2/27/90

9.

DATA EVALUATION RECORD

1.) CHEMICAL: XRM-5019 (sulfonylurea herbicide)

2.) TEST MATERIAL: XRD-498, 99.6% active ingredient. The formulated product XRM-5019 contains 74.9% active ingredient.
EPA No. 464-EUP-RNG; PM-23.

3.) STUDY TYPE: Acute toxicity to the Eastern oyster under flow-through conditions.

4.) CITATION: Manning, S. C. 1988. XRD-498 Herbicide: Acute Toxicity To New Shell Growth Of The Eastern Oyster (Crasostrea virginica) Under Flow-Through Conditions. Hunter ESE Inc. Gainesville, Fl. MRID: 412632-27

5.) REVIEWED BY:
Richard C. Petrie
Agronomist
EEB/EFED

Signature:

Date: 2/27/90

6.) APPROVED BY:
Ann Stavola
Head, Section 3
EEB/EFED

Signature:

Date: 2/27/90

7.) CONCLUSIONS:
This study is scientifically sound and is acceptable for use in hazard assessments (CORE). Solubility above 180 ppm was not achieved for the test material. The EC50 level of >108 mg/L was determined for the Eastern oyster. XRD-498 is categorized as "practically non-toxic" to the Eastern oyster.

8.) RECOMMENDATIONS:
N/A

9.) BACKGROUND:
No background information was found in EEB files.

10.) DISCUSSION OF INDIVIDUAL TESTS:

11.) MATERIALS AND METHODS:

A. TEST ANIMALS

Eastern oysters were obtained from Ocean Pond Corp., Fishers Island, N.Y. Test fish were observed for 7 days before testing, acclimated in recirculating sea water at 26 to 27 degrees C. Valve height was approximately 23 to 42 ml umbo to distal valve edge. No mortalities occurred before test initiation.

B. DOSAGE

Zero, 48, and 96 hour concentrations were measured with HPLC.

	DOSAGES
Nominal:	200,120, 72, 43, 26 mg/L
Measured 0hr:	180, 96, 68, 42, 24 mg/L
Measured 48hr:	172,114, 62, 39, 22 mg/L
Measured 96hr:	167,114, 70, 45, 23 mg/L
Measured Mean:	173,108, 67, 42, 23 mg/L
Mean % of Nominal:	87, 90, 93, 98, 88 %

C. STUDY DESIGN

The test system consisted of fifteen 6 liter glass aquaria with 8.3 liters of test solution 8 cm deep. No solvents were used in this 96 hour flow-through test. Loading was 0.0245 grams per liter of test solution or dilution water daily. Flow rate was continuous at 21 liters/hour. Daily water temperature ranged from 22.3 to 24.9 degrees C. Salinity of water ranged from 31 to 34 ppthousand. DO remained at >97% of saturation throughout the study. The pH ranged from 7.5 to 8.1. Photoperiod was 16 hours light/ 8 hours dark. Prior to test initiation, oyster shells were ground down with 2 to 5 mm of shell removed. Twenty test organisms were assigned randomly to each test level and control. The DO, pH, temperature, and salinity levels were recorded daily.

D. STATISTICAL ANALYSIS

Analysis of variance was used to assess differences in shell growth. No significant differences were found between the control and any treatment concentration. Effects observed could not be related to dosages.

12.) REPORTED RESULTS:

The measured concentrations at day 0 ranged from 24 to 180 mg/L. The test substance was stable with final concentrations 91% of first day measured concentrations. After 96 hours of exposure, mean new shell growth for the control was 1.34 mm. Mean new shell growth for treatment groups ranged from 0.96 mm in 108 mg/L to 1.45 mm in 42 mg/L. One death occurred (5%) at the 108 mg/L concentration. The range of growth compared to control was from +9% at 42 mg/L to -28% at 108 mg ai/L. A +3% response was observed at the highest rate of 173 mg/L. The LC50 was determined to be 173 mg/L. XRD-498 is classified as "practically non-toxic" to Eastern

oyster.

Mean Measured Conc. mg/L	Treat. Mean (SD)	Difference From Control	Percent Change
control	1.34 (+0.55)	------	-----
173	1.38 (+0.72)	+0.04	+03
108*	0.96 (-0.37)	-0.37	-28
67	1.27 (+0.64)	-0.06	-05
42	1.45 (+0.78)	+0.12	+09
23	1.33 (+0.60)	-0.01	-01

* One dead oyster was not measured.

13.) STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:

Due to the low mortality, statistical analysis was not possible. By observation, solubility was attained at approximately 180 ppm. Test results could not be correlated with measured concentrations, salinity, DO levels, pH levels, temperature, or photoperiod. A 65% effect was not achieved at any dose. The XRD-498 technical 96 hour EC50 for the Eastern oyster appears to be greater than >108 mg/L. This level is categorized as "practically non-toxic" to the Eastern oyster.

Two deviations from protocol occurred as follows:

1.) The hourly temperature monitor malfunctioned the first day of the study. A new system was installed and operational by the second day, thus, the first day temperature was not monitored hourly. The temperature ranged 0.7 degrees C below and 1.9 degrees C above the target temperature.

2.) The test oysters were acclimated to within 3 to 4 degrees C of the test temperature as opposed to 2 degrees C in the protocol. This deviation occurred briefly.

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

A. Test Procedure:

Except for the 2 deviations listed above, this study was generally in compliance with EPA GLP standards. The deviations listed above are not believed to significantly alter test results.

B. Statistical Analysis:

No statistical analysis was possible due to low mortality at the highest dose tested. By inspection the EC50 for the Eastern oyster is greater than 100 ppm, "practically non-toxic".

C. Discussion/Results:

This study is judged scientifically sound and acceptable for use in a hazard assessment.

D. Adequacy Of The Study:

(1) Classification: Core
(2) Rationale: N/A
(3) Repairability: N/A