9-13-90

DATA EVALUATION REPORT
ECOLOGICAL EFFECTS BRANCH

1. **Chemical:** Bromacil

2. **Test Material:** Bromacil Technical, 96.6% ai, Lot No. T80717-21

3. **Study Type:** 48-hour Static Acute Test using Daphnia Magna

4. **Study Identification:**

Study Author: Hall, Charles
Study Lab: Haskell Laboratory for Toxicology and Industrial Medicine, duPont de Nemours. Newark, DE.
Study Dates: April 30 - May 1(?), 1986
Study Identification: Report No. 341-86
Sponsor: E. I. duPont de Nemous and Co.
EPA Identification: MRID No. 409515-04

5. **Reviewed By:** Brian Montague, Fisheries Biologist
Ecological Effects Branch
Environmental Fate and Effects Division
Brian Montague 9/12/90

6. **Approved By:** Ray Matheny, Supervisory Biologist
Ecological Effects Branch
Environmental Fate and Effects Division
Ray Matheny 9/13/90

7. **Conclusions:** Bromacil has been shown to have low toxicity to Daphnia magna with an estimated EC_{50} of ~~119~~ mg/L 121 (111 - 148) mg/L with an NOEL of 83 mg/L.
Bpm

8. **Recommendations:** N/A.

9. Submission Purpose: Submitted to satisfy reregistration guideline requirements.

10. **Study Methods and Protocol:** References include EPA's Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, EPA 1600 /4-85/012, 1985. It is assumed this may have offered some guidance in the protocol design used by the laboratory.

Test Organism: Daphnia magna less than 24 hours old were obtained from Haskell laboratory stock. The daphnids were not fed during the testing period.

Dilution Water and Solution Preparation: Hard reconstituted water was used as diluent water. Water chemistry results for the water used in untreated controls at test initiation were as follows: pH-8.0, dissolved oxygen-8.6 mg/L, alkalinity-114 mg/L as $CaCO_3$, hardness-181 mg/L as $CaCO_3$ and conductivity of 585 micro ohms/cm. Test concentrations of 148, 11, 83, 62. 47, 35.5, 27, 20, 14.5, and 11.2 ppm were prepared from a 333 mg/L stock solution. One control group was employed.

Test Methods and Materials: Twenty daphnia were used per concentration and placed in 250 ml glass test vessels containing 200 ml of solution. Two replicates per concentration were utilized (ten daphnia per vessel). Temperature was maintained at 20.1 - 20.2°C, and the photo period utilized was 16 daylight/8 night. Immobility and behavioral observations were made at 24 hour intervals. No measurement of actual test concentrations was made.

11. **Reported Test Results:** Total mortality was occurred only in the highest dosage level of 148 mg/L. A 20% mortality was seen in only one replicate of the next lower dosage of 111 mg/L. No mortality was reported for controls or dosages below 111 mg/L. Water quality parameters for the four test vessels measured remained within guideline requirements.

12. **Study Author's Conclusions:** "Percent immobilities for Daphnia magna exposed to Bromacil (H-16,287) are presented in Table I. The 48-hour EC_{50} was 119 mg/L. The 95% confidence interval on the EC_{50} could not be calculated because there was only one partial immobilization. Concentration data were scale-of-dose transformed to log 10".

13. **Reviewer's Discussion:** It would appear from the results that Bromacil is lethal within very narrow concentration parameters. The NOEL for this study would be 83 mg/L and the EC_{50} as calculated by the author is statistically supported by Agency calculation. Bromacil is practically non-toxic to daphnia at levels between 83 and 111 ppm.

Adequacy of Study:

Classification: Core
Rationale: The study has followed acceptable protocol guidelines.
Repairability: N/A

Montague Bromacil Daphnia 48 hr Static acute

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
148	20	20	100	9.536742E-05
111	20	4	20	.5908966
83	20	0	0	9.536742E-05
62	20	0	0	9.536742E-05
47	20	0	0	9.536742E-05
35.5	20	0	0	9.536742E-05
27	20	0	0	9.536742E-05
20	20	0	0	9.536742E-05
14.5	20	0	0	9.536742E-05
11.2	20	0	0	9.536742E-05

THE BINOMIAL TEST SHOWS THAT 111 AND 148 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 121.3852

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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