142.32 CLIENT: Onalaska Landfill
 TEST ORGANISM: Ceriodaphnia dubia AGE: < 24H LOT No.: 534
 SAMPLE DESCRIPTION: Effluent
 SAMPLE No.(s): 434.01, 434.02 A, B, C
 LAB MEDIA/No. Culture media / 434.02L CONTROL/DILUENT: Black River
 TEST START DATE: 6-14-94 TIME: 1145 TEST END DATE: 6-21-94 TIME: 0830
 ANALYST(s): J. Cooke CODE: _____ PAGE 1 OF 5

TREAT. NO.	TEST SOLN	DAY	OFFSPRING PER REPLICATE										COMMENTS		
			1	2	3	4	5	6	7	8	9	10			
1	LAB	1	OK												
		2	G	OK	G	G	OK	OK	G	OK					
		3	E	G	E		G		E	G					
		4	5	6	5	4	4	6	4	5	4	5			
		5	E			8	E		8	8	E				
		6	10	10	10	E	8	10	E	11	8	9			
		7	16	14	10	14	10	13	10	E	13	15			
												SUMMARY			
												TOTAL	MEAN		
NO. of YOUNG			31	30	25	26	22	29	22	24	25	29	263	26.3	
NO. of BROODS			3	3	3	3	3	3	3	3	3	30	3		
ADULT FATALITIES			0	0	0	0	0	0	0	0	0	0	% SURVIVAL	100	
2	Black River	1	OK												
		2	OK	AD	G			OK	OK	G	OK	AD			
		3	OK		E			G	G	E	G				
		4	4		5	5	6	5	4	4	5				
		5	E		14	10/AD	10	E	8	9	11				
		6	6		E		E	13	E						
		7	10		15		14	15	12	13	17				
												SUMMARY			
												TOTAL	MEAN		
NO. of YOUNG			20	0	34	15	30	33	24	26	33	0	215	21.5	
NO. of BROODS			3	0	3	2	3	3	3	2	3	0	23	2.3	
ADULT FATALITIES			0	1	0	1	0	0	0	0	0	1	3	% SURVIVAL	70
EXPOSURE DAY		0	1	2	3	4	5	6	7						
DATE		6-14	6-15	6-16	6-17	6-18	6-19	6-20	6-21						
DETERMINED / FED BY		<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>						

G = GRAVID E = EYED R = RELEASING YOUNG AD = ADULT DEAD YD = YOUNG DEAD

CHRONIC BIOASSAY REPRODUCTION AND SURVIVAL DATA

PROJECT No.: TSE 142.32 CLIENT: Onalaska Landfill
 TEST ORGANISM: Ceriodaphnia dubia AGE: <24H LOT No.: 534
 SAMPLE DESCRIPTION: Influent
 SAMPLE No.(s): 434-02A,B,C
 LAB MEDIA/No.: Culture media / 434.CC CONTROL/DILUENT: Black River
 TEST START DATE: 6-14-94 TIME: 1145 TEST END DATE: 6-21-94 TIME: 0836
 ANALYST(s): J. Cooke CODE: _____ PAGE 2 OF 5

TREAT. NO.	TEST SOLN	DAY	OFFSPRING PER REPLICATE										COMMENTS	
			1	2	3	4	5	6	7	8	9	10		
3	3.7%	1	OK											
		2	G							OK	OK	G	G	
		3	E							OK	G	E		
		4	4	4	4	5	4	4	AD	5	5	5		
		5	8	8	10	10	9	10	1	10	9	6		
		6	E					12	E		E			
		7	13	16	17	17	G/E	8		8	16	13		
												SUMMARY		
												TOTAL	MEAN	
NO. of YOUNG			25	28	31	32	25	22	0	23	30	24	240	24.0
NO. of BROODS			3	3	3	3	3	3	0	3	3	3	27	2.7
ADULT FATALITIES			0	0	0	0	0	0	1	0	0	0	1	% SURVIVAL 90
4	5%	1	OK											
		2	G						AD	G	OK	AD	G	
		3	E	E	OK	G	G			E	G		E	
		4	6	5	4	4	4			3	3		5	
		5	8	11	7	6	8			9	E		10	
		6	E							E	9		E	
		7	12	13	13	6	14			17	11		14	
												SUMMARY		
												TOTAL	MEAN	
NO. of YOUNG			26	29	24	16	26	0	29	23	0	29	202	20.2
NO. of BROODS			3	3	3	3	3	0	3	3	0	3	24	2.4
ADULT FATALITIES			0	0	0	0	0	1	0	0	1	0	2	% SURVIVAL 80
EXPOSURE DAY			0	1	2	3	4	5	6	7				
DATE			6-14	6-15	6-16	6-17	6-18	6-19	6-20	6-21				
DETERMINED / FED BY			J	J	J	J	J	J	J	J	J			

G - GRAVID E - EYED R - RELEASING YOUNG AD - ADULT DEAD YD - YOUNG DEAD

CHRONIC BIOASSAY REPRODUCTION AND SURVIVAL DATA

PROJECT No.: BE 142.32 CLIENT: Onalaska Landfill
 TEST ORGANISM: Ceriodaphnia dubia AGE: <244 LOT No.: 534
 SAMPLE DESCRIPTION: Influent
 SAMPLE No.(s): 434.02A, B, C
 LAB MEDIA/No.: Culture media / 434.CC1 CONTROL/DILUENT: Black River
 TEST START DATE: 6-14-94 TIME: 1145 TEST END DATE: 6-21-94 TIME: 0830
 ANALYST(s): J. Cooke CODE: _____ PAGE 3 OF 5

TREAT. NO.	TEST SOLN	DAY	OFFSPRING PER REPLICATE										COMMENTS		
			1	2	3	4	5	6	7	8	9	10			
5	10%	1	OK												
		2	G				AD	G							
		3	E						E						
		4	5	5	6	6		5	3	5	5	4			
		5	8	10	10	12		12	9	13	12	10			
		6	E	12	E	E		E							
		7	16	E	16	19		15	11	15	17	14			
												SUMMARY			
												TOTAL	MEAN		
NO. of YOUNG			29	27	32	37	0	32	23	33	34	28	275	27.5	
NO. of BROODS			3	3	3	3	0	3	3	3	3	3	27	2.7	
ADULT FATALITIES			0	0	0	0	1	0	0	0	0	0	1	% SURVIVAL 90	
6	20%	1	OK												
		2	OK	G	G	OK	OK	G	OK						
		3	G	2	E	G	G	E	G						
		4	5	G	4	AD	5	5	E	4	5	5			
		5	E	9	9		E	6	4	12	E	11			
		6	13	14	E		10	E	7	G	12	E			
		7	15	E	11		14	15	12	16	20	14			
												SUMMARY			
												TOTAL	MEAN		
NO. of YOUNG			33	25	24	0	29	26	23	32	37	30	259	25.9	
NO. of BROODS			3	3	3	0	3	3	3	3	3	3	27	2.7	
ADULT FATALITIES			0	0	0	1	0	0	0	0	0	0	1	% SURVIVAL 90	
EXPOSURE DAY		0	1	2	3	4	5	6	7						
DATE		6-14	6-15	6-16	6-17	6-18	6-19	6-20	6-21						
DETERMINED / FED BY		<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>						

G = GRAVID E = EYED R = RELEASING YOUNG AD = ADULT DEAD YD = YOUNG DEAD

CHRONIC BIOASSAY REPRODUCTION AND SURVIVAL DATA

PROJECT No.: ISE 142.32 CLIENT: Alaska Landfish
 TEST ORGANISM: Ceriodaphnia dubia AGE: < 24H LOT No.: 534
 SAMPLE DESCRIPTION: Influent
 SAMPLE No.(s): 434.02A,B,C
 LAB MEDIA/No.: Culture media / 434.ccl CONTROL/DILUENT: Black River
 TEST START DATE: 6-14-94 TIME: 1145 TEST END DATE: 6-21-94 TIME: 0830
 ANALYST(S): J. Cooke CODE: _____ PAGE 4 OF 5

TREAT. NO.	TEST SOLN	DAY	OFFSPRING PER REPLICATE										COMMENTS	
			1	2	3	4	5	6	7	8	9	10		
7	40%	1	OK											Stressed
		2	OK	G	G	OK				G				
		3	G	E	E	G		AD	OK ^s	E				
		4	G	3	4	4	5			G	4	4	4	
		5	5	6	8	6	11			3	6	9	5	
		6	8	G	E					E				
		7	8	11	11	13	18			6	16	14	11	
												SUMMARY		
												TOTAL	MEAN	
NO. of YOUNG												203	20.3	
NO. of BROODS												26	2.6	
ADULT FATALITIES												1	% SURVIVAL 90	
8	80%	1	OK											
		2	OK	G	OK	OK	G	OK						
		3	OG	E	G		E	G			OK	G		
		4	5	3	4	4	3	E		4	G	6		
		5	E	8	E	E	8	8	5	5	4	E		
		6	7	E	8	7	E	6	7	E	4	10		
		7	16	18	9	12	10	8	7	11	G/E	15		
												SUMMARY		
												TOTAL	MEAN	
NO. of YOUNG												222	22.2	
NO. of BROODS												29	2.9	
ADULT FATALITIES												0	% SURVIVAL 100	
EXPOSURE DAY		0	1	2	3	4	5	6	7					
DATE		6-14	6-15	6-16	6-17	6-18	6-19	6-20	6-21					
DETERMINED / FED BY		JC	JC	JC	JC	JC	JC	JC	JC					

G = GRAVID E = EYED R = RELEASING YOUNG AD = ADULT DEAD YD = YOUNG DEAD

CHROMIUM CASADY REPRODUCTION AND SURVIVAL DATA

PROJECT No.: TSE 14232 CLIENT: Onalaska Landfill
 TEST ORGANISM: Coridophila dubia AGE: L20H LOT No.: 534
 SAMPLE DESCRIPTION: Effluent
 SAMPLE No.(s): 434.03A,B,C
 LAB MEDIA/No.: Culture media 434-CCL CONTROL/DILUENT: Black River
 TEST START DATE: 6-14-94 TIME: 1145 TEST END DATE: 6-21-94 TIME: 0830
 ANALYST(s): J. Cooke CODE: _____ PAGE 5 OF 5

TREAT. NO.	TEST SOLN	DAY	OFFSPRING PER REPLICATE										COMMENTS		
			1	2	3	4	5	6	7	8	9	10			
9	Effluent 3.7%	1	OK												
		2	OK												
		3	G	E	G	E	E	G				JK	G		
		4	5	4	4	4	2	4	5	5	4	4			
		5	E	E	E	9	8	E	E						
		6	10	13	10	E	E	10	13	10	8	9			
		7	15	16	15	14	12	15	18	17	16	11			

												SUMMARY		
												TOTAL	MEAN	
NO. of YOUNG			30	33	29	27	22	29	36	32	28	24	290	29.0
NO. of BROODS			3	3	3	3	3	3	3	3	3	3	30	3
ADULT FATALITIES			0	0	0	0	0	0	0	0	0	0	0	% SURVIVAL 100

TREAT. NO.	TEST SOLN	DAY	OFFSPRING PER REPLICATE										COMMENTS		
			1	2	3	4	5	6	7	8	9	10			
		1	OK												
		2	OK				G	G	OK						
		3	G				E	E	G					G	
		4													
		5													
		6													
		7													

												SUMMARY		
												TOTAL	MEAN	
NO. of YOUNG														
NO. of BROODS														
ADULT FATALITIES														% SURVIVAL

EXPOSURE DAY	0	1	2	3	4	5	6	7
DATE	6-14	6-15	6-16	6-17	6-18	6-19	6-20	6-21
DETERMINED / FED BY	J	J	J	J	J	J	J	J

G = GRAVID E = EYED R = RELEASING YOUNG AD = ADULT DEAD YD = YOUNG DEAD

Inhibition Concentration
Calculation
(ICx)

CH2M Hill
July 1991

Client: ONALASKA LANDFILL
Project Number: TSE142.32
Test Solution: INFLUENT
Test Date: 6/14/94
Test Organism: CERIODAPHNIA DUBIA
Response Measured: REPRODUCTION

Concentration (%)	Mean Response	Smoothed Mean Response
Control	21.500	23.820
3.70	24.000	23.820
5.00	20.200	23.820
10.00	27.500	23.820
20.00	25.900	23.820
40.00	20.300	21.250
80.00	22.200	21.250

Linear Interpolation Estimate > 80.00 IC25 (%) Toxic Units

CHRONIC TEST INITIAL CHEMICAL DATA *

PROJECT No.: TSE 142.32 CLIENT: Onalaska Landfill
 TEST ORGANISM: Fathead minnow LAB MEDIA /No.: Culture media/434.CE
 SAMPLE No.(s): 434.02A,B,C ; 434.01 CONTROL/DILUENT: Black River
 SAMPLE DESCRIPTION: Influent
 TEST START DATE: 6-14-94 TIME: 1200 TEST END DATE: 6-21-94 TIME: 1000
 ANALYST(s): J. Coogle & Gillis CODE: Red

TREAT. NO.	TEST SOLN	PARAMETER	EXPOSURE DAY						COMMENTS	
			0	1	2	3	4	5		6
1	LAB	DO	7.7	7.8	7.9	8.1	7.3	7.9	7.9	
		pH	7.8	7.8	8.0	8.1	8.1	8.0	8.1	
		COND	.21	.21	.22	.21	.21	.21	.21	
2	Black River	DO	8.2	8.0	8.0	8.3	7.9	8.4	8.4	
		pH	8.5	8.5	8.7	8.6	8.4	8.6	8.5	
		COND	.17	.19	.17	.17	.18	.20	.19	
3	3.7%	DO	8.2	8.0	8.0	8.3	7.9	8.4	8.4	
		pH	8.5	8.5	8.7	8.5	8.4	8.5	8.5	
		COND	.18	.20	.19	.19	.19	.19	.20	
4	5%	DO	8.1	8.0	8.0	8.3	8.0	8.4	8.4	
		pH	8.5	8.5	8.7	8.5	8.3	8.4	8.4	
		COND	.19	.20	.20	.20	.20	.20	.20	
5	10%	DO	8.1	8.0	8.0	8.3	8.4	8.4	8.4	
		pH	8.4	8.4	8.6	8.5	8.4	8.4	8.4	
		COND	.22	.21	.22	.22	.22	.22	.22	
6	20%	DO	8.1	8.0	8.0	8.3	8.5	8.4	8.4	
		pH	8.3	8.2	8.5	8.4	8.3	8.3	8.4	
		COND	.26	.27	.27	.26	.27	.27	.27	
7	40%	DO	8.1	8.0	8.1	8.3	8.4	8.4	8.4	
		pH	8.3	8.2	8.5	8.4	8.3	8.3	8.4	
		COND	.36	.37	.36	.36	.35	.36	.36	
DATE			6-14	6-15	6-16	6-17	6-18	6-19	6-20	
SAMPLE NO.			434.02A	434.02A	434.02B	434.02B	434.02C	434.02C	434.02C	
DETERMINED BY			JC	JG	JG	JG	JG	JG	JG	

*DO = DISSOLVED OXYGEN (mg/L)

COND = CONDUCTIVITY (mmho)

CHRONIC TEST CHEMICAL DATA*
(1-4 TREATMENTS)

PROJECT No.: TSE 142.32 CLIENT: Onalaska Landfill
 TEST ORGANISM: Fathead minnow LAB MEDIA No.: Cultura med. #/434.CFL
 SAMPLE No.(s): 434.02A,B,C - 434.03A,B,C CONTROL/DILUENT: Black River
 SAMPLE DESCRIPTION: Influent
 TEST START DATE: 6-14-94 TIME: 1200 TEST END DATE: 6-21-94 TIME: 1000
 ANALYST(s): J. Cooche, K. Gillis CODE: _____

INITIAL CHEMICAL MEASUREMENT

TREAT. NO.	TEST SOLN	PARAMETER	EXPOSURE DAY						COMMENTS	
			0	1	2	3	4	5		6
8	80%	DO	8.0	8.0	8.0	8.3	8.3	8.4	8.4	
		pH	8.3	8.2	8.4	8.3	8.2	8.3	8.3	
		COND	.53	.54	.53	.54	.55	.54	.52	
9	Effluent 3.7%	DO	8.1	8.0	8.0	8.2	8.0	8.4	8.4	
		pH	8.4	8.4	8.7	8.5	8.3	8.4	8.5	
		COND	.21	.20	.22	.21	.25	.23	.23	
3	X	DO								
		pH								
		COND								
4	X	DO								
		pH								
		COND								
DATE			6-14	6-15	6-16	6-17	6-18	6-19	6-20	
SAMPLE No.			.02A .03A	.02A .03A	.02B .03B	.02B .03B	.02C .03C	.02C .03C	.02C .03C	
DETERMINED BY			<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	

FINAL CHEMICAL MEASUREMENT

TREAT. NO.	TEST SOLN	PARAMETER	EXPOSURE DAY						COMMENTS	
			1	2	3	4	5	6		7
8	80%	DO	7.4	7.4	7.6	7.6	7.5	7.7	7.8	
		pH	8.4	8.4	8.3	8.3	8.4	8.3	8.3	
9	Effluent 3.7%	DO	7.8	8.0	8.0	7.6	7.8	7.9	8.0	
		pH	8.4	8.4	8.2	8.2	8.3	8.4	8.4	
3	X	DO								
		pH								
4	X	DO								
		pH								
DATE			6-15	6-16	6-17	6-18	6-19	6-20	6-21	
DETERMINED BY			<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	

*DO = Dissolved Oxygen (mg/L) COND = Conductivity (mmho)

CHRONIC TEST FINAL CHEMICAL DATA*

PROJECT No.: BE 142.32 CLIENT: Alaska Landfill
 TEST ORGANISM: Fathead minnow LAB MEDIA /No.: Culture media/434 CFL
 SAMPLE No.(s): 434.02A,B,C, 434.01 CONTROL/DILUENT: Black River
 SAMPLE DESCRIPTION: Influent
 TEST START DATE: 6-14-94 TIME: 1200 TEST END DATE: 6-21-94 TIME: 1000
 ANALYST(s): J. Cooke CODE: _____

TREAT. NO.	TEST SOLN	PARA-METER	EXPOSURE DAY						
			1	2	3	4	5	6	7
1	LAB	DO	7.6	7.2	7.2	7.6	7.5	7.5	7.6
		pH	8.0	7.9	7.9	8.0	8.0	8.1	8.0
2	Black River	DO	7.9	8.1	8.0	7.9	7.9	8.1	8.0
		pH	8.3	8.5	8.2	8.0	8.3	8.4	8.3
3	3.7%	DO	8.0	8.6	8.0	8.0	8.1	8.3	8.1
		pH	8.4	8.6	8.2	8.1	8.3	8.4	8.3
4	5%	DO	8.1	8.2	8.1	7.9	8.2	8.2	8.2
		pH	8.4	8.5	8.3	8.1	8.3	8.4	8.4
5	10%	DO	8.0	8.2	8.2	7.9	8.1	8.2	8.2
		pH	8.3	8.5	8.1	8.1	8.3	8.3	8.4
6	20%	DO	7.9	8.3	8.1	7.9	8.0	8.1	8.1
		pH	8.3	8.4	8.3	8.2	8.3	8.3	8.3
7	40%	DO	7.7	7.7	8.2	7.7	7.9	7.9	8.0
		pH	8.4	8.3	8.3	8.2	8.3	8.3	8.2
DATE			6-15	6-16	6-17	6-18	6-19	6-20	6-21
DETERMINED BY			<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>	<i>JC</i>

*DO = Dissolved Oxygen (mg/L) COND = Conductivity (mmho)

COMMENTS:

CHRONIC BIOASSAY SURVIVAL DATA

PROJECT No.: TSE 14232 CLIENT: Onalaska Landfill
 TEST ORGANISM: Fathead minnows AGE: 224H LOT No.: 1429-1430
 SAMPLE DESCRIPTION: Influent
 SAMPLE No. (s): 434.02A, B, C 434.01
 LAB MEDIA/No.: Culture media 1434.CFL CONTROL/DILUENT: Black River
 TEST START DATE: 6-14-94 TIME: 1200 TEST END DATE: 6-21-94 TIME: 1000
 ANALYST(S): J. Cooke CODE: _____

TREAT NO.	TEST SOLUTION	REP	NUMBER OF FATALITIES PER DAY							TOTAL NUMBER		% SURVIVAL	MEAN SURVIVAL	COMMENTS
			1	2	3	4	5	6	7	SURVIVORS	FATALITIES			
1	LAB	A	0	0	0	0	0	0	0	10	0	100	100%	Stringy type growth on the btm. of all test Chambers containing Black River water. More prevalent in lower conc.
		B	0	0	0	0	0	0	0	10	0	↓		
		C	0	0	0	0	0	0	0	10	0	↓		
		D	0	0	0	0	0	0	0	10	0	↓		
2	Black River	A	0	0	0	1	0	2	1	6	4	60	80%	
		B	0	0	2	0	0	1	0	7	3	70		
		C	0	0	0	0	0	0	0	10	0	100		
		D	0	0	1	0	0	0	0	9	1	90		
3	3.7%	A	0	0	0	1	3	0	0	6	4	60	67.5%	
		B	0	0	0	1	2	0	0	7	3	70		
		C	0	0	0	2	1	0	0	7	3	70		
		D	0	0	2	1	0	0	0	7	3	70		
4	5%	A	0	0	0	1	0	0	0	9	1	90	72.5%	
		B	0	0	1	1	2	0	0	6	4	60		
		C	0	0	0	2	2	2	0	4	6	40		
		D	0	0	0	0	0	0	0	10	0	100		
5	10%	A	0	0	0	0	0	0	0	10	0	100	92.5%	
		B	0	0	0	0	1	0	0	9	1	90		
		C	0	0	0	0	1	0	0	9	1	90		
		D	0	0	0	0	1	0	0	9	1	90		
6	20%	A	0	0	0	0	0	0	0	10	0	100	100%	
		B	0	0	0	0	0	0	0	10	0	↓		
		C	0	0	0	0	0	0	0	10	0	↓		
		D	0	0	0	0	0	0	0	10	0	↓		
7	40%	A	0	0	0	0	0	0	0	10	0	100	100%	
		B	0	0	0	0	0	0	0	10	0	↓		
		C	0	0	0	0	0	0	0	10	0	↓		
		D	0	0	0	0	0	0	0	10	0	↓		

DATE	6-15	6-16	6-17	6-18	6-19	6-20	6-21
DETERMINED BY	JC	JC	JC	JC	JC	JC	JC
FEEDING	AM						
	PM						

mt

SURVIVAL DATA

Analaska smolt

AGE: <24H LOT No.: 1429-1430

LAB No. 434.03A, B, C
 TEST START DATE: 6-14-94 TIME: 1200
 ANALYST(S): J. Cooke

CONTROL/DILUENT: Black River
 TEST END DATE: 6-21-94 TIME: 1000
 CODE:

TREAT. NO.	TEST SOLUTION	REP	NUMBER OF FATALITIES PER DAY							TOTAL NUMBER		% SURVIVAL	MEAN SURVIVAL	COMMENTS
			1	2	3	4	5	6	7	SURVIVORS	FATALITIES			
8	80%	A	0	0	0	0	0	1	0	9	1	90	97.5%	
		B	0	0	0	0	0	0	0	10	0	100		
		C	0	0	0	0	0	0	0	10	0	100		
		D	0	0	0	0	0	0	0	10	0	100		
9	Effluent 3.7%	A	0	0	0	0	0	0	0	10	0	100	97.5%	
		B	0	0	0	0	0	0	0	10	0	100		
		C	0	0	0	0	1	0	0	9	1	90		
		D	0	0	0	0	0	0	0	10	0	100		
3	X	A												
		B												
		C												
		D												
4	X	A												
		B												
		C												
		D												
5	X	A												
		B												
		C												
		D												
6	X	A												
		B												
		C												
		D												
		A												
		B												
		C												
		D												

DATE	6-15	6-16	6-17	6-18	6-19	6-20	6-21
DETERMINED BY	JL	JL	JL	JL	JL	JL	JL
FEEDING	AM	JL	JL	JL	JL	JL	JL
	PM	JL	JL	JL	JL	JL	JL

Revised 11/92

UN4

CHRONIC BIOASSAY GROWTH DATA

PROJECT No.: TSE 142.32 CLIENT: Onalaska Landfill
 TEST ORGANISM: Fathead Minnow AGE: 424h LOT No.: 1429-1430
 SAMPLE DESCRIPTION: Influent (to GAC)
 SAMPLE No.(s): 434.01, 434.02A, B, C
 LAB MEDIA/No.: 434 3FL (culture media) CONTROL/DILUENT: Black River
 TEST START DATE: 6-14-94 TIME: 1200 TEST END DATE: 6-21-94 TIME: 1000
 ANALYST(s): J. Stark CODE: _____

TEST SOLN	TREAT REP	TARE (mg)	TARE + DRY WT (mg)	TOTAL WT (mg)	Signif. Difference Test		IC25 Test	
					No. Surv.	Organism Wt.	No. Exposed	Organism Wt.
Lab	1A	1123.87	1127.27	3.40			10	0.340
	1B	1101.34	1105.90	4.56			↓	0.456
	1C	1104.74	1109.97	5.23			↓	0.523
	1D	1101.78	1106.68	4.90			↓	0.490
Black River	2A	1088.24	1090.29	2.05			10	0.205
	2B	1099.98	1102.59	2.61			↓	0.261
	2C	1098.05	1102.78	4.73			↓	0.473
	2D	1126.80	1130.00	3.20			↓	0.320
3.7%	3A	1125.83	1127.29	1.46			10	0.146
	3B	1113.16	1116.19	3.03			↓	0.303
	3C	1101.74	1105.37	3.58			↓	0.358
	3D	1116.65	1120.52	3.87			↓	0.387
5%	4A	1097.64	1100.50	2.86			10	0.286
	4B	1094.21	1096.36	2.15			↓	0.215
	4C	1127.64	1129.37	1.73			↓	0.173
	4D	1116.94	1121.65	4.71			↓	0.471
10%	5A	1085.29	1089.50	4.21			10	0.421
	5B	1108.55	1112.44	3.89			↓	0.389
	5C	1121.09	1125.17	4.08			↓	0.408
	5D	1099.27	1103.33	4.06			↓	0.406
20%	6A	1116.72	1121.10	4.38			10	0.438
	6B	1100.76	1104.42	3.66			↓	0.366
	6C	1118.26	1122.32	4.06			↓	0.406
	6D	1111.83	1116.39	4.56			↓	0.456
40%	7A	1131.46	1136.32	4.86			10	0.486
	7B	1094.96	1099.26	4.30			↓	0.430
	7C	1089.31	1093.75	4.44			↓	0.444
	7D	1130.870	1135.23	4.53			↓	0.453

COMMENTS: (S)

Mean 1 =	Mean 1 = 0.452
Mean 2 =	Mean 2 = 0.315
Mean 3 =	Mean 3 = 0.299
Mean 4 =	Mean 4 = 0.286
Mean 5 =	Mean 5 = 0.406
Mean 6 =	Mean 6 = 0.417
Mean 7 =	Mean 7 = 0.453

CHRONIC BIOASSAY GROWTH DATA

PROJECT No.: TSE 142.32 CLIENT: Onalaska Landfill
 TEST ORGANISM: Forthogad Minnow AGE: 424h LOT No.: 1420-1430
 SAMPLE DESCRIPTION: Influent + Effluent
 SAMPLE No.(s): 42402A,B,C; 42402A,B
 LAB MEDIA/No.: Culture 1424 CFL CONTROL/DILUENT: Black River
 TEST START DATE: 6-14-94 TIME: 1200 TEST END DATE: 6-21-94 TIME: 1000
 ANALYST(s): J. Stark CODE: _____

TEST SOLN	TREAT REP	TARE (mg)	TARE + DRY WT (mg)	TOTAL WT (mg)	Signif. Difference Test		IC25 Test	
					No. Surv.	Organism Wt.	No. Exposed	Organism Wt.
80%	81A	1125.41	1129.07	3.66			10	0.366
	81B	1113.31	1117.06	3.75			↓	0.375
	81C	1084.98	1088.79	3.81			↓	0.381
	81D	1125.81	1129.87	4.06			↓	0.406
3.7% Effluent	92A	1107.92	1112.40	4.48			10	0.448
	92B	1103.03	1106.93	3.90			↓	0.390
	92C	1091.45	1095.35	3.90			↓	0.390
	92D	1131.54	1136.42	4.88			↓	0.488
	3A							
	3B							
	3C							
	3D							
	4A							
	4B							
	4C							
	4D							
	5A							
	5B							
	5C							
	5D							
	6A							
	6B							
	6C							
	6D							
	7A							
	7B							
	7C							
	7D							

COMMENTS:

Mean 1 =	Mean 1 = 8 0.382
Mean 2 =	Mean 2 = 9 0.429
Mean 3 =	Mean 3 =
Mean 4 =	Mean 4 =
Mean 5 =	Mean 5 =
Mean 6 =	Mean 6 =
Mean 7 =	Mean 7 =

Inhibition Concentration
Calculation
(ICx)

CH2M Hill
July 1991

Client: ONALASKA LANDFILL
Project Number: TSE142.32
Test Solution: INFLUENT
Test Date: 6/14/94
Test Organism: FATHEAD MINNOW
Response Measured: GROWTH (mg)

Concentration (%)	Mean Response	Smoothed Mean Response
Control	0.315	0.365
3.70	0.299	0.365
5.00	0.286	0.365
10.00	0.406	0.365
20.00	0.417	0.365
40.00	0.453	0.365
80.00	0.382	0.365

Linear Interpolation Estimate > 80.00 IC25 (%) Toxic Units

BIOASSAY SAMPLE RECEIPT CHARACTERIZATION

CLIENT Onaleska Landfill PROJECT NO. TSE 142.32

DATE RECVD	SAMPLE NO. DESCRIPTION	TEMP (C)	DO (mg/L)	pH	COND (mmho)	INITIALS
6-13-94	434.01 Black River	20°	10.6	8.7	.14	QC

FILTER DECHLORINATE USE: IMMEDIATE STORE (4 C)
 ALIQUOTS HOMOGENIZED CONTAINER TYPE (G/P) P ODOR
 APPEARANCE: CLEAR CLOUDY SOLIDS COLOR Golden
 COMMENTS

DATE RECVD	SAMPLE NO. DESCRIPTION	TEMP (C)	DO (mg/L)	pH	COND (mmho)	INITIALS
6-13-94	434.02A Influent	4°	11.2	8.2	.51	QC

FILTER DECHLORINATE USE: IMMEDIATE STORE (4 C)
 ALIQUOTS HOMOGENIZED CONTAINER TYPE (G/P) P ODOR
 APPEARANCE: CLEAR CLOUDY SOLIDS COLOR light Yellow
 COMMENTS

DATE RECVD	SAMPLE NO. DESCRIPTION	TEMP (C)	DO (mg/L)	pH	COND (mmho)	INITIALS
6-13-94	434.03A Effluent	4°	7.7	8.0	.57	QC

FILTER DECHLORINATE USE: IMMEDIATE STORE (4 C)
 ALIQUOTS HOMOGENIZED CONTAINER TYPE (G/P) P ODOR
 APPEARANCE: CLEAR CLOUDY SOLIDS COLOR
 COMMENTS

DATE RECVD	SAMPLE NO. DESCRIPTION	TEMP (C)	DO (mg/L)	pH	COND (mmho)	INITIALS
6-15-94	434.02B Influent	6°	11.4	8.3	.57	QC

FILTER DECHLORINATE USE: IMMEDIATE STORE (4 C)
 ALIQUOTS HOMOGENIZED CONTAINER TYPE (G/P) P ODOR
 APPEARANCE: CLEAR CLOUDY SOLIDS COLOR Light Yellow
 COMMENTS

BIOASSAY SAMPLE RECEIPT CHARACTERIZATION

CLIENT Onalaska Landfill PROJECT NO. TS6 14232

DATE RECVD	SAMPLE NO. DESCRIPTION	TEMP (C)	DO (mg/L)	pH	COND (mmho)	INITIALS
6-15-94	434.03B Effluent	16°	7.9	8.2	.54	JK
FILTER <input checked="" type="checkbox"/> DECHLORINATE _____ USE: IMMEDIATE _____ STORE (4 C) <input checked="" type="checkbox"/> ALIQUOTS HOMOGENIZED <input checked="" type="checkbox"/> CONTAINER TYPE (G/P) <u>P</u> ODOR _____ APPEARANCE : CLEAR <input checked="" type="checkbox"/> CLOUDY _____ SOLIDS _____ COLOR _____ COMMENTS						
DATE RECVD	SAMPLE NO. DESCRIPTION	TEMP (C)	DO (mg/L)	pH	COND (mmho)	INITIALS
6-17-94	434.02C Influent	5°	12.3	8.2	.49	JK
FILTER <input checked="" type="checkbox"/> DECHLORINATE _____ USE: IMMEDIATE _____ STORE (4 C) <input checked="" type="checkbox"/> ALIQUOTS HOMOGENIZED _____ CONTAINER TYPE (G/P) <u>P</u> ODOR _____ APPEARANCE : CLEAR <input checked="" type="checkbox"/> CLOUDY _____ SOLIDS _____ COLOR <u>light yellow</u> COMMENTS						
DATE RECVD	SAMPLE NO. DESCRIPTION	TEMP (C)	DO (mg/L)	pH	COND (mmho)	INITIALS
6-17-94	434.03C Effluent	5°	9.1	8.0	.51	JK
FILTER <input checked="" type="checkbox"/> DECHLORINATE _____ USE: IMMEDIATE _____ STORE (4 C) <input checked="" type="checkbox"/> ALIQUOTS HOMOGENIZED <input checked="" type="checkbox"/> CONTAINER TYPE (G/P) <u>P</u> ODOR _____ APPEARANCE : CLEAR <input checked="" type="checkbox"/> CLOUDY _____ SOLIDS _____ COLOR _____ COMMENTS						
DATE RECVD	SAMPLE NO. DESCRIPTION	TEMP (C)	DO (mg/L)	pH	COND (mmho)	INITIALS
FILTER _____ DECHLORINATE _____ USE: IMMEDIATE _____ STORE (4 C) _____ ALIQUOTS HOMOGENIZED _____ CONTAINER TYPE (G/P) _____ ODOR _____ APPEARANCE : CLEAR _____ CLOUDY _____ SOLIDS _____ COLOR _____ COMMENTS						

SUPPLEMENTAL CHEMICAL DATA SUMMARY

PROJECT NO. TSE 142.32
 TEST DATE 6-14-94

CLIENT Alaska Land Fill
 SUMMARIZED BY _____

LABORATORY CONTROL	CONTROL I.D.			
	434 ADL	434 AFL	434 CCL	434 CFL
TOTAL ALKALINITY mg/L CaCO ₃	100	98	92	86
HARDNESS mg/L CaCO ₃	105	125	100	95

SAMPLE DESCRIPTION	SAMPLE NO.			
	<i>Black River</i>	434.01		
TOTAL ALKALINITY mg/L CaCO ₃	62			
HARDNESS mg/L CaCO ₃	65			
TOTAL RESIDUAL CHLORINE mg/L	NA			
TOTAL AMMONIA mg/L	0.03			

SAMPLE DESCRIPTION	SAMPLE NO.		
	<i>100% Influent</i>	434.02A	434.02B
TOTAL ALKALINITY mg/L CaCO ₃	250	346	348 (QA)
HARDNESS mg/L CaCO ₃	215	195	205
TOTAL RESIDUAL CHLORINE mg/L	0	0	0
TOTAL AMMONIA mg/L	10	9.6	13

SAMPLE DESCRIPTION	SAMPLE NO.		
	<i>100% Effluent</i>	434.03A	434.03B
TOTAL ALKALINITY mg/L CaCO ₃	396	326	342
HARDNESS mg/L CaCO ₃	215	185	185/185*
TOTAL RESIDUAL CHLORINE mg/L	0	0	0
TOTAL AMMONIA mg/L	11	9.4	12

NA = Not Analyzed
 * = Duplicate for QA

TEST TEMPERATURE SUMMARY

PROJECT No.: TSE 142.32 CLIENT: Onalaska land fill

ACUTE TEST TEMPERATURE

	DATE								
	6-14-94	6-15	6-16	6-18	6-18				
AVG	20.1	20.0	20.2	20.3	20.3				
MAX									
MIN									
SUM. BY:	<i>M.M.</i>	<i>M.M.</i>	<i>M.M.</i>	<i>M.M.</i>	<i>M.M.</i>				

CHRONIC TEST TEMPERATURE

	DATE							
	6-14-94	6-15	6-16	6-17	6-18	6-19	6-20	6-21
AVG	25.6	25.5	25.6	25.4	25.5	25.6	25.5	25.4
MAX								
MIN								
SUM. BY:	<i>M.M.</i>	<i>M.M.</i>	<i>M.M.</i>	<i>M.M.</i>	<i>M.M.</i>	<i>M.M.</i>	<i>M.M.</i>	<i>M.M.</i>

COMMENTS:

APPENDIX B
CHAIN-OF-CUSTODY FORMS



CHAIN OF CUSTODY RECORD FOR NPDES COMPLIANCE BIOMONITORING

Client Name <i>Onalaska Landfill</i>		Client Shipping Address				NPDES Number		
Sample Kit Tracking Information		Method of Shipment (Check One)		Prepared by/Date:		Ship Samples to: CH2M HILL Bioassay Laboratory 15779 W. Ryerson Road New Berlin, WI 53151 Phone: (414) 784-0448 Fax: (414) 784-0353		
No. of Cooler _____ of _____ Total No. of Bottles _____		<input type="checkbox"/> Fed X _____ <input checked="" type="checkbox"/> Pickup _____ <input type="checkbox"/> UPS _____ <input type="checkbox"/> Other _____		Shipped by/Date:				
Composite Sample Information			Description of Sampling Site			Sample Container		
Flow Proportional <input type="checkbox"/> Time Interval <input type="checkbox"/> Samples/Hour _____ Volume/Sample _____ Total Hours _____ Total Volume _____			SAMPLES COLLECTED FROM BLACK RIVER SLIGHTLY UP-STREAM FROM DISCHARGE POINT, AT SHORELINE.			Plastic <input checked="" type="checkbox"/> Glass <input type="checkbox"/> New <input checked="" type="checkbox"/> Used <input type="checkbox"/>		
Initiated: Date _____ Time _____ Ended: Date _____ Time _____			Chilled During Collection Yes <input type="checkbox"/> No <input type="checkbox"/>			Refrigerant Used For Shipping Wet Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> Other <input type="checkbox"/>		
Sample Description			Sample Type		Sample(s) Shipped Via		Bioassays Required	
Date			No. of Containers		UPS <input type="checkbox"/> Fed X <input type="checkbox"/> Other <input type="checkbox"/>		Acute <input checked="" type="checkbox"/> Chronic <input checked="" type="checkbox"/> Other <input type="checkbox"/>	
Time			Volume		Sampled by (Signature)		Comments	
Time			Volume		Sampled by (Signature)		For Lab Use Sample ID No.	
RIVER WATER			5		25 GAL			
Relinquished By and Title (Signature) <i>[Signature]</i>					Date 6-13-94	Condition of Seal Upon Receipt by Lab		
					Time 17:33	<input checked="" type="checkbox"/> Intact <input type="checkbox"/> Other (Describe) _____		
Received By: (Signature)		Date	Relinquished By: (Signature)		Date	Received By Lab: (Signature)		Date 6-13-94
		Time			Time	<i>James Stark</i>		Time 1735



CHAIN OF CUSTODY RECORD FOR NPDES COMPLIANCE BIOMONITORING

Client Name <u>Onalaska Landfill</u>	Client Shipping Address	NPDES Number
---	-------------------------	--------------

Sample Kit Tracking Information	Method of Shipment (Check One)	Prepared by/Date:	Ship Samples to: CH2M HILL Bioassay Laboratory 15779 W. Ryerson Road New Berlin, WI 53151 Phone: (414) 784-0448 Fax: (414) 784-0353
No. of Cooler <u>1</u> of <u>3</u>	<input type="checkbox"/> Fed X <input checked="" type="checkbox"/> Pickup	Shipped by/Date:	
Total No. of Bottles <u>3</u>	<input type="checkbox"/> UPS <input type="checkbox"/> Other		

Composite Sample Information	Description of Sampling Site	Sample Container
Flow Proportional <input type="checkbox"/> Time Interval <input checked="" type="checkbox"/>		Plastic <input checked="" type="checkbox"/> Glass <input type="checkbox"/> New <input checked="" type="checkbox"/> Used <input type="checkbox"/>
Samples/Hour <u>4</u> Volume/Sample _____		Refrigerant Used For Shipping
Total Hours _____ Total Volume _____		Wet Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> Other <input type="checkbox"/>
Initiated: Date <u>6-11-94</u> Time <u>20:50</u>		Sample(s) Shipped Via
Ended: Date <u>6-12-94</u> Time <u>20:50</u> <u>17:50*</u>		UPS <input type="checkbox"/> Fed X <input type="checkbox"/> Other <input type="checkbox"/>
Chilled During Collection Yes <input type="checkbox"/> No <input type="checkbox"/>		Bioassays Required
		Acute <input checked="" type="checkbox"/> Chronic <input checked="" type="checkbox"/> Other <input type="checkbox"/>

Sample Description	Date	Time	Sample Type		No. of Containers	Volume	Sampled by (Signature)	Comments	For Lab Use Sample ID No.
			Comp	Grab					
INFLUENT #1			✓		1			24 HR COMPOSITE	434.02A
EFFLUENT #1			✓		2			20 HR COMPOSITE	434.03A

Relinquished By and Title (Signature) 	Date <u>6-13-94</u>	Condition of Seal Upon Receipt by Lab <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Other (Describe) _____
	Time <u>17:33</u>	
Received By: (Signature)	Date	Received By Lab: (Signature)
Time	Time	Date <u>6-13-94</u>
		Time <u>1735</u>



CHAIN OF CUSTODY RECORD FOR NPDES COMPLIANCE BIOMONITORING

Client Name		Client Shipping Address				NPDES Number			
Sample Kit Tracking Information		Method of Shipment (Check One)		Prepared by/Date:		Ship Samples to: CH2M HILL Bioassay Laboratory 15779 W. Ryerson Road New Berlin, WI 53151 Phone: (414) 784-0448 Fax: (414) 784-0353			
No. of Cooler _____ of _____ Total No. of Bottles _____		<input type="checkbox"/> Fed X <input type="checkbox"/> Pickup <input type="checkbox"/> UPS <input type="checkbox"/> Other		Shipped by/Date:					
Composite Sample Information			Description of Sampling Site			Sample Container			
Flow Proportional <input type="checkbox"/> Time Interval <input checked="" type="checkbox"/> Samples/Hour _____ Volume/Sample <u>75 mL</u> Total Hours _____ Total Volume _____						Plastic <input checked="" type="checkbox"/> Glass <input type="checkbox"/> New <input type="checkbox"/> Used <input type="checkbox"/> Refrigerant Used For Shipping Wet Ice <input checked="" type="checkbox"/> Blue Ice <input type="checkbox"/> Other <input type="checkbox"/>			
Initiated: Date <u>6/14/94</u> Time <u>9:00 am</u> Ended: Date <u>6/15/94</u> Time <u>9:00 am</u> Chilled During Collection Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>						Sample(s) Shipped Via UPS <input type="checkbox"/> Fed X <input type="checkbox"/> Other <input checked="" type="checkbox"/> <u>Hand Delivered</u>		Bioassays Required Acute <input type="checkbox"/> Chronic <input type="checkbox"/> Other <input type="checkbox"/>	
Sample Description	Date	Time	Sample Type		No. of Containers	Volume	Sampled by (Signature)	Comments	For Lab Use Sample ID No.
			Comp	Grab					
Influent	6/15	9:00	X		2	5 gal	<i>[Signature]</i>		434.02B
Effluent	6/15	9:00	X		2	1.5 gal			434.03B
Relinquished By and Title (Signature)					Date <u>6/15/94</u>		Condition of Seal Upon Receipt by Lab		
<i>[Signature]</i> - Proj Eng					Time <u>5:00 pm</u>		Intact <input checked="" type="checkbox"/> Other (Describe) _____		
					Received By: (Signature)		Relinquished By: (Signature)		Received By Lab: (Signature)
		Date						Time <u>01700</u>	



CHAIN OF CUSTODY RECORD FOR NPDES COMPLIANCE BIOMONITORING

Client Name <i>Onalaska Landfill</i>		Client Shipping Address			NPDES Number	
Sample Kit Tracking Information		Method of Shipment (Check One)		Prepared by/Date:		Ship Samples to: CH2M HILL Bioassay Laboratory 15779 W. Ryerson Road New Berlin, WI 53151 Phone: (414) 784-0448 Fax: (414) 784-0353
No. of Cooler <u>3</u> of <u>3</u> Total No. of Bottles <u>3</u>		<input type="checkbox"/> Fed X <input checked="" type="checkbox"/> Pickup <input type="checkbox"/> UPS <input type="checkbox"/> Other		Shipped by/Date:		
Composite Sample Information			Description of Sampling Site			Sample Container
Flow Proportional <input type="checkbox"/> Time Interval <input checked="" type="checkbox"/> Samples/Hour _____ Volume/Sample <u>5 GAL</u> Total Hours _____ Total Volume <u>5 GAL</u>			INFLUENT: BEFORE CARBON UNIT EFFLUENT: AFTER CARBON UNIT SAMPLE COLLECTION INTERVAL: 15 MINUTES.			Plastic <input checked="" type="checkbox"/> Glass <input type="checkbox"/> New <input checked="" type="checkbox"/> Used <input type="checkbox"/>
Initiated: Date <u>6-16-92</u> Time <u>12:30</u> Ended: Date <u>6-17-92</u> Time <u>12:00</u>			Chilled During Collection Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			Refrigerant Used For Shipping Wet Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> Other <input type="checkbox"/>
Sample Description			Sample Type		Sample(s) Shipped Via	
			No. of Containers		UPS <input type="checkbox"/> Fed X <input type="checkbox"/> Other <input type="checkbox"/>	
			Volume		Bioassays Required	
			Sampled by (Signature)		Acute <input type="checkbox"/> Chronic <input checked="" type="checkbox"/> Other <input type="checkbox"/>	
INFLUENT			1		Comments	
EFFLUENT			2		For Lab Use Sample ID No.	
					434.02C	
					434.03C	
Relinquished By and Title (Signature)				Date	Condition of Seal Upon Receipt by Lab	
<i>[Signature]</i>				<u>6-17-94</u>	<input checked="" type="checkbox"/> Intact <input type="checkbox"/> Other (Describe) _____	
Received By: (Signature)				Time	Received By Lab: (Signature)	
				<u>16:45</u>	<i>James Stark</i>	
Relinquished By: (Signature)				Date	Date	
					<u>6-17-94</u>	
				Time	Time	
					<u>1645</u>	

APPENDIX C
REFERENCE TOXICANT DATA

Table 1. Reference Toxicant Summary

Laboratory: CH2M HILL - Milwaukee, WI

Test Type: Acute

Organism: *Ceriodaphnia dubia*

Age < 24 Hours

of Organisms / Conc.: 20

Test Duration: 48 Hours

Toxicant: Sodium Chloride

Response: Mean % Survival

Calculation: LC50

Reporting Period: July 93 - June 94

Test No	Test Date	Test LC50 (g/L)	12 Month Control Limits			In or Out of Control	Action if Out of Control
			Mean LC50	Mean +2 S.D.	Mean -2 S.D.		
46	7/27/93	2.32	2.63	3.04	2.22	IN	
47	8/31/93	2.45	2.59	2.99	2.20	IN	
48	9/28/93	2.79	2.59	2.98	2.20	IN	
49	10/27/93	2.44	2.56	2.93	2.19	IN	
50	11/23/93	2.67	2.55	2.88	2.21	IN	
51	12/21/93	2.45	2.51	2.80	2.22	IN	
52	01/18/94	2.21	2.49	2.83	2.15	IN	
53	02/22/94	2.45	2.49	2.83	2.16	IN	
54	03/23/94	2.45	2.47	2.76	2.17	IN	
55	04/13/94	2.45	2.47	2.76	2.17	IN	
56	05/31/94	2.67	2.48	2.80	2.17	IN	
57	06/29/94	2.32	2.47	2.80	2.14	IN	

Table 2. Reference Toxicant Summary

Laboratory: CH2M HILL - Milwaukee, WI

Test Type: Acute

Organism: *Daphnia magna*

Age: < 24 Hours

of Organisms / Conc.: 20

Test Duration: 48 Hours

Toxicant: Sodium Chloride

Response: Mean % Survival

Calculation: LC50

Reporting Period: July 93 - June 94

Test No	Test Date	Test LC50 (g/L)	12 Month Control Limits			In or Out of Control	Action if Out of Control
			Mean LC50	Mean +2 S.D.	Mean -2 S.D.		
44	7/27/93	4.90	5.06	6.21	3.90	IN	
45	8/31/93	4.39	4.95	6.10	3.80	IN	
46	9/28/93	4.90	4.94	6.09	3.79	IN	
47	10/27/93	4.90	4.83	5.65	4.01	IN	
48	11/23/93	4.90	4.83	5.65	4.01	IN	
49	12/21/93	4.90	4.77	5.40	4.13	IN	
50	1/18/94	4.90	4.77	5.40	4.13	IN	
51	2/22/94	4.90	4.79	5.42	4.16	IN	
52	3/23/94	4.99	4.76	5.31	4.21	IN	
53	4/13/94	4.90	4.76	5.31	4.21	IN	
54	5/31/94	4.99	4.82	5.28	4.35	IN	
55	6/29/94	4.90	4.87	5.18	4.56	IN	

Table 3. Reference Toxicant Summary

Laboratory: CH2M HILL - Milwaukee, WI

Test Type: Acute

Organism: *Pimephales promelas*

Age: 10 ± 2 Days

of Organisms / Conc.: 20

Test Duration: 96 Hours

Toxicant: Sodium Chloride

Response: Mean % Survival

Calculation: LC50

Reporting Period: July 93 - June 94

Test No	Test Date	Test LC50 (g/L)	12 Month Control Limits			In or Out of Control	Action if Out of Control
			Mean LC50	Mean +2 S.D.	Mean -2 S.D.		
44	7/12/93	6.67	7.81	11.02	4.60	IN	
45	8/16/93	7.86	7.60	10.36	4.84	IN	
46	9/20/93	6.64	7.45	10.19	4.71	IN	
47	10/11/93	8.80	7.42	10.09	4.76	IN	
48	11/9/93	5.81	7.41	10.10	4.73	IN	
49	12/13/93	5.80	7.24	10.04	4.44	IN	
50	1/18/94	7.87	7.04	9.07	5.00	IN	
51	2/14/94	7.24	6.95	8.84	5.06	IN	
52	3/14/94	6.67	6.88	8.73	5.03	IN	
53	4/18/94	8.31	6.95	8.94	4.95	IN	
54	5/16/94	9.53	7.23	9.56	4.90	IN	
55	6/13/94	6.49	7.26	9.54	4.98	IN	

Table 4. Reference Toxicant Summary

Laboratory: CH2M HILL - Milwaukee
Test Type: Chronic
Organism: *Ceriodaphnia dubia*
Age: < 24 Hours
of Organisms / Conc.: 10
Test Duration: 7 days
Toxicant: Sodium Chloride
Response: Mean No. of Young per Adult
Calculation: 25% Inhibition Concentration (IC25)
Reporting Period: July 93 - June 94

Test No	Test Date	IC25 (g/L)	Mean IC25	Mean +2 S.D	Mean -2 S.D.	In or Out	
						Control	Action if Out of Control
44	7/9/93	1.07	1.05	1.42	0.69	IN	
45	8/13/93	1.41	1.07	1.48	0.66	IN	
46	9/24/93	1.16	1.08	1.49	0.66	IN	
47	10/22/93	1.04	1.06	1.44	0.67	IN	
48	11/12/93	0.78	1.03	1.43	0.62	IN	
49	12/3/93	1.01	1.01	1.41	0.61	IN	
50	1/7/94	0.71	0.98	1.40	0.56	IN	
51	2/22/94	0.85	0.96	1.37	0.54	IN	
52	4/5/94	1.06	0.99	1.36	0.61	IN	
53	5/4/94	1.27	1.01	1.42	0.60	IN	
54	5/31/94	1.05	1.01	1.42	0.60	IN	
55	6/18/94	1.12	1.04	1.42	0.66	IN	

Test on 3/29/94 failed acceptability criterion for reproduction; Retest 4/5/94
 Test on 5/4/94 used for April test requirement

Table 5. Reference Toxicant Summary

Laboratory: CH2M HILL - Milwaukee
Test Type: Chronic
Organism: *Ceriodaphnia dubia*
Age: < 24 Hours
of Organisms / Conc.: 10
Test Duration: 7 days
Toxicant: Sodium Chloride
Response: Mean 7- day % Survival and No. of Young per Adult
Calculation: NOEC and LOEC
Reporting Period: July 93 - June 94

Test No	Test Date	Survival		Reproduction			Comments
		NOEC (g/L)	LOEC (g/L)	NOEC (g/L)	LOEC (g/L)		
44	7/9/93	2.00	4.00	0.00	0.50	+	
45	8/13/93	1.50	2.00	1.50	2.00		
46	9/24/93	1.50	2.00	1.00	1.50		
47	10/27/93	2.00	4.00	0.00	0.50	**	
48	11/12/93	2.00	4.00	0.50	1.00		
49	12/3/93	2.00	4.00	0.50	1.00		
50	1/7/94	2.00	4.00	0.50	1.00		
51	2/22/94	2.00	4.00	0.50	1.00		
52	4/5/94	1.00	1.50	1.00	1.50		
53	5/4/94	1.50	2.00	1.00	1.50		
54	5/31/94	2.00	4.00	0.50	1.00		
55	6/18/94	2.00	4.00	0.50	1.00		

+ For reproduction data, only a 12.5% reduction at 0.5 g/L conc. ; Sig. diff. test inappropriate.

** For reproduction data, 0.5 g/L only 9.6% reduction; 1 g/L 20.1% reduced. Sig. diff. test inappropriate

Test on 3/29/94 failed acceptability criterion for reproduction; Retest 4/5/94

Test on 5/4/94 for April test requirement

Table 6. Reference Toxicant Summary

Laboratory: CH2M HILL - Milwaukee

Test Type: Chronic

Organism: *Pimephales promelas*

Age: < 24 Hours

of Organisms / Conc.: 40

Test Duration: 7 days

Toxicant: Sodium Chloride

Response: Mean Growth (mg per number of organisms exposed)

Calculation: 25% Inhibition Concentration (IC25)

Reporting Period: July 93 - June 94

<u>Test No</u>	<u>Test Date</u>	<u>IC25 (g/L)</u>	<u>12 Month Control Limits (IC25) In or Out</u>			<u>of Control</u>	<u>Action if Out of Control</u>
			<u>Mean IC25</u>	<u>Mean +2 S.D.</u>	<u>Mean -2 S.D.</u>		
40	7/20/93	0.62	0.49	0.69	0.30	IN	
41	8/25/93	0.60	0.50	0.71	0.30	IN	
42	9/29/93	0.61	0.53	0.72	0.33	IN	
43	10/12/93	0.56	0.53	0.72	0.34	IN	
44	11/22/93	0.53	0.54	0.72	0.35	IN	
45	12/9/93	0.60	0.55	0.73	0.37	IN	
46	1/11/94	0.33	0.53	0.75	0.32	IN	
47	2/7/94	0.51	0.55	0.71	0.39	IN	
48	3/3/94	0.60	0.56	0.72	0.40	IN	
49	4/12/94	0.40	0.54	0.72	0.36	IN	
50	5/16/94	0.59	0.54	0.72	0.36	IN	
51	6/30/94	0.90	0.57	0.85	0.30	OUT	New lab media used - MHRW as diluent.

Table 7. Reference Toxicant Summary

Laboratory: CH2M HILL - Milwaukee
Test Type: Chronic
Organism: *Pimephales promelas*
Age: < 24 Hours
of Organisms / Conc.: 40
Test Duration: 7 days
Toxicant: Sodium Chloride
Response: Mean % 7 day Survival and Growth (mg)
Calculation: NOEC and LOEC
Reporting Period: July 93 - June 94

Test No	Test Date	Survival		Growth		Comments and Action
		NOEC (g/L)	LOEC (g/L)	NOEC (g/L)	LOEC (g/L)	
40	7/20/93	0.30	1.50	0.30	1.50	
41	8/25/93	0.30	1.50	0.30	1.50	
42	9/29/93	0.30	1.50	0.30	1.50	
43	10/12/93	0.30	1.50	0.30	1.50	
44	11/22/93	0.30	1.50	0.30	1.50	
45	12/9/93	0.30	1.50	0.30	1.50	
46	1/11/94	0.30	1.50	0.30	1.50	
47	2/7/94	0.30	1.50	0.30	1.50	
48	3/3/94	0.30	1.50	0.30	1.50	
49a	4/12/94	0.30	0.60	0.30	0.60	a: Different dilution series used
50	5/16/94	0.30	1.50	0.30	1.50	
51	6/30/94	1.50	3.00	0.30	1.50	