1-22-92

MRID No. 415651-35

DATA EVALUATION RECORD

1. **CHEMICAL:** Acetochlor.
Shaughnessey Number: 121601.

2. **TEST MATERIAL:** Acetochlor technical; 2-chloro-N-(ethoxymethyl)-N-(2-ethyl-6-methylphenyl) acetamide; 89.4% active ingredient w/w; a brown liquid

3. **STUDY TYPE:** Marine Shrimp Acute Static Toxicity Test. Species Tested: Mysid Shrimp (*Mysidopsis bahia*).

4. **CITATION:** Williams, T.D., J.F. Tapp, S.A. Sankey, and B.J. Harland. 1989. Acetochlor Determination of Acute Toxicity to Mysid Shrimps (*Mysidopsis bahia*). Brixham Study No. R1072/G. Study performed by Imperial Chemical Industries PLC, Brixham Laboratory, Freshwater Quarry, Brixham, Devon, U.K. Submitted by ICI Americas, Inc. EPA MRID No. 415651-35.

5. **REVIEWED BY:**

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Signature: Rosemary Graham Mora
Date: 9/20/91

6. **APPROVED BY:**

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Signature: Michael Barry 1-15-92
Date: Daniel Rieder 1-22-92

7. **CONCLUSIONS:** This study is scientifically sound and meets the guideline requirements for an acute toxicity study using mysid shrimp. The 96-hour LC_{50} of acetochlor technical for *Mysidopsis bahia* was 5.3 mg/l based on mean measured concentrations. Based on the results of this study, acetochlor technical is considered moderately toxic to *Mysidopsis bahia*. The NOEC was 3.3 mg/l based on mean measured concentrations.

8. **RECOMMENDATIONS:** N/A

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9. **BACKGROUND:**

10. **DISCUSSION OF INDIVIDUAL TESTS:** N/A

11. **MATERIALS AND METHODS:**

A. **Test Animals:** The test organisms (*Mysidopsis bahia* <24 hours old) were obtained from cultures at the Brixham Laboratory (original cultures from Sea Plantations, Inc., Salem, Massachusetts). The shrimp were not treated for disease and were free of disease symptoms. The culture conditions were the same as those described for the test.

B. **Test System:** The test vessels were covered boroscilicate glass beakers covered with lids containing a solution volume of 1 l. The test vessels were randomly positioned in a temperature-controlled room maintained at 25 ±1°C. The photoperiod was 16 hours of light and 8 hours of darkness.

The dilution water was seawater collected from Tor Bay, Devon, filtered to 1 µm, and salinity-adjusted to 20 ±2 parts per thousand (ppt) with distilled water.

C. **Dosage:** Ninety-six-hour static acute test. Based on the results of a preliminary study, six nominal concentrations were chosen (3.2, 5.6, 10.0, 18.0, 32.0, and 56.0 mg/l). In addition, a dilution water control was also used.

A stock solution was prepared by dissolving 224 mg of test substance in 1714 ml of distilled water, using ultrasonics. The volume was brought to 4000 ml with seawater to produce a concentration of 56 mg/l, and stirred for 30 minutes prior to use. Appropriate aliquots of the this solution were added to dilution water to prepare the remaining test concentrations.

D. **Design:** The test was initiated when ten mysids were randomly assigned to each test vessel (one vessel/treatment and control). The mysids were fed newly-hatched brine shrimp once per day during the test.

Mortality was noted every 24 hours during the study. Dead mysids were removed when observed.

The salinity (in highest concentration and control) and pH (in all vessels) were measured at test initiation

and termination. The dissolved oxygen concentration was measured at test initiation, after 48 hours and test termination. Temperature was measured daily in each test chamber and hourly in a vessel containing dilution water with no shrimp.

Chemical analysis of each concentration was performed using gas chromatography on samples collected at test initiation, after 48 hours, and at test termination.

E. **Statistics:** The LC_{50} values were calculated with the moving average method (Stephan, 1977) using a Brixham Laboratory computer program.

12. **REPORTED RESULTS:** Measured concentrations were 3.3, 6.5, 11.0, 19.0, 33.0, and 59.0 mg/l (Table 1, attached). These measurements represent 103-116% of nominal concentrations.

No mortality was observed in the control or the lowest test concentration (3.3 mg/l) (Table 2, attached). High mortality (80-100%) was observed in the remaining test concentrations. The 96-hour LC_{50} value and 95% confidence interval for mysids exposed to acetochlor technical are 5.5 mg/l and 4.4-6.5 mg/l based on mean measured concentrations. The NOEC is 3.3 mg/l.

During the study, the salinity was 19.2-20.2 ppt, the pH was 7.92-8.12, the temperature was 24.1-25.1°C, and the dissolved oxygen concentration was 6.6-7.5 mg/l.

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:** The authors made no conclusions in the report.

A GLP compliance statement, signed by the study director, the project manager, and a representative of the sponsor company, was included in the report indicating that the study conducted in accordance with the principles of Good Laboratory Practice of the United Kingdom Department of Health Compliance programme (1989). This statement also indicates that this study satisfies the requirements of 40 CFR 160.

14. **REVIEWER'S DISCUSSION AND INTERPRETATION OF STUDY RESULTS:**

A. **Test Procedure:** The test procedures were generally in accordance with protocols recommended by the guidelines, except for the following deviations:

The salinity (19.2-20.2 ppt) and the temperature (24.1-25.1°C) in this test were higher than those recommended in the SEP (10-17 ppt and 22°C).

The recommended photoperiod for a shrimp acute toxicity study is 16-hour light/8-hour dark with 15- to 30-minute transitions. No transition period was mentioned in the report.

Mortality of the test organisms prior to test initiation was not reported.

The test solution volume was only 1 L; the SEP recommends 2-3 L of solution.

B. **Statistical Analysis:** EPA's Toxanal computer program was used to verify the LC_{50} value and 95% confidence interval presented by the authors. The reviewer's value (5.3 mg/l based on mean measured concentrations) and 95% confidence interval (3.3-11 mg/l) are similar to those of the authors (printout, attached).

C. **Discussion/Results:** The deviations listed above probably did not affect the results of this test. This study is scientifically sound and meets the guideline requirements for an acute static toxicity study using mysid shrimp. The 96-hour LC_{50} of acetochlor technical for *Mysidopsis bahia* was 5.3 mg/l based on mean measured concentrations. Based on the results of this study, acetochlor technical is considered moderately toxic to *Mysidopsis bahia*. The NOEC was 3.3 mg/l, based on mean measured concentrations.

D. **Adequacy of the Study:**

(1) Classification: Core.

(2) Rationale: N/A.

(3) Repairability: N/A.

15. **COMPLETION OF ONE-LINER FOR STUDY:** Yes, September 18, 1991.

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ACETOCHLOR

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Rosemary Graham Mora Acetochlor Mysidopsis bahia 9-17-91

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
59	10	10	100	9.765625E-02
33	10	10	100	9.765625E-02
19	10	10	100	9.765625E-02
11	10	10	100	9.765625E-02
6.5	10	8	80	5.46875
3.3	10	0	0	9.765625E-02

THE BINOMIAL TEST SHOWS THAT 3.3 AND 11 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 5.251113

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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