US EPA ARCHIVE DOCUMENT

MRID No. ~~92189-007~~ 157956

DATA EVALUATION RECORD

1. **CHEMICAL:** Triclopyr Triethylamine
Shaughnessey No. 116002

2. **TEST MATERIAL:** Triclopyr OCR-544-82F; 64.7% (±2%) active ingredient (3,5,6-trichloro-2-pyridyloxyacetic acid). 116002

3. **STUDY TYPE:** Freshwater Fish and Invertebrate Static Acute Toxicity Test. Species Tested: Bluegill Sunfish (Lepomis macrochirus), Fathead Minnow (Pimephales promelas), Rainbow Trout (Salmo gairdneri), and Daphnia magna. 72-

4. **CITATION:** McCarty, W.M. and H.C. Alexander. 1978. Toxicity of Triclopyr, Triethylamine Salt, to Freshwater Organisms. Report No. ES-199. Performed by Environmental Sciences Research Laboratory, Dow Chemical U.S.A. Submitted by Dow Chemical U.S.A. EPA MRID No. ~~92189-007~~ 157956. ~~TRID No. 470060-023.~~

5. **REVIEWED BY:**

Jeffrey Bigler
Ecological Effects Branch
Environmental Fate and
Effects Division

Signature: [signature]
Date: 3.6.91

6. **APPROVED BY:**

Charles Lewis
Ecological Effects Branch
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Signature: [signature]
Date: 3/14/91

Henry T. Craven, M.S.
Supervisor, EEB/HED
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Signature:
Date:

7. **CONCLUSIONS:** This study is scientifically sound but does not fulfill the requirements for a freshwater, static acute toxicity study. The submitted data tables were illegible and must be resubmitted before the rainbow trout, bluegill and Daphnia magna studies can be classified as "core". The fathead minnow was tested as a coldwater species and should be retested at 17° or 22°C. Based on nominal concentrations, the 96-hour LC_{50} values of Triclopyr Triethylamine to rainbow trout, fathead minnow and bluegill

sunfish were 552, 947, and 891 mg/L, respectively. The 48-hour LC_{50} value for Daphnia magna was 775 mg/L. These values classify Triclopyr Triethylamine as practically non-toxic to the four species involved.

8. **RECOMMENDATIONS**: See Section 14.D.(3).

9. **BACKGROUND**:

10. **DISCUSSION OF INDIVIDUAL TESTS**: N/A

11. **MATERIALS AND METHODS**:

A. **Test Animals**:

1) Rainbow trout were obtained from a commercial hatchery in Minnesota. They were acclimated to laboratory conditions (12°C and a light schedule of 16-h light/8-h dark) for at least 10 days. Fish were fed a synthetic diet during the acclimation period. Feeding was discontinued 3 days prior to testing. When tested, the fish had an average weight of 0.24 g and an average standard length of 23.5 mm.

2) Fathead minnows were reared in-house. They were acclimated to test conditions as the rainbow trout above. When tested, the fish had an average weight of 0.54 g and an average standard length of 31 mm (range 30-39 mm).

3) Bluegill were obtained from the Hebron National Fish Hatchery in Ohio. They were acclimated to laboratory conditions (22°C and a light schedule of 16-h light/8-h dark) for 10 days. Bluegill were fed similarly to trout and minnows. When tested, the average weight of each fish was 0.6 g and the average standard length 27.7 mm.

4) Daphnia magna were raised in-house. First instar daphnids were used in the test.

B. **Test System**:

1) Fish Tests. Round glass aquaria, measuring 22 cm deep with a 24.5 cm diameter, were filled with 8 L of dechlorinated (by carbon filtration) Lake Huron water. Fish were placed in the test vessels 24 hours before the addition of the test compound. Test vessels were aerated for 24 hours. If no deaths occurred in 24 hours, aeration was stopped and the test material, dissolved in 2-L of water, was added to the container.

The final volume was 10 L. Vessels containing dead fish before the test were cleaned, reset and observed for 24 hours before the addition of test material.

Using constant temperature troughs, the temperature was maintained at 12°±1°C for trout and fathead minnow, and 22°±1°C for bluegill. The loading factors were 0.24, 0.54, and 0.6 g/L for trout, minnow, and bluegill, respectively. The fish were not fed during the test.

2) Daphnids. A stock solution (1 mg/mL in dechlorinated Lake Huron water) was mixed with sufficient dechlorinated Lake Huron water to make a final test volume of 200 mL in 250-mL test beakers. Temperature was maintained at 17°C using a constant temperature incubator.

Dechlorinated lake water used in the test was reported as having a dissolved oxygen (D.O.) of 8.8 mg/L; pH of 7.9; total alkalinity of 85 mg/L as $CaCO_3$; total hardness of 100 mg/L; and specific conductivity of 1700 µmhos/cm. Water quality of raw Lake Huron water prior to filtration by activated carbon (for dechlorination) is presented in Table 1 (attached).

C. Dosage: Ninety-six-hour static test for fish and a 48-hour static test for Daphnia. Test concentrations could not be determined from the data tables. Test solutions were prepared on an as-received basis.

D. Design: Ten fish were exposed to each concentration. Ten daphnids were placed in each beaker, three beakers per concentration. The presence of mortality was observed daily and any dead fish were removed. Dead daphnids were not removed from any beaker during the test.

E. Statistics: The 48 or 96-hour median lethal concentration (LC_{50}) and associated 95% confidence interval (C.I.) for each species were calculated using Finney's probit analysis (1952) or Thompson's moving average method (1947) computer software.

12. REPORTED RESULTS: The 96-hour LC_{50} values and associated confidence intervals for Triclopyr Triethylamine based on nominal concentrations were 552 (469-695), 947 (838-1071), and 891 (787-1011) mg/L for rainbow trout, fathead minnow, and bluegill sunfish, respectively. The 48-hour LC_{50} and

associated confidence interval was 775 (614-1108) mg/L for Daphnia magna.

Daphnia magna control mortality was 7%. There was no control mortality in the fish tests.

No data of environmental conditions during the test were provided.

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

No conclusions were made by the author.

No statements were made regarding quality assurance and good lab practice.

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

A. **Test Procedure:** The test procedures were generally in accordance with protocols recommended by the guidelines, but deviated from the SEP as follows:

The data tables submitted were illegible. The reviewer therefore has no knowledge of the concentrations used in the test. The statistical analysis and endpoints determined could not be checked by the reviewer.

Basic water quality measurements of the dilution water and test solutions were not provided, and it is not stated in the report whether they were measured. Without this information, environmental stresses on the test organisms, such as D.O. below 40% saturation and extremes of pH, have not been monitored and cannot be assumed to not have occurred.

The temperature was not monitored during the study, therefore it cannot be assumed the temperature maintenance systems maintained set temperatures.

Dechlorinated water was used in all tests but is not recommended. The raw lake water contained a significantly high chlorine concentration (10 ppm). Since the dilution water total residual chlorine was not reported and probably not measured, chlorine may be responsible for the 7% control mortality seen in the daphnid test.

No toxic symptoms other than mortality were monitored during the test. Therefore a no-observed-effects concentration could not be estimated.

The fathead minnow was tested as a coldwater species (12°C). The SEP clearly states that the fathead minnow should be tested as a warmwater species (17° or 22°C).

Loading in the bluegill test was listed as 0.6 g/L in the report. The recommended loading in warmwater, static tests is 0.5 g/L.

The fish acclimation period (reported as 10 days) was less than the recommended two weeks.

The temperature (17°C) used in the Daphnia magna test was lower than recommended (20°C).

The age of the Daphnia magna used in the test was not reported. First instar Daphnia magna should be less than 24 hours old.

Pretest mortality and the condition of the Daphnia magna cultures (i.e., presence of ephippia) were not reported.

B. **Statistical Analysis:** The reviewer could not determine LC_{50} values because of illegible data tables.

C. **Discussion/Results:** It is the opinion of the reviewer that variable water quality can affect the toxicity of chemicals. Monitoring water quality is an essential part of every aquatic toxicity test for this reason. Given the high concentration of chlorine in the raw lake water, the total residual chlorine concentration of the dechlorinated dilution water should have been determined. However, the reported LC_{50} values are well above the boundary which classifies Triclopyr Triethylamine as practically non-toxic. Measuring and reporting the physical and chemical parameters during the test would probably not affect the classification.

The temperature used in the fathead minnow test does not satisfy the guideline requirements for a freshwater fish acute toxicity test. The results could not be expected to provide useful information on the response of the fathead minnow to the test material at higher temperatures (i.e. 17° or 22°C) due to changes in the physiology of the organism at lower temperatures. The

registrant should submit the 96-hour LC_{50} for fathead minnows determined at 17° or 22°C. This information could be compared to the value determined at 12°C and would provide insight into the role of temperature in the toxicity of Triclopyr Triethylamine.

The 96-hour LC_{50} values of 552, 947, and 891 mg/L (based on nominal concentrations) for rainbow trout, fathead minnow, and bluegill sunfish, respectively, and the 48-hour LC_{50} of 775 mg/L for Daphnia magna classify Triclopyr Triethylamine as practically non-toxic.

D. **Adequacy of the Study:**

(1) Classification: 1) Fathead minnow: **Supplemental.**

2) Other tests: Supplemental.

(2) Rationale: 1)Fathead minnow: This species was tested as a coldwater fish. 2) Other tests: Data tables submitted were illegible.

(3) Repairability: 1) Fathead minnow: No. 2) Other tests: The registrant must submit legible data tables.

15. COMPLETION OF ONE-LINER FOR STUDY: Yes, 01-21-91.

TABLE I

RAW LAKE HURON WATER ANALYSES

Turbidity as ppm SiO_2	3
Color, APHA	5-10
Alkyl benzene sulfonate, ppm	*nd(0.10)
Arsenic, ppm	<0.005
Barium, ppm	0.011
Cadmium, ppm	nd(0.01)
Chlorine, ppm	10.0
Chromium, ppm	nd(0.01)
Copper, ppm	0.03
Cyanide, ppm	nd(0.01)
Fluoride, ppm	<0.5
Iron, ppm	0.1
Lead, ppm	nd(0.03)
Magnesium, ppm	7.0
Manganese, ppm	0.01
Nitrate, ppm	0.5
Phenols, ppm	nd(0.001)
Selenium, ppm	nd(0.02)
Silver, ppm	nd(0.01)
Sulfate, ppm	16
Total dissolved solids, ppm	144
Zinc, ppm	0.03
PCB's, ppm	$<0.02 \times 10^{-3}$
Mercury, ppb	nd(2)

Haughneasey No. 116002 Chemical Name Triclopyr - Triethylamine Chemical Class ____ Page 1 of 4

Study/Species/Lab/ Accession	Chemical % a.i.	Results	Reviewer/ Date	Validation Status
4-Day Single Dose Oral LD_{50}		LD50 = mg/kg (95% C.L.) Contr. Mort.(%)=		
pecies	____	Slope= # Animals/Level= Age(Days)= Sex =	____	____
ab		14-Day Dose Level mg/kg/(% Mortality) ( ), ( ), ( ), ( ), ( )		
cc.		Comments:		
4-Day Single Dose Oral LD_{50}		LD50 = mg/kg. (95% C.L) Contr. Mort.(%)=		
pecies	____	Slope= # Animals/Level= Age(Days)= Sex =	____	____
ab		14-Day Dose Level mg/kg/(% Mortality) ( ), ( ), ( ), ( ), ( )		
cc.		Comments:		
-Day Dietary LC_{50}		LC50 = ppm (95% C.L.) Contr. Mort.(%)=		
pecies		Slope= # Animals/Level= Age(Days)= Sex =	____	____
ab	____	8-Day Dose Level ppm/(%Mortality) ( ), ( ), ( ), ( ), ( )		
cc.		Comments:		
-Day Dietary LC_{50}		LC50 = ppm (95% C.L) Contr. Mort.(%)=		
pecies		Slope= # Animals/Level= Age(Days)= Sex =	____	____
ab	____	8-Day Dose Level ppm/(%Mortality) ( ), ( ), ( ), ( ), ( )		
cc.		Comments:		
48-Hour LC_{50}		LC50 = 775 ppm* (95% C.L. 674-1108) Contr. Mort.(%)= 7% Sol. Contr. Mort.(%)= N/A		
pecies Daphnia Magna	64.7	Slope= * # Animals/Level= 30 Temperature = 17°C	LR 1/21/91	Supplemental
ab Environmental Sci Res. Lab. Dow Chemical		48-Hour Dose Level ppm /(%Mortality) * ( ), ( ), ( ), ( ), ( )		
tee. MRID 92189-007		Comments: nominal concentrations, * Data tables illegible		
96-Hour LC_{50}		LC50 = pp__ (95% C.L.) Con. Mort(%)= Sol. Con. Mort.(%)=		
pecies		Slope= # Animals/Level= Temp.=	____	____
ab	____	96-Hour Dose Level pp /(%Mortality) ( ), ( ), ( ), ( ), ( )		
cc.		Comments:		
96-Hour LC_{50}		LC50 = pp__ (95% C.L) Con. Mort.(%)= Sol. Con. Mort.(%)=		
pecies		Slope= # Animals/Level= Temp.=	____	____
ab	____	96-Hour Dose Level pp /(%Mortality) ( ), ( ), ( ), ( ), ( )		
cc.		Comments:		

Shaughnessey No. 116002 | Chemical Name Triclopyr Triethylamine | Chemical Class ____ |

Study/Species/Lab/Accession	Chemical % a.i.	Results	Reviewer/Date	Validation Status
14-Day Single Dose Oral LD_{50} Species Lab Acc.		LD_{50} = mg/kg (95% C.L.) Contr. Mort. (%) = Slope = # Animals/Level = Age(Days) = Sex = 14-Day Dose Level mg/kg/(% Mortality) ( ), ( ), ( ), ( ), ( ) Comments:		
14-Day Single Dose Oral LD_{50} Species Lab Acc.		LD_{50} = mg/kg. (95% C.L.) Contr. Mort. (%) = Slope = # Animals/Level = Age(Days) = Sex = 14-Day Dose Level mg/kg/(% Mortality) ( ), ( ), ( ), ( ), ( ) Comments:		
8-Day Dietary LC_{50} Species Lab Acc.		LC_{50} = ppm (95% C.L.) Contr. Mort. (%) = Slope = # Animals/Level = Age(Days) = Sex = 8-Day Dose Level ppm/(%Mortality) ( ), ( ), ( ), ( ), ( ) Comments:		
8-Day Dietary LC_{50} Species Lab Acc.		LC_{50} = ppm (95% C.L.) Contr. Mort. (%) = Slope = # Animals/Level = Age(Days) = Sex = 8-Day Dose Level ppm/(%Mortality) ( ), ( ), ( ), ( ), ( ) Comments:		
48-Hour LC_{50} Species Lab Acc.		LC_{50} = pp__ (95% C.L.) Contr. Mort. (%) = Sol. Contr. Mort. (%) = Slope = # Animals/Level = Temperature = 48-Hour Dose Level pp /(%Mortality) ( ), ( ), ( ), ( ), ( ) Comments:		
96-Hour LC_{50} Species Salmo gairdneri Lab Envieomental Sci. Res. Lab. Dow chemical Acc. MRID 92189-007	64.7	LC_{50} = 552 pp*m* (95% C.L. 469-695) Con. Mort.(%) = 0 % Sol. Con. Mort. (%) = N/A Slope = * # Animals/Level = 10 Temp. = 12°C 96-Hour Dose Level pp /(%Mortality) ( ), ( ), ( ), ( ), ( ) Comments: nominal concentrations * DATA TABLES illegible	LR 1/21/91	Supplement
96-Hour LC_{50} Species Lab Acc.		LC_{50} = pp__ (95% C.L.) Con. Mort. (%) = Sol. Con. Mort. (%) = Slope = # Animals/Level = Temp. = 96-Hour Dose Level pp /(%Mortality) ( ), ( ), ( ), ( ), ( ) Comments:		

Laughlin Accession No. 116002 Chemical Name Triclopyr Triethylamine Chemical Class ____ Page 3 of 4

Study/Species/Lab/Accession	Chemical % a.i.	Results	Reviewer/Date	Validation Status
4-Day Single Dose Oral LD_{50}		LD50 = mg/kg (95% C.L.) Contr. Mort.(%)=		
pecies	____	Slope= # Animals/Level= Age(Days)= Sex =	____	____
ab		14-Day Dose Level mg/kg/(% Mortality) ( ), ( ), ( ), ( ), ( )		
cc.		Comments:		
4-Day Single Dose Oral LD_{50}		LD50 = mg/kg. (95% C.L) Contr. Mort.(%)=		
pecies	____	Slope= # Animals/Level= Age(Days)= Sex =	____	____
ab		14-Day Dose Level mg/kg/(% Mortality) ( ), ( ), ( ), ( ), ( )		
cc.		Comments:		
-Day Dietary LC_{50}		LC50 = ppm (95% C.L.) Contr. Mort.(%)=		
pecies		Slope= # Animals/Level= Age(Days)= Sex =	____	____
ab	____	8-Day Dose Level ppm/(%Mortality) ( ), ( ), ( ), ( ), ( )		
cc.		Comments:		
-Day Dietary LC_{50}		LC50 = ppm (95% C.L) Contr. Mort.(%)=		
pecies		Slope= # Animals/Level= Age(Days)= Sex =	____	____
ab	____	8-Day Dose Level ppm/(%Mortality) ( ), ( ), ( ), ( ), ( )		
cc.		Comments:		
8-Hour LC_{50}		LC50 = pp__ (95% C.L) Contr. Mort.(%)= Sol. Contr. Mort.(%)=		
pecies		Slope= # Animals/Level= Temperature =	____	____
ab	____	48-Hour Dose Level pp /(%Mortality) ( ), ( ), ( ), ( ), ( )		
cc.		Comments:		
6-Hour LC_{50}		LC50 = 947 * ppM (95% C.L. 838-1071) Con. Mor(%)= 0 Sol. Con. Mor.(%)= N/A	LK 1/21/91	INVALID
pecies Pimephales promelas	64.7	Slope= # Animals/Level= 10 Temp.= 12°C		
ab Environmental Res. Lab Dow Chemical		96-Hour Dose Level pp /(%Mortality) ( ), ( ), ( ), ( ), ( )		
cc. MRID 92189-007		Comments: nominal concentrations * Data tables illegible		
6-Hour LC_{50}		LC50 = pp__ (95% C.L) Con. Mort.(%)= Sol. Con. Mort.(%)=		
pecies		Slope= # Animals/Level= Temp.=	____	____
ab	____	96-Hour Dose Level pp /(%Mortality) ( ), ( ), ( ), ( ), ( )		
cc.		Comments:		

Laughinnessey No. 116002 Chemical Name TRICLOPYR Triethylamine Chemical Class ____ Page 4 of 4

Study/Species/Lab/ Accession	Chemical % a.i.	Results	Reviewer/ Date	Validation Status
4-Day Single Dose Oral LD_{50}		LD50 = mg/kg (95% C.L.) Contr. Mort.(%)=		
pecies	____	Slope= # Animals/Level= Age(Days)= Sex =	____	____
ab		14-Day Dose Level mg/kg/(% Mortality) ( ), ( ), ( ), ( ), ( )		
cc.		Comments:		
4-Day Single Dose Oral LD_{50}		LD50 = mg/kg. (95% C.L) Contr. Mort.(%)=		
pecies	____	Slope= # Animals/Level= Age(Days)= Sex =	____	____
ab		14-Day Dose Level mg/kg/(% Mortality) ( ), ( ), ( ), ( ), ( )		
cc.		Comments:		
-Day Dietary LC_{50}		LC50 = ppm (95% C.L.) Contr. Mort.(%)=		
pecies		Slope= # Animals/Level= Age(Days)= Sex =	____	____
ab	____	8-Day Dose Level ppm/(%Mortality) ( ), ( ), ( ), ( ), ( )		
cc.		Comments:		
-Day Dietary LC_{50}		LC50 = ppm (95% C.L) Contr. Mort.(%)=		
pecies		Slope= # Animals/Level= Age(Days)= Sex =	____	____
ab	____	8-Day Dose Level ppm/(%Mortality) ( ), ( ), ( ), ( ), ( )		
cc.		Comments:		
8-Hour LC_{50}		LC50 = pp__ (95% C.L.) Contr. Mort.(%)= Sol. Contr. Mort.(%)=		
pecies		Slope= # Animals/Level= Temperature =	____	____
ab	____	48-Hour Dose Level pp /(%Mortality) ( ), ( ), ( ), ( ), ( )		
cc.		Comments:		
6-Hour LC_{50}		LC50 = 89 ppm (95% C.L. 787 - 1011) Con. Mort(%) = 0 Sol. Con. Mor.(%)= N/A	LR 11/21/91	Supplemental
pecies Lepomis macrochirus	64.7	Slope= # Animals/Level= 10 Temp.= 22°C		
ab Environ. Sci. Ref. Lab Dowchemical		96-Hour Dose Level pp /(%Mortality) ( ), ( ), ( ), ( ), ( )		
cc. MRID # 92189-007		Comments: nominal conc's, Data tables illegible		
6-Hour LC_{50}		LC50 = pp__ (95% C.L.) Con. Mort.(%)= Sol. Con. Mort.(%)=		
pecies		Slope= # Animals/Level= Temp.=	____	____
ab	____	96-Hour Dose Level pp /(%Mortality) ( ), ( ), ( ), ( ), ( )		
cc.		Comments:		