



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, DC 20460

OFFICE OF
PESTICIDES AND
TOXIC SUBSTANCES

MAR 20 1990

1990

MEMORANDUM

SUBJECT: Early Life Stage Study for Rainbow trout Salmo gairdneri
(Accession No. #400561-05) for Lindane Technical

FROM: *for* James W. Akerman, Chief
Ecological Effects Branch
Environmental Fate and Effects Division (H-7507-C) *(Signature)*

TO: George LaRocca (15)
Insecticide-Rodenticide Branch
Registration Division (H-7505-C)

Attached please find the Ecological Effects Branch review of the Lindane Technical Early Life Stage Study for Rainbow trout (Accession No. 400561-05) in response to the Lindane Registration Standard. The results of this study are as follows:

STUDY IDENTIFICATION: Surprenant, D.C., The toxicity of Lindane to Rainbow trout (Salmo gairdneri) Embryos and Larvae. Study # 10566.0286.6104.121. Prepared by: Springborn Bionomics, Inc., Wareham, Mass. Submitted by: Centre International D'Etude du Lindane, Bruxells, Belgium. Acc# 400561-05.

CONCLUSIONS: This study is rated invalid due to the absence of raw data necessary to review an early life stage study. The study may be upgraded if these data are provided.

If you have any questions concerning these studies, please contact Jeffrey Bigler (557-0783) of my staff.

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CONCURRENCES							
SYMBOL	H-7507C	H-7507C	H-7507C				
SURNAME	Bigler	Stand	CS Miller				
DATE	3-18-90	3/20/90	3/20/90				

EPA Form 1320-1 (12-70)

OFFICIAL FILE COPY

192723
RECORD NO.
009001
SHAUGHNESSY NO.

REVIEW NO.

EEB REVIEW

MAR 20 1987

DATE: IN 4-3-87

DATE: OUT _____

FILE OR REG. NO. 52904-C

PETITION OR EXP. NO. _____

DATE OF SUBMISSION 1-21-87

DATE RECEIVED BY EFED 3-31-87

RD REQUESTED COMPLETION DATE 5-29-87

EEB ESTIMATED COMPLETION DATE 5-29-87

RD ACTION CODE 660

TYPE OF PRODUCT(S) : I,D,H,F,N,R,S INSECTICIDE

DATA ACCESSION NO(S). _____

PRODUCT MANAGER (NO.) G. LaRocca

PRODUCT NAME(S) Lindane

COMPANY NAME CIEL

SUBMISSION PURPOSE Review Data Submitted in Support of
Registration Standard.

SHAUGHNESSY NO.	CHEMICAL & FORMULATION(S)	% A.I.
<u>105001</u>	<u>Lindane</u>	<u>99.5</u>
_____	<u>Inert Ingredients</u>	<u>.5</u>
_____	_____	_____

DATA EVALUATION RECORD

1. CHEMICAL: Lindane

2. TEST MATERIAL: Lindane Technical - 99.5% a.i.
(A white powder)

3. STUDY TYPE: Fish Early Life Stage.

Species tested - Rainbow trout (Salmo gairdneri)

4. STUDY IDENTIFICATION: Surprenant, D.C., The toxicity of Lindane to Rainbow trout (Salmo gairdneri) Embryos and Larvae. Study # 10566.0286.6104.121. Prepared by: Springborn Bionomics, Inc., Wareham, Mass. Submitted by: Centre International D'Etude du Lindane, Bruxells, Belgium. Acc# 400561-05.

5. REVIEW BY:

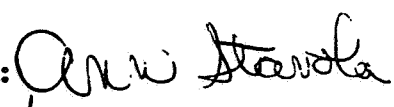
Jeffrey D. Bigler
Fishery Biologist
Ecological Effects Branch
Environmental Fate and
Effects Division (H7507C)

Signature: 

Date: 3-15-90

6. APPROVED BY:

Ann Stavola
Acting Head, Section 3
Ecological Effects Branch
Environmental Fate and
Effects Division (H7507C)

Signature: 

Date: 3/15/90

7. CONCLUSIONS: This study is rated invalid due to the absence of raw data necessary to review an early life stage study. The study may be upgraded if these data are provided.

8. RECOMMENDATIONS: N/A

9. BACKGROUND: These data were submitted in support of the Lindane Registration Standard.

10. DISCUSSION OF INDIVIDUAL TEST - N/A.

11. MATERIALS AND METHODS:

A. Test Organisms: Unfertilized Rainbow trout (Salmo gairdneri) eggs and sperm were supplied by Mount Lassen trout farm, Red Bluffs, California. The eggs were fertilized at the Bionomics laboratory.

B. Test System: A flow-through system consisting of a Mount and Brungs type proportional diluter calibrated to deliver 7 volume turnovers per day, and rectangular 39x20x25 cm glass aquaria, partitioned for 11 liter replicates. Each replicate was equipped with two 5x8 cm glass jars with 16 mesh screen bottoms for the embryo phase. Dilution water was obtained from an untreated well. The well water was aerated before the study.

C. Test Design: During the 25 day embryo phase, one hundred embryos were exposed per treatment level; fifty per replicate; 25 per cup. For the 60 day larval stage, 20 live larvae were impartially collected from the test cups and transferred into the appropriate replicate. Larvae were fed live brine shrimp daily. The photoperiod was 16 hours light and 8 hours dark. Temperature, dissolved oxygen, and pH were measured in all aquaria on day 0, and every other day thereafter.

D. Dose: A solvent control (DMF), dilution water control and five nominal concentrations of 30, 15, 7.5, 3.8, and 1.9 ug/l were the test levels selected. Water samples from the low, mid, and high concentration aquaria were sampled on day 4 and analyzed for Lindane. All replicates were sampled for Lindane on test day 7 and weekly thereafter. The mean measured concentrations were 28, 13, 6.0, 2.9, and 1.9 ug/l.

E. Statistics: Williams' test was used with the following endpoints to evaluate differences between test concentrations and the solvent control:

- Number of embryos hatched
- Percentage of larvae surviving
- length and weight

12. REPORTED RESULTS: (excerpted from study)

The mean measured concentrations of 28, 13, 6.0, 2.9, and 1.9 ug/l represent 76 to 100 percent of the nominal concentrations. The diluter system functioned properly throughout the study except for an accidental injection of the Lindane solution resulting in elevated concentrations ranging from 1.5 to 3.0 times the nominal concentrations. Normal conditions were restored within 2 hours.

The water quality data are presented in table 2. "water quality conditions maintained throughout the exposure were satisfactory for the promotion of embryo hatchability, larval survival, and growth."

A brief summary of the biological results are presented in Table 3. Larval weight was the most sensitive parameter affected by the exposure to Lindane.

The accidental spiking during day 63 of the study resulted in a mortality of 50% in the highest concentration during the ensuing 36 hours. Only 7% mortality occurred during the rest of the study in that concentration.

Larval growth as total length did not appear to be affected as a result of exposure to Lindane. The mean wet weight of the larvae was affected significantly, as compared to the controls, down to the 6.0 ug/l test level. Due to the high mortality in the 28 ug/l test concentration, the growth of these larvae were not statistically analyzed.

13. STUDY AUTHORS' CONCLUSIONS/QA MEASURES:

"The data and report prepared for this study were produced and compiled in accordance with all pertinent EPA Good Laboratory Practice regulations except in the case of characterization and verification of the test substance identity. Maintenance of these records is the responsibility of the test sponsor."

"Based on these results, the maximum acceptable toxicant concentration (MATC) of Lindane for rainbow trout embryo and larvae was estimated to be ≥ 2.9 and ≤ 6.0 ug/l, geometric mean = 4.2 ug/l."

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14. REVIEWER'S DISCUSSION AND INTERPRETATION OF THE STUDY:

A. Test Procedures: This review cannot be completed until all raw data relative to the study are submitted, including any and all notes or comments by the investigator(s).

B. Statistical Analysis: N/A

C. Discussion/Results: This study is rated invalid due to the unavailability of the raw data collected during the course of the study.

D. Adequacy of Study:

Classification - Invalid.

Rational - Lack of raw data.

Repairability - An upgrade from invalid may be made, depending on a review of the required data.