UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

3/15/96

MEMORANDUM

SUBJECT: **Reregistration, Data Evaluation of three Acute Estuarine Studies, Ethoprop (041101), D218402, REREG Case #0106, ID#041101, Sponsor: Rhone-Poulenc.**

TO: **Larry Scnaubelt, PM 72**
Special Review and Reregistration Division (7508W)

FROM: **Anthony F. Maciorowski, Chief**
Ecological Effects Branch
Environmental Fate and Effects Division (7507C)

GUIDELINE	MRID	TOXICITY	ACCEPTABILITY
72-3(A)	436863-01	0.958 ppm	Core
72-3(B)	436863-02	3.7 mg ai/L	Core
72-3(C)	436863-03	18.78 ppb	Core

These studies indicate that Ethoprop is very highly toxic to Estuarine/Marine fish and shrimp and moderately toxic to Estuarine/Marine mollusks. The results from this study triggers an additional data requirements, Estuarine/Marine chronic studies for fish and aquatic invertebrates.

If you have any questions concerning this review please, contact Regina Hirsch (414-695-9796) or Les Touart (305-6134).

BRANCH FILE COPY

DATA EVALUATION RECORD
ACUTE LC_{50} TEST WITH AN ESTUARINE/MARINE FISH
§ 72-3(A)

1. **CHEMICAL:** Ethoprop PC Code No.: 041101

2. **TEST MATERIAL:** Ethoprop Technical, Batch No. 307289119, CAS Registry No. 13194-48-4, a clear liquid. Purity: 96.8%

3. **CITATION**

Authors:	Mark W. Machado
Title:	Ethoprop Technical -- Acute Toxicity to Sheepshead Minnow (*Cyprinodon variegatus*) Under Flow-Through Conditions.
Study Completion Date:	16 May 1995
Laboratory:	Springborn Laboratories, Inc.
Sponsor:	Rhone-Poulenc Ag Company
Laboratory Report ID:	95-4-5811; 10566.1294.6348.505
MRID No.:	436863-01
DP Barcode:	D218402

4. **REVIEWED BY:** Regina Hirsch, Wildlife Biologist, EEB, EFED

Signature: [signature] Date: 3/15/96

5. **APPROVED BY:** Les Touart, Head of Section 1, EEB, EFED

Signature: [signature] Date: 3.5.96

6. **STUDY PARAMETERS**

Scientific Name of Test Organism:	*Cyprinodon variegatus*
Age or Size of Test Organism:	5-9 mm; and 0.01-0.06 g, N = 30
Definitive Test Duration:	96-hours
Study Method:	Flow-through
Type of Concentrations:	Mean measured

7. **CONCLUSIONS:**

Results Synopsis

LC_{50}: 0.958 ppm ai 95% C.I.: 0.761 - 1.45 ppm ai

NOEL: 0.340 ppm ai Probit Slope: 0.340

8. **ADEQUACY OF THE STUDY**

A. **Classification:** Core.

B. **Rationale:** N/A

C. **Repairability:** N/A

9. **Guideline Deviations**

1. Weight of fish was below what is recommended for this type of study.

2. Test aquaria were smaller (11 L volume) than what is recommended (19 L volume).

10. **SUBMISSION PURPOSE:** Reregistration

11. **MATERIALS AND METHODS**

A. **Test Organisms**

Guideline Criteria	Reported Information
Species Preferred species are the sheepshead minnow (*Cyprinodon variegatus*) or the Silverside (*Menidia sp.*).	*Cyprinodon variegatus*
Mean Weight 0.5 - 5 g	0.024 g (0.01-0.06)
Mean Standard Length Longest not > 2x shortest	Mean: 6.1 mm Range: 5.0-9.0 mm
Supplier	Springborn Laboratories brood stock (SLI Lot #94A44)
All fish from same source?	Yes
All fish from the same year class?	Yes

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B. Source/Acclimation

Guideline Criteria	Reported Information
Acclimation Period minimum 14 days	minimum of 14 days
Wild caught organisms were quarantined for 7 days?	N/A
Were there signs of disease or injury?	Not reported
If treated for disease, was there no sign of the disease remaining during the 48 hours prior to testing?	N/A
Feeding No feeding during the study	48 hours prior to testing
Pretest Mortality <3% mortality 48 hours prior to testing	0% mortality prior to testing.

C. Test System

Guideline Criteria	Reported Information
Source of dilution water Soft reconstituted water or water from a natural source, **not** dechlorinated tap water	Cape Cod Canal, Bourne, Massachusetts.
Does water support test animals without observable signs of stress?	Yes
Salinity 30-34 ‰ salinity, weekly range <6 ‰	31 to 32 ‰
Water Temperature 22 ± 1 °C	23°C

Guideline Criteria	Reported Information
pH 8.0-8.3 for marine-stenohaline fishes, 7.7-8.0 for estuarine-euryhaline fishes, monthly range < 0.8	7.8-8.0
Dissolved Oxygen Static: ≥ 60% during 1st 48 hrs and ≥ 40% during 2nd 48 hrs, flow-through: ≥ 60%	80% at 48 hours
Test Aquaria 1. Material: Glass or stainless steel 2. Size: Volume of 19 L (5 gal) or 30 x 60 x 30 cm 3. Fill volume: 15-30 L of solution	Glass 39 x 20 x 25 cm volume of 11 L
Type of Dilution System Must provide reproducible supply of toxicant	A continuous-flow serial dilute with a dilution factor of 60%, a modification of the diluter system described by Benoit et al (1982).
Flow Rate Consistent flow rate of 5-10 vol/24 hours, meter systems calibrated before study and checked twice daily during test period	6.5 vol replacements/24 hours
Biomass Loading Rate Static: ≤ 0.8 g/L at ≤ 17°C, ≤ 0.5 g/L at > 17°C; flow-through: ≤ 1 g/L/day	0.0033 g/L/day
Photoperiod 16 hours light, 8 hours dark	16 h light, 8 h dark.
Solvents Not to exceed 0.5 ml/L for static tests or 0.1 ml/L for flow-through tests	Solvent: acetone Maximum conc.: 0.092 mL/L.

D. Test Design

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Guideline Criteria	Reported Information
Range Finding Test If LC_{50} >100 mg/L with 30 fish, then no definitive test is required.	Preliminary testing was the basis for definitive test concentrations.
Nominal Concentrations of Definitive Test Control & 5 treatment levels; each conc. should be 60% of the next highest conc.; concentrations should be in a geometric series	210, 350, 580, 960, and 1600 ug ai/L.
Number of Test Organisms Minimum 10/level, may be divided among containers	20/treatment level and controls
Test organisms randomly or impartially assigned to test vessels?	Yes
Biological observations made every 24 hours?	Yes
Water Parameter Measurements 1. Temperature Measured constantly or, if water baths are used, every 6 hrs, may not vary > 1°C 2. DO and pH Measured at beginning of test and ever 48 h in the high, medium, and low doses and in the control	Test solution temperature was monitored in one replicate (B) of the control solution throughout the study. DO, pH, and salinity and temperature were measured once daily in both replicates of each treatment level and controls.
Chemical Analysis needed if solutions were aerated, if chemical was volatile, insoluble, or known to absorb, if precipitate formed, if containers were not steel or glass, or if flow-through system was used	Sample were taken from each replicate test solution of each treatment level and controls at 0 and 96-hours of exposure for analysis of Ethoprop concentration.

12. REPORTED RESULTS

A. General Results

Guideline Criteria	Reported Information
Quality assurance and GLP compliance statements were included in the report?	Yes
Recovery of Chemical	87.2 to 103%
Control Mortality Not more than 10% of control organisms may die or show abnormal behavior.	0%
Raw data included?	No
Signs of toxicity (if any) were described?	Yes

Mortality

Concentration (ppb)		Number of Fish	Cumulative Number Dead			
			Hour of Study			
Nominal	Mean Measured		24	48	72	96
Control	0	20	0	0	0	0
Solvent Control	0	20	0	0	0	0
210	340	20	0	0	0	1
350	430	20	0	0[g]	1[bd]	4[e]
580	620	20	1[be]	2[ad]	5[d]	5[abcd]
960	620	20	0[bcd]	0[abcdf]	7[cd]	7[cd]
1600	1500	20	2[abcd]	6[acdf]	13[cdh]	14[h]

[a] 1-2 surviving fish exhibited complete loss of equilibrium.
[b] 1-2 surviving fish exhibited partial loss of equilibrium.

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[c] 1 surviving fish exhibited partial loss of equilibrium and was observed at the surface of the test solution.
[d] Several to all surviving fish were lethargic.
[e] 1-2 surviving fish were lethargic.
[f] 1-2 surviving fish exhibited complete loss of equilibrium and was at the surface of the test solution.
[g] One Surviving fish was at the surface of the test solution.
[h] Several to all surviving fish exhibited partial loss of equilibrium.

Other Significant Results:

B. Statistical Results

Method: Probit Analysis

96-hr LC_{50}: 0.95 ppm ai 95% C.I.: 0.76 -1.40 ppm ai

Probit Slope: ____ NOEC: 0.34 ppm ai

13. VERIFICATION OF STATISTICAL RESULTS

Parameter	Result
Binomial Test LC_{50} (C.I.)	0.904 (0.620 - infinity) ppm ai
Moving Average Angle LC_{50} (95% C.I.)	0.918 (0.698 - 1.642) ppm ai
Probit LC_{50} (95% C.I.)	0.958 (0.761 - 1.447) ppm ai
Probit Slope	2.921
NOEC	0.340 ppm ai

14. REVIEWER'S COMMENTS:

RHirsch Ethoprop Acute Sheepshead Minnow

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
1500	20	14	70	5.765915
621	20	7	35	13.1588
620	20	5	25	2.069473
430	20	4	20	.5908966
340	20	1	5	2.002716E-03

THE BINOMIAL TEST SHOWS THAT 620 AND +INFINITY 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 903.9385

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
2	.4747728	917.7565	698.5878	1641.074

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
3	.1954565	1	.7311044

SLOPE = 2.921231

95 PERCENT CONFIDENCE LIMITS = 1.629741 AND 4.212721

LC50 = 957.9741

95 PERCENT CONFIDENCE LIMITS = 761.63 AND 1447.263

LC10 = 352.051

95 PERCENT CONFIDENCE LIMITS = 198.4942 AND 461.1175

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RHirsch Ethoprop Acute Flow-through with Sheepshead Minnow

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
1.5	20	14	70	5.765915
.621	20	7	35	13.1588
.619	20	5	25	2.069473
.43	20	4	20	.5908966
.34	20	1	5	2.002716E-03

THE BINOMIAL TEST SHOWS THAT .619 AND +INFINITY 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 .903939

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
2	.4747728	.9176729	.6981755	1.642667

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
3	.1953965	1	.7326001

SLOPE = 2.921422

95 PERCENT CONFIDENCE LIMITS = 1.630046 AND 4.212798

LC50 = .9576008

95 PERCENT CONFIDENCE LIMITS = .7613357 AND 1.446652

LC10 = .3519369

95 PERCENT CONFIDENCE LIMITS = .1984764 AND .4609458

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