6-2-94

DATA EVALUATION RECORD

1. CHEMICAL: Endothall

2. TEST MATERIAL: Endothall Technical 77.9%

3. STUDY TYPE: §72-3 96 Hour LC_{50} for Sheepshead Minnow (*Cyprinodon variegatus*)

4. CITATION:

Author: Bettencourt, Michael J.
Title: Endothall Technical - Acute Toxicity to Sheepshead Minnow (*Cyprinodon variegatus*) under Flow-through Conditions
Date: 8-11-93
Laboratory Report #: 92-1-4091
Any Other Study #: 12442.0591.6135.505
Sponsor: Atochem North America, Philadelphia, PA
Laboratory: Springborn Laboratories,Inc, Wareham, MA
MRID No.: 42914102

5. REVIEWED BY:

Dennis J. McLane, Wildlife Biologist Signature:
Ecological Effects Branch
Environmental Fate and Effects Division (H7507 C) Date: 5-16-94

6. APPROVED BY:

Les Touart, Chief, Section 1 Signature:
Ecological Effects Branch
Environmental Fate and Effects Division (H7507C) Date: 6-2-94

7. CONCLUSION The study fulfills the intent of the guidelines. The 96 hour LC_{50} 110 (90-170). This would place endothall technical in the practically non-toxic category.

8. RECOMMENDATIONS N/A

9. BACKGROUND Submitted in support of the Reregistration DCI.

10. MATERIALS AND METHODS

A. Test Organisms:

Guideline Criteria	Reported Information
Species (Scientific Name) (sheepshead; silverside)	*Cyprinodon variegatus*
Mean Weight (0.1-5 grams)	0.31(0.15 - 0.69) grams

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Mean Length(S.L. longest not > 2x shortest	25 (20 -35) mm
Check for signs of disease or injury (yes or no, if yes describe)	Not reported
All fish from the same year class (yes or no)	Not reported
If diseased it can be treated in 48-hr pretest no sign of the disease remains (Report hours prior to test in which no sign of disease or N/A)	Not reported
Other Comments	None

B. Source/Acclimation

Guideline Criteria	Reported Information
All fish from same source (yes or no)	Yes
Wild caught 7 day quarantine (yes or no)	N/A
Acclimation Period (minimum 7 days)	14 days prior to testing
No feeding during the study (When last fed)	Fed daily up to 48 hours before study
Supplier	Aquatic Biosystems, Fort Collins, Colorado
<5% mortality 48 hours prior to testing (% mortality, if any)	<2% mortality recorded in the test population 48 hrs before the study

C. Test Solution:

Guideline Criteria	Reported Information
Describe source of dilution water (prefer soft reconstituted water)	From Cape Cod Canal, Bourne, Massachusetts Filtered through a series of polypropylene core (20 and 5 micron), through a heat exchanger.

Does water support test animals without observable signs of stress?	"The results of these analyses and the ability of mysids to survive and reproduce over several culture generations in the dilution water source,..,"
Natural or reconstituted seawater 30 to 34 ppth salinity	30 -32 ‰
pH of 8 to 8.3 (marine) 7.7 to 8.0 (estuarine)	7.7 - 7.9
Water Temperature (sheepshead & silverside-22°C) (Case by case other species) Maximum variation - 1°C	22-23°C Daily monitoring 21.9 - 23.6°C Continuous monitoring of 1 replicate.
Dissolved Oxygen (Static 1st 48 hrs 40%; 2nd 48 hrs 60%; Flow-through 60%) (% of lowest conc. & hour)	1st 48 hours 107 - 92% 2nd 48 hours 111 - 90%
Aeration during the test period	No
Type of Dilution System (Reproducible supply of toxicant)	An intermittent-proportional diluter
Other Comments	None

D. Test System:

Guideline Criteria	Reported Information
Test Vessel 1. Material (glass or stainless steel) 2. a. Static volume (18.9 L (5 gal or 18900 cc) with 15 L solution) b. Flow-through volume - slightly larger than the static	1. Glass 2. 19.5 L - 15 L solution 3. Flow-through
Photoperiod (16 L & 8 D)	16 hour of light; 8 hours of darkness

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Biomass Loading Rate (Static no > 0.8 g/L ≤ 17°C; >17°C 0.5g/L; Flow-through 1 g/L/24 hrs & must not exceed 10 g/L at any time @ or > 17°C or 5 g/L >17°C)	"... 0.033 g of biomass per liter of flowing test solution per day."
Solvents 1. (Do not exceed 0.5 ml/L for static tests) 2. (Do not exceed 0.1 ml/L for flow-through	N/A
Flow rate 1. Consistent flow rate-meter systems calibrated before study and checked 2*24 hours 2. - 5 to 10 vol/24 hours	1. Yes 2. 6.7 volume replacements /aquarium/24 hours
Other Comments	None

E. Test Design:

Guideline Criteria	Reported Information
Range Finding Test (LC_{50} >100 mg/L with 30 fish, no definitive test required.)	Conc. % Mortality 250 100% 150 100% 90 0% 54 0% 32 0% 19 0%
Definitive Test	
Nominal Concentrations 1. Control+5 treatment levels; 2. Dosage should be 60% of the next highest concentration; 3. Concentrations should be geometric series)	1. Control + 6 treatment levels 2. 60% 3. Conc. in geometric series
Number of Test Organisms; (Minimum 20/level can be divided among containers)	20/Treatment level

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Controls (1. Solvent control should contain highest conc. of solvent added to any test chamber; 2. Minimum control mortality; static 10%; flow-through 5%)	1. Solvent control N/A 2. 0% control mortality
All organisms must be randomly assigned to test vessels. (yes or no, describe if no)	"...impartially selected and distributed to each replicate.."
Water Parameter Measurements 1. Temperature - record every 6 hrs;>1°C. (yes or no) 2. D.O. and pH beginning,48 hrs,end for control high, medium, and low dose. (yes or no)	1. Continuously 2. Daily
Chemical Analysis (needed if aeration, volatile, insoluble, precipitate, not steel or glass, known to adsorb, and flow-through) (yes or no)	yes, flow-through
Other Comments	None

11. REPORTED RESULTS:

Guideline Criteria	Reported Information
Mean Measured Concentrations (report conc.)	300, 170, 90, 64, 44, 23 mg/L
Recovery of Chemical (% recovery)	300 = 120%; 170 = 113%; 90 = 100%; 64 = 118.5%; 44 = 137.5%; 23 = 121%; "...mean measured concentrations which averaged 119% of nominal concentrations."
Mortality & Observations (Describe observations & attach mortality tables & EEB printouts)	See attached copy of Table 3. which show the cumulative mortality.
Applicable Author's Comments	Sublethal effects were darkened pigmentation, erratic swimming behavior.

12. STUDY AUTHOR'S CONCLUSIONS / QUALITY ASSURANCE MEASURES:

The study contain a quality assurance unit statement signed by Doreen S. Newhouse Supervisor, Quality Assurance Unit.

13. REVIEWER'S DISCUSSION AND INTERPRETATION

A. Test Procedure:

The following items did not meet the guideline criteria:

1. The study did not indicate if the fish were checked prior to the study for signs of disease or injury.

2. The study did not indicate that all the fish were from the same year class.

3. The fish were not randomly assigned to the test vessels but, "...impartially selected and distributed to each replicate.

B. Statistical Analysis

Guideline Criteria	Reported Information
Binomial	EEB 112.5 (90 -170) mg/L SLI 110 (90 - 170) mg/L
Moving Average Angle	N/A
Probit	N/A
Comments	See attached Table 3 from the study and EEB's toxanal printout.

C. Discussion/Results:

The discrepancies associated with the this study are not expected to significantly change the toxicity of this product. The 96 hours LC_{50} of 110 (90-170) mg/L indicates that the active ingredient is practically non-toxic.

D. Adequacy of the Study:

1. Classification: Core

2. Rational: The study meets the guideline requirements.

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3. Reparability: N/A

14. COMPLETION DATE OF ONE-LINER FOR STUDY: 5/13/94

MCLANE ENDOTHAL TECHNICAL SHEEPHEAD MINNOW

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
300	20	20	100	9.536742E-05
170	20	20	100	9.536742E-05
90	20	3	15	.1288414
64	20	0	0	9.536742E-05
44	20	0	0	9.536742E-05
23	20	0	0	9.536742E-05

THE BINOMIAL TEST SHOWS THAT 90 AND 170 CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 112.5324

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

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Page 9 is not included in this copy.

Pages _____ through _____ are not included.

The material not included contains the following type of information:

____ Identity of product inert ingredients.

____ Identity of product impurities.

____ Description of the product manufacturing process.

____ Description of quality control procedures.

____ Identity of the source of product ingredients.

____ Sales or other commercial/financial information.

____ A draft product label.

____ The product confidential statement of formula.

____ Information about a pending registration action.

✓ FIFRA registration data.

____ The document is a duplicate of page(s) _____.

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