SAMPLING FOR PESTICIDE RESIDUES IN CALIFORNIA WELL WATER

1996 Update of the Well Inventory Database

For Sampling Results Reported From July 1, 1995 through June 30, 1996

Eleventh Annual Report to
the Legislature,
State Department of Health Services,
Office of Environmental Health Hazard Assessment,
and the State Water Resources Control Board

Pursuant to the
Pesticide Contamination Prevention Act

by
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EXECUTIVE SUMMARY

The Pesticide Contamination Prevention Act

The Pesticide Contamination Prevention Act (PCPA) was enacted in 1985 to prevent further pesticide pollution of the State's ground water. The PCPA requires:

The Department of Pesticide Regulation (DPR) to maintain a statewide database of wells sampled for active ingredients of pesticide products;

Agencies (government and private) to report to DPR the results of any well sampling for the active ingredients of pesticides;

DPR to review findings of pesticide contamination and undertake necessary mitigation;

DPR, in consultation with the California Department of Health Services (CDHS) and the State Water Resources Control Board (SWRCB), to annually make this report to the Legislature, CDHS, the State Office of Environmental Health Hazard Assessment, and SWRCB.

The Well Inventory Database

The well inventory database was developed by DPR (then a division of the California Department of Food and Agriculture) in 1983 before the passage of the PCPA.

The purposes of the database were to centralize information on the occurrence of nonpoint source contamination of ground water by the agricultural use of pesticides and to facilitate graphical, numerical, and spatial analyses of the data.

To meet the requirements of the PCPA, sampling results from both point source and nonpoint source contaimiation are included in the database.

What Happens When Detections are Reported to DPR

When a pesticide is found in ground water, a well-defined process established by the PCPA is triggered. This process allows for comprehensive review of the detection.

DPR refers detections to SWRCB if the pesticide is: not currently registered for use; registered for other than agricultural, outdoor industrial, or outdoor institutional uses; or found in ground water and determined not to be due to legal agricultural use. (See Appendix E for definitions of terms used in this report.)

DPR attempts to verify the detection of pesticides that are currently registered for agricultural use by conducting a well sampling study. There are specific criteria for verification of a detection. If a detection is verified, a determination is made as to whether the contamination occurred because of legal agricultural use of the chemical. Detections may not be verified for one of several reasons, including:

Follow-up sampling has not yet been completed by DPR, or sampling was not conducted by DPR. The detection may have been referred to SWRCB; there may be no wells available for sampling; or permission to sample could not be obtained from the well owner.

Analyses of all other samples taken by DPR in response to the positive sample were negative for the compound under investigation.

General Information about Sampling Results in the Well Inventory Database

A summary of the data in the database by report year is given in Table 1 (page v).
The data can be used to:

Display the geographic distribution of well sampling.

Display the geographic distribution of pesticide residues in sampled wells.

Identify areas potentially sensitive to contamination by the legal agricultural use of pesticides.

There are limitations on interpreting the data, including:

The data indicate which pesticides are present in well water among those pesticides for which analyses were performed. They do not represent a complete survey of ground water quality throughout the state nor do they represent sampling for all pesticides.

Sampling by agencies other than DPR is not necessarily related to suspected agricultural sources of contamination.

The Data in this Report

This is the eleventh report and the fourth update to the 1992 cumulative report on the entire contents of the database.

Data were submitted to DPR from July 1, 1995 to June 30, 1996.
Data are the results of six studies conducted by DPR and CDHS
Data are from studies that were conducted from 1994 to 1996.

Summary of Data in This Report

141,985 records (chemical analyses) were added to the database for this report.

3,564 wells were sampled in 48 counties.

121 pesticide active ingredients and breakdown products were analyzed.

22 compounds were reported with positive detections.

Detections Referred to SWRCB

Detections of 13 chemicals, including three chemicals where historical agricultural applications are considered by DPR to be the source of residues in ground water, were reported to SWRCB. The three chemicals and the number of wells with detections are:

1,2-dibromo-3-chloropropane (DBCP): 370 wells

1,2-dichloropropane (1,2-D): 8 wells, and

ethylene dibromide (EDB): 24 wells.

Summary of Verified Detections

Three herbicides had verified detections: atrazine, bromacil, and simazine.

Verified detections were made in six wells in five counties (See Section I, Table I-6).

Counties with verified detections were: Butte, Kern, Monterey, San Joaquin, and Sutter.

All detections were in private drinking-water wells.

First-time Verified Detections Were Made for the Following Chemicals and Counties:

Bromacil in Monterey County and simazine in Sutter County.

Legal Agricultural Use Determinations

After well sampling and land use surveys are completed, a determination is made as to whether the detection of the pesticide residues in ground water could have been due to legal agricultural use. Specific criteria must be met for this determination to be made.

Four herbicides and one breakdown product were found in ground water as a result of legal agricultural use: atrazine, bromacil, diruon, simazine, and deisopropyl-atrazine.

Legal agricultural use was determined to be the source of pesticide residues in 20 Fresno County wells.

Pesticide Management Zone (PMZ)

A PMZ is a land area where a pesticide has been detected in ground water and where it has been determined that the contamination was due to legal agricultural use. PMZs are established in regulation to prevent further contamination of ground water. The use of certain chemicals is prohibited or restricted in these areas. PMZs have been established in various areas of the state for atrazine, bromacil, diuron, prometon, and simazine.

After evaluation of data, a total of 20 PMZs will be established in regulation in Fresno County.

Factors That Contribute to Ground Water Contamination

DPR environmental scientists continue their work to understand the factors that contribute to ground water contamination by pesticides used in agriculture. They conduct field studies on pesticide movement, investigate contaminated wells, compile extensive databases, and review the work of other scientists. The knowledge gained from these activities is used to develop pesticide use practices designed to prevent further ground water contamination. For the past several years, DPR scientists have been developing an approach that integrates climatic, soil, and geographic data in analyses of their combined influence on the movement of pesticides to ground water. This method may provide a basis for development of regional agricultural management practices to reduce ground water contamination by pesticides.

DPR has begun a three-year program to prevent additional residues from reaching ground water. In cooperation with the University of California Cooperative Extension, DPR has been working with growers, pest control advisors, the agricultural industry, and herbicide registrants to identify practical farm management alternatives that can reduce or prevent off-site movement of herbicides used in grape and citrus production.

The State and Regional Water Boards

SWRCB and nine regional water quality control boards are responsible for protecting the beneficial uses of water in California and for controlling all discharges of waste into waters of the State. Actions taken by SWRCB to prevent pesticides from migrating to ground water are detailed in section IV of this report.

Table 1. Summary of well sampling results included in the Department of Pesticide Regulation's (DPR) well inventory data base, by report year, for data reported through June 30, 1996.

CATEGORY	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	TOTAL [d]
Total **wells** sampled	8987	574	3074	752	2784	1557	4741	2324	2839	3322	3564	20,042
no detections	6583	317	2791	543	2550	1351	3985	1945	2414	2769	3128	15,816
detections [a]	2404	257	283	209	234	206	756	379	425	552	436	4,226
verified detections [b]	44	29	4	140	93	133	67	80	37	213	6	794
Total **counties** sampled	53	20	41	33	53	30	52	46	50	47	48	58
no detections	30	6	24	11	27	11	24	25	30	19	20	11
detections [a]	23	14	17	22	26	19	28	21	20	28	28	47
verified detections [b]	5	3	3	16	8	14	9	17	10	17	5	31
Total **pesticides and related compounds**	160	79	167	96	191	186	125	112	114	166	121	293
no detections	144	64	142	81	164	166	85	83	95	139	99	199
detections [a]	16	15	25	15	27	20	40	29	19	27	22	94
verified detections [b]	8	6	5	9	6	9	5	10	6	9	3	22
Pesticides and related compounds detected in ground water as the result of legal, agricultural use [c]	9	8	1	7	6	7	5	11	8	9	8 [e]	15 [f]

(a) Includes verified and unverified detections.

(b) Detections are designated as verified if residues of a compound are detected in one sample as a result of an analytical method approved by DPR and verified, within 30 days in a second discrete sample taken from the well, by a second analytical method or a second analytical laboratory approved by DPR; or if an unequivocal detection is made in one sample.

(c) Legal, agricultural use is the application of a pesticide, according to its labeled directions and in accordance with all laws and regulations. Agricultural use is defined in Food and Agricultural Code section 11408.

(d) The total is not additive. A single well that had sampling data reported in the 1986, 1988, and 1990 reports is counted one time only.

(e) The 8 compounds are: 1,2-D, atrazine, bromacil, DBCP, deisopropyl-atrazine, diuron, EDB, and simazine.

(f) The 15 compounds are: 1,2-D, aldicarb, aldicarb sulfone, aldicarb sulfoxide, atrazine, bentazon, bromacil, DBCP, deethyl-atrazine, deisopropyl-atrazine, diuron, EDB, prometon, simazine, and 2,3,5,6-tetrachloroterephthalic acid. Aldicarb, atrazine, bentazon, bromacil, diuron, prometon, and simazine have been reviewed through the Pesticide Detection Response Process. DPR considers the remaining chemicals to have reached ground water as a result of legal, agricultural use.

PREFACE

This report fulfills the requirements contained in section 13152, subdivision (e) of the Food and Agricultural Code, directing DPR to report specified information on sampling for pesticide residues in California ground water to the Legislature, CDHS, the Office of Environmental Health Hazard Assessment, and SWRCB annually by December 1.

This report presents data reported to DPR from July 1, 1995 through June 30, 1996. This is the eleventh report and the fourth update of the 1992 cumulative report (Maes *et al.*, 1992) which summarized ground water sampling results for agricultural use pesticides that were reported to DPR between November 1, 1983 and July 1, 1992.

The Pesticide Contamination Prevention Act (PCPA) requires that the annual report give the location of wells for which sampling results were reported. Although well locations are specified by township, range, and section in the database, listing results in this manner in the report is not possible due to the large number of wells sampled. Instead, sampling locations are summarized by county.

The information in this report is presented in four parts: Sections I, II, and III were written by DPR staff. Section IV was written by SWRCB staff.

ACKNOWLEDGMENTS

The authors wish to thank the reviewers whose unique perspectives helped ensure this report's accuracy and readability. In addition, we acknowledge the staff of cooperating federal, state, local, and private agencies for contributing their data, time, and efforts.

DISCLAIMER

The mention of commercial products, their source, or their use, in this report is not to be construed as either an actual or implied endorsement of such product.

TABLE OF CONTENTS

Executive Summary i
Preface vi
Acknowledgments vi
Disclaimer vi
Table of Contents vii
List of Tables viii
List of Acronyms and Abbreviations xi

SECTION I. WELL INVENTORY DATABASE
Introduction 1
Background 1
Contents of the Well Inventory Database 2
Criteria for Classifying Records Added to the Well Inventory Database 3
Interpreting the Data 5
Summary of Data by Total Wells Sampled and Wells with Verified Detections 5
Results by Reporting Agency 5
Results by Pesticide and County 6
Status of Pesticides with Verified Detections 12
Summary of Database Contents by Unverified Samples 14
Summary 19

SECTION II. ACTIONS TAKEN BY THE DEPARTMENT OF PESTICIDE REGULATION TO PREVENT PESTICIDES FROM ENTERING GROUND WATER AS A RESULT OF LEGAL AGRICULTURAL USE
Environmental Hazards Assessment Program 20
Legislative Activities 20
Management Agency Agreement between DPR and the SWRCB 20
Ground Water Protection Training 21
The Pesticide Detection Response Process (PDRP) 22
Actions Taken by DPR on Reported Detections 24
Monitoring Surveys for Pesticides 25
Investigations Where Additional Monitoring Was Not Conducted 25
Agricultural Use Determinations 26
Bentazon Monitoring 27
Groundwater Protection List Monitoring 28
Monitoring Studies Suspended Due to Reallocation of Resources 31
Adjacent Section Monitoring 31
Compliance Monitoring 31
Special Studies 31
Other Activities 32
Summary 33

SECTION III. FACTORS CONTRIBUTING TO PESTICIDE MOVEMENT TO GROUND WATER AS A RESULT OF LEGAL AGRICULTURAL USE
Factors Contributing to the Movement of Pesticides to Ground Water 34
Using Multiple Factors to Identify Areas Vulnerable to Ground Water Contamination 35
Runoff and Leaching 35

References 36

APPENDICES:
A. Summary of Number of Wells Sampled and Number of Positive Detections, by County and Pesticide
Part 1: Counties without any Detection 40
Part 2: Counties with a Detection 47
B. Summary of Well Sampling Surveys Included in the 1996 Update Report 61
C. Analytical Methods for the Verification of Ground Water Contamination by Pesticides 65
D. Materials and Methods Used for Entry of Data into the Database and the Format of Database Records 70
E. Glossary of Terms 76

SECTION IV. ACTIONS TAKEN BY THE STATE WATER RESOURCES CONTROL BOARD TO PREVENT PESTICIDES FROM ENTERING GROUND WATER 86

LIST OF TABLES

SECTION I:
Table I-1. Summary of well sampling results included in the well inventory database, by report year, for data reported through June 30, 1996. 4

Table I-2. Summary of records added to the Department of Pesticide Regulation's well inventory database, by reporting agency, from July 1, 1995 through June 30, 1996. 5

Table I-3. Pesticide active ingredients and breakdown products with analytical results added to the well inventory database for data reported from July 1, 1995 through June 30, 1996, by total number of counties and wells sampled and number of wells with verified and unverified detections. 7

Table I-4. Counties with and without detections of pesticides or related compounds for data reported from July 1, 1995 through June 30, 1996. 10

Table I-5. Comparison, by county, of total pesticides sampled for, and total number of wells sampled versus number of wells with unverified, verified, and negative detections. 11

Table I-6. Summary of wells with verified detections by county and chemical. 12

Table I-7. Status, as of June 30, 1996, of all reported detections of pesticide active ingredients and breakdown products in ground water that were added to the Department of Pesticide Regulation well inventory database from July 1, 1995 through June 30, 1996. 15

SECTION II:

Table II-1. Monitoring studies conducted by the Department of Pesticide Regulation for reported detections of chemicals that have not previously been reviewed by a Subcommittee of the Pesticide Registration and Evaluation Committee Subcommittee. 25

Table II-2. Number of wells with detections of pesticide active ingredients contained in products registered for use as of June 30, 1996, or breakdown products, that were determined, pursuant to Food and Agricultural Code section 13149, to be present in ground water as the result of non-point source, legal agricultural use. 26

Table II-3. Number of sections recommended as Pesticide Management Zones by the Department of Pesticide Regulation from July 1, 1995 through June 30, 1996. 27

Table II-4. Wells sampled for bentazon in 1996. 28

Table II-5. Number of wells sampled, by county, for pesticide active ingredients placed on the Groundwater Protection List. Results are for sampling conducted by the Department of Pesticide Regulation from July 1, 1995 through June 30, 1996 30

SECTION IV:

Table IV-1. Actions taken by the Regional Water Quality Control Board, North Coast Region, (Region 1) 87

Table IV-2. Actions Taken by the Regional Water Quality Control Board, San Francisco Bay Region (Region 2) 88

Table IV-3. Actions Taken By the Regional Water Quality Control Board, Central Coast Region (Region 3) 89

Table IV-4. Actions Taken by the Regional Water Quality Control Board, Los Angeles Region (Region 4) 90

Table IV-5. Actions Taken By The Regional Water Quality Control Board, Central Valley Region (Region 5 Sacramento) 91

Table IV-6. Actions Taken By The Regional Water Quality Control Board, Central Valley Region (Region 5 Fresno) 93

Table IV-7. Actions Taken By The Regional Water Quality Control Board, Lahontan Region (Region 6) 95

Table IV-8. Actions Taken By the Regional Water Quality Control Board, Colorado River Basin Region (Region 7) 95

Table IV-9. Actions Taken By The Regional Water Quality Control Board, Santa Ana Region (Region 8) 96

Table IV-10. Actions Taken By The Regional Water Quality Control Board, San Diego Region (Region 9) 99

LIST OF ACRONYMS AND ABBREVIATIONS

AB 1803	Assembly Bill No. 1803 (Connelly, 1983), Health and Safety Code, sections 4026.2 and 4026.3
AB 2021	Assembly Bill No. 2021 (Connelly, 1985), Food and Agricultural Code, sections 13141 through 13152. Also known as the Pesticide Contamination Prevention Act.
Cal/EPA	California Environmental Protection Agency
3CCR	Title 3, California Code of Regulations
CDHS	California Department of Health Services
1,2-D	1,2-dichloropropane; propylene dichloride
2,4-D	2,4-dichlorophenoxyacetic acid
DBCP	1,2-dibromo-3-chloropropane
DPR	Department of Pesticide Regulation
DWR	California Department of Water Resources
EDB	ethylene dibromide
EHAP	Environmental Hazards Assessment Program (Part of DPR)
EMPM	Environmental Monitoring and Pest Management Branch (DPR)
FAC	Food and Agricultural Code
GWPL	Groundwater Protection List
HAL	health advisory level
MCL	maximum contaminant level
MDL	minimum detection limit
ND	not detected
PCA	pest control advisor
PCPA	Pesticide Contamination Prevention Act of 1985 (AB 2021)
PDRP	Pesticide Detection Response Process
PMZ	pesticide management zone
ppb	parts per billion
PREC	Pesticide Registration and Evaluation Committee
RWQCB	Regional Water Quality Control Board
SB 950	Senate Bill 950: The Birth Defect Prevention Act
SNV	specific numerical value
SWRCB	State Water Resources Control Board
U.S. EPA	U. S. Environmental Protection Agency
USGS	U. S. Geological Survey

I. WELL INVENTORY DATABASE

INTRODUCTION

This report presents information about California water wells that were sampled for pesticide residues. The sampling results were compiled from July 1, 1995 through June 30, 1996 by the Department of Pesticide Regulation (DPR, a department within the California Environmental Protection Agency [Cal/EPA]). The report includes a discussion of actions taken by DPR and the State Water Resources Control Board (SWRCB, also part of Cal/EPA), including the nine Regional Water Quality Control Boards (RWQCBs), to prevent pesticides from entering ground water. Also included in this report is a discussion of factors contributing to the movement of pesticides to ground water as a result of legal agricultural use.

BACKGROUND

Until 1979, little well water sampling was conducted in California to determine if pesticide residues had reached ground water because it was believed that pesticides did not have sufficient mobility or longevity in soil to migrate to ground water. In 1979, however, the soil fumigant 1,2-dibromo-3-chloropropane (DBCP) was detected in ground water in Lathrop, California. That discovery prompted widespread testing, and many areas of DBCP contamination were found. Testing for other pesticides followed and studies have been conducted throughout California by various agencies to determine whether pesticides have migrated to ground water.

In 1983, the Environmental Hazards Assessment Program (EHAP) of DPR developed the well inventory database in order to archive reliable information on the occurrence of non-point source contamination of ground water due to the agricultural use of pesticides, and to facilitate graphical, numerical, and spatial analyses of the data. The contents of the database were described in the report *Agricultural Pesticide Residues in California Well Water: Development and Summary of a Well Inventory Database for Non-Point Sources* (Cardozo *et al.*, 1985).

On January 1, 1986, the Pesticide Contamination Prevention Act (PCPA), added sections 13141 through 13152 to Division 7 of the Food and Agricultural Code (FAC). The PCPA requires DPR to maintain a statewide database of wells sampled for pesticide active ingredients (FAC section 13152[c]) and to report annually to the Legislature, the SWRCB, the California Department of Health Services (CDHS), and Cal/EPA's Office of Environmental Health Hazard Assessment, specific information from the database, as well as actions taken by the Director of DPR and the SWRCB to prevent pesticides from migrating to ground water (FAC section

13152[e]). The first report pursuant to the PCPA, *Sampling for Pesticide Residues in California Well Water: 1986 Well Inventory Database* (Brown, *et al.*, 1986), presented data from the original database, plus data received by DPR from early 1984 through August 31, 1986. Since the passage of the PCPA, both point source and non-point source data are included in the well inventory. The majority of pesticide detections are attributed to non-point sources.

The well inventory is a unique archive of ground water sampling data for a single state. Although databases have been compiled in at least nine other states, only California centralizes monitoring results from various agencies into a single repository.

This is the eleventh annual report and the fourth update of the report, *Sampling for Pesticide Residues in California Well Water: 1992 Well Inventory Data Base, Cumulative Report 1986-1992* (Maes, *et al.*, 1992). Each update discussed well sampling data submitted to DPR by other agencies for inclusion in the well inventory database for the report year, as well as the results of DPR investigations of detections of pesticides currently registered for agricultural use.

This report is organized into several sections. Section I contains a summary of the database by total wells sampled; verified detections; unverified detections; and includes the status of pesticides with verified detections. Section II describes the actions taken by DPR to prevent pesticides from entering ground water. Section III describes factors contributing to pesticide movement to ground water as a result of agricultural use. Section IV contains a summary of actions taken by the SWRCB and the RWQCBs to prevent pesticides from migrating to ground water. Included in the appendices are a summary of the number of wells sampled by county and chemical (Appendix A), a summary of studies included in this report (Appendix B), criteria for verification of samples (Appendix C), a description of the materials and methods and the format of database records (Appendix D), and a glossary of terms (Appendix E)

CONTENTS OF THE WELL INVENTORY DATABASE

Format for Reporting Results

The 1992 cumulative report was a comprehensive summary of all sampling results added to the database since its inception in November 1983, and the first report to discuss the number of wells with detections resulting from the legal agricultural use of pesticides. Prior to 1992, well inventory reports emphasized the number of wells with confirmed, positive samples. In 1989, precise criteria were established for verifying detections of pesticide residues in ground water (Biermann, 1989) as specified by the PCPA (FAC section 13149[3][d]). Since then, only wells with verified detections of pesticide residues are subject to DPR regulatory action. Accordingly,

detections are summarized in this section by (1) total number of wells sampled and total number of wells with verified detections and (2) total number of unverified detections. A yearly summary of all well sampling results included in the well inventory is given in Table I-1.

Criteria for Classifying Records Added to the Well Inventory Database

Each record in the well inventory database represents a well water sample analyzed for a pesticide residue. Each record was classified according to those analytical results as follows:

(1) Well water samples in which pesticide residues were not detected at or above the minimum detection limit (MDL) of the method used for analysis were designated as ***negative***.

(2) Samples in which pesticide residues were detected at or above the MDL were classified into one of three categories:

(a) ***unconfirmed***: Pesticide residues were detected in only one sample during a single monitoring survey. Confirmation of the initial detection by a second positive sample was not possible because either only a single sample was taken from the well or analyses of all other samples taken from the well during the survey were negative for the compound under investigation.

(b) ***confirmed, unverified***: Pesticide residues were detected in two discrete samples taken from a single well during a single monitoring survey. A confirmed detection is unverified unless it meets the criteria of a verified detection.

(c) ***verified***: Confirmed detections are verified if they meet the criteria specified in FAC section 13149(d) of the PCPA. Section 13149(d) requires that the detection of a pesticide in ground water results either from an analytical method approved by the department that provides unequivocal identification of a chemical, or from verification within 30 days by a second analytical method or a second analytical laboratory approved by DPR. Criteria have been set by DPR (Biermann, 1989, 1996; see Appendix C) for determining whether the detection of a pesticide or its breakdown product(s) in ground water meets the standards of section 13149(d).

Table I-1. Summary of well sampling results included in the Department of Pesticide Regulation's (DPR) well inventory database, by report year, for data reported through June 30, 1996.

CATEGORY	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	TOTAL (d)
Total **wells** sampled	8987	574	3074	752	2784	1557	4741	2324	2839	3322	3564	20,042
no detections	6583	317	2791	543	2550	1351	3985	1945	2414	2769	3128	15,816
detections (a)	2404	257	283	209	234	206	756	379	425	552	436	4,226
verified detections (b)	44	29	4	140	93	133	67	80	37	213	6	794
Total **counties** sampled	53	20	41	33	53	30	52	46	50	47	48	58
no detections	30	6	24	11	27	11	24	25	30	19	20	11
detections (a)	23	14	17	22	26	19	28	21	20	28	28	47
verified detections (b)	5	3	3	16	8	14	9	17	10	17	5	31
Total **pesticides and related compounds**	160	79	167	96	191	186	125	112	114	166	121	293
no detections	144	64	142	81	164	166	85	83	95	139	99	199
detections (a)	16	15	25	15	27	20	40	29	19	27	22	94
verified detections (b)	8	6	5	9	6	9	5	10	6	9	3	22
Pesticides and related compounds detected in ground water as the result of legal, agricultural use (c)	9	8	1	7	6	7	5	11	8	9	8 (e)	15 (f)

(a) Includes verified and unverified detections.
(b) Detections are designated as verified if residues of a compound are detected in one sample as a result of an analytical method approved by DPR and verified, within 30 days in a second discrete sample taken from the well, by a second analytical method or a second analytical laboratory approved by DPR; or if an unequivocal detection is made in one sample.
(c) Legal, agricultural use is the application of a pesticide, according to its labeled directions and in accordance with all laws and regulations. Agricultural use is defined in Food and Agricultural Code section 11408.
(d) The total is not additive. A single well that had sampling data reported in the 1986, 1988, and 1990 reports is counted one time only.
(e) The 8 compounds are: 1,2-D, atrazine, bromacil, DBCP, deisopropyl-atrazine, diuron, EDB, and simazine.
(f) The 15 compounds are: 1,2-D, aldicarb, aldicarb sulfone, aldicarb sulfoxide, atrazine, bentazon, bromacil, DBCP, deethyl-atrazine, deisopropyl-atrazine, diuron, EDB, prometon, simazine, and 2,3,5,6-tetrachloroterephthalic acid. Aldicarb, atrazine, bentazon, bromacil, diuron, prometon, and simazine have been reviewed through the Pesticide Detection Response Process. DPR considers the remaining chemicals to have reached ground water as a result of legal, agricultural use.

INTERPRETING THE DATA

This report discusses data submitted to DPR from July 1, 1995 to June 30, 1996. The data are results of six studies, designed and conducted by two agencies for varying purposes.

The information contained in the well inventory database can be used to:

Display the geographic distribution of well sampling.
Display the geographic distribution of pesticide residues in sampled wells.
Identify areas potentially sensitive to contamination by legal, agricultural use of pesticides.
Design studies for future sampling.

Interpretation of sampling results in the well inventory database is subject to the following limitations:

The data indicate which pesticides are present in well water among those pesticides for which analyses were performed. They do not represent a complete survey of ground water quality throughout the state nor do they represent sampling for all pesticides used.

Sampling by agencies other than DPR is not necessarily related to suspected agricultural non-point sources of contamination. It should not be assumed that results submitted by those agencies are an indication of which pesticides are more or less likely to reach ground water as a result of non-point source agricultural use.

SUMMARY OF DATA BY WELLS AND VERIFIED DETECTIONS

RESULTS BY REPORTING AGENCY

The results of six well sampling surveys were added to the well inventory database from July 1, 1995 through June 30, 1996. The surveys were conducted from 1994 through 1996. The data represent a total of 3,564 wells in 48 counties that were sampled for 121 pesticide active ingredients and breakdown products. A brief summary of the data included in the database, by sampling agency, is shown in Table I-2. Some wells were sampled by more than one agency. A summary of each study is presented in Appendix B.

Table I-2. Summary of records added to the Department of Pesticide Regulation's well inventory database, by agency, for the reporting period July 1, 1995 through June 30, 1996.

Sampling agency	Wells sampled	Counties sampled	Chemicals analyzed	Positive detections	Records added to database
DPR	167	21	17	17	1,775
CDHS	3,399	47	117	2,087	140,210

Of the 3,564 wells sampled, 3,401 (95%) were public drinking water wells, 133 (4%) were private drinking water wells, 26 (<1%) were non-drinking water wells, 2 wells were unused, and the use of 2 wells was unknown.

RESULTS BY PESTICIDE AND COUNTY

Sampling Distribution

Sampling results for 121 pesticide active ingredients and breakdown products were reported. The most frequently sampled pesticides, atrazine, simazine, and chlordane, were each analyzed for in over 2,000 wells. Additionally, 16 chemicals were each sampled for in 1,500 to 2,000 wells; 27 chemicals in 1,000 to 1,499 wells; 15 chemicals in 500 to 999 wells; and 65 chemicals in less than 500 wells. A list of the compounds by total number of counties and wells sampled, and number of wells with unverified and verified detections, is given in Table I-3.

Sampling results were reported for 48 of California's 58 counties (Table I-4). The number of pesticides analyzed in each county ranged from 7 (Shasta) to 88 (Kern) (Table I-5). On average, 48 compounds were sampled in the 48 counties. The number of wells sampled in each county ranged from 1 (Humboldt and Shasta) to 865 (Los Angeles). Variations in the number of wells sampled is due primarily to the differences in study design and sampling programs of the sampling agencies.

The 20 counties with and 28 counties without detections are listed in Table I-4. A summary, by county, of pesticides analyzed for and number of wells sampled versus number of wells with verified, negative, and unverified detections is given in Table I-5. A summary of the number of wells sampled and the number of wells with positive detections, by county and chemical is given in Appendix A.

Table I-3. Pesticide active ingredients and breakdown products with analytical results added to the well inventory database for the 1996 report year, by total number of counties and wells sampled and number of wells with verified and unverified detections. Most wells were sampled for more than one compound. Results are for data reported from July 1, 1995 through June 30, 1996.

CHEMICAL	Number of Counties Sampled	Number of Wells Sampled	Wells with Unverified Detections	Wells with Verified Detections
1,1,2,2-TETRACHLOROETHANE	35	1447	1	
1,2,4-TRICHLOROBENZENE	35	1440	1	
1,2-D + 1,3-D + C-3 COMPOUNDS	35	1435		
1,2-DICHLOROPROPANE (1,2-D)	35	1451	8	
1,3-DICHLOROPROPENE (1,3-D)	3	248		
2,3,7,8-TCDD (DIOXIN)	8	62		
2,4,5-T	10	89		
2,4,5-TP (SILVEX)	36	1360		
2,4,6-TRICHLOROPHENOL	1	2		
2,4-D	36	1784		
2,4-DINITROPHENOL	1	2		
3-HYDROXYCARBOFURAN	31	745		
4(2,4-DB), DIMETHYLAMINE SALT	2	2		
ACENAPTHENE	3	149		
ALACHLOR	36	1792		
ALDICARB	33	993		
ALDICARB SULFONE	33	945		
ALDICARB SULFOXIDE	33	946		
ALDRIN	35	973		
AMETRYNE	3	13		
ATRATON	5	22		
ATRAZINE	45	2212		1
BENEFIN (BENFLURALIN)	4	20		
BENTAZON, SODIUM SALT	37	1124	1	
BENZENE (BENZOL)	35	1456	8	
BHC (OTHER THAN GAMMA ISOMER)	7	297	1	
BROMACIL	43	1799		3
BUTACHLOR	39	931		
BUTYLATE	3	13		
CAPTAN	4	20		
CARBARYL	31	1442		
CARBOFURAN	35	1410		
CARBOPHENOTHION	4	20		
CHLORAMBEN	5	49		
CHLORDANE	34	2003		
CHLOROBENZILATE	2	12		
CHLOROMETHANE (METHYL CHLORIDE)	37	1455	17	
CHLORONEB	2	12		
CHLOROTHALONIL	31	885		

Table 3 continued.

CHEMICAL	Number of Counties Sampled	Number of Wells Sampled	Wells with Unverified Detections	Wells with Verified Detections
CHLORPROPHAM	3	13		
CHLORTHAL-DIMETHYL	9	212	2	
CYANAZINE	21	167		
CYCLOATE	3	13		
DALAPON	36	1379		
DBCP	33	1884	370	
DDD	7	297		
DDE	7	297		
DDT	7	297		
DDVP (DICHLORVOS)	2	11		
DEMETON	3	34		
DIAZINON	39	1674		
DICAMBA	34	765		
DICOFOL	4	20		
DIELDRIN	33	935		
DIMETHOATE	39	960		
DINOSEB	35	1366		
DIPHENAMID	3	13		
DIQUAT DIBROMIDE	28	1712	2	
DISULFOTON	6	47		
DIURON	37	1493	2	
DMPA (ZYTROM)	4	18		
ENDOSULFAN	7	297	2	
ENDOSULFAN SULFATE	7	297	1	
ENDOTHALL	26	638		
ENDRIN	35	1589		
ENDRIN ALDEHYDE	7	297		
EPTC	3	13		
ETHYLENE DIBROMIDE	35	1862	24	
FENAMIPHOS	2	11		
FENSULFOTHION	1	2		
GLYPHOSATE, ISOPROPYLAMINE SALT	25	1319		
HEPTACHLOR	34	1594	2	
HEPTACHLOR EPOXIDE	34	1595		
HEXACHLOROBENZENE	35	1481		
HEXAZINONE	22	178		
LINDANE (GAMMA-BHC)	36	1584		
MALATHION	2	217		
MCPA, DIMETHYLAMINE SALT	1	14		
MERPHOS	2	11		
METALAXYL	8	27		
METHIOCARB	11	105		
METHOMYL	34	798		

Table 3 continued.

CHEMICAL	Number of Counties Sampled	Number of Wells Sampled	Wells with Unverified Detections	Wells with Verified Detections
METHOXYCHLOR	36	1540		
METHYL BROMIDE (BROMOMETHANE)	36	1478		
METHYL PARATHION	2	217		
METOLACHLOR	39	912		
METRIBUZIN	36	868		
MEVINPHOS	5	22		
MOLINATE	39	1561		
NAPHTHALENE	32	1501	2	
NAPROPAMIDE	3	13		
NITROFEN	4	20		
ORTHO-DICHLOROBENZENE	35	1442	1	
OXAMYL	34	1370		
OXYDEMETON-METHYL (METASYSTOX)	11	28		
PARAQUAT DICHLORIDE	10	402		
PARATHION OR ETHYL PARATHION	2	217		
PCNB	4	20		
PENDIMETHALIN	1	5		
PERMETHRIN	2	11		
PERMETHRIN, OTHER RELATED	1	4		
PICLORAM	35	1377		
PROMETON	23	187		
PROMETRYN	43	1191		
PROPACHLOR	39	836		
PROPARGITE	1	1		
PROPAZINE	2	11		
PROPOXUR	10	104		
PROPYZAMIDE	10	25		
SIMAZINE	45	2235	3	3
SIMETRYN	6	22		
TEBUTHIURON	3	12		
TERBUTRYN	5	21		
TETRACHLORVINPHOS (STIROFOS)	3	12		
THIOBENCARB	39	1540		
TOXAPHENE	36	1573		
TRIADIMEFON	2	10		
TRICHLOROBENZENES	35	1435	1	
TRIFLURALIN	2	12		
VERNOLATE	2	10		
XYLENE	36	1485	6	
TOTAL	48	3564	431	6

Table I-4. Counties with and without detections of pesticides or related compounds for data reported during the period July 1, 1995 through June 30, 1996.

Counties without detections

Amador	Orange
Calaveras	Placer
Colusa	Plumas
Contra Costa	San Benito
El Dorado	Shasta
Glenn	Siskiyou
Humboldt	Solano
Inyo	Tehama
Lassen	Tuolumne
Napa	Yolo

Counties with detections

Alameda	San Bernardino
Butte	San Diego
Fresno	San Joaquin
Kern	San Luis Obispo
Kings	San Mateo
Lake	Santa Barbara
Los Angeles	Santa Clara
Madera	Santa Cruz
Mariposa	Sonoma
Mendocino	Stanislaus
Merced	Sutter
Monterey	Tulare
Riverside	Ventura
Sacramento	Yuba

Table I-5. Summary, by county, of total number of pesticides and wells sampled versus wells with unverified, verified, and negative detections. Wells may have both unverified and verified detections. Results are for data reported from July 1, 1995 through June 30, 1996.

County	Total Pesticides Sampled	Total Wells Sampled	Wells with Unverified Detections	Wells with Verified Detections	Wells with No Detections
Alameda	9	14	3		11
Amador	31	2			2
Butte	48	37		1	36
Calaveras	22	2			2
Colusa	31	12			12
Contra Costa	56	9			9
El Dorado	56	30			30
Fresno	66`	350	140		210
Glenn	25	14			14
Humboldt	18	1			1
Inyo	13	2			2
Kern	88	175	20	1	155
Kings	55	26	2		24
Lake	52	18	1		17
Lassen	13	25			25
Los Angeles	85	865	23		842
Madera	80	27	3		24
Mariposa	39	4	1		3
Mendocino	51	20	1		19
Merced	85	40	15		25
Monterey	61	60	1	1	58
Napa	12	40			40
Orange	72	241			241
Placer	56	6			6
Plumas	24	37			37
Riverside	58	176	19		157
Sacramento	60	175	9		166
San Benito	11	4			4
San Bernardino	65	302	70		232
San Diego	56	21	1		20
San Joaquin	62	74	19	1	54
San Luis Obispo	62	62	1		61
San Mateo	21	9	1		8
Santa Barbara	87	65	1		64
Santa Clara	61	82	1		81
Santa Cruz	32	29	1		28
Shasta	7	1			1
Siskiyou	46	2			2
Solano	77	19			19
Sonoma	58	73	1		72
Stanislaus	73	116	45		71
Sutter	30	22	2	2	18
Tehama	34	19			19
Tulare	63	142	46		96
Tuolumne	41	5			5
Ventura	66	75	2		73
Yolo	20	12			12
Yuba	78	22	2		20
Total	121	3564	431	6	3128

WELLS AND COUNTIES WITH VERIFIED DETECTIONS

Verified detections were made in a total of 6 wells in 5 counties. All 6 were private drinking water wells. Overall, 3 compounds were found in the 6 wells with verified detections. The verified detections of bromacil and simazine in Kern County were in 1 well. A summary of wells with verified detections, by county and pesticide, is given in Table I-6.

Table I-6. Summary of wells with verified detections of pesticide residues, by county and chemical. Results are for data reported from July 1, 1995 through June 30, 1996.

County	atrazine	bromacil	simazine	Total
Butte	1			1
Kern		1	1	1
Monterey		1 [(a)]		1
San Joaquin		1		1
Sutter			2 [(a)]	2
Total	1	3	3	6

(a) First time verified detection of this chemical in this county

COUNTIES WITH FIRST-TIME, VERIFIED DETECTIONS

Verified detections of pesticides previously found in other areas of California were made in the following counties for the first time: bromacil in Monterey, simazine in Sutter.

STATUS OF PESTICIDES WITH VERIFIED DETECTIONS

Atrazine

For use reported in 1994, 84% of the total 46,497 pounds applied was accounted for in forage-fodder crops (mainly corn). Other sites of major use of this herbicide included rights-of-way, corn for human consumption, forest lands, and landscape maintenance (DPR, 1994). Atrazine was reviewed through the Pesticide Detection Response Process (PDRP), including review by a subcommittee of the Pesticide Registration and Evaluation Committee (PREC), pursuant to FAC sections 13149 through 13151. DPR adopted regulations which prohibit the use of pesticides containing atrazine within an atrazine Pesticide Management Zone (PMZ). A PMZ is a geographic surveying unit of approximately one square mile (a section) that is designated in regulation as sensitive to ground water pollution.

Detections of atrazine residues were verified in 1 well in Butte County out of 2,212 wells sampled in 45 counties. Concentrations of verified detected residues ranged from 0.05 to 0.08 ppb. The CDHS and U. S. EPA maximum contaminant level (MCL, see glossary) for atrazine is 3 ppb.

Bromacil

For use reported in 1994, 82% of the total 192,406 pounds used was accounted for in citrus and 15% for right-of-way uses (DPR, 1994). Bromacil, a herbicide, was reviewed through the PDRP, including review by a subcommittee of the PREC. DPR adopted regulations which prohibit the agricultural, outdoor institutional, or outdoor industrial uses of bromacil in non-crop areas and on rights-of-way within bromacil PMZs. Bromacil was also made a restricted material for which a permit is required for crop uses in bromacil PMZs. The permit can only be issued if growers submit a ground water protection advisory written by a licensed pest control adviser (PCA) who has completed an approved ground water protection course within the previous two years.

Bromacil residues were verified in 3 wells in 3 counties out of 1,799 wells sampled in 43 counties. Concentrations of verified detections ranged from 0.06 to 0.61 ppb. This was the first verified detection of bromacil in Monterey County. No MCL has been established for bromacil. The U. S. EPA Integrated Risk Information Reference dose (IRIS RfD, see glossary) for bromacil is 91 ppb.

Simazine

For use reported in 1994, 76% of the total 897,587 pounds was applied to grape, citrus, and fruit and nut crops, and 17% on rights-of-way (DPR, 1994). Simazine, a herbicide, was reviewed through the PDRP, including review by a subcommittee of the PREC. DPR adopted regulations that prohibit the agricultural, outdoor industrial, or outdoor institutional use of pesticides containing simazine in non-crop areas or on rights-of-way within simazine PMZs. Simazine was also made a restricted material for which a permit is required for crop uses in simazine PMZs.

Simazine residues were verified in 3 wells in 2 counties out of 2,235 wells sampled in 45 counties. This was the first verified detection of simazine in Sutter County. Concentrations of verified detections ranged from 0.06 to 0.12 ppb. Both the CDHS and U. S. EPA MCL for simazine is 4 ppb.

SUMMARY OF DATABASE BY UNVERIFIED DETECTIONS

Unverified samples are reviewed or investigated in one of two ways. Detections of the following are referred to the SWRCB: pesticides that are not currently registered for use, pesticides registered for other than agricultural, outdoor industrial, or outdoor institutional uses, and pesticides in ground water which are determined not to be the result of legal agricultural use. The SWRCB and nine RWQCBs are responsible for protecting the beneficial uses of water in California and for controlling all discharges of waste into waters of the State. Compounds registered for agricultural use in California are investigated by DPR. The investigation of the initial detection may lead to other verified detections, or all subsequent samples may be negative for pesticide residues. Negative follow-up samples may result from delays (sometimes years) in reporting the initial detection to DPR.

A summary of the status of all positive samples (verified and unverified) added to the database for this report is given in Table I-7. Of the 141,985 records added to the well inventory for this report, there were 2,090 (1.5%) unverified detections, taken from 431 wells in 27 counties for a total of 20 pesticide active ingredients or breakdown products.

Of the 2,090 unverified samples, 2,077 (99%) were for chemicals currently not registered or not registered for agricultural use. The chemicals were 1,1,2,2-tetrachloroethane, 1,2,4-trichlorobenzene, 1,2-dichloropropane, benzene, BHC (other than gamma isomer), chloromethane, DBCP, ethylene dibromide, heptachlor, naphthalene, *ortho*-dichlorobenzene, unspecified trichlorobenzenes, and xylene. These detections have been reported to the SWRCB.

Reported unverified detections of 7 compounds, which are contained in or result from pesticides registered for agricultural use, were investigated by DPR: bentazon, chlorthal-dimethyl, diquat dibromide, diuron, endosulfan, endosulfan sulfate, and simazine. The results of these investigations are described in Table I-7.

Table I-7. Status, as of June 30, 1996, of all reported detections of pesticide active ingredients and breakdown products in ground water that were added to the Department of Pesticide Regulation (DPR) well inventory database from July 1, 1995 through June 30, 1996.

Compound Detected	Number of Counties and Wells Sampled	Counties and Number of Wells with Detections	Range of Concentrations Detected (ppb)	Water Quality Criteria (a)	Registration Status Type of Compound Comments
1,1,2,2-tetrachloroethane	35 counties 1447 wells	Los Angeles, 1	0.9	DHS MCL 1	Fumigant. Not registered (NR) for agricultural use. Referred to SWRCB.
1,2,4-trichlorobenzene	35 counties 1440 wells	San Bernardino, 1	2.7	DHS & USEPA MCL 70	NR for agricultural use. Referred to SWRCB.
1,2-dichloropropane (1,2-D; propylene dichloride)	35 counties 1451 wells	Fresno, 2 Kern, 1 Riverside, 2 San Bernardino, 1 San Joaquin, 1 San Mateo, 1	0.5 - 3.2	DHS & USEPA MCL 5	Fumigant. NR. Source of residues was determined by DPR to be due to historical non-point source, legal agricultural use. Regulations were adopted in 1985 that prohibit the use or sale of pesticides in California in which 1,2-D exceeds 0.5% of the total formulation. Referred to SWRCB.
atrazine	45 counties 2212 wells	Butte, 1	0.05 - 0.08	DHS & USEPA MCL 3	Herbicide. Active registration (AR). The verified detection in one well in Butte County is currently under investigation (CUI) by DPR.

(a) Marshack, J.B. A Compilaton of Water Quality Goals. and personal communication. Definitions of the various Water Quality Criteria are given below.

DHS MCL: Maximum Contaminant Level (MCL) adopted by DHS under the Safe Drinking Water Act. MCLs are formally established in regulation and are enforceable by DHS on water suppliers. Values are expressed in ppb.

USEPA IRIS RfD: USEPA Integrated Risk Information System (IRIS) Reference Dose (RfD): published by USEPA's Office of Water. See glossary for complete description. Values are expressed in mg/kg/day.

USEPA MCL: MCL adopted by the U.S. Environmental Protectin Agency (USEPA) under the Safe Drinking Water Act. MCLs are enforceable by the California Department of Health Services (DHS) on water suppliers. Values are expressed in ppb.

CA ISWP: California Inland Surface Water Plan: Numerical water quality objective for sources of drinking water. Human Health Protection (30 day average) value. Values are expressed in ppb.

Table I-7 continued

Compound Detected Registration Status Type of Compound	Number of Counties and Wells Sampled	Counties and Number of Wells with Detections	Range of Concentrations Detected (ppb)	Water Quality Criteria (ppb)[a]	Comments
BHC (other than gamma isomer)	297 counties 7 wells	Los Angeles, 1	0.08		NR. Referred to SWRCB.
bentazon, sodium salt	37 counties 1124 wells	Yuba, 1	2.9	DHS MCL 18	Herbicide. AR. This detection was determined to be due to historical legal agricultural use. No further action will be taken.
benzene	35 counties 1456 wells	Kern, 2 Kings, 2 Los Angeles, 1 Riverside, 1 Santa Cruz, 1 Yuba, 1	0.37 - 8.5	DHS MCL 1 USEPA MCL 5	Benzene was an ingredient in some early grain fumigants. NR for agricultural use. Referred to SWRCB.
bromacil	43 counties 1799 wells	Kern, 1 Monterey, 1 San Joaquin, 1	0.06 - 0.6	USEPA IRIS RfD 91	Herbicide. AR. The three verified detections, one in each county, are CUI by DPR.
chloromethane	37 counties 1455 wells	Alameda, 3 Lake, 1 Mariposa, 1 Sacramento, 9 Stanislaus, 1 Tulare, 1 Ventura, 1	0.5 - 4.8	USEPA IRIS RfD 2.8	Fumigant. NR. Referred to SWRCB.
chlorthal-dimethyl	9 counties 212 wells	Madera, 2	0.37 - 0.54	USEPA IRIS RfD 3500	Herbicide. AR. Unverified detections in both wells are CUI by DPR.

Table I-7 continued

Compound Detected Registration Status Type of Compound	Number of Counties and Wells Sampled	Counties and Number of Wells with Detections	Range of Concentrations Detected (ppb)	Water Quality Criteria (ppb)[a]	Comments
DBCP (1,2-dibromo-3-chloropropane)	33 counties 1884 wells	Fresno, 137 Kern, 16 Los Angeles, 11 Madera, 1 Merced, 14 Riverside, 14 San Bernardino, 68 San Joaquin, 19 Stanislaus, 44 Sutter, 1 Tulare, 45	0.01 - 3.54	DHS & USEPA MCL 0.2	Soil fumigant. NR. Use suspended in 1979. Source of residues considered by DPR to be from historical non-point source, legal agricultural use. Referred to SWRCB
diquat dibromide	28 counties 1712 wells	Santa Barbara, 1 Sonoma, 1	2 - 4	(Diquat) DHS & USPEA MCL 20	Herbicide, disiccant. AR. Follow-up sampling conducted by the DHS was negative in both wells in both counties. No further action will be taken.
diuron	37 counties 1493 wells	Kern, 1 Monterey, 1	0.05	USEPA IRIS RfD 14	Herbicide. AR. No further action will be taken on the unverified detections in both Kern and Monterey counties
endosulfan	7 counties 297 wells	Los Angeles, 2	0.45	CA ISWP 0.9	Insecticide, acaricide. AR. Follow-up sampling conducted by the DHS was negative in both wells. No further action will be taken.
endosulfan sulfate	7 counties 297 wells	Los Angeles, 1	0.15	CA ISWP 0.9	Breakdown product of the active ingredient endosulfan. Follow-up sampling conducted by the DHS for endosulfan was negative. No further action will be taken.
ethylene dibromide (EDB)	35 counties 1862 wells	Fresno, 9 Kern, 4 Los Angeles, 1 Merced, 2 Riverside, 2 San Bernardino, 1 San Luis Obispo, 1 Stanislaus, 2 Sutter, 1 Tulare, 1	0.01 - 0.58	DHS & USEPA MCL 0.05	Fumigant, insecticide, nematicide. NR since 1/87. Referred to SWRCB.

Table I-7 continued

Compound Detected Registration Status Type of Compound	Number of Counties and Wells Sampled	Counties and Number of Wells with Detections	Range of Concentrations Detected (ppb)	Water Quality Criteria (ppb)[a]	Comments
heptachlor	34 counties 1594 wells	Los Angeles, 2	0.06 - 0.09	DHS MCL 0.01 USEPA MCL 0.4	Insecticide. NR. Referred to SWRCB.
naphthalene	32 counties 1501 wells	San Bernardino, 1 Ventura, 1	0.5 - 1.1	USEPA IRIS RfD 28	Fumigant, insecticide. NR for agricultural use. Referred to SWRCB.
ortho-dichlorobenzene	35 counties 1442 wells	Los Angeles, 1	7.1	DHS & USEPA MCL 600	Soil fumigant, herbicide, insecticide. NR since 1/85. Referred to SWRCB.
simazine	45 counties 2235 wells	Kern, 1 Mendocino, 1 Stanislaus, 1 Sutter, 3	0.06 - 1.3	DHS & USEPA MCL 4.0	Herbicide. AR. Detections in Kern and Mendocino counties, and 2 wells in Sutter Co. are CUI by DPR. No further action will be taken on the detection in Stanislaus Co. because that section has already been proposed a PMZ for simazine. No further action will be taken on one unverified detection in Sutter County.
trichlorobenzenes	35 counties 1435 wells	Merced, 1	0.8	DHS MCL 70	NR for agricultural use. Referred to SWRCB.
xylene	36 counties 1485 wells	Los Angeles, 4 San Diego, 1 Santa Clara, 1	1.0 - 27.9	DHS MCL 1750 USEPA MCL 10000	Solvent. NR. There are no products currently registered for agricultural use in California that contain xylene as an active ingredient. Referred to SWRCB.

SECTION I SUMMARY

From July 1, 1995 through June 30, 1996, results were reported for 3,564 wells, located in 48 counties, that were sampled for an overall total of 121 pesticide active ingredients or breakdown products. The data represent six well sampling surveys conducted by two agencies from 1994 through 1996.

Of the 121 compounds, 22 pesticide active ingredients or breakdown products were reported detected in 436 wells in 28 counties. Verified detections were made of three compounds in six wells in five counties. All six wells with verified detections were private drinking water wells.

Verified detections of pesticides previously found in other areas of California were made in the following counties for the first time: bromacil in Monterey and simazine in Sutter.

II. ACTIONS TAKEN BY THE DEPARTMENT OF PESTICIDE REGULATION TO PREVENT PESTICIDES FROM ENTERING GROUND WATER AS A RESULT OF AGRICULTURAL USE

ENVIRONMENTAL HAZARDS ASSESSMENT PROGRAM

The Environmental Monitoring and Pest Management Branch's Environmental Hazards Assessment Program (EHAP) performs the lead role for implementing DPR's environmental protection programs. EHAP personnel design and conduct field studies of air, soil, and surface and ground water to determine the environmental fate of pesticides and conduct monitoring surveys to determine the presence of pesticide residues in ground water. All sampling results reported to DPR with positive pesticide detections are reviewed and either referred to the SWRCB or further investigated by DPR. DPR uses results of these investigations to take actions to prevent pesticide contamination of ground water.

LEGISLATIVE ACTIVITIES

Criteria for Verification

Senate Bill 810, which became effective January 1, 1996, amended section 13150 (d) of the Food and Agricultural Code (FAC) to include "unequivocal" identification of a pesticide residue as a means of satisfying the verification requirements of FAC section 13149. This amendment removes the legal requirement to perform unnecessary and costly laboratory analyses that would not provide additional significant information. An unequivocal identification of a chemical is the equivalent of a verified detection. Additional descriptions of a verified detection and a description of the criteria of unequivocal identification are given in Section I and Appendix C.

MANAGEMENT AGENCY AGREEMENT BETWEEN DPR AND SWRCB

In 1991, DPR and the SWRCB signed a memorandum of understanding (MOU) which established principles of agreement regarding activities of both agencies, identified primary areas of responsibility and authority between the agencies, and provided methods necessary to assure ongoing coordination of activities at both the State and local levels. A memorandum providing interim guidance for implementation of the MOU was issued jointly by the Director of DPR and the Executive Director of SWRCB.

The federal Clean Water Act identifies a management agency agreement (MAA) as a formal method to coordinate water quality issues among government agencies. An MAA is generally

more detailed than an MOU and includes implementation plans. Representatives from DPR and SWRCB formed a workgroup to develop an MAA and implementation plan (California Pesticide Management Plan for Water Quality, or 'pesticide management plan'), which replaced the MOU as the functional agreement between DPR and SWRCB in 1996.

The MAA details the following:

1. Ensures that all pesticides registered in California are used in a manner that protects water quality and the beneficial uses of water while providing effective, environmentally sound pest management.
2. Identifies the roles of both agencies regarding water quality protection and pesticide regulation.
3. Coordinates authorities to solve water quality problems relating to pesticide use by promoting development and use of preventive practices through voluntary, and when necessary, regulatory efforts.
4. Promotes interagency sharing of information relating to the study of pesticides and regulatory efforts.

The pesticide management plan implements the MAA by describing a comprehensive program for protection of surface and ground water quality. It encompasses the development and use of preventive activities and practices, ranging from voluntary to regulatory, to protect the beneficial uses of the State's waters from the potentially harmful effects of pesticides.

GROUND WATER PROTECTION TRAINING

Ground water protection training for licensed PCAs is part of a comprehensive program designed to protect ground water from contamination due to the legal agricultural use of pesticides. PMZs have been established where the detection of five pesticides listed in section (a) of the Groundwater Protection List (FAC section 13145(d), 6800 3CCR) in ground water has been determined to be due to non-point source, legal agricultural use. A PMZ is approximately a one-square-mile area that has been determined to be vulnerable to ground water pollution. A ground water protection advisory (GWPA) written by a licensed PCA who has attended DPR-sponsored ground water protection training within the last two years must be submitted before a permit can be issued by the county agricultural commissioner for application of a regulated pesticide for crop uses in its PMZ. The GWPA contains specific information for applying a regulated pesticide in a PMZ so as to reduce the potential for movement of the chemical into ground water.

DPR has conducted ground water protection training annually since 1989. In February, 1996, training sessions were held in Buena Park, Fresno, Sacramento, and Visalia. The primary objective of the training is to enable PCAs to write site-specific advisories on the appropriate use of certain pesticides to avoid ground water contamination. Information is provided on the extent of pesticide residues in ground water, the sources of pesticide residues, the pathways by which contamination can occur, the factors which influence migration of pesticides to ground water, and measures which can be taken to decrease such movement. These measures include reducing use of leaching pesticides; using proper storage, mixing, loading, rinsing and disposal procedures; and wellhead protection. Since the movement of pesticides to ground water is caused primarily by the dissolution of pesticide residues in water with subsequent movement to ground water aquifers, training places special emphasis on managing irrigation to reduce deep percolation. Additional topics covered in this year's training included a regulatory update, rights-of-way integrated vegetation management (a new perspective on roadside maintenance), weed control in turf and ornamentals, and establishing citrus orchards with polyethylene mulching.

THE PESTICIDE DETECTION RESPONSE PROCESS (conducted pursuant to sections 13149 through 13151 [FAC] of the PCPA)

Under the provisions of the Pesticide Detection Response Process (PDRP, see glossary), EHAP responds to all reports of detections of pesticides in ground water, from its own sampling program or from well sampling conducted by other state, federal, and local agencies or non-government entities. EHAP determines if the reported detection could have resulted from a currently registered pesticide, and if the chemical's presence in ground water is due to legal agricultural use; i.e., the pesticide was properly applied according to its labeled directions and in accordance with federal and state laws and regulations. Detections of pesticides that are not currently registered for use, are registered for other than agricultural, outdoor industrial, or outdoor institutional uses, and are detected in ground water not as a result of legal agricultural use, are referred to the SWRCB for appropriate action.
The SWRCB and nine RWQCBs are responsible for protecting the beneficial uses of water in California and for controlling all discharges of waste into waters of the State.

In order for a detection of a pesticide in ground water to be verified, FAC section 13149(d) of the PCPA requires that the detection of a pesticide or its breakdown products must be by an analytical method approved by DPR and must be verified, either by meeting the specifications of an 'unequivocal' detection, or, within 30 days by a second analytical method or second analytical laboratory approved by the Department. DPR set criteria (Biermann, 1989, 1996;

see Appendix C) for meeting these requirements. Verified detections which are determined to be present as the result of legal agricultural use may be subject to regulatory action by the Director of DPR. Reported detections not verified in follow-up sampling are removed from the PDRP. When residues of a compound in a registered product are detected and verified in ground water for the first time, and determined by the Director of DPR to result from legal agricultural use, a special review is begun pursuant to FAC section 13150. The purpose of the review is to determine whether continued registration, sale, and use of the compound will be allowed. A subcommittee of the PREC holds a hearing, evaluates information, and makes recommendations to the Director of DPR who then makes a determination regarding continued use of the compound in California.

As part of the PDRP, EHAP investigates, evaluates, and mitigates detections of pesticides in ground water. In an effort to use limited resources in the most effective and efficient manner, DPR has reviewed and modified its protocols for determining when field sampling is required. Previously, unless a detection was in or adjacent to an adopted or recommended PMZ, a four-section well sampling survey was initiated. Often, these studies were located in areas that have been thoroughly investigated and little new information was to be gained. The new policy allows DPR to base agricultural use determinations on existing information from well sampling, soil type and vulnerability, depth to ground water, and physico-chemical properties.

A four-section well sampling survey, where wells are sampled in the same section and/or the three most adjacent sections to the original detection, is performed in an attempt to determine if the detection was due to legal agricultural use. Also, a land use survey is conducted in those sections to determine whether there are agricultural and non-agricultural sites where the pesticide could have been applied. It is also determined whether detections could be due to a possible point source contamination.

Under the new policy, EHAP conducts a four-section survey under the following conditions.

1. For reported detections of new active ingredients, that is, pesticide active ingredients for which a Director's finding has not been made pursuant to FAC section 13150.
2. For pesticide active ingredients for which a Director's finding has been made pursuant for FAC section 13150 [6800(a) list chemicals] and:
    a. There has not been a previous detection of a pesticide in ground water in the section due to agricultural use, and,
    b. The sections included in the four-section study area do not include a section which is an adopted or recommended PMZ, and,

c. The detection is not in an area identified by modeling as an area sensitive to ground water pollution, or,
d. Conducting a well survey will provide new information that may be useful for vulnerability assessment.

After well sampling, land use survey, pesticide use information, and U.S. Geological Survey maps are reviewed, the data are evaluated and a determination is made. If the original detection is found not to be due to legal agricultural use, it is removed from the PDRP. Verified detections believed to be due to a possible point source are referred to the SWRCB. Verified detections are determined to be due to legal agricultural use if all the following criteria are met:

1. The residue detected (active ingredient, breakdown product, or any other specified ingredient) is from a pesticide that is registered for agricultural use in California.
2. The application of a pesticide in the vicinity of the detection was reasonably likely.
3. A point source was not a likely cause.
4. A non-agricultural use of the pesticide was not a likely source.
5. A non-pesticide source was not a likely cause.
6. The pesticide should be present in another adjacent section or verified within a second site within a ½ mile radius of original determination.

Verified detections determined to be due to legal, agricultural use trigger the process specified in section 13149(b) of the PCPA.

ACTIONS TAKEN BY DPR ON PESTICIDE DETECTIONS

A total of 22 pesticide active ingredients and breakdown products were detected in well water and reported by DPR or CDHS from July 1, 1995 through June 30, 1996.

EHAP did not conduct investigations for 13 of the 22 detected chemicals because they are not currently registered for agricultural use in California (1,1,2,2-tetrachloroethane, 1,2-D, 1,2,4-trichlorobenzene, benzene, BHC (other than gamma isomer), chloromethane, DBCP, EDB, heptachlor, naphthalene, *ortho*-dichlorobenzene, unspecified trichlorobenzenes, and xylene). Those detections were referred to the SWRCB.

EHAP conducted monitoring studies or investigations for chemicals that are currently registered for agricultural use in California. These studies are described below in two groups. First are chemicals that may have previously been reported and monitored for, but were removed from the PDRP and have not been reviewed by the PREC subcommittee. Second are chemicals that have previously been reviewed through the PDRP and by the PREC subcommittee and investigations were completed without additional well monitoring.
For each study, reported detections may not have been verified because (1) residues were not detected in follow-up sampling or (2) the original positive well could not be resampled.
A more detailed description of each study is given in Appendix B.

Monitoring for pesticides not previously reviewed by the PREC subcommittee
Studies were conducted in 3 counties for 3 active ingredients that have not been reviewed by the PREC subcommittee: endothall, glyphosate, and methyl bromide. None of the compounds were detected in follow-up sampling and all were removed from the PDRP. The studies are summarized in Table II-1

Table II-1 Monitoring studies conducted by the Department of Pesticide Regulation for reported detections of chemicals that have not previously been reviewed by the subcommittee of the Pesticide Registration and Evaluation Committee.

County	Initiating Chemical(s)	Verified Detection(s)	Study Number
Butte	endothall	none	0387
Napa	methyl bromide	none	0388
Santa Barbara	glyphosate	none	0391

Investigations for pesticides previously reviewed through the PDRP and by the PREC subcommittee where additional well monitoring was not conducted
Under new protocols (previously described), EHAP completed 20 investigations for atrazine, bromacil, DIPA, diuron, and simazine in Fresno County. These detections were made during a previous study (soil cluster well sampling; study number 0130), the results of which were presented in the 1995 update report.

AGRICULTURAL USE DETERMINATIONS

As a result of well monitoring and land use surveys conducted from July 1, 1995 through June 30, 1996, and investigations completed by DPR for monitoring studies conducted before July 1, 1995, a total of 20 wells in Fresno County were determined to contain pesticide residues as a result of non-point source, legal agricultural use (Table II-2). For each investigation, the initial detections were determined to be due to legal agricultural use, and PMZs were recommended. The determinations were based on a preponderance of evidence including results obtained from well sampling, 1993 Pesticide Use Report (DPR, 1993) information that the pesticides in question were applied in the section of land containing the well with the verified detection, on U. S. Geological Survey maps which indicated the presence of rights-of-way where the pesticides in question may have been applied, and proximity to sections that are proposed or adopted PMZs. Each investigation is described in Appendix B.

Table II-2. Number of wells with detections of pesticide active ingredients contained in products registered for use as of June 30, 1996, or breakdown products, that were determined, pursuant to Food and Agricultural Code section 13149, to be present in ground water as the result of non-point source, legal agricultural use. Results are given for investigations completed by the Department of Pesticide Regulation from July 1, 1995 through June 30, 1996. Detections due to such use were made for a total of four pesticide active ingredients and one breakdown product in a total of 20 wells in Fresno County.

County	Atrazine	Bromacil	Diuron	Simazine	Deisopropyl-atrazine	Total wells
Fresno	1	9	16	16	17	20

DPR recommended a total of 20 new PMZs (Table II-3) as a result of the determinations. Recommended PMZs must be adopted in regulation before they are subject to regulatory controls.

Table II-3. Number of sections recommended as Pesticide Management Zones by the Department of Pesticide Regulation from July 1, 1995 through June 30, 1996.

County	Chemical(s)	Sections
Fresno	atrazine	1
	diuron	1
	simazine	1
	atrazine, simazine	2
	atrazine, diuron, simazine	6
	bromacil, diuron, simazine	1
	atrazine, bromacil, diuron, simazine	8
Total	atrazine 17, bromacil 9, diuron 16, simazine 18	20

BENTAZON MONITORING

Historically, approximately 98% of all bentazon used in California was for postemergence weed control in rice fields. In 1989, confirmed detections of bentazon were made in 64 wells in 10 counties where rice was a major crop. As a result of those detections, DPR suspended the registration of bentazon until a full review could be conducted through the PDRP. The review resulted in DPR adopting regulations in January 1992 which added bentazon to section 6800(a) of the Groundwater Protection List (GWPL), and established use modifications that prohibited the use of bentazon (1) in Del Norte and Humboldt counties, (2) in the production of rice, (3) before April 1 or after July 31, and (4) in fields where irrigation applied through December 31 of the application year would not be by sprinklers (Title 3 CCR 6486.6). In the PDRP findings, DPR's Director stated that the Department would continue to monitor for the presence of bentazon in ground water in areas where it was applied after the establishment of the use modifications.

Bentazon use information was obtained from the Annual Pesticide Use Report for 1992, 1993, and 1994. That information had been used to select monitoring areas for the 1994-95 bentazon well survey [5]. As a result, the same areas were again selected and bentazon use was plotted by township/range-section on county maps. Sampling crews attempted to sample one or two wells in sections where the greatest quantities of bentazon had been applied.

All of the wells had been sampled during bentazon surveys conducted in 1993, 1994, and/or 1995. In June of 1996, EHAP sampled a total of 7 wells in sections of Monterey, San Mateo, and Santa Barbara counties where bentazon had been applied (Table II-4). These sections were not near rice-growing areas with historical uses of bentazon. The samples taken from these wells were also analyzed for atrazine, simazine, prometon, prometryn, bromacil, diuron, cyanazine, hexazinone, and metribuzin. No residues of bentazon or the other herbicides were detected in any of the samples. After four years of monitoring, EHAP has not detected any bentazon residues in non-rice-growing area ground water where bentazon was used.

Table II-4. Wells sampled for bentazon during 1996.

County	Township/Range-Section	Wells sampled
Monterey	19S/06E-12	1[a]
San Mateo	05S/05W-30	2[b]
Santa Barbara	09N/32W-06	1[c]
	09N/32W-24	1[c]
	09N/33W-02	2[d]

[a] Well was sampled during the 1994 and 1995 surveys.

[b] One well was sampled during the 1993 and 1995 surveys; one was sampled during the 1993, 1994 and 1995 surveys.

[c] Well was sampled during the 1993, 1994 and 1995 surveys.

[d] One well was sampled during the 1993 and 1994 surveys; one was sampled during the 1995 survey.

GROUNDWATER PROTECTION LIST MONITORING

The Groundwater Protection List (GWPL) is a list of pesticides having the potential to pollute ground water. It is required pursuant to FAC section 13145(d) and placed in 3CCR section 6800. The GWPL is divided into sublists (a) and (b). Sublist (a) is comprised of chemicals detected in the soil or ground water as a result of legal agricultural use. Sublist (b) is comprised of chemicals that meet the conditions specified in FAC section 13145(d). These are pesticide active ingredients whose physiochemical properties exceed or are less than certain values (called specific numerical values or SNVs, [Johnson, 1991]) and are

(1) intended to be applied to or injected into the soil by ground-based application equipment or by chemigation or (2) the labels of which recommend that the application be followed, within 72 hours, by flood or furrow irrigation. In order to determine whether these sublist (b) chemicals have migrated to ground water, DPR is required to conduct monitoring.

Chemicals on the GWPL are prioritized for various factors to determine in which order and to what extent the pesticides should be monitored. Chemicals in the first priority for monitoring are pesticide active ingredients that have been detected in ground water due to non-point sources in other states or those given a high priority for risk assessment on the list of pesticide active ingredients created for implementing the Birth Defect Prevention Act (SB950). EHAP samples between 25 and 40 wells for first priority pesticides. DPR selects second priority pesticides based on physiochemical factors and the amount of active ingredient sold per year. EHAP samples 15 to 25 wells for the pesticides given second priority. The remaining pesticides are third priority, and 10 to 15 wells are sampled. DPR placed and prioritized 48 pesticide active ingredients on the GWPL. The first priority group consists of 24 pesticides.

Monitoring during 1995-1996 was conducted for carbofuran, metalaxyl, oxydemeton-methyl, and propyzamide. Carbofuran was not originally listed on the GWPL. However, carbofuran had previously been found in ground water and was to be added to the list as part of a regulation package that was under consideration at the time the monitoring was conducted. Subsequently, the regulation package was not enacted. Six wells each had been previously sampled for metalaxyl and oxydemeton-methyl during the 1991 study conducted to test the procedures for determining the GWPL.

Areas surveyed for potential well sampling locations were selected based on pesticide use reports for either 1992 or 1993. The minimum detection limit (MDL) was 0.1 ppb for carbofuran, metalaxyl and oxydemeton-methyl and 0.05 ppb for propyzamide. Water samples from each well were also analyzed for nine herbicides: atrazine, bromacil, diuron, prometon, prometryn, simazine, cyanazine, hexazinone, and metribuzin.

A total of 115 wells in 20 counties were sampled for these pesticides from July 1, 1995 through June 30, 1996. Sampling results, by county and pesticide, are presented in Table II-5. None of the chemicals from sublist (b) of the GWPL were detected in any of the wells. However, verified detections were made of pesticides on sublist (a): atrazine in 1 well in Butte County; bromacil in 1 well each in Kern, Monterey, and San Joaquin counties, and simazine

in 1 well in Kern County and in two wells in Sutter County. These detections are currently under investigation by EHAP.

The wells sampled from July 1, 1995 through July 1, 1996 together with wells sampled in previous years have satisfied the GWPL sampling requirements for the pesticides carbofuran, metalaxyl, oxydemeton-methyl, and propyzamide. None of these pesticides were detected in ground water. No additional monitoring will be conducted unless a report of ground water contamination by one of those active ingredients is received.

Table II-5. Number of wells sampled, by county, for pesticide active ingredients placed on the Groundwater Protection List (Title 3, California Code of Regulations, section 6800(b)), and carbofuran. Results are for sampling conducted by the Department of Pesticide Regulation from July 1, 1995 through June 30, 1996.

County	**Carbofuran**	**Metalaxyl**	**Oxydemeton-methyl**	**Propyzamide**
Butte	5			
Colusa	4			
Fresno			1	3
Glenn	1			
Kern	2	5	2	1
Merced		3		
Monterey	4	4	10	4
Sacramento	3			3
San Benito			2	2
San Joaquin	6	3		
San Luis Obispo			1	2
San Mateo			1	
Santa Barbara		2	4	3
Santa Clara			1	
Santa Cruz			2	3
Sutter	5	4		
Tulare	3		2	
Ventura		3	2	3
Yolo	1	3		
Yuba	1			
1995-96 Totals	35	27	28	25
Sampled 1990-91	0	6	6	0
Total	35	33	34	25

MONITORING STUDIES SUSPENDED DUE TO REALLOCATION OF RESOURCES

To optimize resources and obtain the most useful and appropriate information on which to base recommended pesticide use practices and regulations, DPR has suspended adjacent section monitoring and compliance monitoring. Resources have been reallocated to the special studies described below.

Adjacent section monitoring

In previous years EHAP sampled wells located in sections of land adjacent to PMZs to determine whether ground water in those sections is vulnerable to contamination by pesticides. The sampling results and information gathered during land use surveys were used to determine whether an adjacent section should be declared a PMZ.

Compliance monitoring

Regulations to prevent further ground water contamination in PMZs include prohibiting certain uses of chemicals in sublist (a) of the GWPL within their PMZs. Agricultural, outdoor industrial, and outdoor institutional use of atrazine and prometon is prohibited within their respective PMZs. Non-crop and rights-of-way use of bromacil, diuron, or simazine is prohibited within their PMZs. To ensure compliance with those regulations, EHAP had conducted yearly soil monitoring in approximately 10% of the PMZs for each regulated pesticide.

SPECIAL STUDIES

A Voluntary Program of Modified Farm Management Practices to Prevent Herbicide Residues From Reaching Ground Water

Residues of the herbicides simazine, diuron, and bromacil are associated with citrus and grape production and have been detected in several hundred domestic wells in Fresno and Tulare counties. Since degradation of pesticides or their breakdown products is generally much slower in ground water than at the surface, it may take many years for residues in ground water to dissipate.

EHAP has begun a three-year program to prevent additional residues from reaching ground water. In cooperation with the University of California Cooperative Extension (UCCE), EHAP has been working with growers, PCAs, the agricultural industry, and herbicide registrants to identify practical farm management alternatives that can reduce or prevent off-site movement of herbicides used in grape and citrus production.

One hypothesis of this program is that preemergent herbicides can be maintained on-site after application through site-specific farm management strategies. These management strategies might include modified irrigation, weed control, or application methods. Recent EHAP studies also demonstrate that preventing residues from moving off-site can have a positive effect on herbicide efficacy. In some cases, reduced-use or non-use pest management practices that prevent herbicide movement to ground water may be most practical.

Two core groups, one for grapes and one for citrus, consisting of growers, PCAs and farm advisors have been established by UCCE. These groups have begun to identify and prioritize management practices that minimize off-site movement of herbicides in grapes and citrus. EHAP has also sought the input of pesticide registrants, commodity groups, and other interested parties to find potential solutions to herbicide movement to ground water. Selected management practices have begun to be evaluated in field sites under actual growing conditions by UCCE and DPR. Evaluation criteria include herbicide movement, yield, tree or vine health, and root health. Workshops will be used to demonstrate management practices.

OTHER ACTIVITIES

Representatives from the Environmental Monitoring and Pest Management Branch participate in monthly meetings of the California Department of Transportation (Caltrans) Roadside Vegetation Management Committee. The committee deals with issues involving implementation of Caltrans' Integrated Vegetation Management Program, including ground and surface water protection.

EHAP produced and distributed informative pamphlets pertaining to ground water protection. "Farm Management Practices That Minimize Pesticide Movement to Ground Water" is a pocket-sized reference including information on general concepts about ground water protection, farm management practices to reduce off-site movement of pesticides, and well-head protection (Troiano, 1995). "Surface and Ground Water" provides a list of pesticide active ingredients known to be potential ground water or surface water contaminants when used in agriculture, and lists many basic measures for preventing surface and ground water contamination by pesticides (DPR 1995).

Work continued on implementing ELISA assays for triazines. An ELISA assay for bromacil in a soil matrix was developed. Advantages of this ELISA assay over traditional HPLC analysis include decreases in solvent waste and analysis time, use of less hazardous solvents, and a cost reduction of 76% per sample (Linde, *et al.*, 1996)

SECTION II SUMMARY

From July 1, 1995 through June 30, 1996, EHAP sampled 167 wells in 21 counties. The samples were analyzed for a total of 17 pesticide active ingredients and breakdown products. Verified detections were made in six wells in five counties of three compounds: atrazine, bromacil, and simazine.

DPR determined that residues of atrazine, bromacil, diuron, simazine, and deisopropyl-atrazine had reached ground water as the result of legal, agricultural use in a total of 20 wells in Fresno County. A total of 20 sections in Fresno County were recommended as PMZs.

III. FACTORS CONTRIBUTING TO PESTICIDE MOVEMENT TO GROUND WATER AS A RESULT OF AGRICULTURAL USE

FACTORS CONTRIBUTING TO THE MOVEMENT OF PESTICIDES TO GROUND WATER

The PCPA requires the Department to include in the annual report an analysis of the factors that contribute to the movement of pesticides to ground water. Factors which determine the probability of an agricultural use pesticide reaching ground water include the chemical's physiochemical properties, pesticide formulation, site of application, soil type, climate, and irrigation practices.

Pesticides may reach ground water by leaching or direct streaming. Leaching is the process by which pesticide residues are dissolved or suspended in water and are carried through the soil matrix as it recharges a ground water aquifer. Direct streaming is the movement of a pesticide to ground water through conduits. A natural conduit to ground water includes structures such as sink holes, macropores, insect and animal burrows, root channels, karst formations (limestone basins or cavities), and deep cracks in clay soils. Man-made conduits to ground water include poorly constructed or damaged well seals or casings, agricultural drainage wells (dry wells), and improperly abandoned water, oil, or natural gas wells. Surface water runoff is the off-site movement of water. This occurs when the amount of water entering the area (rain or irrigation) is greater than the amount of water that can penetrate the soil or be moved into plants. Pesticide residues in runoff can reach ground water through direct streaming.

Ground water contamination may arise from point or non-point sources. Point source contamination occurs when the pesticide comes from a defined (usually small) area such as from spills (improper handling, storage, disposal), direct injection into ground water during mixing or chemigation, or direct movement of surface water containing residues through natural or man-made conduits. Non-point source contamination occurs when pesticides reach ground water from a large area, typically as a result of movement of pesticide after an agricultural application.

Many of the factors contributing to pesticide movement to ground water have been addressed in research conducted by EHAP. A summary of recent studies is presented here.

Using Multiple Factors To Identify Areas Vulnerable to Ground Water Contamination
For the past several years, EHAP scientists have been developing an approach that integrates climatic, soil, and geographic data in analyses of their combined influence on the movement of pesticides to ground water. EHAP scientists conducted well monitoring studies and field investigations as they continued to examine this new method of identifying areas in California that are vulnerable to ground water pollution by the legal agricultural use of pesticides. Specifically, research was aimed at gaining confidence in a statistical classification method using groups produced by the principal components analysis classification algorithm (Troiano, *et. al.*, in press). This method, combined with additional information such as depth to ground water, provides a basis for development of regional agricultural management practices and regulatory options to reduce ground water contamination by pesticides.

Runoff and Leaching
Simazine and diuron are preemergent herbicides that are used on highway rights-of-way during the rainy season. As such, they are a potential source of surface and ground water pollution. EHAP, in cooperation with Caltrans, the agency responsible for weed control along all State and interstate highways in California, conducted a study in Glenn County.
The objective of this study was to investigate the movement of simazine and diuron from treated highway right-of-way in storm runoff. Specifically, to determine what amount of the simazine and diuron that is applied to highway shoulders leaves the treated shoulder in storm runoff, and to what depth it infiltrates the soil on treated shoulders (Powell, 1996).

Simazine and diuron were applied together in a spray to a strip next to highway pavement at three sites, and simulated rain was applied to the treated areas. Concentrations of simazine and diuron were measured in water running off the sites and in soil cores. Similar measurements were made at other treated sites after natural rainfall events.

Significant amounts of simazine and diuron were detected in runoff from both sites with artificial and natural rainfall. Soil cores were taken to a depth of 3.0 m. Soil samples taken at sites receiving artificial rainfall contained simazine and diuron residues both before and after application of these herbicides. The residues detected before application are apparently from herbicide applications made in previous years. There was a high degree of variability in the concentration of residues detected in soil samples. The variability is probably attributable to the complex infiltration and transport processes in soils. The maximum depth at which herbicide was found at any sites was 0.3 m.

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Appendix A
Summary of number of wells sampled and number of positive detections, by county and chemical

This appendix is presented in two sections. The first contains summaries for counties without any pesticide detection. The second contains summaries for counties with any detection. In each section, the counties are given alphabetically. Sampling results are reported for the period July 1, 1995 through June 30, 1996. The counties without and with detections are as follows:

Counties without detections

Amador
Calaveras
Colusa
Contra Costa
El Dorado
Glenn
Humboldt
Inyo
Lassen
Napa
Orange
Placer
Plumas
San Benito
Shasta
Siskiyou
Solano
Tehama
Tuolumne
Yolo

Counties with detections

Alameda
Butte
Fresno
Kern
Kings
Lake
Los Angeles
Madera
Mariposa
Mendocino
Merced
Monterey
Riverside
Sacramento
San Bernardino
San Diego
San Joaquin
San Luis Obispo
San Mateo
Santa Barbara
Santa Clara
Santa Cruz
Sonoma
Stanislaus
Sutter
Tulare
Ventura
Yuba

Appendix A part 1. Counties without any detection. Number of wells sampled for each chemical.

Amador: for each chemical, 1 well was sampled. A total of 2 wells were sampled.

2,4,5-TP (SILVEX)	DBCP	METOLACHLOR
2,4-D	DIMETHOATE	METRIBUZIN
ALACHLOR	DINOSEB	MOLINATE
ALDRIN	DIURON	PICLORAM
ATRAZINE	ENDRIN	PROMETRYN
BENTAZON, SODIUM SALT	ETHYLENE DIBROMIDE	PROPACHLOR
BROMACIL	HEPTACHLOR	SIMAZINE
BUTACHLOR	HEPTACHLOR EPOXIDE	THIOBENCARB
CHLORDANE	HEXACHLOROBENZENE	TOXAPHENE
CHLOROTHALONIL	LINDANE (GAMMA-BHC)	
DALAPON	METHOXYCHLOR	

Calaveras: for each chemical, 2 wells were sampled. A total of 2 wells were sampled.

2,4,5-TP (SILVEX)	DIAZINON	PICLORAM
2,4-D	DICAMBA	PROMETRYN
ATRAZINE	DIMETHOATE	PROPACHLOR
BENTAZON, SODIUM SALT	DINOSEB	SIMAZINE
BROMACIL	DIURON	THIOBENCARB
BUTACHLOR	METOLACHLOR	TOXAPHENE
CHLOROTHALONIL	METRIBUZIN	
DALAPON	MOLINATE	

Colusa: A total of 12 wells were sampled.

2,4,5-TP (SILVEX)	5	CARBOFURAN	12	METRIBUZIN	4
2,4-D	8	CYANAZINE	4	MOLINATE	7
3-HYDROXYCARBOFURAN	5	DALAPON	5	OXAMYL	5
ALDICARB	8	DIAZINON	5	PICLORAM	2
ALDICARB SULFONE	8	DICAMBA	8	PROMETON	4
ALDICARB SULFOXIDE	8	DIMETHOATE	8	PROMETRYN	9
ATRAZINE	9	DINOSEB	5	PROPACHLOR	5
BENTAZON, SODIUM SALT	5	DIURON	12	SIMAZINE	11
BROMACIL	11	HEXAZINONE	4	THIOBENCARB	7
BUTACHLOR	5	METHOMYL	8		
CARBARYL	5	METOLACHLOR	5		

Appendix A part 1 continued. Counties without any detection. Number of wells sampled for each chemical.

Contra Costa: A total of 9 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	6	CHLORDANE	9	LINDANE (GAMMA-BHC)	9
1,2,4-TRICHLOROBENZENE	6	CHLOROMETHANE	6	METHOMYL	9
1,2-D + 1,3-D + C-3 COMPOUNDS	6	CHLOROTHALONIL	7	METHOXYCHLOR	9
1,2-DICHLOROPROPANE	6	DALAPON	9	METHYL BROMIDE	6
2,4,5-TP (SILVEX)	9	DBCP	7	METOLACHLOR	7
2,4-D	9	DIAZINON	7	METRIBUZIN	6
3-HYDROXYCARBOFURAN	9	DICAMBA	9	MOLINATE	7
ALACHLOR	9	DIELDRIN	9	NAPHTHALENE	5
ALDICARB	9	DIMETHOATE	7	ORTHO-DICHLOROBENZENE	6
ALDICARB SULFONE	9	DINOSEB	9	OXAMYL	9
ALDICARB SULFOXIDE	9	DIQUAT DIBROMIDE	7	PICLORAM	9
ALDRIN	9	DIURON	7	PROMETRYN	7
ATRAZINE	7	ENDOTHALL	7	PROPACHLOR	9
BENTAZON, SODIUM SALT	9	ENDRIN	9	SIMAZINE	7
BENZENE (BENZOL)	6	ETHYLENE DIBROMIDE	7	THIOBENCARB	7
BROMACIL	7	GLYPHOSATE,	9	TOXAPHENE	9
BUTACHLOR	7	HEPTACHLOR	9	TRICHLOROBENZENES	6
CARBARYL	9	HEPTACHLOR EPOXIDE	9	XYLENE	6
CARBOFURAN	9	HEXACHLOROBENZENE	9		

El Dorado: A total of 30 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	30	CARBOFURAN	2	LINDANE (GAMMA-BHC)	2
1,2,4-TRICHLOROBENZENE	30	CHLORDANE	2	METHOMYL	2
1,2-D + 1,3-D + C-3 COMPOUNDS	30	CHLOROMETHANE	30	METHOXYCHLOR	2
1,2-DICHLOROPROPANE	30	CHLOROTHALONIL	2	METHYL BROMIDE	30
2,3,7,8-TCDD (DIOXIN)	2	DALAPON	2	METOLACHLOR	2
2,4,5-TP (SILVEX)	2	DBCP	2	METRIBUZIN	2
2,4-D	2	DIAZINON	2	MOLINATE	2
3-HYDROXYCARBOFURAN	2	DICAMBA	2	NAPHTHALENE	30
ALACHLOR	2	DIELDRIN	2	ORTHO-DICHLOROBENZENE	30
ALDICARB	2	DIMETHOATE	2	OXAMYL	2
ALDICARB SULFONE	2	DINOSEB	2	PICLORAM	2
ALDICARB SULFOXIDE	2	DIQUAT DIBROMIDE	2	PROMETRYN	2
ALDRIN	2	ENDOTHALL	2	PROPACHLOR	2
ATRAZINE	2	ENDRIN	2	SIMAZINE	2
BENTAZON, SODIUM SALT	2	ETHYLENE DIBROMIDE	2	THIOBENCARB	2
BENZENE (BENZOL)	30	GLYPHOSATE	2	TOXAPHENE	2
BROMACIL	2	HEPTACHLOR	2	TRICHLOROBENZENES	30
BUTACHLOR	2	HEPTACHLOR EPOXIDE	2	XYLENE	30
CARBARYL	2	HEXACHLOROBENZENE	2		

Glenn: A total of 14 wells were sampled

3-HYDROXYCARBOFURAN	1	CARBOFURAN	2	MOLINATE	13
ALACHLOR	3	CYANAZINE	1	OXAMYL	1
ALDICARB	1	DIAZINON	13	PROMETON	1
ALDICARB SULFONE	1	DIMETHOATE	13	PROMETRYN	14
ALDICARB SULFOXIDE	1	DIURON	1	PROPACHLOR	13
ATRAZINE	14	HEXAZINONE	1	SIMAZINE	14
BROMACIL	14	METHOMYL	1	THIOBENCARB	13
BUTACHLOR	13	METOLACHLOR	13		
CARBARYL	1	METRIBUZIN	13		

Appendix A part 1 continued. Counties without any detection. Number of wells sampled for each chemical.

Humboldt: One well was sampled for each chemical. A total of 1 well was sampled.

2,4,5-TP (SILVEX)	DALAPON	HEPTACHLOR EPOXIDE
2,4-D	DICAMBA	HEXACHLOROBENZENE
ALACHLOR	DIELDRIN	LINDANE (GAMMA-BHC)
ALDRIN	DINOSEB	METHOXYCHLOR
BENTAZON, SODIUM SALT	ENDRIN	PICLORAM
CHLORDANE	HEPTACHLOR	TOXAPHENE

Inyo: Two wells were sampled for each chemical. A total of 2 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	CHLOROMETHANE	ORTHO-DICHLOROBENZENE
1,2,4-TRICHLOROBENZENE	DBCP	TRICHLOROBENZENES
1,2-D + 1,3-D + C-3 COMPOUNDS	ETHYLENE DIBROMIDE	XYLENE
1,2-DICHLOROPROPANE	METHYL BROMIDE	
BENZENE (BENZOL)	NAPHTHALENE	

Lassen: A total of 25 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	8	BENZENE (BENZOL)	8	SIMAZINE	18
1,2,4-TRICHLOROBENZENE	8	CHLOROMETHANE	8	TRICHLOROBENZENES	8
1,2-D + 1,3-D + C-3 COMPOUNDS	8	METHYL BROMIDE	8	XYLENE	8
1,2-DICHLOROPROPANE	8	NAPHTHALENE	6		
ATRAZINE	18	ORTHO-DICHLOROBENZENE	8		

Napa: A total of 40 wells were sampled

ATRAZINE	40	DIAZINON	1	METRIBUZIN	38
BROMACIL	38	DIURON	39	PROMETON	38
CYANAZINE	38	HEXAZINONE	38	PROMETRYN	38
DALAPON	2	METHYL BROMIDE	38	SIMAZINE	40

Appendix A part 1 continued. Counties without any detection. Number of wells sampled for each chemical.

Orange: A total of 241 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	229	CHLOROTHALONIL	231	METHIOCARB	29
1,2,4-TRICHLOROBENZENE	229	DALAPON	49	METHOMYL	35
1,2-D + 1,3-D + C-3 COMPOUNDS	229	DBCP	236	METHOXYCHLOR	235
DICHLOROPROPANE	228	DDD	225	METHYL BROMIDE	229
1,3-DICHLOROPROPENE (1,3-D)	226	DDE	225	METHYL PARATHION	216
2,3,7,8-TCDD (DIOXIN)	7	DDT	225	METOLACHLOR	224
2,4,5-TP (SILVEX)	49	DIAZINON	224	METRIBUZIN	224
2,4-D	49	DICAMBA	46	MOLINATE	225
3-HYDROXYCARBOFURAN	35	DIELDRIN	231	NAPHTHALENE	233
ACENAPTHENE	136	DIMETHOATE	222	ORTHO-DICHLOROBENZENE	229
ALACHLOR	234	DINOSEB	49	OXAMYL	40
ALDICARB	36	DIQUAT DIBROMIDE	231	PARAQUAT DICHLORIDE	224
ALDICARB SULFONE	36	DIURON	203	PARATHION OR ETHYL PARATHION	216
ALDICARB SULFOXIDE	36	ENDOSULFAN	225	PICLORAM	49
ALDRIN	232	ENDOSULFAN SULFATE	225	PROMETRYN	223
ATRAZINE	226	ENDOTHALL	15	PROPACHLOR	236
BENTAZON, SODIUM SALT	49	ENDRIN	235	PROPOXUR	29
BENZENE (BENZOL)	229	ENDRIN ALDEHYDE	225	SIMAZINE	226
BHC (OTHER THAN GAMMA)	225	ETHYLENE DIBROMIDE	236	THIOBENCARB	224
BROMACIL	225	GLYPHOSATE	45	TOXAPHENE	235
BUTACHLOR	224	HEPTACHLOR	235	TRICHLOROBENZENES	229
CARBARYL	40	HEPTACHLOR EPOXIDE	235	XYLENE	229
CARBOFURAN	40	HEXACHLOROBENZENE	235		
CHLORDANE	235	LINDANE (GAMMA-BHC)	235		
CHLOROMETHANE	229	MALATHION	216		

Placer: A total of 6 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	4	CARBOFURAN	2	LINDANE (GAMMA-BHC)	4
1,2,4-TRICHLOROBENZENE	4	CHLORDANE	4	METHOMYL	2
1,2-D + 1,3-D + C-3 COMPOUNDS	4	CHLOROMETHANE	4	METHOXYCHLOR	4
DICHLOROPROPANE	4	CHLOROTHALONIL	4	METHYL BROMIDE	4
2,3,7,8-TCDD (DIOXIN)	2	DALAPON	2	METOLACHLOR	2
2,4,5-TP (SILVEX)	4	DBCP	2	METRIBUZIN	2
2,4-D	4	DIAZINON	2	MOLINATE	2
3-HYDROXYCARBOFURAN	2	DICAMBA	4	NAPHTHALENE	4
ALACHLOR	2	DIELDRIN	4	ORTHO-DICHLOROBENZENE	4
ALDICARB	2	DIMETHOATE	2	OXAMYL	2
ALDICARB SULFONE	2	DINOSEB	4	PICLORAM	4
ALDICARB SULFOXIDE	2	DIQUAT DIBROMIDE	2	PROMETRYN	2
ALDRIN	4	ENDOTHALL	2	PROPACHLOR	2
ATRAZINE	2	ENDRIN	4	SIMAZINE	2
BENTAZON, SODIUM SALT	4	ETHYLENE DIBROMIDE	2	THIOBENCARB	2
BENZENE (BENZOL)	4	GLYPHOSATE	2	TOXAPHENE	4
BROMACIL	2	HEPTACHLOR	4	TRICHLOROBENZENES	4
BUTACHLOR	2	HEPTACHLOR EPOXIDE	4	XYLENE	4
CARBARYL	2	HEXACHLOROBENZENE	4		

Appendix A part 1 continued. Counties without any detection. Number of wells sampled for each chemical.

Plumas: A total of 37 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	4	BUTACHLOR	2	NAPHTHALENE	4
1,2,4-TRICHLOROBENZENE	6	CHLOROMETHANE	4	ORTHO-DICHLOROBENZENE	4
1,2-D + 1,3-D + C-3 COMPOUNDS	4	DIAZINON	16	PROMETRYN	2
DICHLOROPROPANE	4	DIMETHOATE	2	PROPACHLOR	2
ALACHLOR	1	DIURON	14	SIMAZINE	28
ATRAZINE	11	METHYL BROMIDE	4	THIOBENCARB	2
BENZENE (BENZOL)	4	METOLACHLOR	2	TRICHLOROBENZENES	4
BROMACIL	10	MOLINATE	2	XYLENE	4

San Benito: A total of 4 wells were sampled.

ATRAZINE	4	HEXAZINONE	4	PROMETRYN	4
BROMACIL	4	METRIBUZIN	4	PROPYZAMIDE	2
CYANAZINE	4	OXYDEMETON-METHYL	2	SIMAZINE	4
DIURON	4	PROMETON	4		

Shasta: One well was samled for each chemical. A total of 1 well was sampled.

2,4,5-TP (SILVEX)	ENDRIN	METHOXYCHLOR
2,4-D	LINDANE (GAMMA-BHC)	TOXAPHENE
BENTAZON, SODIUM SALT		

Siskiyou: One well was sampled for each chemical. A total of 2 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	CARBOFURAN	HEXACHLOROBENZENE
DICHLOROPROPANE	CHLORDANE	LINDANE (GAMMA-BHC)
2,4,5-TP (SILVEX)	DALAPON	METHOMYL
2,4-D	DBCP	METHOXYCHLOR
3-HYDROXYCARBOFURAN	DIAZINON	METOLACHLOR
ALACHLOR	DICAMBA	MOLINATE
ALDICARB	DIELDRIN	OXAMYL
ALDICARB SULFONE	DIMETHOATE	PICLORAM
ALDICARB SULFOXIDE	DINOSEB	PROMETRYN
ALDRIN	DIQUAT DIBROMIDE	PROPACHLOR
ATRAZINE	ENDOTHALL	SIMAZINE
BENTAZON, SODIUM SALT	ENDRIN	THIOBENCARB
BENZENE (BENZOL)	ETHYLENE DIBROMIDE	TOXAPHENE
BROMACIL	GLYPHOSATE	XYLENE
BUTACHLOR	HEPTACHLOR	
CARBARYL	HEPTACHLOR EPOXIDE	

Appendix A part 1 continued. Counties without any detection. Number of wells sampled for each chemical.

Solano: A total of 19 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	13	CHLOROTHALONIL	1	METHOMYL	1
1,2,4-TRICHLOROBENZENE	13	CHLORPROPHAM	2	METHOXYCHLOR	4
1,2-D + 1,3-D + C-3 COMPOUNDS	13	CHLORTHAL-DIMETHYL	3	METHYL BROMIDE	13
DICHLOROPROPANE	13	CYCLOATE	2	METOLACHLOR	4
2,4,5-T	3	DALAPON	4	METRIBUZIN	4
2,4,5-TP (SILVEX)	4	DBCP	4	MEVINPHOS	2
2,4-D	4	DIAZINON	4	MOLINATE	4
3-HYDROXYCARBOFURAN	1	DICAMBA	4	NAPHTHALENE	13
ALACHLOR	4	DIELDRIN	4	NAPROPAMIDE	2
ALDICARB	1	DIMETHOATE	4	ORTHO-DICHLOROBENZENE	13
ALDICARB SULFONE	1	DINOSEB	4	OXAMYL	1
ALDICARB SULFOXIDE	1	DIPHENAMID	2	PARAQUAT DICHLORIDE	4
ALDRIN	4	DIQUAT DIBROMIDE	4	PICLORAM	4
AMETRYNE	2	DISULFOTON	2	PROMETON	2
ATRATON	2	ENDOTHALL	1	PROMETRYN	5
ATRAZINE	4	ENDRIN	4	PROPACHLOR	4
BENTAZON, SODIUM SALT	4	EPTC	2	SIMAZINE	4
BENZENE (BENZOL)	13	ETHYLENE DIBROMIDE	4	SIMETRYN	2
BROMACIL	4	FENSULFOTHION	2	TEBUTHIURON	2
BUTACHLOR	4	GLYPHOSATE	1	TERBUTRYN	2
BUTYLATE	2	HEPTACHLOR	4	TETRACHLORVINPHOS	2
CARBARYL	1	HEPTACHLOR EPOXIDE	4	THIOBENCARB	4
CARBOFURAN	1	HEXACHLOROBENZENE	10	TOXAPHENE	4
CHLORAMBEN	3	HEXAZINONE	2	TRICHLOROBENZENES	13
CHLORDANE	4	LINDANE (GAMMA-BHC)	4	XYLENE	13
CHLOROMETHANE	13	METHIOCARB	1		

Tehama: A total of 19 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	12	DIAZINON	4	METOLACHLOR	4
1,2,4-TRICHLOROBENZENE	12	DIELDRIN	3	METRIBUZIN	4
1,2-D + 1,3-D + C-3 COMPOUNDS	12	DIMETHOATE	4	MOLINATE	4
DICHLOROPROPANE	12	DIURON	17	ORTHO-DICHLOROBENZENE	12
ALACHLOR	15	ENDRIN	3	PROMETRYN	4
ALDRIN	3	HEPTACHLOR	3	PROPACHLOR	4
ATRAZINE	16	HEPTACHLOR EPOXIDE	3	SIMAZINE	16
BENZENE (BENZOL)	12	HEXACHLOROBENZENE	3	THIOBENCARB	4
BROMACIL	4	LINDANE (GAMMA-BHC)	3	TOXAPHENE	3
BUTACHLOR	4	METHOXYCHLOR	3	TRICHLOROBENZENES	12
CHLORDANE	3	METHYL BROMIDE	12	XYLENE	12
CHLOROMETHANE	12				

Appendix A part 1 continued. Counties without any detection. Number of wells sampled for each chemical.

Tuolumne: A total of 5 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	2	CHLOROMETHANE	2	METHYL BROMIDE	2
1,2,4-TRICHLOROBENZENE	2	CHLOROTHALONIL	4	METOLACHLOR	4
1,2-D + 1,3-D + C-3 COMPOUNDS	2	DALAPON	4	MOLINATE	4
DICHLOROPROPANE	2	DIAZINON	4	NAPHTHALENE	2
2,4,5-TP (SILVEX)	4	DICAMBA	3	ORTHO-DICHLOROBENZENE	2
2,4-D	4	DIELDRIN	3	PICLORAM	4
ALACHLOR	3	DIMETHOATE	4	PROMETRYN	4
ALDRIN	3	DINOSEB	4	PROPACHLOR	4
ATRAZINE	4	ENDRIN	3	SIMAZINE	4
BENTAZON, SODIUM SALT	4	HEPTACHLOR	3	THIOBENCARB	4
BENZENE (BENZOL)	2	HEPTACHLOR EPOXIDE	3	TOXAPHENE	3
BROMACIL	4	HEXACHLOROBENZENE	3	TRICHLOROBENZENES	2
BUTACHLOR	4	LINDANE (GAMMA-BHC)	3	XYLENE	2
CHLORDANE	3	METHOXYCHLOR	3		

Yolo: A total of 12 wells were sampled.

ALACHLOR	5	DIMETHOATE	5	MOLINATE	5
ATRAZINE	9	DIURON	4	PROMETON	4
BROMACIL	9	ETHYLENE DIBROMIDE	7	PROMETRYN	9
BUTACHLOR	5	HEXAZINONE	4	PROPACHLOR	5
CARBOFURAN	1	METALAXYL	3	SIMAZINE	9
CYANAZINE	4	METOLACHLOR	5	THIOBENCARB	5
DIAZINON	5	METRIBUZIN	9		

Appendix A part 2: Counties with any positive detection. Number of wells sampled for each chemical, and the number of wells with a positive detection (in parentheses).

Alameda: A total of 14 wels were sampled

ALDRIN	1	DBCP	5	METHOXYCHLOR	4
ATRAZINE	4	ETHYLENE DIBROMIDE	5	SIMAZINE	4
CHLOROMETHANE	3	HEXACHLOROBENZENE	13		
	(3)	LINDANE (GAMMA-BHC)	4		

Butte: A total of 37 wells were sampled.

2,4,5-TP (SILVEX)	6	CYANAZINE	10	HEXAZINONE	10
2,4-D	6	DALAPON	6	LINDANE (GAMMA-BHC)	6
3-HYDROXYCARBOFURAN	24	DBCP	6	METHOMYL	24
ALACHLOR	11	DIAZINON	13	METHOXYCHLOR	6
ALDICARB	24	DICAMBA	6	METOLACHLOR	13
ALDICARB SULFONE	24	DIELDRIN	6	METRIBUZIN	23
ALDICARB SULFOXIDE	24	DIMETHOATE	13	MOLINATE	13
ALDRIN	6	DINOSEB	6	OXAMYL	24
ATRAZINE	24	DIQUAT DIBROMIDE	6	PICLORAM	6
	(1)	DIURON	19	PROMETON	10
BENTAZON, SODIUM SALT	6	ENDOTHALL	12	PROMETRYN	23
BROMACIL	23	ENDRIN	6	PROPACHLOR	13
BUTACHLOR	13	ETHYLENE DIBROMIDE	6	SIMAZINE	24
CARBARYL	24	GLYPHOSATE	6	THIOBENCARB	13
CARBOFURAN	29	HEPTACHLOR	6	TOXAPHENE	6
CHLORDANE	6	HEPTACHLOR EPOXIDE	6		
CHLOROTHALONIL	6	HEXACHLOROBENZENE	6		

Fresno: A total of 350 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	214	CHLORTHAL-DIMETHYL	178	METHOXYCHLOR	228
1,2,4-TRICHLOROBENZENE	214	CYANAZINE	4	METHYL BROMIDE	214
1,2-D + 1,3-D + C-3 COMPOUNDS	214	DALAPON	233	METOLACHLOR	33
1,2-DICHLOROPROPANE	214	DBCP	341	METRIBUZIN	12
	(2)		(137)	MOLINATE	33
2,4,5-TP (SILVEX)	233	DIAZINON	33	NAPHTHALENE	214
2,4-D	233	DICAMBA	38	ORTHO-DICHLOROBENZENE	214
3-HYDROXYCARBOFURAN	39	DIELDRIN	33	OXAMYL	234
ALACHLOR	228	DIMETHOATE	33	OXYDEMETON-METHYL	1
ALDICARB	234	DINOSEB	233	PARAQUAT DICHLORIDE	17
ALDICARB SULFONE	234	DIQUAT DIBROMIDE	245	PICLORAM	233
ALDICARB SULFOXIDE	234	DIURON	11	PROMETON	4
ALDRIN	52	ENDOTHALL	244	PROMETRYN	37
ATRAZINE	232	ENDRIN	228	PROPACHLOR	33
BENTAZON, SODIUM SALT	38	ETHYLENE DIBROMIDE	341	PROPARGITE	1
BENZENE (BENZOL)	214		(9)	PROPOXUR	3
BROMACIL	37	GLYPHOSATE	204	PROPYZAMIDE	3
BUTACHLOR	33	HEPTACHLOR	228	SIMAZINE	232
CARBARYL	39	HEPTACHLOR EPOXIDE	228	THIOBENCARB	33
CARBOFURAN	234	HEXACHLOROBENZENE	225	TOXAPHENE	228
CHLORDANE	228	HEXAZINONE	4	TRICHLOROBENZENES	214
CHLOROMETHANE	214	LINDANE (GAMMA-BHC)	228	XYLENE	214
CHLOROTHALONIL	28	METHIOCARB	3		
		METHOMYL	39		

Appendix A part 2 continued. Counties with any positive detection. Number of wells sampled and number of wells with positive detection (in parentheses).

Kern: A total or 175 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	66
1,2,4-TRICHLOROBENZENE	63
1,2-D + 1,3-D + C-3 COMPOUNDS	62
1,2-DICHLOROPROPANE	67 (1)
2,4,5-T	9
2,4,5-TP (SILVEX)	82
2,4-D	82
3-HYDROXYCARBOFURAN	30
ALACHLOR	74
ALDICARB	54
ALDICARB SULFONE	21
ALDICARB SULFOXIDE	21
ALDRIN	52
ATRAZINE	95
BENEFIN (BENFLURALIN)	5
BENTAZON, SODIUM SALT	81
BENZENE (BENZOL)	68 (2)
BHC (OTHER THAN GAMMA)	5
BROMACIL	79 (1)
BUTACHLOR	25
CAPTAN	5
CARBARYL	40
CARBOFURAN	75
CARBOPHENOTHION	5
CHLORAMBEN	5
CHLORDANE	83
CHLOROMETHANE	66
CHLOROTHALONIL	56
CHLORTHAL-DIMETHYL	5
CYANAZINE	10
DALAPON	90
DBCP	104 (16)
DDD	5
DDE	5
DDT	5
DEMETON	5
DIAZINON	72
DICAMBA	41
DICOFOL	5
DIELDRIN	35
DIMETHOATE	63
DINOSEB	76
DIQUAT DIBROMIDE	62
DISULFOTON	5
DIURON	43 (1)
DMPA (ZYTROM)	5
ENDOSULFAN	5
ENDOSULFAN SULFATE	5
ENDOTHALL	62
ENDRIN	83
ENDRIN ALDEHYDE	5
ETHYLENE DIBROMIDE	100 (4)
GLYPHOSATE	41
HEPTACHLOR	85
HEPTACHLOR EPOXIDE	85
HEXACHLOROBENZENE	71
HEXAZINONE	10
LINDANE (GAMMA-BHC)	83
METALAXYL	5
METHIOCARB	10
METHOMYL	34
METHOXYCHLOR	83
METHYL BROMIDE	66
METOLACHLOR	28
METRIBUZIN	35
MEVINPHOS	5
MOLINATE	70
NAPHTHALENE	61
NITROFEN	5
ORTHO-DICHLOROBENZENE	66
OXAMYL	62
OXYDEMETON-METHYL	2
PARAQUAT DICHLORIDE	5
PCNB	5
PENDIMETHALIN	5
PICLORAM	86
PROMETON	15
PROMETRYN	73
PROPACHLOR	14
PROPOXUR	10
PROPYZAMIDE	1
SIMAZINE	92 (1)
SIMETRYN	5
TERBUTRYN	5
THIOBENCARB	69
TOXAPHENE	83
TRICHLOROBENZENES	62
XYLENE	61

Kings: A total of 26 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	12
1,2,4-TRICHLOROBENZENE	12
1,2-D + 1,3-D + C-3 COMPOUNDS	12
1,2-DICHLOROPROPANE	12
2,4,5-TP (SILVEX)	24
2,4-D	24
3-HYDROXYCARBOFURAN	24
ALACHLOR	24
ALDICARB	24
ALDICARB SULFONE	24
ALDICARB SULFOXIDE	24
ALDRIN	24
ATRAZINE	24
BENTAZON, SODIUM SALT	24
BENZENE (BENZOL)	14 (2)
BROMACIL	24
BUTACHLOR	24
CARBARYL	24
CARBOFURAN	24
CHLORDANE	24
CHLOROMETHANE	12
CHLOROTHALONIL	24
DALAPON	24
DBCP	24
DIAZINON	24
DICAMBA	24
DIELDRIN	24
DIMETHOATE	24
DINOSEB	24
DIQUAT DIBROMIDE	24
DIURON	23
ENDOTHALL	24
ENDRIN	24
ETHYLENE DIBROMIDE	24
GLYPHOSATE	23
HEPTACHLOR	24
HEPTACHLOR EPOXIDE	24
HEXACHLOROBENZENE	24
LINDANE (GAMMA-BHC)	24
METHOMYL	24
METHOXYCHLOR	24
METHYL BROMIDE	12
METOLACHLOR	24
MOLINATE	24
NAPHTHALENE	12
ORTHO-DICHLOROBENZENE	12
OXAMYL	24
PICLORAM	24
PROMETRYN	24
PROPACHLOR	24
SIMAZINE	24
THIOBENCARB	24
TOXAPHENE	24
TRICHLOROBENZENES	12
XYLENE	12

Appendix A part 2 continued. Counties with any positive detection. Number of wells sampled and number of wells with positive detection (in parentheses).

Lake: A total of 18 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	5	CHLOROMETHANE	5	LINDANE (GAMMA-BHC)	9
1,2,4-TRICHLOROBENZENE	5		(1)	METHOMYL	1
1,2-D + 1,3-D + C-3 COMPOUNDS	5	CHLOROTHALONIL	1	METHOXYCHLOR	9
1,2-DICHLOROPROPANE	5	DALAPON	5	METHYL BROMIDE	5
2,4,5-TP (SILVEX)	10	DBCP	1	METOLACHLOR	1
2,4-D	10	DIAZINON	3	MOLINATE	1
ALACHLOR	1	DICAMBA	1	NAPHTHALENE	5
ALDICARB	1	DIELDRIN	1	ORTHO-DICHLOROBENZENE	5
ALDICARB SULFONE	1	DIMETHOATE	2	OXAMYL	4
ALDICARB SULFOXIDE	1	DINOSEB	4	PICLORAM	5
ALDRIN	1	DIQUAT DIBROMIDE	4	PROMETRYN	3
ATRAZINE	7	DIURON	1	PROPACHLOR	1
BENTAZON, SODIUM SALT	1	ENDOTHALL	4	SIMAZINE	7
BENZENE (BENZOL)	5	ENDRIN	8	THIOBENCARB	1
BROMACIL	3	ETHYLENE DIBROMIDE	4	TOXAPHENE	9
BUTACHLOR	1	HEPTACHLOR	9	TRICHLOROBENZENES	5
CARBOFURAN	3	HEPTACHLOR EPOXIDE	9	XYLENE	5
CHLORDANE	8	HEXACHLOROBENZENE	1		

Los Angeles: A total or 865 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	259	CHLOROBENZILATE	8	HEXACHLOROBENZENE	304
	(1)	CHLOROMETHANE	257	LINDANE (GAMMA-BHC)	373
1,2,4-TRICHLOROBENZENE	260	CHLORONEB	8	MALATHION	1
1,2-D + 1,3-D + C-3 COMPOUNDS	257	CHLOROTHALONIL	130	METHIOCARB	2
1,2-DICHLOROPROPANE	258	CHLORTHAL-DIMETHYL	2	METHOMYL	220
1,3-DICHLOROPROPENE (1,3-D)	8	DALAPON	340	METHOXYCHLOR	373
2,3,7,8-TCDD (DIOXIN)	1	DBCP	218	METHYL BROMIDE	257
2,4,5-T	40		(11)	METHYL PARATHION	1
2,4,5-TP (SILVEX)	345	DDD	47	METOLACHLOR	172
2,4,6-TRICHLOROPHENOL	2	DDE	47	METRIBUZIN	157
2,4-D	758	DDT	47	MOLINATE	556
2,4-DINITROPHENOL	2	DEMETON	25	NAPHTHALENE	323
3-HYDROXYCARBOFURAN	213	DIAZINON	687	ORTHO-DICHLOROBENZENE	260
ACENAPTHENE	3	DICAMBA	188		(1)
ALACHLOR	570	DIELDRIN	188	OXAMYL	379
ALDICARB	214	DIMETHOATE	136	PARAQUAT DICHLORIDE	85
ALDICARB SULFONE	214	DINOSEB	340	PARATHION OR	1
ALDICARB SULFOXIDE	214	DIQUAT DIBROMIDE	747	ETHYL PARATHION	
ALDRIN	187	DISULFOTON	25	PERMETHRIN	8
ATRATON	6	DIURON	608	PICLORAM	340
ATRAZINE	735	ENDOSULFAN	47	PROMETRYN	184
BENTAZON, SODIUM SALT	342		(2)	PROPACHLOR	131
BENZENE (BENZOL)	263	ENDOSULFAN SULFATE	47	PROPOXUR	2
	(1)		(1)	SIMAZINE	735
BHC (OTHER THAN GAMMA)	47	ENDOTHALL	13	SIMETRYN	1
	(1)	ENDRIN	373	THIOBENCARB	556
BROMACIL	643	ENDRIN ALDEHYDE	47	TOXAPHENE	360
BUTACHLOR	190	ETHYLENE DIBROMIDE	215	TRICHLOROBENZENES	257
CARBARYL	745		(1)	TRIFLURALIN	8
CARBOFURAN	379	GLYPHOSATE	795	XYLENE	314
CHLORAMBEN	30	HEPTACHLOR	372		(4)
CHLORDANE	783		(2)		
		HEPTACHLOR EPOXIDE	373		

Appendix A part 2 continued. Counties with any positive detection. Number of wells sampled and number of wells with positive detection (in parentheses).

Madera: A total of 27 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	6
1,2,4-TRICHLOROBENZENE	6
1,2-D + 1,3-D + C-3 COMPOUNDS	6
1,2-DICHLOROPROPANE	6
2,4,5-T	4
2,4,5-TP (SILVEX)	23
2,4-D	23
3-HYDROXYCARBOFURAN	24
ALACHLOR	24
ALDICARB	24
ALDICARB SULFONE	24
ALDICARB SULFOXIDE	24
ALDRIN	17
ATRAZINE	24
BENEFIN (BENFLURALIN)	4
BENTAZON, SODIUM SALT	23
BENZENE (BENZOL)	6
BHC (OTHER THAN GAMMA)	4
BROMACIL	17
BUTACHLOR	17
CAPTAN	4
CARBARYL	24
CARBOFURAN	24
CARBOPHENOTHION	4
CHLORDANE	24
CHLOROMETHANE	6
CHLOROTHALONIL	12
CHLORTHAL-DIMETHYL	3
	(2)
DALAPON	23
DBCP	18
	(1)
DDD	4
DDE	4
DDT	4
DEMETON	4
DIAZINON	17
DICAMBA	23
DICOFOL	4
DIELDRIN	17
DIMETHOATE	17
DINOSEB	23
DIQUAT DIBROMIDE	17
DISULFOTON	4
DIURON	5
DMPA (ZYTROM)	2
ENDOSULFAN	4
ENDOSULFAN SULFATE	4
ENDOTHALL	17
ENDRIN	24
ENDRIN ALDEHYDE	4
ETHYLENE DIBROMIDE	18
GLYPHOSATE	17
HEPTACHLOR	24
HEPTACHLOR EPOXIDE	24
HEXACHLOROBENZENE	21
LINDANE (GAMMA-BHC)	24
METHIOCARB	4
METHOMYL	24
METHOXYCHLOR	24
METHYL BROMIDE	6
METOLACHLOR	14
METRIBUZIN	4
MEVINPHOS	4
MOLINATE	24
NAPHTHALENE	6
NITROFEN	4
ORTHO-DICHLOROBENZENE	6
OXAMYL	24
PCNB	4
PICLORAM	23
PROMETON	4
PROMETRYN	17
PROPACHLOR	12
PROPOXUR	4
SIMAZINE	24
SIMETRYN	4
TERBUTRYN	4
THIOBENCARB	21
TOXAPHENE	24
TRICHLOROBENZENES	6
XYLENE	1

Mariposa: A total of 4 wells were sampled.

2,4,5-TP (SILVEX)	3
2,4-D	3
3-HYDROXYCARBOFURAN	2
ALACHLOR	2
ALDICARB	2
ALDICARB SULFONE	2
ALDICARB SULFOXIDE	2
ALDRIN	2
ATRAZINE	2
BENTAZON, SODIUM SALT	3
BROMACIL	2
BUTACHLOR	2
CARBARYL	2
CARBOFURAN	2
CHLORDANE	2
CHLOROMETHANE	1
	(1)
CHLOROTHALONIL	2
DALAPON	3
DIAZINON	2
DICAMBA	3
DIELDRIN	2
DIMETHOATE	2
DINOSEB	3
ENDRIN	2
HEPTACHLOR	2
HEPTACHLOR EPOXIDE	2
HEXACHLOROBENZENE	2
LINDANE (GAMMA-BHC)	2
METHOMYL	2
METHOXYCHLOR	2
METOLACHLOR	2
MOLINATE	2
OXAMYL	2
PICLORAM	3
PROMETRYN	2
PROPACHLOR	2
SIMAZINE	2
THIOBENCARB	2
TOXAPHENE	2

Appendix A part 2 continued. Counties with any positive detection. Number of wells sampled and number of wells with positive detection (in parentheses).

Mendocino: A total of 20 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	4	CHLOROMETHANE	4	METHOXYCHLOR	2
1,2,4-TRICHLOROBENZENE	4	CHLOROTHALONIL	7	METHYL BROMIDE	4
1,2-D + 1,3-D + C-3 COMPOUNDS	4	DALAPON	19	METOLACHLOR	1
1,2-DICHLOROPROPANE	4	DIAZINON	8	MOLINATE	1
2,4,5-TP (SILVEX)	8	DICAMBA	1	NAPHTHALENE	4
2,4-D	8	DIELDRIN	1	ORTHO-DICHLOROBENZENE	4
ALDICARB	1	DIMETHOATE	7	OXAMYL	10
ALDICARB SULFONE	1	DINOSEB	7	PICLORAM	10
ALDICARB SULFOXIDE	1	DIQUAT DIBROMIDE	10	PROMETRYN	7
ALDRIN	1	DIURON	8	PROPACHLOR	1
ATRAZINE	19	ENDOTHALL	10	SIMAZINE	19
BENTAZON, SODIUM SALT	1	ENDRIN	2		(1)
BENZENE (BENZOL)	4	ETHYLENE DIBROMIDE	10	THIOBENCARB	1
BROMACIL	7	HEPTACHLOR	2	TOXAPHENE	2
BUTACHLOR	1	HEPTACHLOR EPOXIDE	2	TRICHLOROBENZENES	4
CARBARYL	1	HEXACHLOROBENZENE	1	XYLENE	4
CARBOFURAN	7	LINDANE (GAMMA-BHC)	1		
CHLORDANE	2	METHOMYL	1		

Merced: A total of 40 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	9	CHLOROTHALONIL	13	LINDANE (GAMMA-BHC)	16
1,2,4-TRICHLOROBENZENE	9	CHLORTHAL-DIMETHYL	4	METALAXYL	3
1,2-D + 1,3-D + C-3 COMPOUNDS	9	CYANAZINE	3	METHIOCARB	5
1,2-DICHLOROPROPANE	9	DALAPON	16	METHOMYL	16
2,4,5-T	1	DBCP	35	METHOXYCHLOR	16
2,4,5-TP (SILVEX)	16		(14)	METHYL BROMIDE	9
2,4-D	16	DDD	6	METOLACHLOR	12
3-HYDROXYCARBOFURAN	16	DDE	6	METRIBUZIN	15
4(2,4-DB), DIMETHYLAMINE SALT	1	DDT	6	MOLINATE	12
ALACHLOR	12	DIAZINON	12	NAPHTHALENE	9
ALDICARB	16	DICAMBA	16	NITROFEN	2
ALDICARB SULFONE	16	DICOFOL	2	ORTHO-DICHLOROBENZENE	9
ALDICARB SULFOXIDE	16	DIELDRIN	16	OXAMYL	16
ALDRIN	16	DIMETHOATE	12	PCNB	2
ATRAZINE	15	DINOSEB	16	PERMETHRIN	3
BENEFIN (BENFLURALIN)	2	DIQUAT DIBROMIDE	14	PERMETHRIN, OTHER RELATED	4
BENTAZON, SODIUM SALT	16	DIURON	12	PICLORAM	16
BENZENE (BENZOL)	9	DMPA (ZYTROM)	2	PROMETON	3
BHC (OTHER THAN GAMMA)	6	ENDOSULFAN	6	PROMETRYN	15
BROMACIL	15	ENDOSULFAN SULFATE	6	PROPACHLOR	16
BUTACHLOR	12	ENDOTHALL	14	PROPOXUR	5
CAPTAN	2	ENDRIN	16	SIMAZINE	15
CARBARYL	16	ENDRIN ALDEHYDE	6	THIOBENCARB	12
CARBOFURAN	16	ETHYLENE DIBROMIDE	29	TOXAPHENE	16
CARBOPHENOTHION	2		(2)	TRICHLOROBENZENES	10
CHLORAMBEN	4	GLYPHOSATE	9		(1)
CHLORDANE	16	HEPTACHLOR	16	TRIFLURALIN	4
CHLOROBENZILATE	4	HEPTACHLOR EPOXIDE	16	XYLENE	9
CHLOROMETHANE	9	HEXACHLOROBENZENE	16		
CHLORONEB	4	HEXAZINONE	3		

Appendix A part 2 continued. Counties with any positive detection. Number of wells sampled and number of wells with positive detection (in parentheses).

Monterey: A total of 60 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	7	CHLOROTHALONIL	2	METHOXYCHLOR	2
1,2,4-TRICHLOROBENZENE	7	CYANAZINE	23	METHYL BROMIDE	7
1,2-D + 1,3-D + C-3 COMPOUNDS	7	DALAPON	5	METOLACHLOR	5
1,2-DICHLOROPROPANE	7	DBCP	30	METRIBUZIN	25
2,4,5-TP (SILVEX)	5	DIAZINON	5	MOLINATE	5
2,4-D	5	DICAMBA	5	NAPHTHALENE	9
3-HYDROXYCARBOFURAN	5	DIELDRIN	2	ORTHO-DICHLOROBENZENE	7
ALACHLOR	2	DIMETHOATE	3	OXAMYL	5
ALDICARB	5	DINOSEB	5	OXYDEMETON-METHYL	10
ALDICARB SULFONE	5	DIQUAT DIBROMIDE	2	PICLORAM	5
ALDICARB SULFOXIDE	5	DIURON	25	PROMETON	23
ALDRIN	2		(1)	PROMETRYN	28
ATRAZINE	28	ENDRIN	2	PROPACHLOR	2
BENTAZON, SODIUM SALT	6	ETHYLENE DIBROMIDE	30	PROPYZAMIDE	4
BENZENE (BENZOL)	7	GLYPHOSATE	5	SIMAZINE	28
BROMACIL	28	HEPTACHLOR	2	THIOBENCARB	3
	(1)	HEPTACHLOR EPOXIDE	2	TOXAPHENE	2
BUTACHLOR	5	HEXACHLOROBENZENE	2	TRICHLOROBENZENES	7
CARBARYL	5	HEXAZINONE	23	XYLENE	7
CARBOFURAN	9	LINDANE (GAMMA-BHC)	2		
CHLORDANE	2	METALAXYL	4		
CHLOROMETHANE	7	METHOMYL	5		

Riverside: A total of 176 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	42	CARBARYL	85	HEPTACHLOR EPOXIDE	88
1,2,4-TRICHLOROBENZENE	42	CARBOFURAN	85	HEXACHLOROBENZENE	87
1,2-D + 1,3-D + C-3 COMPOUNDS	41	CHLORDANE	88	LINDANE (GAMMA-BHC)	88
1,2-DICHLOROPROPANE	44	CHLOROMETHANE	41	METHOMYL	83
	(2)	CHLOROTHALONIL	84	METHOXYCHLOR	88
2,3,7,8-TCDD (DIOXIN)	2	DALAPON	71	METHYL BROMIDE	41
2,4,5-TP (SILVEX)	81	DBCP	144	METOLACHLOR	108
2,4-D	81		(14)	METRIBUZIN	48
3-HYDROXYCARBOFURAN	83	DIAZINON	109	MOLINATE	110
ACENAPTHENE	10	DICAMBA	77	NAPHTHALENE	51
ALACHLOR	110	DIELDRIN	84	ORTHO-DICHLOROBENZENE	42
ALDICARB	83	DIMETHOATE	108	OXAMYL	85
ALDICARB SULFONE	83	DINOSEB	81	PICLORAM	81
ALDICARB SULFOXIDE	83	DIQUAT DIBROMIDE	16	PROMETRYN	108
ALDRIN	84	DIURON	101	PROPACHLOR	75
ATRAZINE	110	ENDOTHALL	14	SIMAZINE	110
BENTAZON, SODIUM SALT	81	ENDRIN	88	THIOBENCARB	110
BENZENE (BENZOL)	43	ETHYLENE DIBROMIDE	144	TOXAPHENE	88
	(1)		(2)	TRICHLOROBENZENES	41
BROMACIL	111	GLYPHOSATE	56	XYLENE	43
BUTACHLOR	108	HEPTACHLOR	88		

Appendix A part 2 continued. Counties with any positive detection. Number of wells sampled and number of wells with positive detection (in parentheses).

Sacramento: A total of 175 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	157		(9)	METHOMYL	2
1,2,4-TRICHLOROBENZENE	157	CHLOROTHALONIL	3	METHOXYCHLOR	3
1,2-D + 1,3-D + C-3 COMPOUNDS	157	CYANAZINE	6	METHYL BROMIDE	157
1,2-DICHLOROPROPANE	157	DALAPON	3	METOLACHLOR	2
2,4,5-TP (SILVEX)	3	DBCP	2	METRIBUZIN	8
2,4-D	3	DIAZINON	2	MOLINATE	2
3-HYDROXYCARBOFURAN	2	DICAMBA	3	NAPHTHALENE	157
ALACHLOR	2	DIELDRIN	3	ORTHO-DICHLOROBENZENE	157
ALDICARB	2	DIMETHOATE	2	OXAMYL	2
ALDICARB SULFONE	2	DINOSEB	3	PICLORAM	3
ALDICARB SULFOXIDE	2	DIQUAT DIBROMIDE	2	PROMETON	6
ALDRIN	3	DIURON	8	PROMETRYN	8
ATRAZINE	9	ENDOTHALL	2	PROPACHLOR	2
BENTAZON, SODIUM SALT	3	ENDRIN	3	PROPYZAMIDE	3
BENZENE (BENZOL)	157	ETHYLENE DIBROMIDE	2	SIMAZINE	9
BROMACIL	8	GLYPHOSATE	2	THIOBENCARB	2
BUTACHLOR	2	HEPTACHLOR	3	TOXAPHENE	3
CARBARYL	2	HEPTACHLOR EPOXIDE	3	TRICHLOROBENZENES	157
CARBOFURAN	5	HEXACHLOROBENZENE	3	XYLENE	157
CHLORDANE	3	HEXAZINONE	6		
CHLOROMETHANE	166	LINDANE (GAMMA-BHC)	3		

San Bernardino: A total of 302 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	56	CHLORDANE	113	HEPTACHLOR	112
1,2,4-TRICHLOROBENZENE	56	CHLOROMETHANE	58	HEPTACHLOR EPOXIDE	112
	(1)	CHLOROTHALONIL	79	HEXACHLOROBENZENE	111
1,2-D + 1,3-D + C-3 COMPOUNDS	56	DALAPON	98	LINDANE (GAMMA-BHC)	112
1,2-DICHLOROPROPANE	57	DBCP	258	METHOMYL	5
	(1)		(68)	METHOXYCHLOR	112
2,3,7,8-TCDD (DIOXIN)	32	DDD	1	METHYL BROMIDE	56
2,4,5-T	1	DDE	1	METOLACHLOR	6
2,4,5-TP (SILVEX)	112	DDT	1	METRIBUZIN	3
2,4-D	112	DIAZINON	95	MOLINATE	110
3-HYDROXYCARBOFURAN	5	DICAMBA	17	NAPHTHALENE	83
ALACHLOR	110	DIELDRIN	18		(1)
ALDICARB	9	DIMETHOATE	6	ORTHO-DICHLOROBENZENE	56
ALDICARB SULFONE	9	DINOSEB	111	OXAMYL	96
ALDICARB SULFOXIDE	9	DIQUAT DIBROMIDE	14	PICLORAM	112
ALDRIN	18	DIURON	77	PROMETRYN	6
ATRAZINE	109	ENDOSULFAN	1	PROPACHLOR	17
BENTAZON, SODIUM SALT	111	ENDOSULFAN SULFATE	1	SIMAZINE	109
BENZENE (BENZOL)	56	ENDOTHALL	10	THIOBENCARB	110
BHC (OTHER THAN GAMMA)	1	ENDRIN	112	TOXAPHENE	112
BROMACIL	97	ENDRIN ALDEHYDE	1	TRICHLOROBENZENES	56
BUTACHLOR	7	ETHYLENE DIBROMIDE	237	XYLENE	56
CARBARYL	92		(1)		
CARBOFURAN	96	GLYPHOSATE	29		

Appendix A part 2 continued. Counties with any positive detection. Number of wells sampled and number of wells with positive detection (in parentheses).

San Diego: A total of 21 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	17	CARBARYL	2	HEXACHLOROBENZENE	3
1,2,4-TRICHLOROBENZENE	17	CARBOFURAN	2	LINDANE (GAMMA-BHC)	3
1,2-D + 1,3-D + C-3 COMPOUNDS	17	CHLORDANE	6	METHOMYL	1
1,2-DICHLOROPROPANE	17	CHLOROMETHANE	17	METHOXYCHLOR	6
2,4,5-T	3	CHLOROTHALONIL	2	METHYL BROMIDE	17
2,4,5-TP (SILVEX)	5	CHLORTHAL-DIMETHYL	3	METOLACHLOR	2
2,4-D	6	DALAPON	6	METRIBUZIN	5
3-HYDROXYCARBOFURAN	1	DBCP	6	MOLINATE	6
ALACHLOR	6	DIAZINON	3	ORTHO-DICHLOROBENZENE	17
ALDICARB	1	DICAMBA	2	OXAMYL	2
ALDICARB SULFONE	1	DIELDRIN	5	PICLORAM	6
ALDICARB SULFOXIDE	1	DIMETHOATE	2	PROMETRYN	2
ALDRIN	5	DINOSEB	6	PROPACHLOR	2
ATRATON	3	DIQUAT DIBROMIDE	1	SIMAZINE	6
ATRAZINE	6	DIURON	2	THIOBENCARB	3
BENTAZON, SODIUM SALT	6	ENDRIN	6	TOXAPHENE	5
BENZENE (BENZOL)	17	ETHYLENE DIBROMIDE	6	TRICHLOROBENZENES	17
BROMACIL	2	HEPTACHLOR	6	XYLENE	17
BUTACHLOR	2	HEPTACHLOR EPOXIDE	6		(1)

San Joaquin: A total of 74 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	6	CHLOROMETHANE	4	METALAXYL	3
1,2,4-TRICHLOROBENZENE	4	CHLOROTHALONIL	27	METHOMYL	28
1,2-D + 1,3-D + C-3 COMPOUNDS	4	CYANAZINE	10	METHOXYCHLOR	29
1,2-DICHLOROPROPANE	7	DALAPON	25	METHYL BROMIDE	4
	(1)	DBCP	39	METOLACHLOR	33
2,4,5-TP (SILVEX)	28		(19)	METRIBUZIN	35
2,4-D	28	DIAZINON	33	MOLINATE	33
3-HYDROXYCARBOFURAN	28	DICAMBA	27	NAPHTHALENE	8
ALACHLOR	32	DIELDRIN	29	ORTHO-DICHLOROBENZENE	4
ALDICARB	28	DIMETHOATE	33	OXAMYL	28
ALDICARB SULFONE	28	DINOSEB	28	PARAQUAT DICHLORIDE	1
ALDICARB SULFOXIDE	28	DIQUAT DIBROMIDE	28	PICLORAM	28
ALDRIN	29	DIURON	10	PROMETON	10
ATRAZINE	43	ENDOTHALL	28	PROMETRYN	43
BENTAZON, SODIUM SALT	28	ENDRIN	29	PROPACHLOR	29
BENZENE (BENZOL)	6	ETHYLENE DIBROMIDE	31	PROPYZAMIDE	1
BROMACIL	43	GLYPHOSATE	2	SIMAZINE	43
	(1)	HEPTACHLOR	29	THIOBENCARB	33
BUTACHLOR	33	HEPTACHLOR EPOXIDE	29	TOXAPHENE	30
CARBARYL	28	HEXACHLOROBENZENE	29	TRICHLOROBENZENES	4
CARBOFURAN	34	HEXAZINONE	10	XYLENE	6
CHLORDANE	29	LINDANE (GAMMA-BHC)	29		

Appendix A part 2 continued. Counties with any positive detection. Number of wells sampled and number of wells with positive detection (in parentheses).

San Luis Obispo: A total of 62 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	7	CHLOROTHALONIL	31	METHOXYCHLOR	50
1,2,4-TRICHLOROBENZENE	7	CYANAZINE	3	METHYL BROMIDE	7
1,2-D + 1,3-D + C-3 COMPOUNDS	7	DALAPON	47	METOLACHLOR	8
1,2-DICHLOROPROPANE	7	DBCP	41	METRIBUZIN	3
2,4,5-TP (SILVEX)	47	DIAZINON	44	MOLINATE	48
2,4-D	53	DICAMBA	19	NAPHTHALENE	7
3-HYDROXYCARBOFURAN	19	DIELDRIN	42	ORTHO-DICHLOROBENZENE	7
ALACHLOR	48	DIMETHOATE	46	OXAMYL	48
ALDICARB	27	DINOSEB	47	OXYDEMETON-METHYL	1
ALDICARB SULFONE	17	DIQUAT DIBROMIDE	51	PARAQUAT DICHLORIDE	14
ALDICARB SULFOXIDE	19	DIURON	49	PICLORAM	50
ALDRIN	42	ENDOTHALL	1	PROMETON	3
ATRAZINE	54	ENDRIN	50	PROMETRYN	42
BENTAZON, SODIUM SALT	47	ETHYLENE DIBROMIDE	41	PROPACHLOR	8
BENZENE (BENZOL)	7		(1)	PROPYZAMIDE	2
BROMACIL	51	GLYPHOSATE	1	SIMAZINE	54
BUTACHLOR	8	HEPTACHLOR	50	THIOBENCARB	48
CARBARYL	51	HEPTACHLOR EPOXIDE	50	TOXAPHENE	45
CARBOFURAN	48	HEXACHLOROBENZENE	39	TRICHLOROBENZENES	7
CHLORDANE	50	HEXAZINONE	3	XYLENE	7
CHLOROMETHANE	7	LINDANE (GAMMA-BHC)	45		
		METHOMYL	36		

San Mateo: A total of 9 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	5	BROMACIL	3	OXYDEMETON-METHYL	1
1,2,4-TRICHLOROBENZENE	5	CHLOROMETHANE	5	PROMETON	3
1,2-D + 1,3-D + C-3 COMPOUNDS	5	CYANAZINE	3	PROMETRYN	3
1,2-DICHLOROPROPANE	6	DIURON	3	SIMAZINE	3
	(1)	HEXAZINONE	3	TRICHLOROBENZENES	5
ATRAZINE	3	METHYL BROMIDE	5	XYLENE	5
BENTAZON, SODIUM SALT	2	METRIBUZIN	3		
BENZENE (BENZOL)	5	ORTHO-DICHLOROBENZENE	5		

Appendix A part 2 continued. Counties with any positive detection. Number of wells sampled and number of wells with positive detection (in parentheses).

Santa Barbara: A total of 65 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	18	DALAPON	40	METOLACHLOR	16
1,2,4-TRICHLOROBENZENE	17	DBCP	46	METRIBUZIN	29
1,2-D + 1,3-D + C-3 COMPOUNDS	18	DDVP (DICHLORVOS)	7	MEVINPHOS	7
1,2-DICHLOROPROPANE	18	DIAZINON	45	MOLINATE	50
2,4,5-T	7	DICAMBA	16	NAPHTHALENE	18
2,4,5-TP (SILVEX)	41	DIELDRIN	21	NAPROPAMIDE	7
2,4-D	41	DIMETHOATE	17	ORTHO-DICHLOROBENZENE	18
3-HYDROXYCARBOFURAN	16	DINOSEB	40	OXAMYL	48
ALACHLOR	49	DIPHENAMID	7	OXYDEMETON-METHYL	4
ALDICARB	19	DIQUAT DIBROMIDE	38	PARAQUAT DICHLORIDE	10
ALDICARB SULFONE	16		(1)	PICLORAM	40
ALDICARB SULFOXIDE	16	DISULFOTON	7	PROMETON	20
ALDRIN	21	DIURON	55	PROMETRYN	37
AMETRYNE	7	ENDOTHALL	7	PROPACHLOR	9
ATRATON	7	ENDRIN	44	PROPAZINE	7
ATRAZINE	63	EPTC	7	PROPOXUR	7
BENTAZON, SODIUM SALT	45	ETHYLENE DIBROMIDE	46	PROPYZAMIDE	3
BENZENE (BENZOL)	18	FENAMIPHOS	7	SIMAZINE	63
BROMACIL	58	GLYPHOSATE	17	SIMETRYN	6
BUTACHLOR	16	HEPTACHLOR	48	TEBUTHIURON	6
BUTYLATE	7	HEPTACHLOR EPOXIDE	48	TERBUTRYN	6
CARBARYL	44	HEXACHLOROBENZENE	43	TETRACHLORVINPHOS	6
CARBOFURAN	49	HEXAZINONE	20	THIOBENCARB	43
CHLORDANE	48	LINDANE (GAMMA-BHC)	44	TOXAPHENE	44
CHLOROMETHANE	18	MERPHOS	7	TRIADIMEFON	6
CHLOROTHALONIL	34	METALAXYL	2	TRICHLOROBENZENES	17
CHLORPROPHAM	7	METHIOCARB	7	VERNOLATE	6
CHLORTHAL-DIMETHYL	7	METHOMYL	31	XYLENE	18
CYANAZINE	15	METHOXYCHLOR	44		
CYCLOATE	7	METHYL BROMIDE	18		

Santa Clara: A total of 82 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	76	CHLOROMETHANE	74	METHOMYL	14
1,2,4-TRICHLOROBENZENE	74	CHLOROTHALONIL	14	METHOXYCHLOR	18
1,2-D + 1,3-D + C-3 COMPOUNDS	74	CYANAZINE	1	METHYL BROMIDE	74
1,2-DICHLOROPROPANE	76	DALAPON	20	METOLACHLOR	14
2,3,7,8-TCDD (DIOXIN)	15	DBCP	15	METRIBUZIN	14
2,4,5-TP (SILVEX)	20	DIAZINON	14	MOLINATE	15
2,4-D	20	DICAMBA	20	NAPHTHALENE	55
3-HYDROXYCARBOFURAN	14	DIELDRIN	17	ORTHO-DICHLOROBENZENE	74
ALACHLOR	18	DIMETHOATE	14	OXAMYL	15
ALDICARB	15	DINOSEB	20	OXYDEMETON-METHYL	1
ALDICARB SULFONE	15	DIQUAT DIBROMIDE	15	PICLORAM	20
ALDICARB SULFOXIDE	14	DIURON	15	PROMETON	1
ALDRIN	17	ENDOTHALL	15	PROMETRYN	15
ATRAZINE	16	ENDRIN	18	PROPACHLOR	17
BENTAZON, SODIUM SALT	20	ETHYLENE DIBROMIDE	15	SIMAZINE	16
BENZENE (BENZOL)	76	GLYPHOSATE	15	THIOBENCARB	15
BROMACIL	15	HEPTACHLOR	18	TOXAPHENE	18
BUTACHLOR	14	HEPTACHLOR EPOXIDE	18	TRICHLOROBENZENES	74
CARBARYL	14	HEXACHLOROBENZENE	18	XYLENE	77
CARBOFURAN	15	HEXAZINONE	1		(1)
CHLORDANE	18	LINDANE (GAMMA-BHC)	18		

Appendix A part 2 continued. Counties with any positive detection. Number of wells sampled and number of wells with positive detection (in parentheses).

Santa Cruz: A total of 29 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	11	CARBOFURAN	13	NAPHTHALENE	15
1,2,4-TRICHLOROBENZENE	11	CHLOROMETHANE	11	ORTHO-DICHLOROBENZENE	11
1,2-D + 1,3-D + C-3 COMPOUNDS	11	CYANAZINE	5	OXAMYL	11
1,2-DICHLOROPROPANE	11	DBCP	13	OXYDEMETON-METHYL	2
3-HYDROXYCARBOFURAN	11	DIURON	5	PROMETON	5
ALDICARB	13	ETHYLENE DIBROMIDE	13	PROMETRYN	5
ALDICARB SULFONE	13	GLYPHOSATE	13	PROPYZAMIDE	3
ALDICARB SULFOXIDE	13	HEXAZINONE	5	SIMAZINE	5
ATRAZINE	5	METHOMYL	11	TRICHLOROBENZENES	11
BENZENE (BENZOL)	11	METHYL BROMIDE	11	XYLENE	11
	(1)	METRIBUZIN	5		
BROMACIL	5				

Sonoma: A total of 73 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	31	CHLORDANE	43	METHIOCARB	31
1,2,4-TRICHLOROBENZENE	31	CHLOROMETHANE	30	METHOMYL	36
1,2-D + 1,3-D + C-3 COMPOUNDS	31	CHLOROTHALONIL	33	METHOXYCHLOR	43
1,2-DICHLOROPROPANE	31	DALAPON	48	METHYL BROMIDE	31
2,4,5-TP (SILVEX)	47	DBCP	3	METOLACHLOR	35
2,4-D	47	DIAZINON	35	METRIBUZIN	30
3-HYDROXYCARBOFURAN	34	DICAMBA	34	MOLINATE	35
4(2,4-DB), DIMETHYLAMINE SALT	1	DIELDRIN	30	NAPHTHALENE	31
ALACHLOR	30	DIMETHOATE	35	ORTHO-DICHLOROBENZENE	31
ALDICARB	35	DINOSEB	36	OXAMYL	45
ALDICARB SULFONE	36	DIQUAT DIBROMIDE	45	PICLORAM	45
ALDICARB SULFOXIDE	36		(1)	PROMETRYN	35
ALDRIN	29	DIURON	33	PROPACHLOR	35
ATRAZINE	55	ENDOTHALL	43	PROPOXUR	31
BENTAZON, SODIUM SALT	33	ENDRIN	43	SIMAZINE	55
BENZENE (BENZOL)	31	ETHYLENE DIBROMIDE	14	THIOBENCARB	35
BROMACIL	35	HEPTACHLOR	43	TOXAPHENE	43
BUTACHLOR	35	HEPTACHLOR EPOXIDE	43	TRICHLOROBENZENES	31
CARBARYL	36	HEXACHLOROBENZENE	31	XYLENE	31
CARBOFURAN	34	LINDANE (GAMMA-BHC)	43		

Appendix A part 2 continued. Counties with any positive detection. Number of wells sampled and number of wells with positive detection (in parentheses).

Stanislaus: A total of 116 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	53
1,2,4-TRICHLOROBENZENE	53
1,2-D + 1,3-D + C-3 COMPOUNDS	53
1,2-DICHLOROPROPANE	53
1,3-DICHLOROPROPENE (1,3-D)	14
2,4,5-T	14
2,4,5-TP (SILVEX)	30
2,4-D	30
3-HYDROXYCARBOFURAN	14
ALACHLOR	66
ALDICARB	14
ALDICARB SULFONE	14
ALDICARB SULFOXIDE	14
ALDRIN	15
ATRAZINE	31
BENEFIN (BENFLURALIN)	9
BENTAZON, SODIUM SALT	16
BENZENE (BENZOL)	53
BHC (OTHER THAN GAMMA)	9
BROMACIL	31
BUTACHLOR	15
CAPTAN	9
CARBARYL	14
CARBOFURAN	51
CARBOPHENOTHION	9
CHLORDANE	66
CHLOROMETHANE	53 (1)
CHLOROTHALONIL	4
DALAPON	67
DBCP	109 (44)
DDD	9
DDE	9
DDT	9
DIAZINON	31
DICAMBA	29
DICOFOL	9
DIELDRIN	15
DIMETHOATE	15
DINOSEB	67
DIQUAT DIBROMIDE	42
DIURON	8
DMPA (ZYTROM)	9
ENDOSULFAN	9
ENDOSULFAN SULFATE	9
ENDOTHALL	52
ENDRIN	66
ENDRIN ALDEHYDE	9
ETHYLENE DIBROMIDE	96 (2)
GLYPHOSATE	8
HEPTACHLOR	66
HEPTACHLOR EPOXIDE	66
HEXACHLOROBENZENE	66
LINDANE (GAMMA-BHC)	66
MCPA, DIMETHYLAMINE SALT	14
METHOMYL	14
METHOXYCHLOR	15
METHYL BROMIDE	53
METOLACHLOR	15
METRIBUZIN	11
MOLINATE	31
NAPHTHALENE	60
NITROFEN	9
ORTHO-DICHLOROBENZENE	53
OXAMYL	51
PCNB	9
PICLORAM	53
PROMETRYN	31
PROPACHLOR	15
SIMAZINE	31 (1)
THIOBENCARB	31
TOXAPHENE	66
TRICHLOROBENZENES	53
XYLENE	49

Sutter: A total of 22 wells were sampled.

1,2,4-TRICHLOROBENZENE	1
1,2-D + 1,3-D + C-3 COMPOUNDS	1
ATRAZINE	15
BROMACIL	10
BUTACHLOR	1
CARBOFURAN	8
CHLOROMETHANE	1
CYANAZINE	9
DBCP	1 (1)
DIAZINON	1
DIMETHOATE	1
DIURON	15
ETHYLENE DIBROMIDE	1 (1)
HEXAZINONE	9
METALAXYL	4
METHOMYL	3
METHYL BROMIDE	1
METOLACHLOR	1
METRIBUZIN	11
MOLINATE	2
NAPHTHALENE	1
ORTHO-DICHLOROBENZENE	1
OXAMYL	3
PROMETON	9
PROMETRYN	10
PROPACHLOR	1
SIMAZINE	19 (3)
THIOBENCARB	2
TRICHLOROBENZENES	1
XYLENE	1

Appendix A part 2 continued. Counties with any positive detection. Number of wells sampled and number of wells with positive detection (in parentheses).

Tulare: A total of 142 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	22
1,2,4-TRICHLOROBENZENE	22
1,2-D + 1,3-D + C-3 COMPOUNDS	22
1,2-DICHLOROPROPANE	22
2,4,5-TP (SILVEX)	42
2,4-D	42
3-HYDROXYCARBOFURAN	41
ALACHLOR	40
ALDICARB	41
ALDICARB SULFONE	41
ALDICARB SULFOXIDE	41
ALDRIN	40
ATRAZINE	47
BENTAZON, SODIUM SALT	42
BENZENE (BENZOL)	22
BROMACIL	47
BUTACHLOR	42
CARBARYL	41
CARBOFURAN	44
CHLORDANE	40
CHLOROMETHANE	23
	(1)
CHLOROTHALONIL	23
CYANAZINE	5
DALAPON	42
DBCP	124
	(45)
DIAZINON	42
DICAMBA	42
DIELDRIN	40
DIMETHOATE	42
DINOSEB	42
DIQUAT DIBROMIDE	36
DIURON	5
ENDOTHALL	36
ENDRIN	40
ETHYLENE DIBROMIDE	124
	(1)
GLYPHOSATE	3
HEPTACHLOR	40
HEPTACHLOR EPOXIDE	40
HEXACHLOROBENZENE	40
HEXAZINONE	5
LINDANE (GAMMA-BHC)	40
METHIOCARB	7
METHOMYL	41
METHOXYCHLOR	40
METHYL BROMIDE	22
METOLACHLOR	42
METRIBUZIN	23
MOLINATE	42
NAPHTHALENE	22
ORTHO-DICHLOROBENZENE	22
OXAMYL	41
OXYDEMETON-METHYL	2
PARAQUAT DICHLORIDE	7
PICLORAM	42
PROMETON	5
PROMETRYN	47
PROPACHLOR	42
PROPOXUR	7
SIMAZINE	47
THIOBENCARB	42
TOXAPHENE	40
TRICHLOROBENZENES	22
XYLENE	22

Ventura: A total of 75 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	43
1,2,4-TRICHLOROBENZENE	41
1,2-D + 1,3-D + C-3 COMPOUNDS	42
1,2-DICHLOROPROPANE	43
2,3,7,8-TCDD (DIOXIN)	1
2,4,5-TP (SILVEX)	51
2,4-D	52
3-HYDROXYCARBOFURAN	36
ALACHLOR	40
ALDICARB	39
ALDICARB SULFONE	36
ALDICARB SULFOXIDE	36
ALDRIN	42
ATRAZINE	54
BENTAZON, SODIUM SALT	51
BENZENE (BENZOL)	43
BROMACIL	54
BUTACHLOR	37
CARBARYL	44
CARBOFURAN	45
CHLORDANE	51
CHLOROMETHANE	43
	(1)
CHLOROTHALONIL	18
CYANAZINE	8
DALAPON	51
DBCP	39
DIAZINON	42
DICAMBA	38
DIELDRIN	41
DIMETHOATE	42
DINOSEB	51
DIQUAT DIBROMIDE	46
DIURON	42
ENDOTHALL	2
ENDRIN	51
ETHYLENE DIBROMIDE	39
GLYPHOSATE	13
HEPTACHLOR	51
HEPTACHLOR EPOXIDE	51
HEXACHLOROBENZENE	49
HEXAZINONE	8
LINDANE (GAMMA-BHC)	50
METALAXYL	3
METHIOCARB	6
METHOMYL	36
METHOXYCHLOR	51
METHYL BROMIDE	43
METOLACHLOR	37
METRIBUZIN	43
MOLINATE	45
NAPHTHALENE	41
	(1)
ORTHO-DICHLOROBENZENE	41
OXAMYL	42
OXYDEMETON-METHYL	2
PARAQUAT DICHLORIDE	35
PICLORAM	52
PROMETON	8
PROMETRYN	46
PROPACHLOR	37
PROPOXUR	6
PROPYZAMIDE	3
SIMAZINE	54
THIOBENCARB	45
TOXAPHENE	50
TRICHLOROBENZENES	42
XYLENE	43

Appendix A part 2 continued. Counties with any positive detection. Number of wells sampled and number of wells with positive detection (in parentheses).

Yuba: A total of 22 wells were sampled.

1,1,2,2-TETRACHLOROETHANE	10	CHLOROMETHANE	10	METHOXYCHLOR	4
1,2,4-TRICHLOROBENZENE	10	CHLORPROPHAM	4	METHYL BROMIDE	10
1,2-D + 1,3-D + C-3 COMPOUNDS	10	CHLORTHAL-DIMETHYL	7	METOLACHLOR	12
1,2-DICHLOROPROPANE	10	CYANAZINE	1	METRIBUZIN	13
2,4,5-T	7	CYCLOATE	4	MEVINPHOS	4
2,4,5-TP (SILVEX)	15	DALAPON	15	MOLINATE	12
2,4-D	15	DBCP	7	NAPHTHALENE	10
3-HYDROXYCARBOFURAN	8	DDVP (DICHLORVOS)	4	NAPROPAMIDE	4
ALACHLOR	12	DIAZINON	12	ORTHO-DICHLOROBENZENE	10
ALDICARB	8	DICAMBA	15	OXAMYL	8
ALDICARB SULFONE	8	DIELDRIN	7	PICLORAM	15
ALDICARB SULFOXIDE	8	DIMETHOATE	8	PROMETON	5
ALDRIN	7	DINOSEB	15	PROMETRYN	13
AMETRYNE	4	DIPHENAMID	4	PROPACHLOR	8
ATRATON	4	DISULFOTON	4	PROPAZINE	4
ATRAZINE	13	DIURON	6	SIMAZINE	16
BENTAZON, SODIUM SALT	15 (1)	ENDRIN	7	SIMETRYN	4
BENZENE (BENZOL)	10 (1)	EPTC	4	TEBUTHIURON	4
BROMACIL	13	ETHYLENE DIBROMIDE	9	TERBUTRYN	4
BUTACHLOR	12	FENAMIPHOS	4	TETRACHLORVINPHOS	4
BUTYLATE	4	HEPTACHLOR	7	THIOBENCARB	8
CARBARYL	8	HEPTACHLOR EPOXIDE	7	TOXAPHENE	7
CARBOFURAN	9	HEXACHLOROBENZENE	7	TRIADIMEFON	4
CHLORAMBEN	7	HEXAZINONE	5	TRICHLOROBENZENES	10
CHLORDANE	7	LINDANE (GAMMA-BHC)	7	VERNOLATE	4
		MERPHOS	4	XYLENE	4
		METHOMYL	8		

Appendix B

Summary of Studies
Included in the 1996 Update Report

The following summarizes the well sampling surveys that were added to the well inventory database during the period July 1, 1995 - June 30, 1996. The study number assigned by DPR is shown to the left.

I. CALIFORNIA DEPARTMENT OF HEALTH SERVICES (Sanitary Engineering Branch)

0023 Sampled for a total of 117 chemicals in 47 counties: Alameda, Amador, Butte, Calaveras, Colusa, Contra Costa, El Dorado, Fresno, Glenn, Humbolt, Inyo, Kern, Kings, Lake, Lassen, Los Angeles, Madera, Mariposa, Mendocino, Merced, Monterey, Napa, Orange, Placer, Plumas, Riverside, Sacramento, San Bernardino, San Diego, San Joaquin, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, Shasta, Siskiyou, Solano, Sonoma, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Ventura, Yolo, and Yuba counties; July 1994 - December 1995; 3,399 wells sampled.

II. DEPARTMENT OF PESTICIDE REGULATION (Environmental Hazards Assessment Program)
Analyses were performed for the listed chemicals.
Bold indicates the chemical(s) for which the study was initiated.
<u>Underline</u> indicates a verified detection of the chemical was made.

0386 <u>Atrazine</u>, <u>bromacil</u>, **carbofuran**, cyanazine, diuron, hexazinone, **metalaxyl**, metribuzin, **oxydemeton-methyl**, prometon, prometryn, **propyzamide**, <u>simazine</u>; Butte, Colusa, Fresno, Glenn, Kern, Merced, Monterey, Sacramento, San Benito, San Joaquin, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, Sutter, Tulare, Ventura, Yolo, and Yuba counties; June 1995 - May 1996; 115 wells sampled. Ground Water Protection List Monitoring.

0387 Atrazine, bromacil, cyanazine, diuron, **endothall**, hexazinone, metribuzin, prometon, prometryn, simazine; Butte County; June 1995; 6 wells sampled.

0388 Atrazine, bromacil, cyanazine, diuron, hexazinone, **methyl bromide**, metribuzin, prometon, prometryn, simazine; Napa County; August 1995; 38 wells sampled.

0391 Atrazine, bromacil, cyanazine, diuron, **glyphosate**, hexazinone, metribuzin, prometon, prometryn, simazine; Santa Barbara County; January 1995; 2 wells sampled.

0392 Atrazine, **bentazon**, bromacil, cyanazine, diuron, hexazinone, metribuzin, prometon, prometryn, simazine; Monterey, San Mateo, and Santa Barbara counties; June 1996; 7 wells sampled. Bentazon Monitoring.

Well sampling studies were not conducted for the following detections because investigations of the detections were conducted according to the "Revised protocol for selecting sampling areas and wells in a four-section survey to locate a second positive well site". Based on the investigation, PMZs were recommended. No study number was assigned so the associated file name is given. The initial detections for these files were made by the Environmental Hazards Assessment Program as part of the Soil Cluster Well Sampling Study (0130). The results from this study were reported in the 1995 Update.

Z314 Bromacil, DIPA, diuron, simazine; Fresno County. Based on the investigation, section 13S/22E-36 should be declared a PMZ for atrazine, bromacil, diuron, and simazine.

Z315 Bromacil, DIPA, diuron, simazine; Fresno County. Based on the investigation, section 13S/23E-24 should be declared a PMZ for atrazine, bromacil, diuron, and simazine.

Z316 Bromacil, DIPA, diuron, simazine; Fresno County. Based on the investigation, section 13S/23E-26 should be declared a PMZ for atrazine, bromacil, diuron, and simazine.

Z317 Bromacil, DIPA, diuron, simazine; Fresno County. Based on the investigation, section 13S/23E-31 should be declared a PMZ for atrazine, bromacil, diuron, and simazine.

Z318 Atrazine, DIPA, diuron, simazine; Fresno County. Based on the investigation, section 13S/23E-32 should be declared a PMZ for atrazine, diuron, and simazine.

Z319 DIPA, diuron, simazine; Fresno County. Based on the investigation, section 13S/23E-34 should be declared a PMZ for atrazine, diuron, and simazine.

Z322 Diuron; Fresno County. Based on the investigation, section 14S/22E-03 should be declared a PMZ for diuron.

Z323 DIPA, simazine; Fresno County. Based on the investigation, section 14S/22E-13 should be declared a PMZ for atrazine. This section was previously declared a PMZ for diuron and simazine.

Z325 DIPA, diuron, simazine; Fresno County. Based on the investigation, section 14S/22E-20 should be declared a PMZ for atrazine, diuron, and simazine.

Z326 Bromacil, diuron, simazine; Fresno County. Based on the investigation, section 14S/22E-33 should be declared a PMZ for bromacil, diuron, and simazine.

Z330 DIPA, simazine; Fresno County. Based on the investigation, section 14S/23E-28 should be declared a PMZ for atrazine and simazine.

Z331 Simazine; Fresno County. Based on the investigation, section 14S/23E-32 should be declared a PMZ for simazine.

Z334 DIPA, diuron, simazine; Fresno County. Based on the investigation, section 14S/24E-35 should be declared a PMZ for atrazine, diuron, and simazine.

Z336 DIPA, simazine; Fresno County. Based on the investigation, section 15S/22E-03 should be declared a PMZ for atrazine and simazine.

Z338 DIPA, diuron, simazine; Fresno County. Based on the investigation, section 15S/24E-12 should be declared a PMZ for atrazine, diuron, and simazine.

Z339 Bromacil, DIPA, diuron; Fresno County. Based on the investigation, section 15S/24E-13 should be declared a PMZ for atrazine, bromacil, diuron, and simazine.

Z340 Bromacil, DIPA, diuron, simazine; Fresno County. Based on the investigation, section 15S/24E-14 should be declared a PMZ for atrazine, bromacil, diuron, and simazine.

Z341 DIPA, diuron; Fresno County. Based on the investigation, section 15S/24E-23 should be declared a PMZ for atrazine, diuron, and simazine.

Z342 Bromacil, DIPA, diuron; Fresno County. Based on the investigation, section 15S/24E-25 should be declared a PMZ for atrazine, bromacil, diuron, and simazine.

Z343 Bromacil, DIPA, diuron, simazine; Fresno County. Based on the investigation, section 15S/24E-36 should be declared a PMZ for atrazine, bromacil, diuron, and simazine.

Appendix C

Analytical Methods for the Verification of Ground Water Contamination by Pesticides

VERIFICATION

All reports of pesticide residues in ground water are considered verified after the following has occurred:

1. A finding results from an analytical method approved by the department that provides unequivocal identification of a chemical, or,
2. Two discrete samples from the same site have been taken by the Department, no longer than 30 days apart, and
   - (a) the residue has been detected by one laboratory using different analytical methods approved by the Department, or
   - (b) the residue has been detected by two different laboratories using an analytical method approved by the Department

If only a degradation product of the substance under investigation is subsequently detected, then the degradation product itself must be detected in a second discrete sample.

Definition of Different Analytical Methods

Confirmation of a residue by a second analytical method is intended to increase the confidence in the positive detection of a chemical by the first analytical method. If the measurement procedures of the second method vary only slightly from the first method, it is likely that an erroneous identification in the first determination would also occur in the second. Therefore, the second method should be based on separation and/or detection processes as different from the first method as feasible.

The minimum changes needed in the first method to qualify it for consideration as a second method depend on the specificity of both methods. The following matrix lists the possible combinations where *detection and separation* is defined as a significant change in both detector and separation procedure, *detection* is a significant change in the detector only, and *detection or separation* is a significant change in the detector or separation procedure.

Minimum requirements for procedural changes in a first method to qualify it as a second method:

	SECOND METHOD	
FIRST METHOD	***non-specific***	***specific***
specific	detection & separation	detection
non-specific	detection	detection or separation

Specific Methods
A specific method provides positive identification of the measured chemical. This unequivocal identification implies that the detection system can distinguish the target compound from all other compounds in a given mixture, with or without the need for an additional separation procedure. A method is also considered to be specific if all known interferences yield insignificant responses; i.e., the sensitivity for the interfering compound is less than 0.1 percent of the sensitivity for the target compound.

Examples for specific methods are spectroscopic techniques like mass spectroscopy (MS) and Fourier transform infrared (FTIR) spectroscopy, which are generally used together with separation techniques like gas chromatography (GC) or high performance liquid chromatography (HPLC).

Nonspecific Methods
All methods that respond to more than one chemical and which use detectors that cannot distinguish between these different chemicals are considered to be nonspecific. Analytical methods that incorporate nonspecific detectors rely completely on separation procedures for identification. The problem with nonspecific detectors is that they can only prove the absence of a chemical when no signal is registered at the proper conditions for the chemical in question. When a signal is measured, however, one can only say that it is likely that the signal is caused by that chemical. But it is not a proven fact, as another component of the unknown mixture might interfere and the detector cannot distinguish between the two.

This definition of nonspecific includes the majority of GC techniques. For example, nitrogen-phosphorus specific detectors used in GC analysis are specific only on the atomic level; they can distinguish nitrogen and phosphorus atoms from other atoms, but they cannot distinguish between one nitrogen-containing chemical and another.

Significant Change
A significant change in detector means a change in detection principle (for GC, a change from a flame photometric detector [FPD] to a conductivity detector, for example). A significant change in the separation procedure is either a change in separation principle (from GC to HPLC, for example) or a change in the separation condition (i.e., using a different type of column), as long as this change will alter the sequence in which the compounds are registered.

Following are examples for the three types of minimum changes (detection and separation, detection only, and detection or separation), given in the previous matrix, that qualify as significant changes:

Case 1
When both the first and the second method are nonspecific, both the detector and the separation procedure have to be changed significantly. For example, a first method using GC separation and a FPD could use as a second method either a GC with a significantly different column and a nitrogen-phosphorus detector (changing separation conditions and detector) or an HPLC separation with a UV-detector (changing separation principle and detector).

Case 2
When only one of the methods is specific, just the detection principle has to be changed; the separation procedure may be kept the same (GC/FPD and GC/MS using the same column, for example).

Case 3
When both methods are specific, either the detector or the separation procedure may be changed. Examples for these cases are GC/MS and HPLC/MS (keeping the same detector) or GC/MS and GC/FTIR (keeping the same separation conditions).

In cases (2 and 3) where only a change in detector is needed, it is acceptable to use an integrated system where the effluent of the separation step is split and routed to two detectors. An example for this is GC/MS/FTIR, where the effluent of the GC is analyzed by MS and FTIR simultaneously. As this integrated analytical instrument uses two specific detectors, it counts as both a first and second method.

Screening Methods
Special consideration has to be given to qualitative or semi-quantitative methods typically used for screening. Qualitative methods yield only detected/not detected results; semi-quantitative methods indicate the order of magnitude for the concentration of the identified chemical. Samples identified as positive will be forwarded for analysis by a quantitative method.

In this case, the qualitative screen is considered to be the first method. The quantitative method is then selected based on the above criteria for a second method. A second quantitative method (i.e., a third analysis method) is required only when verification is needed not only for the identity of the compound but also for its concentration. Analogously, a qualitative method may be used as a second method if verification of the concentration is not required. A qualitative method cannot be used as a second method when the first method is qualitative.

For example: a specific enzyme-linked immunosorbent assay (ELISA) may be used as a first method, even if it is used just as a detected/not detected screen. A nonspecific ELISA qualifies as a second detector for the effluent from an HPLC. Note, however, that any ELISA which shows significant cross-reactivity to other compounds is considered to be nonspecific and would also require a change in the separation procedure.

Unequivocal Detection Methods

The basic requirement for an unequivocal detection is that the target compound can be distinguished from potential interferences present in an environmental sample. This can be achieved by two routes:

a) The method is known not to show any significant interferences from other chemicals. Example: an enzyme-linked immunosorbent assay (ELISA) that has been tested for cross-reactivity.
b) The method uses a detection process that can be used to identify the chemical structure of the compound. Example: mass spectroscopy (MS) or infrared (IR) spectroscopy.

Any method that does not meet the above criteria will require a confirmation analysis by a second method or a second laboratory. Detection methods that meet the above criteria are likely to provide unequivocal detections, but this is influenced by the operating conditions and the nature of the chemical analyzed. Even though these detection methods provide the capability to identify a chemical, it does not imply that they will be able to do so unequivocally under all operating conditions or for all chemicals. Therefore, the determination as to whether a given analysis method can be considered unequivocal will not be based generically on the detection method used, but must be made on a case-by-case basis in consultation with the chemistry laboratory. Only the explicit operating instructions contained in a written and approved method, together with the supporting data of the method validation, will provide enough information to make a determination. A specific analysis method will only be recommended to the branch chief as an unequivocal method according to AB 2021 if both the chemist in charge of the method development and the senior environmental research scientist assigned to the project sign off on this designation.

Appendix D

Materials and Methods Used for Collection, Preparation, Verification, and Entry of Data into the Database

and

Format of Database Records

MATERIALS AND METHODS

Data Collection

Section 13152, subdivision (c) of the PCPA requires all government agencies that sample wells for pesticides to submit their sampling data and analytical results to DPR for inclusion in the well inventory database. DPR has notified appropriate agencies of this law and requested them to submit required information. DPR has also contacted private companies that conduct well sampling for pesticides to request those sampling results for the well inventory. Agencies supplied sampling data as published reports, raw laboratory results, or retrievals of information on magnetic media from their databases.

Sampling results were reviewed to determine if they met the criteria for inclusion in the database:

1. Results were for the analyses of pesticides or pesticide breakdown products;
2. Samples were taken from a well;
3. Samples were obtained from an untreated and unfiltered system;
4. Location of each well was identified by at least township/range/section according to the U.S. Geological Survey's Public Lands Survey Coordinate system;
5. Data had not previously been entered into the database.

The PCPA also requires DPR, the SWRCB, and CDHS to jointly establish minimum requirements for well sampling that will ensure precise and accurate results. The agencies agreed upon the following minimum reporting requirements, effective December 1, 1986, which are applicable only to well samples taken after that date:

1. State well number
2. County;
3. Date of sample (month, day, and year);
4. Chemical analyzed for;
5. Individual sample concentration,;
6. Minimum detectable limit;
7. Sampling agency;
8. Analyzing laboratory;
9. Street address of well location
10. Well type;
11. Sample type (e.g., initial or confirmation).

Optional information to be included when available:

1. Method of analysis;
2. Well depth;
3. Depths of top and bottom perforations of the well casing;
4. Depth of standing water in the well at time of sampling;
5. Year the well was drilled;
6. Whether a driller's log was located;
7. Known or suspected source of contamination.

Data Preparation

The analytical results for each pesticide residue or related chemical in a well water sample constitute one record in the well inventory database. Unless they were received on computer tape, data that met the prescribed criteria were transcribed onto forms for data entry. A number was assigned to each sampling survey under which all pertinent records and notes were filed. When possible, state well numbers were obtained from the Department of Water Resources (DWR).

Data Verification and Entry into the Permanent Database

The completed coding forms were sent to the Franchise Tax Board for data entry. The data were returned to DPR on magnetic tape and loaded into the well inventory database. Print-outs of the data were generated, proofread against the original data, and edited as necessary.

Before being added to the permanent well inventory database, each record undergoes verification by programs developed by DPR staff. All data errors are corrected. An explanation of the major procedures follows.

Township/range/section (T/R/S) verification:
The townships, ranges, and sections assigned to each county by the U.S. Geological Survey's Public Lands Survey Coordinate System were entered into a database. A program compares each new record's township, range, and section against the valid database.

Base Meridian verification:
Six counties in California (Kern, San Luis Obispo, Trinity, Inyo, Siskiyou, and San Bernardino) are intersected by the Public Lands Survey baseline/meridian boundaries. Data for a single well reported with different base meridians but under the same well number would exist as two unique wells in the database. This program examines the township and range for each well number to verify that the base meridian is valid.

Unique Address verification:
The well location address for each new record is checked against existing well location information for that well number in the database. Each well must have a unique well number and address.

Other fields
The chemical code, sampling agency, analytical lab are also verified to ensure the codes are valid and that the codes exist in the support tables.

FORMAT OF RECORDS IN THE WELL INVENTORY DATABASE

The well inventory database is comprised of two tables. The first contains analytical information, the second contains well location and construction information. Each laboratory analysis of a well water sample for the presence of a pesticide active ingredient or breakdown product comprises one record in the well inventory database. An explanation of the record format follows.

Table 1

Column	Explanation of Database Fields
1-2	County code: a minimum reporting requirement. This code is consistent with DPR Pesticide Use Report format.
3-14	State well number (township/range/section/tract/sequence number): a minimum reporting requirement. The state well number is based on the U.S. Geological Survey's Public Lands Survey Coordinate System (Davis and Foote, 1966). The DWR uses this system to numerically identify individual wells in California. Township lines (cols. 3-5) are oriented from north to south. Range lines (cols. 6-8) are oriented east to west. A six-mile-by six-mile township is divided into 36 one-mile-by-one-mile sections (cols. 9-10), numbered consecutively from 1 to 36. Each section is again divided into 16 individual 40-acre tracts (col. 11) that are identified by letters (A through R, excluding I and O). Wells in a tract are further identified with a sequential number (cols. 12-14) in the order of identification by the DWR. If information is not available from DWR, an in-house, tract and sequence is assigned.
15	Base line and meridian: this minimum reporting requirement is included in the state well number. The base line/meridians divide the state into three areas: Humboldt, Mount Diablo, and San Bernardino, forming the basic structure for Township/Range/Section numbering.
16	In-house code specifying DWR state well number or number assigned by DPR.
17-20	Study number: numbers were assigned consecutively as studies were obtained.
21-24	Sampling agency code: a minimum reporting requirement.
25-33	Date of sample: a minimum reporting requirement. Day, month, and year are included. The middle month of an indicated period is used only when a season is designated as the sampling date; e.g., "all samples were taken in the spring of 1982." The precise sampling date is recorded for most studies.

Column	Explanation of Database Record Fields
34-38	Chemical code: a minimum reporting requirement. Each chemical is assigned a five-digit alpha-numeric code which corresponds to the chemical codes used in the Pesticide Use Reporting System maintained by the Information Systems Branch of DPR.
39	Sample-type: a minimum reporting requirement. Sample-type codes are used to signify whether an analysis is a positive or negative detection; whether a positive sample is the initial or replicate detection; and to denote whether the same laboratory and analyzing method were used for both the initial detection and confirmation samples.
40-45	Chemical concentration: a minimum reporting requirement. Analytical results are recorded in parts per billion (ppb). Trace amounts, non-detected, or less than the minimum detection limit are recorded as non-detected.
46-51	Minimum detection limit (MDL): a minimum reporting requirement. Recorded in ppb.
52-55	Analyzing laboratory: a minimum reporting requirement.
56	Method of analysis: designates the origin of the protocol for the analytical method.
57-65	Date of analysis: a minimum reporting requirement.
66-69	File name: in house file designation.
70-71	Summary year: indicates the year of the Well Inventory Update Report for which the record was reported. Usually, a summary year is July 1 to the following June 30.
72-75	Water depth: the depth of standing water in the well at the time of sampling.
76	Point or non-point: detections of pesticides in ground water that have been determined to be present due to a point-source (from a specific site, such as a spill or at a waste-site) or non-point source (not traceable to a single definable location) are designated by a P or N, respectively. Detections that have not had a source determination are designated as –.
77	Status: in house code to describe specific criteria of an analytical result based on the study, well, chemical, and summary year.
78	Zone: designates whether the section has been proposed or declared a PMZ.
79-80	County: the county in which the well is located. (Used for database indexing)
81-120	Notes: any pertinent notes can be entered into this field.

Table 2

Column	Explanation of Database Record Fields
1-16	Well number: includes fields 1-16 from Table 1.
17-20	Well depth (in feet), as recorded on the well log, or obtained from the well owner.
21-23	Depth to top of perforation (in feet), as recorded on the well log.
24-27	Depth to bottom of perforation (in feet), as recorded on the well log; often corresponds to depth of completed well.
28-29	Log year: year the well was drilled (information obtained from well log, raw data, or verbally from a well owner).
30	Well code: a minimum reporting requirement. This code indicates well use; e.g., private domestic, irrigation, etc.
31-38	Latitude: the latitude is expressed in degrees (DD), minutes (MM), and seconds (SS.s). Seconds may be specified to the nearest tenth of a second. The format is DDMMSS.s.
39-47	Longitude: the longitude is expressed in degrees (DDD), minutes (MM), and seconds (SS.s). Seconds may be specified to the nearest tenth of a second. The format is DDDMMSS.s.
48-87	Well location information: a minimum reporting requirement. Designates the street name and number or descriptive address of the well.

Appendix E

Glossary of Terms

AB 1803 – (1983) A law that required the California Department of Health Services (DHS) to evaluate each public water system to determine its potential for contamination. The systems were required to conduct specified water analyses and to report those results to the DHS. Monitoring required by AB 1803 was completed in June 1989. Based on sampling results, the DHS may require a system to conduct periodic water analyses and to report to the DHS the results of the analyses on a quarterly basis.

AB 2021 – See *Pesticide Contamination Prevention Act.*

acaricide – A pesticide (miticide) used to control mites and ticks.

Action level (AL) – Published by DHS's Office of Drinking Water, ALs are based mainly on health affects. ALs are advisory to water suppliers. Although not legally enforceable, the majority of water suppliers have complied with action levels as though they were *maximum contaminant levels.*

active ingredient – The chemical or chemicals in a pesticide formulation that are biologically active and are capable, in themselves, of preventing, destroying, repelling or mitigating insects, fungi, rodents, weeds, or other pests.

adsorption – In the context of this report, the surface retention of pesticide molecules of a gas, liquid, or dissolved substance to a solid in such a manner that the adsorbed chemical is slowly made available. Soils high in clay or organic content may tend to adsorb pesticides.

Agricultural commissioner – For each county in California, the person in charge of the County Department of Agriculture. Under the supervision of DPR, the commissioner enforces the laws and regulations pertaining to agricultural and structural pest control and all other pesticide uses.

agricultural use – (See also *legal agricultural use* and *legal agricultural use determination.*) The use of any pesticide or method or device for the control of any pests, or the use of any pesticide for the regulation of plant growth or defoliation of plants. It excludes the sale or use of pesticides in properly labeled packages or containers which are intended only for any of the following: home use, use in structural pest control, industrial or institutional use, the control of an animal pest under the written prescription of a veterinarian, local districts, or other public agencies which have entered into and operate under a cooperative agreement with the Department of Health Services pursuant to section 2426 of the Health and Safety Code. (Food and Agricultural Code, section 11408.)

analysis – The determination of the composition of a substance by laboratory methods. In this case, it includes the separation and measurement of a pesticide or its degradation product from the sample matrix.

aquifer – A geologic formation, group of formations, or part of a formation, that is water bearing and which transmits water in sufficient quantity to supply springs and pumping wells.

basin irrigation – A method of watering by confining irrigation water around the plant stem or trunk by means of a soil dam. Also called flood irrigation.

Birth Defect Prevention Act (BDPA) – (SB 950, 1984) A law requiring DPR to acquire certain toxicological data for registered pesticides in order to make a scientific determination that their uses will not cause significant adverse health effects. The BDPA prohibits the registration of any new

pesticide active ingredient if required mandatory health effects studies are missing, incomplete, or invalid. Pesticide active ingredients already registered that are identified as having the potential to cause significant adverse health effects following a thorough review by DPR scientific staff will be canceled.

breakdown product – See *degradation product.*

Cal/EPA - California Environmental Protection Agency. Comprised of the Department of Pesticide Regulation, the Department of Toxic Substances Control, the Integrated Waste Management Board, the Water Resources Control Board, the Air Resources Board, and the Office of Environmental Health Hazard Assessment.

CCR (3CCR) - California Code of Regulations. Title 3, California Code of Regulations (3CCR). California Code of Regulations contains enforceable regulations that provide the specific means for implementation of laws. Title 3 CCR contains regulations pertaining to food and agriculture, including sale and use of pesticides.

chemigation – The application of pesticides through irrigation water, using irrigation techniques and equipment.

coding – A system whereby specific information concerning the analysis of a well water sample for the presence of pesticides is converted to a code of letters and numbers according to a key in order to enter the data into the well inventory database.

confirmed detection – For purposes of the well inventory database, the detection of a compound in two discrete samples taken from the same well during the time period of a single monitoring survey.

database record – The results of each chemical analysis of a well water sample for a pesticide residue or related chemical and other corresponding sampling information constitutes one record in the database.

defoliant – A compound used to remove foliage from crop plants such as cotton, soybean, or tomato, usually to facilitate harvesting.

degradation product – A substance resulting from the transformation of a pesticide active ingredient by physical or chemical processes (e.g., oxidation, reduction, hydrolysis, photolysis).

desiccant – A compound that promotes drying or removal of moisture from plant tissues.

direct streaming – A pathway by which agricultural chemicals may reach ground water; the movement of pesticide residue in runoff surface water to subsurface soil and, ultimately, ground water, through dry wells, soil cracks, or other direct pathways.

discrete sample – Samples taken separately from a well; not a single sample split into smaller samples.

dry well – A small-diameter hole or pit dug into the ground and filled with gravel or other material for the disposal of surface water by infiltration into soil.

economic poison – A pesticide or plant growth regulator; in California, any of the following: any spray adjuvant, any substance, or mixture of substances which is intended to be used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest which may infest or be detrimental to vegetation, man, animals, or households, or be present in any agricultural or nonagricultural environment. Includes fungicides, herbicides, insecticides, nematicides, rodenticides, desiccants, defoliants, plant growth regulators.

emulsifiable concentrate – A concentrated pesticide formulation containing organic solvent and emulsifier to aid suspension of the active ingredient when diluted with water.

established PMZ – A *pesticide management zone* (PMZ) listed in section 6802, Title 3 of the California Code of Regulations (3CCR).

FAC - Food and Agricultural Code. The laws pertaining to food and agriculture, including the registration, sale, and use of pesticides. Specific regulations for implementation of law are in the *California Code of Regulations.*

flood irrigation – See *basin irrigation.*

formulation – The way in which a pesticide product, containing the active ingredient, the carrier, and other additives, is prepared for use. Includes preparation as wettable powder, granular, emulsifiable concentrate, etc.

fumigant – A chemical used in the form of a volatile liquid or a gas. Its vapors kill insects, nematodes, fungi, bacteria, seeds, roots, or entire plants; usually applied in an enclosure of some kind or in the soil.

fungicide – A chemical used to kill or inhibit fungi.

granular – A pesticide mixed with or coating small pellets or sand–like materials, and applied with seeders, spreaders, or special equipment. Granular pesticides are often used to control soil pests.

ground water – Water beneath the surface of the ground, whether or not flowing through known and definite channels.

Ground water protection advisories (GWPA) – Written information given by a licensed pest control adviser, who has successfully completed the Ground Water Protection Training Program given by DPR, that must be submitted by permit applicants before the county agricultural commissioner can issue a use permit for allowed uses of a regulated pesticide in a pesticide management zone (PMZ). The GWPA contains specific information for applying the regulated pesticide in a sensitive area (PMZ) in order to prevent or minimize the movement of pesticide residues to ground water.

Groundwater Protection List (GWPL) – A list, required by the PCPA and established in section 6800 (3CCR), of pesticides having the potential to pollute ground water. The GWPL is divided into two sublists. Sublist (a) is comprised of chemicals that have been detected in ground water as a result of legal, agricultural use. Sublist (b) contains pesticide active ingredients whose physicochemical properties exceed or are less than the *specific numerical values* and that are labeled for soil

application under certain conditions. Chemicals placed on the GWPL are subject to certain restrictions and reporting requirements.

Health advisory level (HAL) – An advisory number published by U.S. EPA's Office of Drinking Water and Office of Water Regulations and Standards. Short-term (10 days or less), long–term (7 years or less), and lifetime exposure health advisories for non-carcinogens and suspected human carcinogens are included where data sufficient for derivation of the advisories exist. HALs are a guideline which include a margin of safety to protect human health. Water containing pesticides at or below the lifetime HAL is acceptable for drinking every day over the course of one's lifetime.

half-life – The time required for a given amount of a substance to be reduced by half due to chemical and/or biological processes.

herbicide – A pesticide used to control unwanted vegetation either before or after its emergence from the soil.

historical agricultural use – The documented use of a chemical, no longer registered for such use, that has been applied over time in a specific area for the production of an agricultural commodity.

hydrolysis – In the context of this report, alteration of a pesticide by water.

inert ingredient – An ingredient in a formulation which has no pesticidal action.

initial detection sample – For a single study and a particular well, the initial detection sample for a chemical is the positive sample with the earliest sampling date and/or time. Replicate samples are coded in relation to the initial detection sample.

insecticide – A pesticide used to kill insects.

institutional use – Use within the confines of, or on property necessary for the operation of, buildings such as hospitals, factories, schools, libraries, auditoriums and office complexes.

large public water system well – A well supplying 200 or more service connections.

law – State laws and statutes are the result of action by the California legislature.

leaching – A pathway by which agricultural chemicals may reach ground water; the process by which pesticides carried by water, either in the dissolved or suspended state, through the soil matrix as it recharges a ground water aquifer.

legal agricultural use – The application of a pesticide, according to label directions and in accordance with federal and state laws and regulations, for agricultural use as defined in Food and Agricultural Code, section 11408. (See *agricultural use*.)

legal agricultural use determination – A determination required by Food and Agricultural Code (FAC) section 13149 and based upon the following criteria: (1) the detection of a pesticide ingredient or its degradation product that has been verified according to DPR criteria; (2) a detection of the same pesticide ingredient or its degradation product in ground water, verified at a second site in either an adjacent section or within one-half mile radius of the original, verified detection; (3) the detected

pesticide ingredient must be formulated in a product which has listed on its label one or more agricultural uses; (4) the application of the agricultural use product(s) in the vicinity of the reported detections should either be documented historically, confirmed by local interviews, or presumed by the identification of a target pest or commodity; (5) the Director may consider a preponderance of evidence as meeting these criteria.

macropore – Space in soil, occupied by air and water, that allows the ready movement of air and percolating water.

maximum contaminant level (MCL) – MCLs are part of the drinking water quality standards adopted by DHS and by U.S. EPA under the Safe Drinking Water Act. MCLs are formally established in regulation and are enforceable by the DHS on water suppliers. Primary MCLs take into consideration both health-based criteria and technologic and economic factors relating to the ability to achieve and monitor these concentrations in drinking water supply systems.

maximum contaminant level goals (MCL goals) – MCL goals are promulgated by the U.S. EPA and are the first step in establishing MCLs. MCL goals are purely health-based values and are set at "zero" for chemicals classified by the U.S. EPA as "known" and "probable" human carcinogens.

metabolite – In the case of a pesticide, a compound derived from the action upon the pesticide by a living organism (bacteria, plant, insect, higher animal, etc.). The chemical transformation varies (oxidation, reduction, conjugation, etc.) and the metabolite may be more toxic or less toxic than the parent compound. The same derivative may, in some cases, develop through exposure of the pesticide in the environment. (See also *degradation product.*)

minimum detection limit (MDL) – The lowest concentration of analyte that a method of analysis can reliably quantify. The MDL is established in protocol for a study either as a result of a method validation study or by using accepted proven analytical methods (e.g., U.S. EPA methods).

mitigation measure – An activity to substantially reduce any adverse impact of a given condition.

model – Mathematical equations that represent certain processes. These equations can be implemented in a computer program in order to facilitate calculations and test model predictions against measured data.

modified use – See *use requirement.*

monitoring study – See *survey.*

monitoring well – Any artificial excavation by any method for the purpose of monitoring fluctuations in ground water levels, quality of underground waters, or the concentration of contaminants in underground waters.

negative analysis – A well water sample in which pesticide residues were not detected at or above the minimum detection limit of the method used for analysis.

nematicide – A pesticide used to control nematodes.

nematode – Nematodes are microscopic, worm like animals that live saprophytically in water or soil, or as parasites of plants and animals. Plant parasitic nematodes are also known as eel worms.

non–crop areas – These areas include rights-of-way, golf courses, and cemeteries. There may be agricultural use of pesticides in non-crop areas, e.g., for weed control around buildings on a farm.

non–point source – Contamination which cannot be traced to a small, definable location (compare with *point source*), e.g., applications of agricultural chemical to crops.

organic matter – Plant and animal debris or remains found in the soil in all stages of decay. The major elements in organic matter are carbon, oxygen, and hydrogen.

parts per billion (ppb) – A way to express the concentration of a chemical in a liquid, a solid, or in air. One microgram of a chemical in one liter of water is equal to one ppb.

permit – Permits are issued by county agricultural commissioners for the use of chemicals that have been designated as restricted pesticides. Restricted pesticides, for various reasons, are potentially more hazardous than other pesticides.

pest – Any of the following that is, or is liable to become, dangerous or detrimental to the agricultural or nonagricultural environment of the state: any insect, predatory animal, rodent, nematode, or weed; any form of terrestrial, aquatic, or aerial plant or animal, virus, fungus, bacteria, or other microorganisms on or in living humans or other living animals; anything that the Director of the California Department of Food and Agriculture or Director of the Department of Pesticide Regulation declares, by regulation, to be a pest.

Pest Control Adviser (PCA) – A person licensed by DPR and registered with the county agricultural commissioner who makes pest control recommendations. All agricultural use recommendations must be in writing and contain certain information. A PCA must complete continuing education requirements before his/her license may be renewed.

pesticide – See *economic poison.*

Pesticide Contamination Prevention Act (PCPA) – (AB 2021) A law, effective January 1, 1986, which added sections 13141 through 13152 to Division 7 of the FAC. The PCPA requires each registrant of an economic poison to submit specified information to the Director of DPR, provides for the establishment of the Groundwater Protection List, requires the Director to perform soil and water monitoring, provides for a specific response to the detection of pesticides in soil and ground water, and requires the Director to maintain a specified well sampling database and to report certain information annually to the Legislature, the DHS, and the State Water Resources Control Board on well sampling.

Pesticide Detection Response Process (PDRP) – A process, established in sections 13149 through 13151 (FAC) by the PCPA, in which the detection of a pesticide residue in soil (at specific depths) or ground water, is investigated, evaluated, and, when necessary, mitigated. As part of the process, a determination must be made that the detection probably resulted from a legal agricultural use application of the pesticide. As a result of this process, the use of a pesticide in California may be modified or canceled.

pesticide management zone (PMZ) – A geographic surveying unit of approximately one square mile (a section) that is designated in regulation as sensitive to ground water pollution. The use of a pesticide inside its PMZ is subject to certain ground water protection restrictions and requirements.

pesticide residue – In this case, the amount of a pesticide active ingredient remaining in a soil or ground water sample at the time of analysis.

physicochemical properties – The types of behavior that a substance exhibits in chemical reactions are called its chemical properties; other characteristics that are typical of a substance are called its physical properties. Taken together, the chemical and physical properties of a substance are called its physicochemical properties.

plume – The elongated (generally cigar–shaped) pattern of a chemical in ground water arising from contamination.

point source – A source of contamination, such as a spill or at a waste site, that is initially deposited and concentrated in a small, well–defined area. The contamination can be traced to its point of origin by locating a specifically shaped pattern in the ground water called a plume.

positive detection – A well water sample in which the presence of a pesticide chemical is detected at or above the minimum detection limit of the analytical method used for analysis of the compound under investigation. A positive analysis may be designated as confirmed or unconfirmed.

preemergent treatment – Treatment made after a crop is planted but before it or the weeds emerge.

range – A single series or row of townships, each six miles square, extending parallel to, and numbered east and west from, a survey base meridian line. (See *well numbering system.*)

recommended PMZ – A section of land (one square mile) identified by DPR as sensitive to ground water pollution by specific pesticides, not yet adopted into regulation in section 6802 (3CCR).

registered pesticide – A pesticide product approved by the USEPA and DPR for use in California.

registrant – A person, or corporation, that has registered an economic poison for use in California and has obtained a certificate of registration from the Department.

regulation – These are adopted by state agencies to implement or clarify statutes enacted by the California Legislature. They can also be adopted in response to federal legislation, court decisions, changing technologies, and concerns for the health and well-being of the residents of California.

related compounds – See *degradation product* and *metabolite.*

replicate sample – A discrete sample taken from a well at the same time as the initial detection sample; not a single sample split into multiple samples.

restricted material – Compounds designated as "restricted materials" in section 6400 (3CCR) that, for various reasons, are potentially more hazardous to people, animals, or the environment than other pesticides. As a result, the use of these materials is regulated more closely and use is permitted only by trained personnel when additional precautionary measures are taken.

right–of–way – The strip of land over which facilities such as highways, railroads, or power lines are built.

sanitary seal – A slurry of cement or clay which fills the annular space between the well casing and the drilled hole, down to a certain depth, to protect the well against contamination or pollution by entrance of surface and/or shallow, subsurface waters.

section – A land unit of 640 acres (one square mile) equal to 1/36 of a township. (See *well numbering system.*)

selective pesticide – A pesticide that kills specific pest species, but does not effect much or most of the other fauna or flora, including beneficial species, through either differential toxic action or through the manner in which the pesticide is used (formulation, dosage, timing, placement, etc.)

slow-release formulation – The incorporation of a pesticide in a permeable covering that permits its release over a period of time at a reduced, but effective rate.

small public water system well – A well serving fewer than 200 connections.

soil adsorption coefficient (Koc) – A measure of the tendency of compounds such as pesticide active ingredients, or their biologically active transformation products, to adhere to the surfaces of soil particles.

specific numerical values (SNVs) – Certain numeric threshold values set for the following physical and chemical properties of pesticide active ingredients: water solubility, soil adsorption coefficient, hydrolysis, aerobic and anaerobic soil metabolism, and field dissipation. The PCPA associates these properties with the longevity and mobility of a chemical in the soil and requires the establishment of SNVs in regulation as a means of identifying pesticides with the potential to pollute ground water.

State Well Number – See *well numbering system.*

survey – In the context of this report, well monitoring conducted by an agency or private firm for a specified length of time in a designated area. A survey typically involves well water sampling and chemical analysis.

summary year – The period, usually July 1 through the following June 30, during which sampling results for the presence of pesticides in California ground water are collected and processed for inclusion in the well inventory database. These data are summarized in DPR's annual Well Inventory Report.

township – A public land surveying unit which is a square parcel of land, six miles on each side. The location of a township is established as being so many six–mile units east or west of a north–south line running through an initial point (called the "principal meridian") and so many six–mile units north or south of an east–west line running through another point (called the "baseline"; see also, *well numbering system*).

triazines – A class of chemical compounds derived from any of three isomeric compounds, each having three carbon and three nitrogen atoms in a six–membered ring. Triazines are strong inhibitors of photosynthesis. Atrazine, prometon, and simazine are triazines.

unconfirmed detection – For a particular well, the detection of a pesticide in a single sample during the time period of an individual monitoring study. Confirmation of the initial detection by a second positive sample was not possible because either (1) only a single sample was taken from the well or (2) analyses of all other samples taken from the well during the study were negative.

U.S. EPA IRIS RfD – An oral reference dose that is an estimate of a daily oral exposure to the human population (including sensitive subgroups) that is believed likely to be without an appreciable risk of certain deleterious effects during a lifetime. Expressed in mg/kg/day.

use requirement – Restrictions established in regulation for the use of certain pesticides. For example, section 6484.1 (3CCR) states that agricultural, outdoor institutional, and outdoor industrial uses of pesticides containing atrazine are prohibited in the pesticide management zones listed in 6802(c) (3CCR).

vapor pressure – A physical property that indicates the rate of evaporation of a compound. The higher the vapor pressure, the more volatile the compound.

verified (DPR study) – The unequivocal detection of a pesticide or a pesticide breakdown product, or the detection of a chemical in two discrete samples taken from a single well during a 30–day time period, and analyzed either by the same laboratory using different analytical methods or by two laboratories using the same method. The analytical methods used must be approved by DPR. Verification of the presence of a compound in ground water by this criteria fulfills section 13149(d) (FAC) of the PCPA and may be used for regulatory purposes.

volatile – A compound is said to be volatile when it readily evaporates on exposure to air at ordinary temperatures and pressures.

water solubility – The property of a substance to dissolve in water.

water well - any artificial excavation constructed by any method for the purpose of extracting water from, or injecting water into, the underground.

well head – The immediate area surrounding the top of a well.

well numbering system – The California well numbering system is based on a grid system commonly referred to as the Public Lands Survey. Under this system, all tracts of lands are tied to an initial point and identified as being in a township. A *township* is a square parcel of land six miles on each side. Its location is established as being so many six–mile units east or west of a north–south line running through the initial point (called the "principal meridian") and so many six–mile units north or south of an east–west line running through the point (called the "baseline"). The meridian lines parallel to, and east or west of, the principal meridian are called *range* lines. Every township is further divided into 36 parts called sections. A *section* is a square parcel of land one mile on a side, each containing 640 acres. Each section of land is divided into sixteen 40–acre tracts. Once the township, range, section, and tract are known, each well is assigned a unique sequence number (in chronological order) by Department of Water Resources (DWR) personnel. This number is known as the state well number.

wettable powder – A powder formulation that, on addition to water, forms a suspension.

IV. PESTICIDE CONTAMINATION PREVENTION ACT ANNUAL REPORT TO THE LEGISLATURE STATE WATER RESOURCES CONTROL BOARD OCTOBER 1996

Actions taken by the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCBs) to prevent economic poisons from migrating to ground waters of the State are as follows:

A. SWRCB

SWRCB staff participated in the following activities:

- In cooperation with Department of Pesticide Regulation (DPR) staff, completed development of the Management Agency Agreement (MAA) and its accompanying implementation plan to further coordinate pesticide and water quality management activities.

- In cooperation with DPR staff and other stakeholders, completed development of reports of the public advisory task forces for the SWRCB's Inland Surface Waters Plan and the Enclosed Bays and Estuaries Plan.

- In cooperation with DPR staff and other stakeholders, completed summarization of recommendations from the Nonpoint Source Program's Technical Advisory Committees.

- Development of draft write-ups of watershed management case studies illustrating potential compatibility of environmental protection and economic goals.

- Reviewed many proposed legislative bills regarding pesticides and ground water and prepared staff recommendations for the SWRCB's consideration.

- Reviewed and commented on DPR's proposed regulations to amend AB 2021 (Pesticide Contamination Prevention Act).

- Regular attendance at meetings sponsored by the DPR, including the interagency Pesticide Advisory Committee (PAC), Pesticide Registration and Evaluation Committee (PREC), Pest Management Advisory Committee (PMAC), the Interagency Coordinating Committee for Agricultural Regulatory Programs, and the Pesticide Bag Burning Work Group.

- Discussions with U.S. Geological Survey scientists on studies dealing with pesticides and water quality.

- Submittal of a workplan to U.S. Environmental Protection Agency (U.S. EPA) pursuant to Section 106 of the Clean Water Act (CWA) for Federal Fiscal Year (FFY) 1996 funding for pesticides and ground water-related work.

- Review, on an ongoing basis, of DPR Notices of "Materials Entering Evaluation" and advice to DPR on potential water quality impacts of pesticide registration and use decisions.

- Work on adapting the "Pesticide Use Retrieval System" database queries of 1990 and 1991 pesticide usage in select watersheds within the State.

B. RWQCB

Information on actions to prevent economic poisons from migrating to the ground waters of the State by each of the nine RWQCBs is listed in Tables 1 through 9.

Table IV-1. Actions taken by the Regional Water Quality Control Board, North Coast (Region 1), In FY 1995-96.

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Del Norte	Smith River Plains	Aldicarb, 1,2-D	Ongoing monitoring program.
Humboldt	U.S. Forest Service Nursery McKinleyville	Dithiocarbamate	USFS monitoring with RWQCB support.
	Blue Lake Forest Products	Pentachlorophenol, Tetrachlorophenol, Copper 8-Quinolinolate	State Superfund Site with ongoing assessment.
	Carlotta Lumber Company	Pentachlorophenol, Tetrachlorophenol	Ongoing contamination assessment and cleanup.
	Beaver Lumber Company, Arcata	Pentachlorophenol, Tetrachlorophenol	Contamination cleanup.
	Sun Valley Bulb Farms	Chlorothalonil, Dithiocarbamate, Oxamyl	Ongoing monitoring and assessment to prevent discharges to surface water and ground water under RWQCB direction.
Mendocino	Marcel Peterson	Chlordane	Remediation underway; new well.
Siskiyou	Mount Heron	Strychnine	Source removal.
	Hi-Ridge Lumber Company	Pentachlorophenol, Tetrachlorophenol	Ongoing contamination assessment and cleanup.
	Pine Mountain Lumber Company	Pentachlorophenol, Tetrachlorophenol	Ongoing contamination assessment and cleanup.
Trinity	Stone Forest Industries, Burnt Ranch	Pentachlorophenol, Tetrachlorophenol	Ongoing contamination assessment.

Table IV-2. Actions Taken by the Regional Water Quality Control Board, San Francisco Bay (Region 2), In FY 1995-96.

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Alameda	Parker & Amchem	2,4-D	Soil removal in September 1988 (work completed). Ground water monitoring ongoing. RWQCB Order. No. 91-079 specifies schedules for investigations and cleanup. No monitoring for 2,4-D is required after many years of non-detect levels of 2,4-D.
	Jones-Hamilton	Pentachlorophenol	RWQCB Order No. 89-110 specified time schedule for investigation/cleanup. Ground water cleanup underway. No sampling of ground water for pesticides.
	Port of Oakland (Embarcadero Cove)	Chlordane, Pentachlorophenol, DDT, Endosulfan, 2,3,7,8-TCDD, DDD	Department of Toxic Substances Control (DTSC) has lead and has approved a Remedial Action Plan including continuous ground water monitoring.
	Lincoln Properties (Orsetti Site)	DDE, 2,4-D	Alameda County Water District is the lead agency. Ground water cleanup underway.
	Peerless Southern Pacific Railroad	Pentachlorophenol	City of Berkeley Health Department has lead. Additional soil and ground water investigations required.
	FMC, Newark	EDB	RWQCB Order No. 89-055 specified time schedule for investigation and cleanup. Ground water cleanup underway.
	3830 Old Santa Rita Road, Pleasanton	Dicamba, Dichloroprop, 2,4-D, 2,4,5-T	Pesticide found in grab water samples. One monitoring well installed on-site. Alameda County Department of Environmental Health lead on this site. Site closed October 1990.
Contra Costa	Chevron	Endrin, Lindane, Dieldrin, DDT, Arsenic	Submitted closure plan for Class I impoundment. A cut-off wall with a ground water extraction trench around the impoundment has been constructed.
	Levin Metals	Aldrin, 4,4'-DDD, 4,4'-DDE, o,p,-DDT, Dieldrin, BHC	U.S. Environmental Protection Agency (U.S. EPA) lead on-site cleanup. Workplan for dredging of affected sediments pending.
	FMC, Richmond	DDT, DDD, DDE, Dieldrin, Chlordane, Tedion, Endosulfan, Ethion, Carbophenothion, Heptachlor	California Department of Health Services (DHS) lead on-site cleanup. Cleanup completed. Monitor to assure remaining pollutants do not migrate.
Marin	Former Sonoma Mosquito Abatement District, San Rafael	DDD, DDE, DDT, Dieldrin	DTSC or San Rafael Fire Department is lead agency. Some soil removal has already taken place (approximately 3000 yd^3 in 1992). Old MWs destroyed. DTSC asking for permanent multilayer clay cap and remediation or encapsulation of remaining soil plus a deed restriction. DTSC not actively involved for several years due to funding issues. Seven new wells were installed in 1996.

Table IV-3. Actions Taken By the Regional Water Quality Control Board, Central Coast (Region 3), In FY 1995-96.

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Monterey	Monterey SoilService, King City	EDB, 1,2-D, DDT, DBCP, Toxaphene	Site is being actively remediated.
	WFS-Salinas	Dinoseb	Interim remediation underway.
	Castlerock Estates	Toxaphene, beta-BHC, delta- BHC, 4,4'-DDE, 4,4'-DDT, 4,4-DDE, 4,4-DDT, 4,4-DDD	Correct practices at pesticide applicator facility.
Santa Barbara	J.R. Simplot Inc., Guadalupe	Benzene, Toluene, Xylenes	Remediation underway.
Santa Clara	Castle-Veg-Tech, Morgan Hill	Toxaphene, Endrin, Lindane, Endosulfan	Site is being actively remediated.
Santa Cruz	PUREGRO, Watsonville	1,2-DCP	Remedial action underway.
	WFS-Greengro, Watsonville	1,2-DCP, Endosulfan	Pilot testing of remedial action currently taking place.
	WFS, Watsonville	DDT, DDD, Toxaphene	Site is being actively remediated.

Table IV-4. Actions Taken by the Regional Water Quality Control Board, Los Angeles (Region 4), In FY 1995-96.

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Los Angeles	Dominquez Park Landfill, Redondo Beach	Bis (2-ethylhexyl) phthalate	Additional ground water monitoring was required. (No data received as of August 16, 1995.)
	Bixby Village Sanitary Landfill (City Dump Salvage No. 1), Long Beach	Aldrin, Beta-BHC, Alpha-BHC, Bis (2-ethlhexyl) phthalate, Delta-BHC, 4,4'-DDE, 4,4'-DDT, 1,4-Dichlorobenzene, Dieldrin, 2,4-Dinitrophenol, Endosulfan I, Endrin, Endrin aldehyde, Lindane, Heptachlor	Monitoring has not adequately demonstrated that the subject disposal site is not the source of pollutants and listed pesticides detected in ground water monitoring wells downgradient of the disposal site. Two additional semiannual sampling events must be performed for U.S. EPA Method 625. A workplan must be submitted to the RWQCB. (No additional monitoring data received as of August 15, 1995.)
	Market Place Sanitary Landfill (City Dump Salvage No. 2), Long Beach	Alpha-BHC, Bis (2-ethylhexyl) phthalate, Delta-BHC, 4,4'-DDE, 4,4'-DDT, Endosulfan I, Lindane, Heptachlor	Monitoring has not adequately demonstrated that the subject disposal site is not the source of pollutants and listed pesticides detected in ground water monitoring wells downgradient of the disposal site. Two additional semiannual sampling events must be performed for U.S.EPA Method 625. A workplan must be submitted to the RWQCB. No additional monitoring data received as of August 15, 1995.
	Studebaker-Loynes Sanitary Landfill (City Dump Salvage No. 3), Long Beach	Alpha-BHC, Bis (2-ethylhexyl) phthalate, 4,4'-DDD, 4,4'-DDE, Di-n-octyl-phthalate, Endosulfan I, Endosulfan II, Endrin, Lindane, Heptachlor	Monitoring has not adequately demonstrated that the subject disposal site is not the source of pollutants and listed pesticides detected in ground water monitoring wells downgradient of the disposal site. Two additional semiannual sampling events must be performed for U.S. EPA Method 625. A workplan must be submitted to the RWQCB. (No additional monitoring data received as of August 15, 1995.)
	Peter Pitchess Honor Rancho Landfill, Castaic Junction	Bis (2-ethylhexyl) phthalate	It appears that the subject landfills may have affected ground water in the vicinity with pesticide and other compounds. Two additional semiannual Solid Waste Assessment Test (SWAT) monitoring events were required. A workplan was also required. Received two additional SWAT monitoring events, with no detections.
	Royal Boulevard Land Reclamation Site, Torrance	Lindane, 1,3-Dichloropropene	The responsible party is monitoring ground water pursuant to their closure requirements. Semiannual data received, under review.
	Port Disposal Landfill, Wilmington	Bis (2-ethylhexyl) phthalate, Di-n-Octyl-phthalate	Chemical compounds were detected in excess of the regulatory levels, and the site was directed to submit a workplan to assess the nature and extent of the releases and to develop a corrective action program. (No data received as of August 16, 1995).
	Port Disposal Banning Pit and Macco Pit, Wilmington	Bis (2-ethylhexyl) phthalate, Napthalene, Di-n-Butyl phathalate, 2-Methyl-naphthalene	Chemical compounds were detected in excess of the regulatory levels, and the site was directed to submit a workplan to assess the nature and extent of the releases and to develop a corrective action program. Received four more quarters of data as of August 16, 1995. Data under review.
	City of Compton Landfill	Di(2-ethylhexyl) phthalate (DEHP), Di-n-Octyl-phthalate	Two semiannual ground water monitoring events were required. (No data received as of August 16, 1995).

Table IV-5. Actions Taken By The Regional Water Quality Control Board, Central Valley (Region 5, Sacramento), In FY 1995-96.

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Colusa	Moore Aviation	Atrazine, 2,4,5-TP, 2,4-D, 2,4-Dichlorophenol, 4-Nitrophenol	Ground water remediation ongoing. Soils bioremediation complete for most constituents.
Merced	Merced Municipal Airport	1,2 Dichlorobenzene, 1,2 Dichloroethane, 1,2 Dichlorothane (cis), 1,2 Dichlorothane (trans), 1,3 Dichloropropane (cis), Alachlor, Benzene, Captan, Carbophenothion (trithion), Chloroform, DDT (total), Dicofol (Kethane), Dieldrin, Endosulfan I, II, Endosulfan sulfate, Endrin, Endrin aldehyde, Endrin ketone, Ethylbenzene, Heptachlor epoxide, Methoxychlor, Tetrachloroethylene (PCE), Toluene, Toxaphene, TPH-diesel, TPH-gasoline, Trichloroethylene (TCE), Vinyl chloride, Xylenes	Health risk assessment underway. Deeper ground water zones being assessed.
	J.R. Simplot, Winton	1,2-DCP, Dieldrin, Benefin, 1,2,3-TCP, DBCM, DBCP, Endrin, Alachlor	Cleanup and Abatement Order issued. Off-site monitoring wells installed. Remediation should begin by 10/96.
	BAC, Inc.	Chromium, Arsenic, Copper	RWQCB Lead Agency. Ground water extraction and treatment system in pilot study phase. Plume spreading due to ground water flow direction change. Working on enhancing reinjection with infiltration gallery.
	Western Farm Service, Merced	1,2-DCP	Assessment has been requested.
Sacramento	Sacramento Army Depot	Diazinon, Dursban	Assessment report requested. Federal Superfund work in progress. Cleanup of pesticides completed.
	Natomas Field	Alachlor, Dicofol, DDE, DDT, Toxaphene, Gamma-BHC, Dieldrin	Cleanup and Abatement Order drafted. Meetings have been held with the responsible parties.
	McClellan Air Force Base	Aldrin, Alpha-BHC, Beta-BHC, Delta-BHC, Gamma-BHC, (Lindane), 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Dieldrin, Alpha Endosulfan, Endosulfan Sulfate, Heptachlor, Heptachlor Epoxide, 2,4-D, 2,4,5-T, 2,4,5-TP	Ground water cleanup underway. For the last 4-5 years, no pesticides found in ground water.
	Bureau of Land Management, Fitzerald Ranch	Toxaphene	Buried empty pesticide containers found on land purchased by Bureau of Land Management. Soil excavated, ground water in pit contains toxaphene. Monitoring wells to be installed in 1995.

Table IV-5 (cont.) Central Valley (Region 5, Sacramento)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
San Joaquin	Occidental Chemical	EDB, DBCP, Sulfolane	Site remediation occurring pursuant to stipulation and judgement approving settlement (1981).
	Defense Depot, Tracy	Dieldrin, Simazine	Assessment ongoing as part of the site-wide remedial investigations. Draft Remedial Information Report complete.
	Sharpe Army Depot, Stockton	Bromacil	Assessment ongoing.
	Marley Cooling	Arsenic, Copper, Chromium	Ground water cleanup underway.
	U.S. Navy Communication Station	DDD, DDE	Assessment ongoing. Soil removal actions have occurred and more are planned. Ground water assessment underway.
	Triple "E" Produce	Chloroform	Bioremediation began September 1993 and is ongoing. However, concentrations have increased in downgradient well, so ground water extraction and treatment is now proposed.
	Pure Gro/Brea Agricultural Service, Stockton	1,2-DCP, Chloroform, PCE, Bromoform, 1,1-DCA, Dibromochloromethane, bromochloromethane, bromodichloromethane	Soil and ground water investigation ongoing. Off-site plume definition continuing. Some soil remediation underway.
	Former Oxychem/ Simplot/ PureGro	DBCP, 1,2-DCP, 1,1-DCE, 1,2-DCA, Chlorobenzene, 1,1,2-TCA, Mevinphos, Fensulfothion, Dinoseb, Dicamba, 2,4,5-T, Atrazine, Monuron, Carbaryl, Carbofuran, Propham, Diuron, Propoxur, 1,1,2,2-TCA, atraton, 2,4-DB, bromocil, chloromethane, tebuthiuron, simazine, methiocarb, MCPP, fenuron, chloroform, chloroxuron, dichloroprop, EDB, oxamyl	On-site soil assessment completed. Off-site ground water plume definition continuing. Health risk assessment underway.
	Cal Farm Supply	b-BHC, Dieldrin, Prometon, Simazine, Atrazine, 2,4,5-TP, Dinoseb	Soils cleaned up. Ground water investigation continues.
Solano	Wickes Forest Industries	Chromium (Cr^{3+} and Cr^{6+}), Arsenic, Copper	Ground water cleanup ongoing.
Stanislaus	Chemurgic Agricultural Chemicals	BHC, DDT	Ongoing monitoring. Revised Cleanup and Abatement Order issued in late 1993. Area with elevated BHC concentrations discovered in 1994. Considering soil excavation and ground water extraction and treatment.
	Geer Road Landfill	1,1-DCA, 1,1,1-TCA, TCE, Chloridazon, Freons	Ground water cleanup underway.
	Rhone-Poulenc (formerly Union Carbide) Test Plots	Aldicarb	Monitoring has ended and wells were abandoned under the oversight of Stanislaus County Department of Environmental Resources. Site was closed in the spring of 1995.
	Shell Agricultural Research Facility	Cyanazine, Atrazine, Chloroform, Planavin, 1,1-DCE, DBCP, Nitrate	Additional ground water investigation ongoing.
	Valley Wood	Copper, Chromium, Arsenic	Out-of-court settlement. Federal Superfund site. Interim cleanup in progress.

Table IV-5 (cont.) Central Valley (Region 5, Sacramento)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Sutter	Bowles Flying Service	2,4-D, Thiobencarb, Diuron, Metalaxyl, Molinate, Simazine	Cease and Desist Order issued under the TPCA program. On DTSC's list as needing a Premliminary Endangerment Assessment. Monitoring wells installed.
	PureGro, Robbins	alachlor, aldrin, dicofol, monuron, 1,2-DCA, 1,2-DCP, diphenamid	Assessment has been requested.
Yolo	Frontier Fertilizer Company, Davis	EDB, DCP, DBCP, Carbon tetrachloride	DTSC installed interim ground water treatment system. U.S. EPA expanded the system and is conducting an investigation to determine extent of plume.
	U.C. Davis	Chlorpyrifos, Dicamba, Atrazine, Aldrin, Simazine, Dieldrin, Endrin, DDT	Cleanup and Abatement Order issued. Additional assessment ongoing.
	J.R. Simplot, Courtland	EDB, 2,4-DB, Dicofol, Dicamba, 2,4,5-TP, Carbophenthion, DDT, Dieldrin, Dinoseb, Picloram	Cleanup and Abatement Order issued. Final soil assessment completed; health risk assessment underway. Submitted final ground water remediation proposal.

Table IV-6. Actions Taken By The Regional Water Quality Control Board, Central Valley (Region 5, Fresno), in FY 1995-96.

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Fresno	Thompson Hayward Agriculture & Nutrition	Alpha-BHC, Beta-BHC, Gamma-BHC, Dieldrin, DBCP, Diphenamid, Heptachlor, Heptachlor Epoxide	State Superfund site. Contamination assessment ongoing.
	Occidental Chemical/ J.R. Simplot	Dieldrin	Monitoring of ground water continues.
	FMC Corporation	Aldrin, Dieldrin, DDT, DDD, DDE, Heptachlor, Lindane, Toxaphene, Ethyl Parathion, Malathion, Ethion, Endosulfan, Dimethoate, Furadan, Dinitrocresol, Dinoseb (DNBP)	State Superfund site. Remedial investigation/ feasibility study in progress. Interim ground water removal process began December 1994.
	Britz, Inc., Five Points	Toxaphene, DDT, DNBP	State Superfund site. Remedial investigation and health assessment report submitted. Soil and ground water remediation feasibility study also submitted. Additional contamination assessment ongoing.
	Fresno County Wells	DBCP, EDB, 1,2-D	Pesticides detected in 146 wells (AB 1803 sampling). San Joaquin Valley DBCP Advisory Committee is overseeing studies on remedial alternatives for DBCP problems.
	Coalinga Airport	DDT, Chlorpyrifos, DEF, Ethion, Disyston	Contamination assessment needed.
	Union Carbide Test Plot	Aldicarb	Additional contamination assessment needed.
	Spain Air	Ethion, DEF, Parathion, Trithion, Dinoseb, Paraquat, DDE, DDT, Endosulfan II	Assessment needed.

Table IV-6 (cont.) Central Valley (Region 5, Fresno)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Kern	Brown & Bryant, Inc., Arvin	1,2-D, 1,3-D, DBCP, Dinoseb, EDB	Federal Superfund site. U.S. EPA has prepared Remedial Information Feasibility Study Report.
	Puregro Company, Bakersfield	DBCP	State Superfund site. Further assessment conducted. The waste discharge requirements for closure of a former dry well were issued March 1994.
	Guimarra Vineyard	DBCP	Contamination assessment and pond closure plan needed.
	Dick Garriott Crop Dusting, Bakersfield	Chlordane, DDE, DDT, PCNB, Endosulfan I & II, Methoxychlor, Carbofuran, Carbaryl, Bufencarb, DEF, Tedion, Diazinon, Chlorpyrifos, Ethyl Parathion, Diuron, Dinoseb, Dicamba	Cleanup and Abatement Order issued in 1993. TPCA site. Hydrogeological Assessment Report completed in 1993. Work in progress to determine extent of ground water degradation. Impoundment is covered.
	USDA, Shafter	Dichlobenil, EPTC, Prometryne, DDT, DDE, DDD, Dieldrin, Toxaphene, Silvex, PCP, Chlorpropham, Ametryn, Atrazine	Developing a closure plan.
	Brown and Bryant, Inc., Shafter	Chlordane, DDD, DDE, DDT, Dieldrin, Endrin, Heptachlor, Toxaphene	State Superfund site. Contamination assessment ongoing.
	Kern County Wells	DBCP, 1,2-D, EDB	Pesticides detected in 57 wells (AB 1803 sampling). No assessment underway.
Madera	Chowchilla Municipal Airport	Dieldrin, Alpha-BHC, Endosulfan, PCNB, DDT, DDE, Lindane	Contamination assessment needed.
Madera	Madera County Wells	DBCP, 1,2-D, EDB	DBCP detected in two wells (AB 1803 sampling). No assessment underway.
	Western Farm Service, Inc.	Dinoseb, DBCP, Dieldrin	Assessment ongoing. Impoundment closed. Developing closure plan for soils.
	Madera Municipal Airport	DDT, DDE, Toxaphene, Dicofol, Endrin	Soil and ground water investigation underway.
Kings	Lemoore N.A.S.	Unspecified	Investigation ongoing.
	Blair Field	2,4-D, Dicofol, Diazinon, Propargite	Assessment needed.
	Blair Aviation	Trifluralin, Mevinphos, Phorate	Contamination assessment needed.
	Lakeland Dusters	DDT, Toxaphene	Contaminated soils excavated and stockpiled on site. Remediation underway.
Tulare	Mefford Field, City of Tulare	p,p'-DDT, p,p'-DDE, 2,4,5-TCP, Dicamba, DNBP, Diuron	Contamination assessment and mitigation reports needed.
	Tulare Airport	2,4-D, DNBP	Assessment needed.
	Kaweah Crop Dusters	DDT, 2,4-D, 2,4,5-T, Methoxychlor	DHS Remedial Action Order issued January 1984. Cleanup ongoing.
	Tulare County Wells	1,2-D	Detected in wells through AB 1803 sampling. No assessment underway.
Tuolumne	Tuolumne County Wells	Methylene Chloride	Detected in one well (AB 1803 sampling).
Yuba	Beale Air Force Base	Lindane	Ground water investigation underway.

Table IV-7. Actions Taken By The Regional Water Quality Control Board, Lahontan (Region 6), In FY 1995-96.

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Inyo	Haiwee Reservoir	Copper sulfate	Potential for ground water contamination will be evaluated.

Table IV-8. Actions Taken By the Regional Water Quality Control Board, Colorado River Basin (Region 7), In FY 1995-96.

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Imperial	Central Brave Agricultural Service	4,4'-DDE, Endosulfan	Recalcitrant Discharger. Referred to Attorney General for nonpayment of fees.
	City of Brawley	4,4'-DDE, Dieldrin	Contaminated soil excavated and transported to Class I facility. Site closed.
	Visco Flying Service	4,4'-DDE, 4,4'-DDD, 4,4'-DDT, Endosulfan I & II	Impoundment remediated, capped, and closed in place.
	J.R. Simplot Company, Sandin Siding Facility	Dieldrin, 4,4'-DDT, Endrin	Cleanup and Abatement Order issued. Site in remediation. Risk base corrective action in-progress
	Stoker Company	Endosulfan I & II, Dinoseb, 2,4-DB	Land treatment facility undergoing closure.
	Ross Flying Service	4,4'-DDD, 4,4'-DDE 4,4'-DDT, Dieldrin	Closure of surface impoundment.
Riverside	West Coast Flying	Endosulfan I & II, Disulfoton	Recalcitrant discharger. Referred to Attorney General for nonpayment of fees.
	Woten Aviation Services	Disyston, DEF, Ethyl Parathion, Methyl Parathion	Cleanup and Abatement Order issued. U.S. EPA has lead in cleanup.
	Foster Gardner, Inc., Coachella Facility	1,2-Dichloroethane, 1,2-D, Ethylene Dibromide	Cleanup and Abatement Order issued October 1991 by RWQCB. Imminent and Substantial Endangerment Order issued by DTSC on August 21, 1992. Cleanup on-going.
	Farmers Aerial Service, Inc.	4,4'-DDE, Endosulfan I	Closure of disposal area.
	Coachella Valley Mosquito Abatement District	DDT	Under investigation. Pesticide contamination insignificant, UST Cleanup only.
	Crop Production Services, Blythe (Formerly Pure Gro MW-24)	1,2-Dichloropropane	Undergoing cleanup.

Table IV-9. Actions Taken By The Regional Water Quality Control Board, Santa Ana (Region 8), In FY 1995-96.

There are currently 103 confirmed detections of pesticides in the Santa Ana Region. Only one of these has been attributed to a point source discharge. Ground water extraction and treatment at this site is being performed under an order issued by the RWQCB. With the exception of this, all detections on this list are from domestic and agricultural production wells. One hundred and one of these wells contain dibromochloropropane (DBCP), four contain simazine, and one contains 1,2-dichloropropene (three wells contain both DBCP and simazine).

The presence of DBCP in the Region's ground water has resulted in both an actual and threatened impact on the beneficial use of water as a drinking water supply since 80 of the 101 wells containing DBCP are drinking water wells.

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Orange	Great Lakes Chemical Corporation (formerly Great Western Savings), Irvine	1,2-D, EDB, 1,2-DCA	A new National Pollutant Discharge Elimination System (NPDES) permit was issued July 7, 1995. Ground water extraction and treatment continuing.
Riverside	Sunnymead Mutual Water Company (North and South Well)	DBCP	Both wells were sold to Eastern Municipal Water District in February 1991. Customers are being served by the new District from other supply sources. North Well has been completely rehabilitated. South Well will be used for emergency purposes only.
	Arlington Basin	DBCP	Construction of a 7 MGD reverse osmosis plant with partial flow through a GAC unit for treatment of TDS, NO_3 and DBCP was completed in September 1990. About 4 MGD of ground water is treated and 2 MGD is bypassed. Treated water is mixed with the bypassed water and discharged to a local channel for ground water recharge purposes. Salt brine (0.8 MGD) is discharged to the Santa Ana Regional Interceptor which discharges to the ocean via the Orange County sewage treatment plant.
	City of Corona (Well 8, mun.)	Simazine	Well has been completely rehabilitated. Simazine was not detected in the sampling after rehabilitation work. No further action being taken.
	Home Gardens County Water District (Wells 2 & 3, mun.)	DBCP, Simazine	Water purveyor has closed these wells and is now purchasing water from the City of Riverside.
	City of Riverside, Twin Spring, mun.	DBCP	Well is out of service. No mitigation measures in effect.
	Victoria Farms MWC (Well 01 & 03, mun.)	DBCP	Water purveyor has closed these wells and is now purchasing water from the City of San Bernardino.
	City of Corona (Well 17, mun.)	Simazine, DBCP	Well is being used. Trace of DBCP was detected in March 1991 sampling.
	City of Riverside (Russell "B")	Simazine, DBCP	Water is being blended with other supply wells in the area.
	City of Riverside (1st Street)	DBCP	Well is not being used due to high concentrations of DBCP. No mitigation measures in effect.
	City of Riverside (Electric Street, mun.)	DBCP	Well water is being blended with water from other supply wells; blended water is sampled on a bi-weekly basis.
	City of Riverside (Palmyrita, mun.)	DBCP	Well is not being used due to high concentrations of DBCP. No mitigation measures in effect.
	City of Riverside (3 wells, mun.)	DBCP	Water from Hunt Wells No. 6, 10, and 11 is being blended with other wells in the area.
	City of Riverside (3 wells, emergency, Downtown Riverside)	DBCP	No mitigation measures in effect. These three wells are also contaminated with industrial organic solvents. Investigation is underway to determine the source of the solvents.
	Riverside County Hall Record, (pr)	DBCP	No mitigation measures in effect. VOCs such as Trichloroethylene and Perchloroethylene have also been found. Well is used for emergency purposes only.

Table IV-9 (cont.) Santa Ana (Region 8).

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Riverside	Loma Linda University, Arlington, (Wells 1 & 2, mun.)	DBCP	The University water supply system is tied into the City of Riverside domestic water supply distribution system. These two wells are used for irrigation purposes at the school.
	City of Riverside (Moor-Griffith, mun.)	DBCP	Well is out of service.
	Lake Hemet MWD (Wells A and B, mun.)	DBCP	Well A is being used for domestic purposes. No trace of DBCP has been found during the past two rounds of sampling. Well B is being used by a local farmer for irrigation purposes.
	Buschlen, Dwight (mun.)	DBCP	Well was abandoned about eight years ago. A second well on the property with traces of DBCP is being used for irrigation only.
San Bernardino	Gage System Wells (12 wells, mun.)	DBCP	The City of Riverside operates the Gage System which consists of 15 wells located along the Santa Ana River. These wells are being blended for domestic use. Trace amounts of radon have been detected in some of these wells. The City installed three deep wells in the area to increase blending capacity. New wells are in operation.
	Bunker Hill Basin: Crafton/Redlands area (36 wells)	DBCP	The City of Redlands started construction of a 6,000 gpm granular activated carbon (GAC) treatment system in September 1991. This GAC system treats ground water from two wells. Treated water is being put into the local water supply distribution system. Funding for this system is from the SWRCB ($2.8 million) and bond money through the State Expenditure Plan ($1.9 million) which is managed by DTSC. The system has been on line since May 1993.
San Bernardino	South San Bernardino Company Water District (4 wells, mun.)	DBCP	All four wells are out of service. The City of San Bernardino Water Department purchased the water district in July 1991. The City now supplies all the customers in the area.
	Cucamonga CWD (4 wells, mun.)	DBCP	Well No. 13 has not been used since 1991. The other three wells are standby wells and are used on a limited basis. Water is being purchased from Metropolitan Water District (MWD).
	Monte Vista CWD (3 wells, mun.)	DBCP	All three wells are on standby status. Water is being purchased from MWD.
	City of Upland (14 wells)	DBCP	Ten wells are out of operation. Four wells are currently being used and are being blended with other supply wells.
	City of Loma Linda (6 wells, mun.)	DBCP	Two wells have been abandoned. One well is out of operation due to high nitrates. The City also purchases treated water from the City of San Bernardino.

Table IV-10. Actions Taken By The Regional Water Quality Control Board, San Diego (Region 9), In FY 1995-96.

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
San Diego	City of Oceanside Water Utility District (Well No. 12-11S/ 4W-18L1 S)	1,2-DCP (1,2-Dicloropropane)	This backup drinking water well is located in the San Luis Rey River Valley. Up to 2.3 ppm has been detected in this well. The City of Oceanside is continuing monitoring of this well and reports to the State's DHS.
	Truly Nolen Exterminating, Inc.	Aldrin, Dieldrin, Chlordane	This is an on-site abandoned well which allegedly received pesticide wastes several years ago. Contaminated soil has been removed. Trace levels still exist in ground water. No further monitoring required. (RWQCB lead)
	San Pasqual Valley Union School (three wells)	Ethylene dibromide	Three drinking water wells impacted with Ethylene dibromide above MCL. City of San Diego monitored the wells until last year, wells were washed out by flood in 1993.