7-21-93

Date Out: 7/14/93

Chemical Code:012301
DP Barcode: D191409
D191677

ENVIRONMENTAL FATE AND GROUND WATER BRANCH

Review Action

To: Linda Propst, PM #73
Special Review and Reregistration Division (H7508W)

From: David Wells, Acting Section Head
Ground Water Technology Section
Environmental Fate & Ground Water Branch/EFED (H7507C)
Dan A Wells 7/21/93

Thru: Henry Jacoby, Chief
Environmental Fate & Ground Water Branch/EFED (H7507C)
Henry Jacoby 7/19/93

Attached, please find the EFGWB review of...

Common Name:	Bromacil	Trade name:	Hyvar,Krovar,Krovar II
Company Name:	Du Pont Agricultural Products		
ID #:			
Purpose:	Review Supplemental Submission to Small-Scale Retrospective Ground- Water Monitoring Study		

Type Product:	Action Code:	EFGWB #(s):	Review Time:
Herbicide	629	93-0742, 93-0768	3 days

STATUS OF STUDIES IN THIS PACKAGE:

Guideline #	MRID	Status[1]
None	None	I

STATUS OF DATA REQUIREMENTS ADDRESSED IN THIS PACKAGE:

Guideline #	Status[2]
166-2	N

[1]Study Status Codes: A = Acceptable U = Upgradeable C = Ancillary I = Invalid.
[2]Data Requirement Status Codes: S = Satisfied P = Partially satisfied N = Not satisfied R = Reserved W = Waived.

1. CHEMICAL:

Chemical name: 5-Bromo-3-sec-Butyl-6-Methyluracil
Common name: Bromacil
Trade name(s): Hyvar, Krovar, Krovar II
Structure:

2. TEST MATERIAL:

Not Applicable.

3. STUDY/ACTION TYPE:

Review Supplemental Submission to Small-Scale Retrospective Ground-Water Monitoring Study

4. STUDY IDENTIFICATION:

Title: On the Analysis of the Central Ridge Site Bromacil Data

Author: Dr. C. John Peter

Identifying No.: 012301
DP Barcode: D191677
EFGWB #: 93-0768
Date Sent to EFED: 5/8/93

5. REVIEWED BY:

Kevin J. Costello
Signature: Kevin J. Costello
Hydrologist
OPP/EFED/EFGWB/Ground-Water Section
Date_____

6. APPROVED BY:

David Wells
Signature: David A. Wells
Acting Section Head
OPP/EFED/EFGWB/Ground-Water Section

7. CONCLUSIONS:

DuPont's interpretation of bromacil detections at their Central Ridge study site is based on unlikely assumptions, and is not credible. The central premise of this report, that the concentration detected in a single upgradient well can be directly subtracted from the concentrations detected in nine separate downgradient wells to obtain "corrected concentrations," is incorrect. Thus, DuPont's conclusions based on this premise are also incorrect. EFGWB does not concur with the assertion that "the data supports that applying bromacil at the new recommended rates will not impair the water quality" of the Central Ridge region of Florida.

8. RECOMMENDATIONS:

EFGWB accepts the possibility that bromacil residues in the ground water may have been transported from the upgradient site to the small-scale retrospective ground-water monitoring study site, but does not accept the method or results of the "correction" applied to the concentrations detected in the study site wells. The elevated levels of bromacil in the monitoring wells that were detected, in spite of the reduction in the application rates in succeeding years, indicate that DuPont's suggested lower application rates would most successfully be evaluated through the completion of a small-scale prospective ground-water monitoring study in the Central Ridge. Such a study was recommended in EFGWB's September 28, 1992 review of the Central Ridge study report.

9. BACKGROUND

Du Pont, working in conjunction with the Florida Department of Environmental Regulation (FDER) and the Florida Department of Agriculture and Consumer Services (FDACS), chose three citrus-growing sites to conduct small-scale retrospective ground-water studies. These sites were selected to represent the three major citrus-growing regions in Florida. The purpose of the study was to determine if residues of bromacil "have reached the potable groundwater beneath the sites under normal conditions." A progress report was submitted to OPP in March 1992. EFGWB responded to this report in its review of September 28, 1992, in which EFGWB requested a small-scale prospective monitoring study for the use of bromacil on Florida citrus.

The greatest evidence of bromacil leaching to ground water was found at the Central Ridge region site in Polk County, in central Florida. The stratigraphy of this site was described as "sand to depth." Ten monitoring wells were installed on site, with 9 of the 10 in three clusters of three wells each. The depths of these wells were staggered, covering a range from 14 to 54 feet deep. The depth to ground water was as shallow as 12 feet during the study. Bromacil was detected in ground water at all 10 wells, in every

sample taken in quarterly sampling from 1987 to 1992. Of the 204 samples analyzed, 23 (11%) had bromacil concentrations above the Health Advisory Level of 90 ppb.

10. DISCUSSION:

EFGWB cannot accept many of the assumptions required to make Du Pont's conclusions credible. The central premise of this report, that the concentration detected in a single upgradient well can be directly subtracted from the concentrations detected in nine separate downgradient wells to obtain "corrected concentrations," is incorrect. Since the ground water flowing past well MW-10 will not flow to all of the downgradient monitoring wells, this report assumes that the concentration of bromacil detected in MW-10 is the exact concentration to be found in a "front" of ground water flowing uniformly toward the monitoring wells.

The report states that "only measured values from well 10 were used and no attempt was made to estimate an adjusted correction factor." This method further reduces the value of the resulting "corrected concentrations" for several reasons. By not taking degradation of bromacil into account, the resulting "correction factor" might be too large for wells downgradient of, or deeper than, MW-10. The report takes note of this possibility for wells deeper than MW-10, but erroneously assumes that this allows one to estimate whether the "correction" "is too little or too much." That "correction factors" leading to negative concentrations are to large is obvious, but calculating a positive concentration in this manner gives absolutely no indication of what portion of the detected bromacil was applied on-site.

EFGWB agrees with Du Pont that the quarterly sampling undertaken for this study would allow "little flexibility in choosing different correction factors." This report assumes a travel time from MW-10 to the three downgradient well clusters of 3, 6 and 9 months, although due to the north-south flow gradient, ground water would be very unlikely to flow from MW-10 to all three of the downgradient well clusters. However, the quarterly sampling scheme results in application of "3-month corrections" to samples taken from 56 to 209 days after MW-10 sampling, "6-month corrections" after 105 to 218 days, and "9-month corrections" after 202 to 419 days. As a result, the values subtracted from the actual measured concentrations are inconsistent with Du Pont's own estimate of how long bromacil from offsite would travel from well to well. In addition, although the report claims to assume a downward ground-water flow of 4 feet per year, it is clear that by applying the same "correction factor" to each well in a cluster, that this assumption was not factored into the equation.

The inconsistencies described above render the resulting "corrected concentrations" listed in Table 2a nearly meaningless. The specific assertion that many of the samples with bromacil concentrations above the HAL of 90 ppb can be corrected to have concentrations

below the HAL is particularly unconvincing. This report does not support the contention that reductions in the application rate of bromacil have led to concentrations in ground water below the HAL.