Shaughnessy No.: 080807
DP Barcode: D163344
Case: 838839
Submission: S394105
Date Out of EFGWB: OCT 7, 1992

TO: Cathy Pearce
Product Manager #60
Special Review and Reregistration Division

FROM: Henry Nelson, Ph.D., Head
Surface Water Section
Environmental Fate and Groundwater Branch/EFED (H7507C)

THRU: Hank Jacoby, Chief
Environmental Fate and Groundwater Branch
Environmental Fate and Effects Division (H7507C)

Attached, please find the EFGWB review of:

Reg./File #(s): _____

Common Names: Simazine

Type of Product: Herbicide

Product Name: Numerous

Company Name: CIBA-GEIGY

Purpose: Review of literature simazine in surface water data

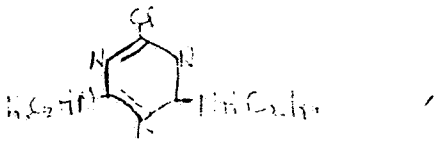
Action Code: 801

EFGWB #(s): 92-0646

Total Review Time: 1.0 day

The report is a literature/STORET summary of simazine concentrations in ground water and surface water submitted by CIBA-GEIGY in response to an August 8, 1989 data call-in. This review is by the Surface Water Section of the only the surface water portion of the report. The review of the ground water portion of the report has been or will be submitted separately by the Groundwater Section.

1. CHEMICAL:
Common Name: Simazine
Chemical Name: 2-chloro-4,6-bis(ethylamino)-1,3,5-triazine
Type of Product: Herbicide
Chemical Structure:



Physical/Chemical Properties
Molecular Weight: 201.69
Physical State: White crystalline solid
Aqueous Solubility: 3.5 mg/L @ 20°C
Vapor Pressure: 6.1 X 10^{-9} mm Hg @ 20°C
Log Octanol/Water Partition Coefficient: 2.51

2. TEST MATERIALS:
Not applicable

3. STUDY/ACTION TYPE:
Review of simazine in surface water data collected from the literature by CIBA-GEIGY in response to an August 8, 1989 data call-in.

4. STUDY IDENTIFICATION:
A summary of simazine data in ground and surface water. 1991. Paul H. Roux. Submitted by CIBA-GEIGY. MRID #417946-02. Bar Code:D163344.

REFERENCES SUMMARIZED:
Reference 1: Glotfelty DE, Taylor AW, Isensee AR, Jersey J, and Glenn S. 1984. Atrazine and simazine movement to Wye River Estuary. J. Environ. Quality 13(1): 115-121

Reference 2: Glenn S, and Angle JS. 1987. Atrazine and simazine in runoff from conventional and no-till corn watersheds. Agriculture, Ecosystems, and Environment 18: 273-280.

Reference 3: Lietman PL, Ward JR, and Behrendt TE. 1981. Effects of specific land uses on nonpoint sources of suspended sediment, nutrients, and herbicides - Pequea Creek Basin, Pennsylvania 1979-80. U.S. Geological Survey - Water Resources Investigations Report 83-4113. 88p.

Reference 4: Written communication, Monsanto data for surface water. Supplied by CIBA-GEIGY, 1986.

Reference 5: Pereira WE, Rostad CE, and Leiker TJ. 1988. Occurrence, distribution and fate of herbicides in the lower Mississippi River and its tributaries. U.S. Geological Survey Draft. Submitted to Environ. Sci. & Technol.

Reference 6: Miltner RJ, Baker DB, Speth TJ, and Frank CA. 1988. Treatment of seasonal pesticides in surface waters. Water Engineering Research Laboratory. U.S. Environmental Protection Agency, Cincinnati, OH.

Reference 7: U.S. EPA. STORET Database. 1990.

5. REVIEWED BY:
Henry Nelson, Ph.D., Head H Nelson
Surface Water Section
Environmental Fate and Groundwater Branch/EFED

6. APPROVED BY:
Hank Jacoby, Chief
Environmental Fate and Groundwater Branch
Environmental Fate and Effects Division/OPP

7. CONCLUSIONS:

(1) The surface water data fields are adequate except:

(a) the USGS hydrological unit should be specified

(b) the average concentration should include non-detects using either the detection limit, 50% of the detection limit, or 0.0; an average of detects is misleading.

(c) there should be a 3 letter code (e.g., RUN) to designate runoff water as opposed to river (RIV), lake (LAK), creek (CRK), or reservoir (RES). Since concentrations in runoff water are typically much higher than in receiving waters, runoff water should have its own category instead of being grouped into other (OTH).

(2) There were several discrepancies between the written summaries and the corresponding data tables:

(a) Reference 1: the range of positive concentrations and the average of detects in the Wye River estuary are designated as unknown in the summary, but can be obtained from the data table.

(b) Reference 2: the number of sampling locations are stated to be 2 in the summary, but 4 in the data table.

(c) Reference 3: the average positive concentration (presumably across all sampling locations) was listed as 1.7 ppb in the summary, but none of the average positive concentrations exceeded 0.30 ppb in the data table.

(d) Reference 4: the average positive concentration is listed as "not applicable" in the summary; however, the range of average positive concentrations across the 24 community water systems sampled could and should have been provided.

(3) There was no data table provided for reference 6.

(4) Reference 7 (STORET): in cases where only one sample had detectable simazine, the positive average concentration was listed as 0.00 in the data table; the concentration in the sample should have been listed.

(5) None of the simazine data in the 6 non-STORET references was of concern with respect to the current drinking water MCL for simazine of 4 ug/L. The "questionable" STORET data may be of concern if it has the proper units and is for surface water body samples rather than for runoff samples. In addition, a number of single detects of simazine at concentrations > than the MCL of 4 ug/L may also be of concern (see recommendations).

8. RECOMMENDATIONS:

(1) A number of studies containing simazine data were reviewed by EFGWB as part of the overall triazine review (see EFGWB #s 92-0002 and 92-0199 dated 3/10/92 and the shorter summary document entitled ""). Those should be noted by SRRD.

(2) The average of detected atrazine concentrations (which is generally greater than the average of all samples including the non-detects) was greater than the MCL for simazine (4 ug/L) at 11 of the 835 sampling locations listed in STORET. Although 5 of those locations had suspiciously high maximum concentrations (see discussion of reference 7) and the remaining 6 were based upon one detection, it would probably be advisable to ask the registrant to obtain additional information on those data, summarize it and then submit it to EFGWB for further review.

9. BACKGROUND

The report is a literature/STORET summary of simazine concentrations in ground water and surface water submitted by CIBA-GEIGY in response to an August 8, 1989 data call-in. This review is only of the surface water portion. The review of the ground water portion has been or will be submitted separately by the Groundwater Section.

10. DISCUSSION:

(1) Reference 1: Monthly samples were collected from the Wye River estuary in MD from 5/80 to 10/82. Simazine was detected at $\geq$ 0.01 ppb in 9 of the 15 monthly samples collected. The highest concentration reported was 2.4 ppb. The average of the 9 detects was 0.90 ug/L. Setting non-detects = 0.0, the average concentration of all 15 samples would be 0.54 ppb. Concentrations in runoff water reportedly ranged from below detection to 300 ppb.

(2) Reference 2: Concentrations of simazine in runoff water from conventionally tilled and no-till fields in MD were compared. The summary states that simazine concentrations in runoff from conventionally tilled fields were generally greater than in runoff from no-till fields. However, this could not be confirmed because

the data was not labeled with respect to tillage. Samples were collected at 2 fields from 6/79 to 10/79, at a third field from 6/81 to 10/81, and from a fourth field from 5/82 to 6/82. Simazine concentrations in the runoff ranged from 1 to 456 ppb at the first field, 0.6 to 210 ppb at the second field, 1 to 1.8 ppb at the third field, and up to 2 ppb at the fourth field.

(3) Reference 3: Samples were collected 5/79 to 12/80 from Pequea Creek, PA during both base and storm flow. The maximum simazine concentrations reported was 4.8 ppb during storm flow and 2.3 ppb during base flow. However, the average of detects did not exceed 0.3 ppb in storm flow and 0.2 ppb in base flow.

(4) Reference 4: Samples were collected weekly 4/85-2/86 from 24 surface water source community water systems in Iowa, Illinois, Indiana, Mississippi, Missouri, North Carolina, and Missouri. The maximum simazine concentration reported was 1.8 ppb which is well below the MCL for simazine of 4 ppb. The average of detects did not exceed 0.47 ppb.

(5) Reference 5: Samples were collected 7/87 to 6/88 from 26 Lower Mississippi Basin locations in Arkansas, Illinois, Kentucky, Louisiana, Missouri, Mississippi, Ohio, and Tennessee. The highest reported simazine concentration was 1.2 ppb (at an Ohio location) which is well below the MCL for simazine of 4 ug/L. The highest average of detects was 0.53 ppb at an Ohio location.

(6) Reference 6: Pre-treatment samples were collected 5/84 to 10/84 from 3 water treatment plants (locations not specified). The maximum simazine concentration reported was 1.2 ppb which is well below the MCL for simazine of 4 ug/L. The average of detects (presumably over the 3 treatment plants) was 0.37 ppb.

(7) Reference 7 STORET: As pointed out by CIBA-GEIGY, the STORET database lacks much of the information called for in the summary format. Consequently, it is difficult to interpret the data. In addition, reported concentrations of various chemicals in STORET are occasionally 3 orders of magnitude below or above the actual value due to a failure to convert to the proper units. Suspicious maximum concentrations include 1300 ppb, 700 ppb, 500 ppb, 500 ppb, and 310 ppb in 1986-1988 samples collected from unspecified water types in California, and 238 ppb in a 1987 sample collected from an unspecified water type in Ohio. Unless those concentrations were for runoff water samples (sample type unspecified), they are much higher (2 orders of magnitude) than are typically seen for simazine in receiving surface waters. The next highest maximum simazine concentration reported for a sampling location was 28 ppb.

Simazine was detected in one or more samples collected from 181 of the 835 sampling locations summarized in STORET. The average of detected atrazine concentrations (which is generally greater than the average of all samples including the non-detects) was greater than the MCL for simazine (4 ug/L) at 11 of the locations. However, 5 of those locations had suspiciously high

maximum concentrations (see previous paragraph) and the remaining 6 were based upon one detection.

11. COMPLETION OF ONE-LINER:
Not applicable

12. CBI INDEX:
Not applicable

ETOXIS (IV)

DP BARCODE: D163344

CASE: 838839 DATA PACKAGE RECORD DATE: 03/17/9
SUBMISSION: S394105 BEAN SHEET Page 1 of 1

* * * CASE/SUBMISSION INFORMATION * * *

CASE TYPE: SPECIAL REVIEW ACTION: 801 RESUBMISSION
CHEMICALS: 080807 Simazine (2-Chloro-4,6-bis(ethylamino)-s-triazine 100.00

ID#: 080807
COMPANY:
PRODUCT MANAGER: 60 ~~JANET AUERBACH~~ Cathy Pearse 703-308-8010 ROOM: CS1 2H2
PM TEAM REVIEWER: PHILIP POLI 703-308-8038 ROOM: CS1 2L5
RECEIVED DATE: 02/25/91 DUE OUT DATE: 04/26/91

* * * DATA PACKAGE INFORMATION * * *

DP BARCODE: 163344 EXPEDITE: N DATE SENT: 04/08/91 DATE RET.: / /
CHEMICAL: 080807 Simazine (2-Chloro-4,6-bis(ethylamino)-s-triazine)
DP TYPE: 001 Submission Related Data Package
ADMIN DUE DATE: 06/07/91 CSF: N LABEL: N

ASSIGNED TO	DATE IN	DATE OUT
DIV : EFED	04/09/91	/ /
BRAN: EFGB	/ /	/ /
SECT: IO	/ /	/ /
REVR :	/ /	/ /
CONTR:	/ /	/ /

This has been assigned to you since 4/9/91 EB.

* * * DATA REVIEW INSTRUCTIONS * * *

Response to EPA review of simazine water monitoring Summaries received by Ciba-Geigy on December 28, 1990. Data includes three volumes (MRID #417946-00 through 417946-02). Data was misplaced and therefore not received by the review manager (Philip Poli) until 3/29/91. A disk was apparently lost during the mailing process and the Agency has requested another copy from Ciba-Geigy. This disc will be passed along for review when received from the registrant. Please review this response to the Agency's 12/19/90 letter which required the registrant to address data integrity problems by June 8, 1991.

* * * ADDITIONAL DATA PACKAGES FOR THIS SUBMISSION * * *

DP BC	BRANCH/SECTION	DATE OUT	DUE BACK	INS	CSF	LABEL

MRID
417945-00
-01
-02

note on review that this is companion to ground water submission reviewed by RWTS

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