DATA EVALUATION RECORD

1. Chemical: Sulfosate (Shaughnessy No. 128501)

2. Test Material: Formulated product: SC-0224 4-LC (liquid concentrate)

   40.8% ai (as per proposed label of study sponsor)

3. Study/Action Type: Fish acute LC_{50}

   Bluegill sunfish (Lepomis macrochirus)

4. Study ID: The acute toxicity of SC-0224 4-LC to the bluegill sunfish (Lepomis macrochirus)

   Biospherics, Inc.
   Project No. 82-E-1119B
   Report date: November 1982
   Study sponsor: Stauffer Chemical Company
   Study location: EPA Accession No. 250545

5. Reviewed by: James D. Felkel
   Wildlife Biologist
   EEB/HED
   Signature: James D. Felkel
   Date: 1-20-87

6. Approved by: Henry Craven
   Supervisory Biologist
   EEB/HED
   Signature: Henry T. Craven
   Date: 1/20/87

7. Conclusions:

   This study is scientifically sound. With a 96-hr LC_{50} of 4.9 mg/L, this formulation is considered "moderately toxic" to the bluegill sunfish. A data requirement for this study may be fulfilled with submission of photoperiod information and confirmation of exact formulation composition (i.e., whether exactly as shown in June 3, 1983 Confidential Statement of Formula).

8. Recommendations:

   The study may be upgraded from supplemental to core for this formulation with the information cited in #7 above.

9. Background: N/A.

10. Discussion of Individual Test: N/A.

11. Materials and Methods:

a. Test animals - Bluegill sunfish (Lepomis macrochirus) from Andy Zulick, CT; mean length 45.9 mm (38.3 to 54.2 m); mean weight 1.05 g (0.59 to 1.99 g); approximately 6 to 7 months old.

b. Dosage form - In static bioassay, no solvent.

c. Study design

(1) Range finding:
- polystyene containers
- 4 L test solution
- 3 fish/vessel
- 0.1, 1.0, 10, 100, 1000 mg/L
- 96 hr

(2) Definitive:
- glass containers
- 15 L test solution
- 10 fish/vessel
- control, 1, 2, 4, 6, 10 mg/L
- DO, temp., pH measured at beginning and every 24 hr.
- loading: 0.7
- 96 hr
- dilution water quality pH 7.3, hardness 150 mg/L as $CaCO_3$, alkalinity 104 mg/L as $CaCO_3$, source - 400' well

(3) Statistics - Binomial probability method (Stephan 1979).

12. Reported Results:

DO - 3.4 to 8.9 mg/L
pH - 6.8 to 7.3
Mean temp. - 20.1 °C (20 to 20.5 °C)
24, 48, 72, and 96-hr LC_{50} - 5 mg/L (4 to 6 mg/L)
24, 48, 72, and 96-hr NOEL - 4 mg/L

13. Study Author's Conclusions/QA Measures:

See above reported results. Test ". . . inspected by the Quality Assurance Unit according to Biospherics SOP 2.3.4 'QA Study Inspections'."

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedure: Polystyrene containers used in the range-finding test would not be acceptable in the definitive study.

Reported procedures for the definitive test were generally consistent with current guidelines (1982). However, photoperiod was not reported and water temperatures were measured daily rather than continuously as recommended by the Committee on Methods for Toxicity Tests with Aquatic Organisms (1975). Also, the 1-2-4-6-10 mg/L test series is not geometric, nor are all levels $\geq$ 60% of the next level. Dilution water was harder than recommended (150 mg/L as $CaCO_3$ vs. 40 to 48 mg/L as $CaCO_3$).

b. Statistical Analysis: A check of the statistical analysis was conducted and is attached.

c. Discussion/Results: An approximate LC_{50} is determined to be 4.9 mg/L, very close to that reported in the study. The dose-response curve is very steep, with no mortality at 4 mg/L, but 100% mortality at 6 mg/L. Dissolved oxygen at 48 hours is < 60% saturation at all test levels, including controls. It went below 40% saturation at 2 mg/L in the final 48 hours. The June 5, 1986 SEP recommends a 0.5 loading level for water temperatures > 17 °C. The formulated product appears to be approximately 714X as toxic as technical material (technical LC_{50} with bluegill reported in August 9, 1983 EEB review: 3500 mg/L).

d. Adequacy of the Study:

(1) Classification: Supplemental for this formulation.

(2) Rationale: While the study is scientifically sound, the photoperiod should be reported and the registrant must confirm whether the composition of formulation is exactly as described in the June 3, 1983 Confidential Statement of Formula.

(3) Reparability: Study may be upgraded to core for this formulation with submission of information cited above.

15. Completion of One-Liner for Study:

One-liner generated automatically by current computer program.

16. CBI Appendix: N/A.

J. FELKEL SC-0224 4-LC BLUEGILL 12-15-86

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
10	10	10	100	9.765625E-02
6	10	10	100	9.765625E-02
4	10	0	0	9.765625E-02
2	10	0	0	9.765625E-02
1	10	0	0	9.765625E-02

THE BINOMIAL TEST SHOWS THAT 4 AND 6 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 4.898978.

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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