

## Memorandum

To: Ronald J. Oshima, Assistant Director  
Division of Enforcement, Environmental  
Monitoring, and Data Management

Date: March 13, 1998

From: Department of Pesticide Regulation - 1020 N Street, Room 161  
Sacramento, California 95814-5624

Subject: AGRICULTURAL USE DETERMINATION FOR NORFLURAZON RESIDUES IN  
GROUND WATER

Norflurazon is an active ingredient in economic poisons (herbicides) which have been registered for use in California for several years. The total numbers of pounds of norflurazon used in California during the years 1991-1995 were 142,137, 184,474, 174,438, 164,806, and 153,677, respectively. During those years, approximately 35 percent of the total use was on deciduous nuts, 20 percent on grapes, 17 percent on stone fruits, 13 percent on citrus and the remainder on deciduous fruits, rights-of-way, and asparagus.

Until recently, the only well water samples collected in California that were analyzed for norflurazon were from six wells sampled by the U.S. Environmental Protection Agency in 1989. No norflurazon residues were detected in any of those samples. In 1996, norflurazon was selected for monitoring as an active ingredient from the Ground Water Protection List. This selection was made because norflurazon had recently been detected in ground water in Florida, and because of increased use of norflurazon in some areas of the Central Valley where ground water pollution by soil applied herbicides was a problem. A total of 40 wells were sampled in seven counties, and water samples were analyzed for norflurazon, and 6800(a) herbicides (Attachment 1). Norflurazon residues were verified in one well each in Fresno and Tulare Counties. Overall, samples from 18 of the 40 wells contained one or more herbicide residues. The norflurazon positive well in Tulare County



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also contained residues of bromacil, diuron, simazine, and ACET, a metabolite of atrazine and simazine. The well in Fresno County contained diuron, simazine, and ACET. In response to the detections of norflurazon, a four-section well survey was conducted around each positive well in October 1996.

In Tulare County, five wells were sampled in four of the sections adjoining the norflurazon contamination (Attachment 2). No norflurazon was detected, but four of the wells contained residues of simazine, diuron, or bromacil. Since a second norflurazon positive well was not found, the norflurazon detection in Tulare County was determined not to be the result of legal agricultural use. However, because other herbicides were present in many of the samples and norflurazon use was increasing in the area, additional wells were monitored in November 1996. Of the nine wells sampled in seven sections with high use of norflurazon, none contained norflurazon residues. Again, residues of one or more other herbicides used in the area were found in seven of the nine wells. No additional monitoring for norflurazon was conducted in Tulare County.

In the Fresno County survey, five wells were sampled in three sections, including one well sampled in the section containing the norflurazon detection (Attachment 3). Norflurazon residues were verified in that well and in one well in another section. There were now three norflurazon positive wells in two adjoining sections. Each of the five wells also contained residues of simazine, and/or diuron. In each section where norflurazon residues were found in ground water, applications of norflurazon had been documented in pesticide use reports and there were sites where the herbicide could have been used. As a result, we recommended that norflurazon should be entered into the detection response process. Expanded well monitoring was conducted in Fresno County during December 1996 to determine the extent of norflurazon contamination (Attachment 3). Twenty-six additional wells located in 15 sections with documented norflurazon use were sampled. Norflurazon residues were verified in single wells in each of five sections. Each norflurazon positive well also

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contained residues of one or more herbicides previously found in the area.

At the completion of monitoring in Fresno County, we had identified eight norflurazon positive wells located in seven different one square mile sections of land (Attachment 4). The greatest distance between any two of the sections was approximately six miles.

Pursuant to Section 13149 of the Food and Agricultural Code, within 90 days after such a detection, the Department of Pesticide Regulation is required to determine whether the pesticide residues resulted from agricultural use in accordance with state and federal laws and regulations, and to state, in writing, the reasons for the determination.

In order to make this determination, an investigation was conducted. Assisted by the Fresno County Agricultural Commissioner, the Pesticide Enforcement Branch investigated the seven sections in which the contaminated wells are located to record notable observations of the locales including possible point sources (Attachment 5). Field investigations around the well sites were conducted during April, 1997. Possible pesticide mixing/loading sites and some pesticide storage sheds were present in most sections. However, no other potential point sources for ground water contamination were observed. It was mentioned that most of the sections with norflurazon contamination were located over an old river bottom. Pesticide use reports for each section were examined, and numerous applications of norflurazon to fields in the sections under investigation were documented. The Pesticide Enforcement Branch investigator noted that some applications of norflurazon may have exceeded the rate recommended for the soil type but this information was inconclusive.

Based on this investigation, the Environmental Monitoring and Pest Management Branch has determined that the norflurazon residues in well water resulted from legal agricultural use.

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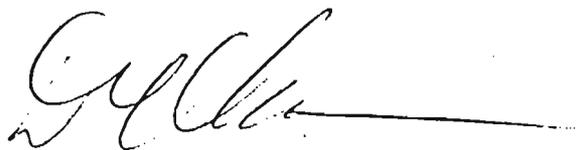
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The reasons for this determination are as follows:

1. Norflurazon has been applied for agricultural use in the vicinity of the wells where norflurazon residues have been found in ground water.
2. There is no evidence that the residues resulted from a point source, non-agricultural use or illegal use.

We recommend that this determination be adopted by James W. Wells, Director, of the Department of Pesticide Regulation.

If you have any comments or questions, please feel free to call me.



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Environmental Monitoring and  
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Attachments

cc: James W. Wells  
Paul Gosselin  
Sharon Dobbins  
Veda Federighi  
Barry Cortez



Approved: James W. Wells  
James W. Wells, Director

Date: 3/27/98

