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Department of Pesticide Regulation

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MEMORANDUM

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TO: Joe Karkoski
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SUBJECT: SAMPLING FOR PESTICIDES ON THE GROUNDWATER PROTECTION LIST (TITLE 3, CALIFORNIA CODE OF REGULATIONS SECTION 6800[B])

In response to comments recently posted to your Web site from Clean Water Action dated August 6, 2012, I am providing you with additional information about the Department of Pesticide Regulation's (DPR's) ground water program. The Pesticide Contamination Prevention Act (PCPA) was passed in 1985 in response to pesticide pollution of ground water as a result of agricultural use. Three fumigants - dibromochloropropane, ethylene dibromide, and 1,2 dichloropropane (1- had been found prior to 1985 at levels of concern to human health. The purpose of the PCPA was to prevent further pollution of ground water used for drinking water supplies by agricultural use pesticides. Pollution was defined in law as "the introduction into the groundwaters of the state of an active ingredient (A.I.), other specified product, or degradation product of an A.I. of a pesticide above a level, with an adequate margin of safety that does not cause adverse health effects."

Among other provisions, the PCPA requires DPR to identify pesticides with the potential to pollute ground water, place them on the Groundwater Protection List by regulation, and conduct sampling to determine if those pesticides have migrated to ground water. Pesticides are placed in Title 3, California Code of Regulations (3 CCR) section 6800(b) of the Groundwater Protection List if they pass a statistical screen for both mobility and persistence and if they are either intentionally applied to or injected into soil or have

labels that require or recommend flood or furrow irrigation within 72 hours after application. DPR is required to develop analytical methods and to commence ground water sampling within one year after a pesticide is placed on the 3 CCR section 6800(b) list. Because of the large number of pesticides initially placed on the list and the large number of pesticides subsequently added to the list, DPR prioritizes pesticides for chemical method development and monitoring. At first, the priority was to sample for pesticides from the 3 CCR section 6800(b) list that would have the greatest impacts on human health if found in ground water. Many of the first monitored pesticides were insecticides that were primarily applied to plant surfaces. None of these

pesticides were found in ground water as a result of legal agricultural use, presumably because they were primarily applied to foliage. The method to prioritize the list then changed to identify pesticides that had a high potential to move and be detected in ground water, focusing on those instead. To date, pesticides that have been found in ground water due to legal agricultural use are primarily applied to soil.

DPR's current method to prioritize pesticides on the 3 CCR section 6800(b) list includes a combination of information on amount of pesticide used, the site and method of application (such as soil applications or applications associated with flood or furrow irrigation), and a modeling procedure that relates ease of movement through soil due to the chemical properties of a pesticide. Registration status also plays a role as there are 15 pesticides on the 3 CCR section 6800(b) list that are no longer registered, for which DPR has no regulatory authority. Lastly, the areas chosen for sampling combine data on the amount of pesticide used with information on soil and depth to ground water. This approach enables sampling ground water in vulnerable areas where there is a higher potential for pesticide use to result in contamination.

In addition, the PCPA requires all state and local agencies to report all results of well monitoring for pesticides to DPR. DPR staff responds to detections of currently registered pesticides to confirm reports and/or conduct additional monitoring. These data often include sampling results for 3 CCR section 6800(b) pesticides, which supplements monitoring conducted by DPR. The data are stored in DPR's Well Inventory Data Base, which includes information on wells sampled in the Eastern San Joaquin River Watershed area. A large portion of that reported data is for local public water systems reported to DPR by the California Department of Public Health, or well monitoring conducted by the U.S. Geological Survey. These 2 agencies and DPR collectively have monitored 1,257 wells for 45 pesticides on the 3 CCR section 6800(b) list in the Eastern San Joaquin River Watershed (Figure 1). Four of the 45 pesticides have been detected in a total of 6 wells, only one of which was confirmed and attributed to agricultural use. This pesticide, hexazinone, was found in three wells and after formal review by a subcommittee of the Pesticide Registration Evaluation Committee (as required in the PCPA), was determined not to pollute or threaten to pollute ground water based on the definition of pollution given in the law (<http://www.cdpr.ca.gov/docs/emon/grndwtr/hexazinone.htm>). The evidence for widespread contamination of 3 CCR section 6800(b) listed pesticides is not apparent from these data.

DPR has been working towards the goal of increased productivity by requesting the laboratory to develop methods where many pesticides can be detected in one water sample. These chemical analyses are referred to as "screens." The first screen was developed to measure 11 pesticide parent and degradation products and later modified to measure over 15 chemicals in one sample. These screens were developed in addition to chemical analytical methods DPR had developed over the years, yielding a total capacity for analysis of some 73 pesticides and degradation

products. A current goal is to develop another pesticide screen that will measure eight additional 3 CCR section 6800(b) listed pesticides for monitoring to be conducted in 2013. DPR also plans to secure funding for the development of a screen to cover the remaining pesticides on the 3 CCR section 6800(b) list by fiscal year 2013/2014.

In addition to monitoring, since 2002 DPR has used a model to predict ground water contamination prior to registration of potentially mobile, persistent pesticides. If modeling predicts pesticide movement to ground water, either additional data are requested to determine ifmitigation is needed, or mitigation measures are added to the label. This level of scrutiny provides for protection of ground water prior to pesticide use in California.

In summary, DPR prioritizes monitoring based on a pesticide's relative potential to pollute groundwater, which is determined by a pesticide's physical and chemical properties, computer modeling results, and on application and use patterns. Reporting of pesticide monitoring results to DPR by other agencies provides for an efficient use of limited resources and for additional vigilance to protect ground water. Well sampling reported for the Eastern San Joaquin River Watershed has provided data for 45 pesticides on the 3 CCR section 6800(b) list with samples collected from 1,257 individual wells. For these data, collected over 20 years, four pesticides on the 3 CCR section 6800(b) list have been detected in 6 wells. Only one pesticide has been linked to agricultural use. DPR plans to develop two multi-residue screens that will cover the remaining pesticides on the 3 CCR section 6800(b) list. In order to provide further protective action, since 2002 DPR has modeled the ground water contamination potential of new A.I.s proposed for registration that are mobile and persistent. This process has resulted in appropriate mitigation measures, if needed, to protect ground water before recommending registration approval. Given these efforts, we believe the DPR program has been vigilant and will in the future increase abilities to identify emerging pesticide concerns in ground water.

Figure 1. Wells Tested for and Wells with Detections of 3 CCR 6800(b) Pesticides within the Eastside San Joaquin River Watershed.