SAMPLING FOR PESTICIDE RESIDUES IN CALIFORNIA WELL WATER 2018 Update

Annual Well Sampling Report
Pursuant to the
Pesticide Contamination Prevention Act

California Environmental Protection Agency
DEPARTMENT OF PESTICIDE REGULATION
Environmental Monitoring Branch
Groundwater Protection Program

November 2019

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Cover photo—old windmill that once pumped groundwater. *Photo credit: Coco Parisienne*

SUMMARY

As required under Food and Agricultural Code (FAC) section 13152(e), this report summarizes the results of groundwater sampling for pesticide residues from January through December 2017 by the Department of Pesticide Regulation (DPR) and the State Water Resources Control Board (SWRCB). The report also includes United States Geological Survey (USGS) data from 2011 to 2016 that had not been previously reported to DPR. Actions taken by DPR to prevent migration of pesticides to groundwater from nonpoint agricultural sources are identified in Table 2 and wells with detections are identified by county in Appendix D.[1]

A total of 5,635 wells were sampled for one or more of 315 agricultural use pesticides and pesticide degradates (Table i).[2] Eighty-six pesticides/degradates were detected; 18 of the detected pesticides are no longer registered for use in California (Table 2).

Table i. Summary of well sampling results from DPR (2017), SWRCB (2017), and previously unreported USGS data (2011-2016).

	DPR	SWRCB	USGS	†TOTAL	Percent Detections
‡ **Pesticides/Degradates Sampled**	49	98	254	315	27.3
Pesticides/Degradates Detected	13	9	81	86	
‡‡ **Wells Sampled**	84	4,567	1,063	5,635	14.0
Wells with Detections	47	354	392	786	
Counties Sampled	5	57	51	57	73.7
Counties with Detections	4	19	38	42	

† "Total" reflects *unique* values, not a summation of values. For example, of the 58 California counties, some counties are sampled by more than one agency, but some are not sampled at all. (For the 2017 data, San Francisco County was not sampled.)

‡ "Pesticides Sampled" and "Pesticides Detected" represents the total number of pesticides sampled or found in groundwater regardless of the number of sampling events or detections that occurred during the reporting period.

‡‡ "Wells Sampled" and "Wells with Detections" represents the total number of wells sampled or found to contain pesticide residues regardless of the number of sampling events or detections that occurred during the reporting period.

[1] Although DPR is required to provide locations of sampled wells, in this report information is summarized by county to protect well owner privacy. DPR can provide additional location information—including township, range, and section—upon request.

[2] Some exceptions to the "agricultural use" status of sampled pesticides apply; some industrial use pesticides and pesticides that are no longer—or never were—registered for use in California are included due to the varying monitoring goals of reporting agencies.

PREFACE

This report fulfills the requirements of the Pesticide Contamination Prevention Act of 1985 (PCPA), Assembly Bill (AB) 2701 of 2004, and Senate Bill 1117 of 2014. The PCPA originally required DPR to submit the results of groundwater sampling for pesticide residues in an annual *written* report; AB 2701 amended the PCPA to require DPR to post the information on the DPR Web site.

ACKNOWLEDGEMENTS

The authors wish to thank the reviewers whose unique perspectives and experiences helped ensure the accuracy and readability of this report. We gratefully acknowledge the staff of DPR and cooperating federal, state, local, and private agencies for contributing to the database.

DISCLAIMER

As required by the PCPA, this report describes active ingredients of registered pesticide products that have been found in groundwater. DPR provides this information to satisfy legal mandates and provide information to the public. Any discussion of commercially available pesticide products does not constitute an actual or implied endorsement of the products by DPR.

ABBREVIATIONS

CAC	County Agricultural Commissioner
CALVUL	California Vulnerability Model
3CCR	Title 3, California Code of Regulations
CDPH	California Department of Public Health
DDW	Division of Drinking Water
DPR	Department of Pesticide Regulation
FAC	Food and Agriculture Code
GAMA	Groundwater Ambient Monitoring and Assessment Program
GWPA	Ground Water Protection Area
GWPL	Groundwater Protection List
LLNL	Lawrence Livermore National Laboratory
LEACHM	Leaching Estimation and Chemistry Model
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
OEHHA	Office of Environmental Health Hazard Assessment
PCPA	Pesticide Contamination Prevention Act
PHG	Public Health Goal
PMZ	Pesticide Management Zone
ppb	Parts per billion
SNV	Specific Numerical Value
SWRCB	State Water Resources Control Board
U.S. EPA	United States Environmental Protection Agency
USGS	United States Geological Survey

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BACKGROUND

PROTECTING GROUNDWATER FROM PESTICIDE CONTAMINATION — THE PCPA

The Department of Pesticide Regulation (DPR) began addressing pesticide contamination of groundwater in the early 1980s after the discovery of 1,2-dibromo-3-chloropropane (DBCP) in well water. Subsequent reports of pesticides in groundwater led to passage of the Pesticide Contamination Prevention Act (PCPA) of 1985,[3] an act designed to prevent pesticide *pollution* [4] of groundwater by *agricultural use* [5] pesticides, with emphasis on the protection of public drinking water supplies.

The PCPA of 1985 added Article 15 (sections 13141 – 13152) to the Food and Agricultural Code (FAC). FAC section 13150 allows the continued sale and use of detected pesticides provided certain conditions for use have been met. DPR authorizes use modifications of detected pesticides under the Restricted Materials permit program (Title 3, California Code of Regulations [3CCR] section 6400 et seq.), implemented by California's County Agricultural Commissioners (CACs).

The PCPA authorized establishment of a program that identifies pesticides that have the potential to pollute groundwater.[6] Under this program, DPR is required to conduct groundwater sampling, maintain a database of wells sampled for pesticides, and conduct a formal review to determine if use of detected pesticides can be modified to protect groundwater.

To implement the PCPA, DPR:

- Obtains physical/chemical/environmental fate data from pesticide registrants to support the registration of agricultural use pesticides; maintains the data in DPR's Pesticide Chemistry Database (see Pesticide Data Index).
- Uses data in the Pesticide Chemistry Database to establish persistence and mobility threshold values called specific numerical values (SNVs)[7] and evaluates the groundwater pollution potential of agricultural use pesticides based (in part) on these values. **NOTE:** Senate Bill (SB) 1117 modified the process for determining pollution potential by requiring DPR to develop a *peer reviewed method* [8] (in consultation with a subcommittee of the Director's Pesticide Registration and Evaluation Committee) to determine the potential of a pesticide to pollute groundwater using SNVs. This revised procedure is currently under development.

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[3] The PCPA added sections 13141-13152 to the FAC. 3CCR sections 6416-6487.5 and 6800-6804 implement these FAC sections.

[4] FAC section 13142 defines "*pollution" as "*the consequence of polluting," and "*pollute*" as "…to introduce a product into the groundwaters of the state resulting in an active ingredient, other specified ingredient, or a degradation product of a pesticide above a level that does not cause adverse health effects, accounting for an adequate margin of safety."

[5] California's definition of "agricultural use" is broad and includes not only pesticides used in production agriculture, but also those used on turf (e.g., golf courses, cemeteries) and along rights-of-way.

[6] See DPR's Groundwater Protection Program.

[7] SNV threshold values for all parameters are listed in 3CCR section 6804.

[8] Peer review is conducted using the process described in section 57004 of the Health and Safety Code.

- Compiles the Groundwater Protection List (GWPL)[9] that includes agricultural use pesticide active ingredients, other specified ingredients, and degradation products that have the potential to pollute groundwater. Also added are pesticides whose use has been modified following their detection in groundwater.[10]
- Utilizes contaminant transport modeling tools to:
    - Evaluate the contamination potential of pesticides prior to their California registration;
    - Prioritize pesticides for monitoring; and
    - Define Ground Water Protection Areas (GWPAs).[11]
- Monitors for agricultural use pesticides on the GWPL and their degradates to determine if they have migrated to groundwater.
- Evaluates reported pesticide and degradate detections in groundwater, including those reported by other agencies.[12]
- Determines whether detection of a pesticide in groundwater is the result of *legal* agricultural use[13] and if so, conducts a formal review process to determine if the pesticide's use can be modified to prevent pollution.
- Conducts ongoing groundwater monitoring of pesticides whose continued use has been modified to prevent pollution.
- Continuously reviews new science and data that could impact the validity of a finding that a pesticide has not polluted and does not threaten to pollute the groundwater of the state.
- Resubmits a pesticide to the formal review process if new information indicates that continued use of a previously reviewed pesticide threatens to pollute the groundwater of the state.

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[9] The Groundwater Protection List (3CCR section 6800) is divided into two parts. Section 6800(a) includes seven chemicals that have been detected in groundwater or soil and are regulated as groundwater contaminants: atrazine, bentazon, bromacil, diuron, norflurazon, prometon, and simazine. Section 6800(b) includes 98 chemicals that have the potential to become groundwater contaminants based on their mobility, persistence, and legal uses. SB 1117 requires DPR to *"…include on the GWPL each active ingredient, other specified ingredient, and degradation product of a pesticide that, when applied, has the potential to pollute groundwater."*

[10] Previously detected pesticides on the GWPL (3CCR section 6800[a]) include: atrazine, bentazon (Basagran®), bromacil, norflurazon, prometon, simazine, and diuron (except diuron products with less than 7% diuron that are applied to foliage).

[11] See Appendix A for more information on GWPAs.

[12] See Appendix B for a list of reporting agencies and a discussion of their role in the PCPA process.

[13] Legal agricultural uses include pesticide applications made in accordance with the registered pesticide label.

In addition, DPR:

- Maintains a database of pesticide detections in groundwater reported to DPR by local, county, and state agencies.[14]
- Prepares an annual Well Sampling Report that summarizes monitoring results and specifies actions taken by DPR in response to detections from nonpoint agricultural sources. Annual Well Sampling Reports are available at: http://www.cdpr.ca.gov/docs/emon/grndwtr/wellinv/wirmain.htm.

IDENTIFYING POTENTIAL GROUNDWATER CONTAMINANTS UNDER THE PCPA

DPR developed several evaluation procedures to estimate a pesticide's potential to pollute groundwater. These procedures are described below.

Using Environmental Fate Data to Predict Pesticide Behavior in the Environment

The PCPA required DPR to establish threshold SNVs for six physical/chemical parameters presumed to be correlated to a pesticide's potential to leach to groundwater: water solubility, soil organic carbon coefficient (Koc), hydrolysis half-life, aerobic soil metabolism half-life, anaerobic soil metabolism half-life, and field dissipation half-life. Water solubility and Koc are indicators of *mobility* within the soil, while hydrolysis half-life, aerobic and anaerobic soil metabolism, and field dissipation are indicators of *persistence* of the pesticide in soil.[15] A pesticide is predicted to have the potential to leach to groundwater if it is both mobile and persistent.

DPR developed threshold SNVs by evaluating nationwide groundwater studies and performing a statistical comparison of the physical/chemical attributes of pesticides detected in groundwater as a result of legal agricultural use (called *leachers*), and pesticides not detected (*nonleachers*). Analysis showed data for water solubility, hydrolysis half-life, Koc, and anaerobic soil metabolism half-life were significantly different for leachers and nonleachers (Johnson, 1991).[16] However, leacher and nonleacher aerobic soil metabolism data were not significantly different.[17]

After establishing threshold SNVs, DPR scientists used the data to characterize a pesticide's behavior in the environment. Pesticides that exceed at least one mobility SNV, one persistence SNV, and are applied under specific conditions are placed on the GWPL and monitored to determine if they have migrated to groundwater as a result of their legal agricultural use.

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[14] See Appendix C for more information on the Well Inventory Database.

[15] Although DPR has not established an SNV for field dissipation data, these data are used in modeling procedures to assess the leaching potential of new products proposed for registration.

[16] An evaluation of SNVs for these properties resulted in the identification of 90 percent of the chemicals found in groundwater due to legal agricultural use.

[17] Because the PCPA requires DPR to establish an SNV for each physical/chemical parameter, and because soil metabolism half-life appears to be an ineffective predictor of a pesticide's groundwater contamination potential, the SNV for aerobic soil metabolism half-life is set at a value that minimizes its importance in the discrimination procedure.

SB 1117 modified the process for estimating pollution potential by requiring DPR to develop a peer reviewed SNV-based method in consultation with a subcommittee of the Director's Pesticide Registration and Evaluation Committee. This revised procedure is currently under development.

Using Computer Modeling Tools to Predict Pesticide Contamination Potential

In addition to evaluating the contamination potential of agricultural use pesticides by comparing SNV values, DPR scientists use two models to predict pesticide behavior.[18]

- **LEACHM**, the ***leaching estimation and chemistry model*** (Hutson, 2003) is a pesticide fate and transport modeling tool used to evaluate the leaching potential of a pesticide. The model enables DPR scientists to predict a pesticide's movement through the root zone of a leaching-vulnerable soil (Spurlock, 2000) and predict the occurrence and magnitude of well water concentrations based upon mobility and persistence data, label information, climate data, and label-recommended irrigation practices (Troiano and Clayton, 2009). If the pesticide is determined to be a potential groundwater contaminant following the evaluation, the registrant is required to take steps (e.g., amending the product label or committing to a stewardship program) to mitigate the potential threat to groundwater before DPR will approve the pesticide for use in California. If mitigation is not possible, California registration is denied.

- **CALVUL**, *the **California vulnerability model*** is used to evaluate areas of California that are vulnerable to pesticide contamination based on soil type and depth-to-groundwater. If pesticide use on a given section of land is deemed likely to result in groundwater contamination, the section is designated a GWPA.[19]

MONITORING FOR PESTICIDES—PRIORITIZING THE CANDIDATES

Pesticides predicted to have the potential to contaminate groundwater are ranked for annual monitoring.[20] This ranking enables DPR to focus limited resources on pesticides that present the greatest contamination risk. DPR assigns highest priority to California registered agricultural use pesticides that are:

- On the GWPL; [21]

[18] The data used in these models are maintained in DPR's Pesticide Chemistry Database. The database includes pesticide mobility and persistence data submitted by pesticide registrants.

[19] To use a pesticide regulated as a groundwater contaminant in a GWPA, users must obtain a Restricted Materials permit from their County Agricultural Commissioner. These permits specify the enforceable management practices required for use in each type of GWPA. For more information on GWPAs, see Appendix A.

[20] For more information on pesticide monitoring ranking see: Clayton, M. 2011, *Selection of Pesticide Active Ingredients for Future Analytical Method Development and Ground Water Monitoring.* Available at: http://www.cdpr.ca.gov/docs/emon/pubs/ehapreps/analysis_memos/ai_priorities_2011_2304-ross.pdf

[21] DPR samples groundwater for pesticides on the GWPL to: 1) determine if pesticides identified as potential contaminants have migrated to groundwater as a result of their legal agricultural use; 2) expand GWPAs if additional detections are made; and 3) assess the effectiveness of mitigation measures used in the GWPAs.

- Reported as detections in groundwater by public agencies (see Appendix B for a list of reporting agencies);
- Believed to have a higher likelihood of contaminating groundwater based on computer simulated transport modeling or based upon a review of new science and data that indicate the pesticide could potentially pollute groundwater;
- Used intensively, or whose use is increasing (coupled with other risk factors such as persistence and mobility in soil); or
- Injected into the soil by ground-based application equipment, or applied by chemigation, or followed within 72 hours by flood or furrow irrigation.

DPR also assigns a higher priority to pesticides that:

- Have been detected previously in California (or nationwide); and
- Have no monitoring history in California.

Responding to Pesticide Detections in Groundwater

DPR conducts sampling to confirm detections of agricultural use pesticides, but does not conduct additional sampling if the detected pesticide is:

- No longer registered for use as a pesticide in California (e.g., detections from legacy pesticide use or from non-pesticidal use);
- Reported in error or is an invalid detection due to unacceptable analytical variability;
- Not detected in follow-up samples taken by the reporting agency;
- Detected at a concentration below DPR's Screening Level (less than 80 percent of DPR's analytical reporting limit; screening level of 0.04 ppb);
- Regulated as a groundwater contaminant under 3CCR section 6800(a) and detected in a GWPA (where use of the pesticide is regulated);
- Registered for use as a pesticide but also occurs naturally (such as copper); or
- Detected in a private well that DPR does not have permission to sample. DPR will defer sampling and place a pesticide on a "watch list" if the pesticide was detected at less than 80 percent of DPR's analytical reporting limit, or if DPR is unable to develop an analytical method that meets the criteria necessary to validate the detection.

If groundwater detections of an active ingredient or its degradates are determined to be from a pesticide's legal agricultural use, the findings are subject to a formal review process to determine if the pesticide's use can continue under modified conditions.[22] If it is determined use can be modified to the extent that there is a high probability it will not pollute, DPR adds the pesticide to the GWPL and requires applicators to adopt mitigation measures when applying the pesticide in GWPAs. Detections of agricultural use pesticides (or their degradates or other specified ingredients) that do not trigger the formal review process are placed on a "watch list" and tracked by DPR for changes in detection concentration or frequency.

If a detected pesticide is added to the GWPL and regulated as a groundwater contaminant under 3CCR section 6800(a)—and the well is located in a GWPA—regulation of use under the Restricted Materials permit program is believed to constitute an adequate response to detections unless concentrations are high enough to indicate existing mitigation measures are not adequate to prevent pollution. If the well is not located in a GWPA, DPR may establish a GWPA that includes the well site if: 1) the well is in a section of land that is adjacent to an existing GWPA, or 2) the pesticide is detected in two or more wells within a four-section area that is not adjacent to an existing GWPA. (For more information on GWPAs, see Appendix A.)

Areas of Non-Authorization

State law does not authorize DPR to regulate pesticide use when detections in groundwater are the result of manufacturing processes, accidental spills/releases, or illegal disposal; DPR refers these detections to the SWRCB for further investigation.

ASSESSING THE EFFECTIVENESS OF MITIGATION MEASURES

In 1999, DPR established a well monitoring network to evaluate baseline pesticide concentrations in an effort to measure the effectiveness of groundwater protection regulations. Currently, DPR's well monitoring network includes 61 shallow, domestic wells located in runoff and/or leaching GWPAs in Fresno and Tulare counties. Preliminary analysis suggests that regulatory action taken by DPR has resulted in measurable decreases in both detection frequencies and well water concentrations for many regulated pesticides (Garretson, 1999 and 2012).

[22] Pesticides that have been subject to the formal review process include aldicarb (1988); atrazine (1986); bentazon (1989); bromacil (1986); chlorthal dimethyl (2018); diuron (1986); hexazinone (2010); metolachlor/S-metolachlor (2016); norflurazon (1998); prometon (1986); and simazine (1986). With the exception of aldicarb, chlorthal dimethyl, hexazinone, and metolachlor/S-metolachlor, it was determined the agricultural use of these pesticides could be modified so there would be a high probability that their continued use would not pollute groundwater. In 1988, statewide use restrictions were adopted for aldicarb. Chlorthal dimethyl (2018), hexazinone (2010), and metolachlor/S-metolachlor (2016) were determined not to have polluted or threatened to pollute groundwater in the state, but continued monitoring of each was recommended.

Another pesticide recently placed in the formal review process was alachlor (2016). The formal review of alachlor was suspended due to the imminent federal cancellation of all alachlor products.

SAMPLING RESULTS

DETECTIONS OF PESTICIDES AND RELATED DEGRADATES

This annual report includes well sampling data from DPR and SWRCB for the sampling period of January through December 2017. This report also includes previously unreported well sampling data from the USGS for the sampling period of May 2011 through December 2016. Table 1 includes the well sampling data from all three agencies.

Over 5,600 (5,635) wells were sampled for one or more of 315 agricultural use pesticides and pesticide degradates. Of the wells sampled, 786 wells tested positive for one or more pesticides/ degradates. Sampling efforts yielded detections of 86 pesticides/degradates, 18 of which are not registered for use in California.

Sampling data was collected from wells in 57 counties; San Francisco County was not sampled by any agency in calendar year 2017 or the previously unreported USGS data. Forty-two counties had wells with detections. (See Appendix D for county sampling results.)

Table 1. Summary of well sampling results for 2017 and previously unreported USGS data.

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
1,2-D + 1,3-D + C-3 pesticides	4,336 0	2,290 0	48 0	0.05	--	SWRCB
1,2-Dicloropropane (1,2-D) (propylene dichloride)[2]	6,694 145	4,046 94	57 15	0 - 0.5	0.001 - 2.6	SWRCB USGS
1,3-D (1,3-dichloropropene) (Telone®)	6,415 0	3,384 0	56 0	0 - 0.5	--	SWRCB USGS
1,4-Dichlorobenzene (p-DCB)[1]	1,138 8	1,042 7	51 5	0 - 0.1	0.011 - 3.26	USGS
1-Naphthol ***(degradate of carbaryl)***	602 0	563 0	47 0	0.036 - 0.072	--	USGS
2-(1-Hydroxyethyl)-6-methylaniline ***(degradate of acetochlor)***	277 0	270 0	24 0	0 - 1	--	USGS
2,4,5-T (2,4,5-tichloro phenoxy acetic acid)	461 0	369 0	24 0	0.09 - 2	--	SWRCB
2,4,5-Trichlorophenol	48 0	48 0	3 0	5.1 - 53	--	USGS
2,4,6-Trichlorophenol	68 0	58 0	4 0	4 - 43	--	SWRCB USGS
2,4-D (2,4-dichlorophenoxy-acetic acid)[1]	1,559 1	1,240 1	47 1	0 - 10	0.03	SWRCB USGS

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
2,4-Xylenol	48 0	48 0	3 0	5.1 - 53	--	USGS
2,6-Diethylaniline ***(degradate of alachlor)[2]***	602 2	563 2	47 2	0.006	0.001 - 0.003	USGS
2-Aminobenzimidazole ***(degradate of bentazon)***	288 0	281 0	24 0	0 - 0.05	--	USGS
2-Ethyl-6-methylaniline ***(degradate of metolachlor, diuron, monuron)***	602 0	563 0	47 0	0.01 - 0.02	--	USGS
2-Hydroxy alachlor ***(degradate of alachlor)***	288 0	281 0	24 0	0 - 0.05	--	USGS
2-Hydroxyatrazine ***(degradate of atrazine)[1]***	288 1	281 1	24 1	0 - 0.02	0.003	USGS
2-Isopropyl-6-methyl-4-pyrimidinol ***(degradate of diazinon)[1]***	288 2	281 2	24 2	0 - 0.05	0.033 - 0.079	USGS
3,4-Dichloroaniline **(*degradate of diuron, propanil)[1]***	603 12	564 12	47 10	0.004 - 0.008	0.006 - 0.089	USGS
3,5-Dichloroaniline ***(degradate of iprodione, dichloran)[1]***	350 5	313 5	47 3	0.004 - 0.006	0.002 - 0.005	USGS
3-PBA ***(degradate of cypermethrin)***	288 0	281 0	24 0	0 - 0.25	--	USGS
4(2,4-DB), dimethylamine salt	245 0	184 0	13 0	3 - 30	--	SWRCB

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
4-CLOC	602 0	563 0	47 0	0.005 - 0.008	--	USGS
4-Hydroxy chlorothalonil ***(degradate of chlorothalonil)[1]***	288 1	281 1	24 1	0 - 0.1	0.088	USGS
4-Hydroxy molinate ***(degradate of molinate)***	288 0	281 0	24 0	0 - 0.05	--	USGS
Acephate	288 0	281 0	24 0	0 - 0.05	--	USGS
ACET (deisopropyl-atrazine or deethyl-simazine) ***(degradate of atrazine/simazine)[1]***	372 93	365 89	27 10	0 - 0.05	0.003 - 0.743	DPR USGS
Acetochlor	1,216 0	830 0	52 0	0 - 0.1	--	SWRCB USGS
Acetochlor ESA ***(degradate of acetochlor)***	288 0	281 0	24 0	0 - 0.4	--	USGS
Acetochlor OA ***(degradate of acetochlor)***	573 0	281 0	24 0	0 - 0.25	--	USGS
Acetochlor sulfinylacetic acid ***(degradate of acetochlor)***	288 0	281 0	24 0	0 - 0.5	--	USGS
Acifluorfen	114 0	92 0	7 0	0 - 0.5	--	SWRCB
Acrylonitrile[2]	489 1	483 1	43 1	0 - 0.8	0.21	USGS

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Alachlor	3,179 0	2,440 0	55 0	0 - 1	--	DPR SWRCB USGS
Alachlor 2nd Amide ***(degradate of alachlor)***	892 0	805 0	51 0	0 - 0.02	--	USGS
Alachlor OXA ***(degradate of alachlor)***	576 0	281 0	24 0	0 - 0.5	--	USGS
Alachlor sulfinylacetic acid ***(degradate of alachlor)***	288 0	281 0	24 0	0 - 0.2	--	USGS
Aldicarb	990 0	848 0	45 0	0 - 3	--	SWRCB USGS
Aldicarb sulfone ***(degradate of aldicarb)***	1,001 0	859 0	45 0	0 - 4	--	SWRCB USGS
Aldicarb sulfoxide ***(degradate of aldicarb)***	1,001 0	859 0	45 0	0 - 3	--	SWRCB USGS
Aldrin	697 0	441 0	35 0	0.005 - 0.075	--	SWRCB
Allyl alcohol	633 0	625 0	45 0	0 - 5	--	USGS
Alpha-terpineol	633 0	625 0	45 0	6	--	USGS
Ametryne	287 0	281 0	24 0	0 - 0.01	--	USGS

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Anthranilic acid isopropylamide *(degradate of bentazon)*	288 0	281 0	24 0	0 - 0.01	--	USGS
Asulam	286 0	281 0	24 0	0 - 0.25	--	USGS
Atraton	16 0	16 0	5 0	0.5	--	SWRCB
Atrazine[1]	3,422 119	2,680 104	55 25	0 - 0.5	0.001 - 0.6	DPR SWRCB USGS
Azinphos-methyl (Guthion®)	976 0	889 0	51 0	0 - 0.12	--	DPR USGS
Azinphos-methyl-oa *(degradate of azinphos-methyl)*	891 0	804 0	51 0	0 - 0.05	--	USGS
Azoxystrobin[1]	372 1	365 1	27 1	0 - 0.05	0.002	DPR USGS
Benefin (benfluralin)[1]	602 3	563 3	47 2	0.014 - 0.038	0.002 - 0.003	USGS
Bensulide (Betasan®)	84 0	84 0	5 0	0.05	--	DPR
Bentazon (Basagran®)[1]	1,329 4	1,120 4	45 3	0 - 2	0.002 - 0.015	DPR SWRCB USGS
BHC (other than gamma isomer)	289 0	118 0	10 0	0.005 - 0.05	--	SWRCB

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Bifenthrin	288 0	281 0	24 0	0 - 0.1	--	USGS
Bromacil[1]	1,478 48	1,123 31	44 6	0 - 10	0.001 - 5.48	DPR SWRCB USGS
Bromoxynil phenol	288 0	281 0	24 0	0 - 0.079	--	USGS
Butachlor	919 0	701 0	32 0	0.3 - 0.38	--	SWRCB
Butralin	288 0	281 0	24 0	0 - 0.025	--	USGS
Butylate	288 0	281 0	24 0	0 - 0.05	--	USGS
Camphor[1]	14 2	13 2	2 1	0.044 - 0.08	0.021 - 0.035	USGS
Captan[1]	189 1	94 1	7 1	0.1	0.27	SWRCB
Carbaryl	1,700 0	1,468 0	54 0	0 - 5	--	DPR SWRCB USGS
Carbendazim	287 0	280 0	24 0	0 - 0.05	--	USGS
Carbofuran	1,635 0	1,366 0	54 0	0 - 5	--	DPR SWRCB USGS

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Carbon disulfide[2]	2,124 54	1,502 53	53 18	0 - 0.5	0.1 - 5.2	SWRCB USGS
Carbophenothion	189 0	94 0	7 0	0	--	SWRCB
Carboxy molinate ***(degradate of molinate)***	288 0	281 0	24 0	0 - 0.25	--	USGS
Chlordane	755 0	580 0	32 0	0.1	--	SWRCB
Chlorobenzilate	11 0	11 0	1 0	0	--	SWRCB
Chloroneb	11 0	11 0	1 0	0	--	SWRCB
Chloropicrin[1]	634 1	625 1	45 1	0 - 1.88	0.032	USGS
Chlorosulfonamide acid ***(degradate of halosulfuron)***	288 0	281 0	24 0	0 - 0.075	--	USGS
Chlorothalonil	141 0	120 0	13 0	0.1 - 5	--	SWRCB
Chlorpropham	184 0	89 0	7 0	0	--	SWRCB
Chlorpyrifos[1]	904 2	816 2	51 2	0 - 0.16	0.001 - 0.003	SWRCB USGS

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Chlorpyrifos oxon *(degradate of chlorpyrifos)*	892 0	805 0	51 0	0 - 0.08	--	USGS
Chlorsulfuron[1]	288 1	281 1	24 1	0 - 0.1	0.007	USGS
Chlorthal dimethyl (dacthal/DCPA)[1]	615 1	575 1	47 1	0 - 0.008	0.001	SWRCB USGS
Chorimuron ethyl	288 0	281 0	24 0	0 - 0.05	--	USGS
Clomazone	76 0	76 0	5 0	0.05	--	DPR
Cyanazine	829 0	649 0	51 0	0 - 0.25	--	SWRCB USGS
Cyfluthrin	604 0	564 0	47 0	0.016	--	USGS
Cyhalothric acid *(degradate of bifenthrin)*	286 0	279 0	23 0	0 - 5	--	USGS
Cypermethrin	604 0	564 0	47 0	0.02	--	USGS
DACT (diaminochlorotriazine) *(degradate of simazine)*[1]	372 110	365 106	27 12	0 - 0.25	0.001 - 5.05	DPR USGS
Dacthal acid degradates[1]	315 24	264 22	25 8	0 - 0.1	0.1 - 1.1	SWRCB

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Dalapon[2]	1,008 1	800 1	35 1	5 - 10	83	SWRCB"
DBCP (1,2-dibromo-3-chloropropane)[2]	5,557 1,501	3,316 370	55 12	0 - 0.4	0.008 - 1.32	SWRCB USGS
DDD (dichloro diphenyl dichloro ethane) ***(degradate of DDT)***	150 0	118 0	10 0	0.005 - 0.02	--	SWRCB
DDE (dichloro diphenyl dichloro ethylene) ***(degradate of DDT)***	150 0	118 0	10 0	0.005 - 0.01	--	SWRCB
DDT (dichloro diphenyl trichloro ethane)	150 0	118 0	10 0	0.005 - 0.02	--	SWRCB
DDVP (dichlorvos)	898 0	811 0	51 0	0 - 1	--	SWRCB USBS
DEA (deethyl-atrazine) ***(degradate of atrazine)***[1]	976 115	889 101	51 22	0 - 0.25	0.002 - 0.276	DPR USGS
Dechlorofipronil ***(degradate of fipronil)***	288 0	281 0	24 0	0 - 0.01	--	USGS
Dechlorometolachlor ***(degradate of metolachlor)***[1]	288 3	281 3	24 2	0 - 0.003	0.001 - 0.003	USGS
DEET	14 0	13 0	2 0	0.04 - 0.06	--	USGS
Deiodo flubendiamide ***(degradate of flubendiamide)***	288 0	281 0	24 0	0 - 0.25	--	USGS

Pesticide or Degradate	Samples Taken Positive Samples	Wells Sampled Wells with Detections	Counties Sampled Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Deisopropylhydroxyatrazine ***(degradate of atrazine)***	288 0	281 0	24 0	0 - 0.25	--	USGS
Deisopropyl prometryn ***(degradate of prometryn)***	288 0	281 0	24 0	0 - 0.003	--	USGS
Demethyl fluometuron ***(degradate of fluometuron)²***	288 2	281 2	24 1	0 - 0.01	0.001	USGS
Demeton	288 0	281 0	24 0	0 - 0.005	--	USGS
Desisopropyl desethyl atrazine ***(degradate of atrazine)¹***	288 3	281 3	24 3	0 - 0.01	0.001 - 0.011	USGS
Desulfinyl fipronil ***(degradate of fipronil)***	288 0	281 0	24 0	0 - 0.004	--	USGS
Desulfinyl fipronil amide ***(degradate of fipronil)***	892 0	805 0	51 0	0 - 0.029	--	USGS
Diazinon	1,862 0	1,540 0	54 0	0 - 2	--	DPR SWRCB USGS
Diazoxon	355 0	348 0	28 0	0 - 0.012	--	USGS
Dicamba	981 0	806 0	43 0	0 - 1.5	--	SWRCB USGS
Dichloran	76 0	76 0	5 0	0.05	--	DPR

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Dichlobenil (Casaron®)	76 0	76 0	5 0	0.05	--	DPR
Dichlorprop, butoxyethanol ester	189 0	128 0	12 0	0 - 5	--	SWRCB
Dicrotophos	889 0	803 0	51 0	0 - 0.16	--	USGS
Dieldrin[2]	1,119 2	947 2	51 2	0.005 - 0.071	0.011 - 0.065	SWRCB USGS
Diflubenzuron[1]	287 1	280 1	24 1	0 - 0.01	0.002	USGS
Diflufenzopyr	288 0	281 0	24 0	0 - 0.1	--	USGS
Dimethenamid	372 0	365 0	27 0	0 - 0.05	--	DPR USGS
Dimethenamid ESA ***(degradate of dimethenamid)[1]***	576 1	281 1	24 1	0 - 0.189	0.01	USGS
Dimethenamid OA ***(degradate of dimethenamid)***	288 0	281 0	24 0	0 - 0.25	--	USGS
Dimethoate	1,955 0	1,626 0	54 0	0 - 20	--	DPR SWRCB USGS
Dinoseb	1,111 0	823 0	36 0	0.2 - 2	--	SWRCB

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Diphenamid	192 0	95 0	7 0	100	--	SWRCB
Diquat dibromide	1,058 0	765 0	37 0	2 - 4	--	SWRCB
Disulfoton	874 0	712 0	51 0	0 - 0.05	--	DPR SWRCB USGS
Disulfoton oxon sulfone ***(degradate of disulfoton)***	288 0	281 0	24 0	0 - 0.025	--	USGS
Disulfoton oxon sulfoxide ***(degradate of disulfoton)***	288 0	281 0	24 0	0 - 0.01	--	USGS
Disulfoton sulfone ***(degradate of disulfoton)***	640 0	558 0	51 0	0 - 0.05	--	USGS
Diuron[1]	474 44	383 35	29 6	0 - 1	0.002 - 0.189	DPR SWRCB USGS
Diuron-desdimethyl ***(degradate of diuron)***	288 0	281 0	24 0	0 - 0.25	--	USGS
Diuron-desmethyl ***(degradate of diuron)***[1]	288 23	281 23	24 6	0 - 0.05	0.001 - 0.023	USGS
DNOC, sodium salt	48 0	48 0	3 0	10 - 110	--	USGS
DSMN (desmethyl norflurazon or demethylnorflurazon) ***(degradate of norflurazon)***[1]	372 54	365 53	27 6	0 - 0.05	0.001 – 1.17	DPR USGS

Pesticide or Degradate	Samples Taken Positive Samples	Wells Sampled Wells with Detections	Counties Sampled Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Endosulfan	150 0	118 0	10 0	0.005 - 0.01	--	SWRCB
Endosulfan I	352 0	314 0	47 0	0.006 - 0.01	--	USGS
Endosulfan II	150 0	118 0	10 0	0.005 - 0.01	--	SWRCB
Endosulfan sulfate ***(degradate of endosulfan)***	531 0	429 0	48 0	0.005 - 0.05	--	SWRCB USGS
Endothall	1,148 0	674 0	37 0	2 - 45	--	SWRCB
Endrin	798 0	581 0	32 0	0.005 - 0.1	--	SWRCB
Endrin aldehyde	150 0	118 0	10 0	0.01 - 0.05	--	SWRCB
EPTC (S-ethyl-dipropylthiocarbamate)[1]	861 3	669 3	52 3	0 - 1	0.007 - 0.015	SWRCB USGS
Ethion	610 0	570 0	47 0	0 - 0.01	--	SWRCB USGS
Ethion monooxon ***(degradate of ethion)***	565 0	528 0	46 0	0.021	--	USGS
Ethofumesate	84 0	84 0	5 0	0.05	--	DPR

Pesticide or Degradate	Samples Taken Positive Samples	Wells Sampled Wells with Detections	Counties Sampled Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Ethoprop (prophos)	714 0	633 0	51 0	0 - 0.05	--	DPR USGS
Ethylene dibromide (EDB)[2]	4,924 30	3,205 9	55 4	0 - 0.028	0.008 - 0.17	SWRCB USGS
Ethylene dichloride[2]	1,124 3	1,036 3	51 2	0 - 0.2	0.09 - 0.26	USGS
Ethyl-methylphenyl-aminopropanol ***(degradate of metolachlor)***	288 0	281 0	24 0	0 - 0.05	--	USGS
Etoxazole	288 0	281 0	24 0	0 - 0.05	--	USGS
Famoxadone	150 0	147 0	21 0	0.06 - 0.25	--	USGS
Fenamiphos	943 0	874 0	51 0	0 - 0.05	--	DPR USGS
Fenamiphos sulfone ***(degradate of fenamiphos)***	891 0	804 0	51 0	0 - 0.054	--	USGS
Fenamiphos sulfoxide ***(degradate of fenamiphos)***	882 0	795 0	51 0	0 - 0.08	--	USGS
Fenbutatin-oxide (Vendex®)	288 0	281 0	24 0	0 - 0.1	--	USGS
Fentin hydroxide	288 0	281 0	24 0	0 - 0.25	--	USGS

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Fipronil	892 0	805 0	51 0	0 - 0.018	--	USGS
Fipronil sulfide ***(degradate of fipronil)[1]***	892 5	805 5	51 5	0 - 0.016	0.003 - 0.007	USGS
Fipronil sulfonate ***(degradate of fipronil)[1]***	288 1	281 1	24 1	0 - 0.1	0.107	USGS
Fipronil sulfone ***(degradate of fipronil)[1]***	892 1	805 1	51 1	0 - 0.024	0.003	USGS
Fipronil-carboxamide ***(degradate of fipronil)[1]***	288 1	281 1	24 1	0 - 0.01	0.003	USGS
Flubendiamide	288 0	281 0	24 0	0 - 0.01	--	USGS
Fludioxonil[1]	84 1	84 1	5 1	0.05	0.066	DPR
Flumetsulam	281 0	274 0	24 0	0 - 0.05	--	USGS
Fluometuron[2]	288 2	281 2	24 2	0 - 0.05	0.01	USGS
Fonofos (Dyfonate®)	968 0	881 0	51 0	0 - 0.05	--	DPR USGS
Glyphosate[1]	784 1	582 1	37 1	20 - 25	50	SWRCB

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Halosulfuron-methyl	288 0	281 0	24 0	0 - 0.05	--	USGS
Heptachlor	754 0	577 0	32 0	0.005 - 0.01	--	SWRCB
Heptachlor epoxide	756 0	578 0	32 0	0.005 - 0.01	--	SWRCB
Hexachlorobenzene	918 0	686 0	39 0	0.01 - 11	--	SWRCB USGS
Hexazinone[1]	976 22	889 20	51 15	0 - 0.05	0.001 - 0.353	DPR USGS
Hydroxy didemethyl fluometuron ***(degradate of fluometuron)***	288 0	281 0	24 0	0 - 0.25	--	USGS
Hydroxy monodemethyl fluometuron ***(degradate of fluometuron)***[2]	288 1	281 1	24 1	0 - 0.05	0.009	USGS
Hydroxyacetochlor ***(degradate of acetochlor)***	288 0	281 0	24 0	0 - 0.05	--	USGS
Hydroxycarbofuran ***(degradate of carbofuran)***	1,000 0	858 0	45 0	0 - 3	--	SWRCB USGS
Hydroxydiazinon ***(degradate of diazinon)***	288 0	281 0	24 0	0 - 0.05	--	USGS
Hydroxyfluometuron ***(degradate of fluometuron)***	288 0	281 0	24 0	0 - 0.05	--	USGS

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Hydroxymetolachlor *(degradate of metolachlor)*[1]	288 4	281 4	24 3	0 - 0.01	0.001 - 0.005	USGS
Hydroxysimazine *(degradate of simazine)*[1]	288 1	281 1	24 1	0 - 0.25	0.003	USGS
Hydroxytebuthiuron *(degradate of tebuthiuron)*	288 0	281 0	24 0	0 - 0.05	--	USGS
Imazamox	288 0	281 0	24 0	0 - 0.05	--	USGS
Imazaquin[2]	288 1	281 1	24 1	0 - 0.05	0.004	USGS
Imazethapyr[1]	288 1	281 1	24 1	0 - 0.05	0.005	USGS
Imidacloprid[1]	372 9	365 9	27 1	0 - 0.05	0.006 - 5.97	DPR USGS
Indoxacarb	288 0	281 0	24 0	0 - 0.05	--	USGS
Iprodione	604 0	564 0	47 0	0.014	--	USGS
Isofenphos	604 0	564 0	47 0	0.006 - 0.014	--	USGS
Isoxaflutole	274 0	267 0	23 0	0 - 0.05	--	USGS

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Kresoxim-methyl	288 0	281 0	24 0	0 - 0.05	--	USGS
Lactofen	285 0	278 0	24 0	0 - 0.25	--	USGS
Lambda-cyhalothrin	352 0	314 0	47 0	0.01 - 0.014	--	USGS
Lindane (gamma-BHC)	898 0	656 0	37 0	0.005 - 0.2	--	SWRCB
Linuron[1]	372 2	365 2	27 2	0 - 0.05	0.001 - 0.002	DPR USGS
Malaoxon	885 0	799 0	51 0	0 - 0.022	--	USGS
Malathion[1]	967 1	881 1	51 1	0 - 0.05	0.004	DPR USGS
MCPA	246 0	241 0	24 0	0 - 0.25	--	USGS
MCPA, dimethylamine salt	56 0	17 0	4 0	10 - 100	--	SWRCB
MCPP (2-(4-chloro-2-methylphenoxy) propionic acid)	56 0	17 0	4 0	10 - 100	--	SWRCB
Merphos	1 0	1 0	1 0	2	--	SWRCB

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Metalaxyl	990 0	899 0	51 0	0 - 0.16	--	DPR USGS
Metam sodium	1 0	1 0	1 0	0.006	--	USGS
Metconazole	288 0	281 0	24 0	0 - 0.01	--	USGS
Methamidophos	288 0	281 0	24 0	0 - 0.05	--	USGS
Methidathion	892 0	805 0	51 0	0 - 0.02	--	USGS
Methiocarb	464 0	416 0	32 0	0.05 - 5	--	DPR SWRCB
Methomyl	1,000 0	858 0	45 0	0 - 2	--	SWRCB USGS
Methomyl oxime ***(degradate of methomyl)***	199 0	194 0	21 0	0 - 2	--	USGS
Methoxychlor	874 0	638 0	36 0	0.005 - 10	--	SWRCB
Methoxyfenozide[1]	288 16	281 16	24 7	0 - 0.005	0.001 - 0.286	USGS
Methyl bromide	4,862 0	3,046 0	56 0	0 - 2	--	SWRCB USGS

Pesticide or Degradate	Samples Taken Positive Samples	Wells Sampled Wells with Detections	Counties Sampled Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Methyl iodide[2]	489 1	483 1	43 1	0 - 0.26	0.04	USGS
Methyl paraoxon ***(degradate of parathion)***	892 0	805 0	51 0	0 - 0.05	--	USGS
Methyl parathion	680 0	640 0	47 0	0.008 - 0.05	--	DPR USGS
Metolachlor[1]	1,978 10	1,637 10	54 7	0 - 20	0.001 - 0.105	DPR SWRCB USGS
Metolachlor ESA ***(degradate of metolachlor)***[1]	288 13	281 13	24 6	0 - 0.1	0.004 - 4.37	USGS
Metolachlor hydroxy morpholinone ***(degradate of metolachlor)***	288 0	281 0	24 0	0 - 0.25	--	USGS
Metolachlor OXA ***(degradate of metolachlor)***[1]	288 2	281 2	24 2	0 - 0.25	0.11 - 0.213	USGS
Metribuzin[1]	2,000 1	1,626 1	54 1	0 - 2	0.007	DPR SWRCB USGS
Metribuzin DA	573 0	281 0	24 0	0 - 0.25	--	USGS
Metribuzin-DK ***(degradate of metribuzin)***	251 0	244 0	24 0	0 - 0.5	--	USGS
Mevinphos	1 0	1 0	1 0	0.5	--	SWRCB

Pesticide or Degradate	Samples Taken Positive Samples	Wells Sampled Wells with Detections	Counties Sampled Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Mirex	2 0	2 0	1 0	0	--	SWRCB
Molinate[2]	2,086 1	1,682 1	55 1	0 - 2	0.004	SWRCB USGS
MTP ***(degradate of dacthal)***	288 0	281 0	24 0	0 - 2	--	USGS
Myclobutanil[1]	892 1	805 1	51 1	0 - 0.05	0.01	USGS
Naled	271 0	264 0	23 0	0 - 0.25	--	USGS
Napropamide	84 0	84 0	5 0	0.05	--	DPR
Nicosulfuron[1]	287 1	280 1	24 1	0 - 0.014	0.001	USGS
Norflurazon[1]	456 38	365 26	27 3	0 - 0.05	0.001 - 0.374	DPR USGS
Novaluron	283 0	276 0	24 0	0 - 0.25	--	USGS
o-Cresol	48 0	48 0	3 0	5.1 - 53	--	USGS
O-Ethyl O-methyl S-propyl phosphorothioate ***(degradate of ethoprop)***	288 0	281 0	24 0	0 - 0.01	--	USGS

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
O-Ethyl S-methyl S-propyl phosphorodithioate ***(degradate of ethoprop)***	288 0	281 0	24 0	0 - 0.05	--	USGS
O-Ethyl S-propyl phosphorothioate ***(degradate of ethoprop)***	288 0	281 0	24 0	0 - 0.25	--	USGS
Omethoate ***(degradate of dimethoate)***	288 0	281 0	24 0	0 - 0.005	--	USGS
Ortho-dichlorobenzene	5,579 0	3,067 0	52 0	0.5	--	SWRCB
Orthosulfamuron	288 0	281 0	24 0	0 - 0.05	--	USGS
Oryzalin[1]	372 3	365 3	27 3	0 - 0.05	0.004 - 0.036	DPR USGS
Oxamyl[1]	1,281 1	1,003 1	45 1	0 - 20	0.001	SWRCB USGS
Oxamyl oxime ***(degradate of oxamyl)***	288 0	281 0	24 0	0 - 0.05	--	USGS
Oxydisulfoton ***(degradate of disulfoton)***[2]	288 1	281 1	24 1	0 - 0.005	0.003	USGS
Oxyfluorfen	628 0	549 0	50 0	0 - 1	--	USGS
Para-chloro-meta-cresol	48 0	48 0	3 0	5.1 - 53	--	USGS

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Paraquat dichloride	24 0	20 0	2 0	20	--	SWRCB
Parathion or ethyl parathion	76 0	76 0	5 0	0.05	--	DPR
Paroxon	288 0	281 0	24 0	0 - 0.025	--	USGS
PCNB (pentachloronitrobenzene)	6 0	6 0	2 0	0.1	--	SWRCB
p-Cresol[2]	62 3	61 3	5 2	0.08 - 110	0.01 - 0.08	USGS
Pendimethalin[1]	892 1	805 1	51 1	0 - 0.05	0.011	USGS
Pendimethalin metabolite ***(degradate of pendimethalin)***	283 0	278 0	24 0	0 - 0.25	--	USGS
Pentachlorophenol (PCP)	55 0	54 0	4 0	1.6 - 53	--	USGS
Permethrin	903 0	816 0	51 0	0 - 0.05	--	SWRCB USGS
Permethrin, other related compounds	299 0	292 0	25 0	0 - 0.05	--	SWRCB USGS
Phorate	968 0	881 0	51 0	0 - 0.05	--	DPR USGS

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Phorate sulfone *(degradate of phorate)*	288 0	281 0	24 0	0 - 0.05	--	USGS
Phorate sulfoxide *(degradate of phorate)*	288 0	281 0	24 0	0 - 0.01	--	USGS
Phoratoxon	854 0	787 0	51 0	0 - 0.25	--	USGS
Phoratoxon sulfone *(degradate of phoratoxon)*	283 0	276 0	24 0	0 - 0.05	--	USGS
Phoratoxon sulfoxide *(degradate of phoratoxon)*	281 0	274 0	24 0	0 - 0.05	--	USGS
Phosmet (Imidan®)	584 0	546 0	47 0	0.08 - 0.14	--	USGS
Phosmet-oa *(degradate of phosmet)*	564 0	529 0	47 0	0.051	--	USGS
Phostebupirim	288 0	281 0	24 0	0 - 0.005	--	USGS
Picloram	986 0	787 0	35 0	0.05 - 1	--	SWRCB
Piperonyl butoxide	357 0	350 0	27 0	0 - 0.25	--	DPR USGS
P-Nitrophenol *(degradate of ethyl parathion)*	48 0	48 0	3 0	25 - 270	--	USGS

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Profenofos	281 0	274 0	24 0	0 - 0.01	--	USGS
Prometon[1]	1,277 27	1,004 24	51 11	0 - 0.5	0.002 - 0.151	DPR SWRCB USGS
Prometryn	1,235 0	1,040 0	52 0	0 - 2	--	DPR SWRCB USGS
Propachlor	1,391 0	726 0	34 0	0 - 0.5	--	SWRCB
Propanil[1]	716 2	634 2	51 2	0 - 0.05	0.005 - 0.06	DPR USGS
Propargite	640 0	558 0	51 0	0 - 0.05	--	USGS
Propazine[2]	288 4	281 4	24 3	0 - 0.05	0.001 - 0.006	USGS
Propiconazole[1]	640 1	558 1	51 1	0 - 0.01	0.005	USGS
Propoxur[1]	669 10	614 10	42 4	0 - 5	0.001 - 0.003	SWRCB USGS
Propyzamide	892 0	805 0	51 0	0 - 0.05	--	USGS
Prosulfuron	288 0	281 0	24 0	0 - 0.05	--	USGS

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Pymetrozine	93 0	92 0	11 0	0.002 - 0.25	--	USGS
Pyraclostrobin	288 0	281 0	24 0	0 - 0.003	--	USGS
Pyridaben	288 0	281 0	24 0	0 - 0.05	--	USGS
Pyriproxyfen	288 0	281 0	24 0	0 - 0.003	--	USGS
Secbumeton	16 0	16 0	5 0	0.5	--	SWRCB
Siduron	288 0	281 0	24 0	0 - 0.05	--	USGS
Silvex	1,021 0	795 0	35 0	0.07 - 1	--	SWRCB
Simazine[1]	4,290 219	2,701 176	55 25	0 - 1	0.001 - 0.128	DPR SWRCB USGS
Sulfentrazone[1]	288 1	281 1	24 1	0 - 0.05	0.002	USGS
Sulfometuron methyl[1]	288 2	281 2	24 2	0 - 0.004	0.001 - 0.002	USGS
Sulfosulfuron[1]	288 1	281 1	24 1	0 - 0.05	0.001	USGS

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Sulfosulfuron ethyl sulfone ***(degradate of sulfosulfuron)***	288 0	281 0	24 0	0 - 0.01	--	USGS
Tebuconazole	288 0	281 0	24 0	0 - 0.05	--	USGS
Tebufenozide[1]	288 1	281 1	24 1	0 - 0.003	0.001	USGS
Tebupirimfos oxon ***(degradate of tebupirimfos)***	288 0	281 0	24 0	0 - 0.01	--	USGS
Tebuthiuron[1]	997 20	888 18	51 10	0 - 0.056	0.002 - 0.121	DPR USGS
Tebuthiuron degradate 104	288 0	281 0	24 0	0 - 0.05	--	USGS
Tebuthiuron TP 109 (OH) ***(degradate of tebuthiuron)***	288 0	281 0	24 0	0 - 0.25	--	USGS
Tefluthrin	352 0	314 0	47 0	0.01 - 0.014	--	USGS
Terbacil	575 0	441 0	35 0	0 - 0.25	--	SWRCB USGS
Terbufos	858 0	790 0	51 0	0 - 0.018	--	USGS
Terbufos oxon ***(degradate of Terbufos)***	288 0	281 0	24 0	0 - 0.01	--	USGS

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Terbufos oxon sulfone *(degradate of Terbufos)*	1,180 0	805 0	51 0	0 - 0.05	--	USGS
Terbufos oxon sulfoxide *(degradate of Terbufos)*	288 0	281 0	24 0	0 - 0.01	--	USGS
Terbufos sulfoxide *(degradate of Terbufos)*	288 0	281 0	24 0	0 - 0.005	--	USGS
Terbuthylazine	892 0	805 0	51 0	0 - 0.05	--	USGS
Terbutryn	16 0	16 0	5 0	0.5	--	SWRCB
Tetrachloroethane	5,574 0	3,064 0	51 0	0.5	--	SWRCB
Tetraconazole[1]	576 3	281 3	24 3	0 - 0.315	0.001 - 0.037	USGS
Thiabendazole	25 0	25 0	9 0	0.004	--	USGS
Thiamethoxam	84 0	84 0	5 0	0.05	--	DPR
Thiobencarb[1]	2,977 1	1,966 1	55 1	0 - 1	0.003	DPR SWRCB USGS
Toxaphene	766 0	581 0	32 0	0.5 - 1	--	SWRCB

Pesticide or Degradate	Samples Taken / Positive Samples	Wells Sampled / Wells with Detections	Counties Sampled / Counties with Detections	‡Reporting Limit (ppb)	Detected Concentration Range (ppb)	Sampling Agency(s)
Trans-propiconazole	352 0	314 0	47 0	0.01 - 0.018	--	USGS
Triallate	288 0	281 0	24 0	0 - 0.05	--	USGS
Tribufos	891 0	805 0	51 0	0 - 0.1	--	USGS
Triclopyr	288 0	281 0	24 0	0 - 0.1	--	USGS
Trifloxystrobin[1]	288 1	281 1	24 1	0 - 0.003	0.001	USGS
Trifluralin[1]	742 4	679 4	48 2	0 - 0.022	0.001 - 0.006	SWRCB USGS
Uniconazole	84 0	84 0	5 0	0.05	--	DPR
Vernolate	16 0	8 0	2 0	1 - 2	--	SWRCB

‡ Some detection values listed in this table are below the reporting limit. Each reporting agency determines the value they will report regardless of "accepted" reporting limits. For instance, the SWRCB may report *estimated values*, which can be below reporting limits.

1 Pesticides detected

2 Pesticides detected that are not registered for use in California

DPR RESPONSES TO PESTICIDE DETECTIONS

As required under the PCPA (FAC section 13152[e][4]), this section of the annual report describes actions taken by DPR to mitigate the detection of agricultural use pesticides in groundwater (Table 2).

Table 2 summarizes detections of nonpoint agricultural source pesticides in groundwater in 2017 and previously unreported detections by the USGS and DPR's responses. Of the 86 agricultural use pesticide/degradate detections reported:

- 15 are pesticides (or degradates of a parent compound) listed under 3CCR section 6800(a) and already regulated as groundwater contaminants within GWPAs
- 28 are pesticides (or degradates of a parent compound) listed under 3CCR section 6800(b) as potential groundwater contaminants
- 24 are not listed under 3CCR sections 6800(a) or (b); one is a degradate of two parent compounds: one parent is listed under 3CCR section 6800(a) and the second parent is listed under 3CCR section 6800(b)
- 18 are no longer registered for use as a pesticide in California (e.g., detections from legacy pesticide use or from non-pesticidal use).

Table 2. Pesticides detected in groundwater in 2017 and previously unreported detections by the USGS. Detection concentrations and drinking water quality standards are reported in parts per billion (ppb). DPR response to agricultural use pesticide detections reported in 2017 and previously unreported detections by the USGS.

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	†Drinking Water Quality Standards (ppb)					*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b)
				CA MCL	OEHHA PHG	U.S. EPA MCL	U.S. EPA MCLG	††Cancer Group	‡DPR Response to Detections (0.04 ppb screening level)
1,2-Dichloropropane (1,2-D) (propylene dichloride)	94	45	0.001 – 2.6	5	0.5	5	0	B2	**Not registered for use in California since 1990.**
1,4-Dichlorobenzene (p-DCB)	7	2	0.011 - 3.26	5	6	75	75	C	This pesticide is not on the GWPL. --- This is the first reported detection of this pesticide in California. The two (2) wells with detections over the DPR screening level were determined not to be from legal agricultural use.

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	†Drinking Water Quality Standards (ppb)					*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b)
				CA MCL	OEHHA PHG	U.S. EPA MCL	U.S. EPA MCLG	††Cancer Group	‡DPR Response to Detections (0.04 ppb screening level)
2,4-D (2,4-dichlorophenoxy-acetic acid)	1	0	0.03	70	20	70	70	D	This pesticide is not on the GWPL. ----- No detections were over the DPR screening level.
2,6-Diethylaniline ***(degradate of alachlor)***	2	0	0.001 - 0.003	---	---	---	---	---	**Parent pesticide not registered for use in California since 2016.**
2-Hydroxyatrazine ***(degradate of atrazine)***	1	0	0.003	---	---	---	---	---	Parent pesticide is on the GWPL, 3CCR section 6800(a). ----- No detections were over the DPR screening level.
2-Isopropyl-6-methyl-4-pyrimidinol ***(degradate of diazinon)***	2	1	0.033 - 0.079	---	---	---	---	---	Parent pesticide is on the GWPL, 3CCR section 6800(b). ----- This is the first reported detection of this pesticide degradate in California. One (1) well had a detection that exeeded the DPR screening level. DPR is currently reviewing these results and is conducting further investigation.

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	†Drinking Water Quality Standards (ppb)					*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b)
				CA MCL	OEHHA PHG	U.S. EPA MCL	U.S. EPA MCLG	††Cancer Group	‡DPR Response to Detections (0.04 ppb screening level)
3,4-Dichloroaniline ***(degradate of diuron, propanil)***	12	1	0.006 - 0.089	---	---	---	---	---	Parent pesticides are on the GWPL, 3CCR section 6800(a) and (b), respectively. ----- Parent pesticide (believed to be diuron in this instance) is on the GWPL, 3CCR section 6800(a). One (1) well had a detection that exeeded the DPR screening level. DPR is currently reviewing these results and is conducting further investigation.
3,5-Dichloroaniline ***(degradate of iprodione, dichloran)***	5	0	0.002 - 0.005	---	---	---	---	---	Parent pesticides are on the GWPL, 3CCR section 6800(b). ----- No detections were over the DPR screening level.
4-Hydroxy chlorothalonil ***(degradate of chlorothalonil)***	1	1	0.088	---	---	---	---	---	Parent pesticide is on the GWPL, 3CCR section 6800(b). ----- This is the first reported detection of this pesticide degradate in California. One (1) well had a detection that exeeded the DPR screening level. DPR is currently reviewing these results and is conducting further investigation.

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	†Drinking Water Quality Standards (ppb)					*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b) ‡DPR Response to Detections (0.04 ppb screening level)
				CA MCL	OEHHA PHG	U.S. EPA MCL	U.S. EPA MCLG	††Cancer Group	
ACET (deisopropyl-atrazine or deethyl-simazine) ***(degradate of atrazine, simazine)***	89	75	0.003 - 0.743	---	---	---	---	---	Parent pesticides are on the GWPL, 3CCR section 6800(a). ----- Sixty-four (64) wells located in Ground Water Protection Areas (GWPAs) had detections that exceeded the DPR screening level.‡‡ Pesticide applications in GWPAs are made under the authority of the Restricted Materials permit program (applications are managed by County Agricultural Commissioners). Eleven (11) wells not in GWPAs had detections that exeeded the DPR screening level. DPR is currently reviewing these results and is conducting further investigation.
Acrylonitrile	1	1	0.21	---	---	---	---	B1	**Not registered for use in California. This chemical is also a product of industrial and hazardous waste sites.**
Atrazine	104	7	0.001 - 0.6	1	0.15	3	3	N	This pesticide is on the GWPL, 3CCR section 6800(a). ----- One (1) well with a detection over the DPR screening level is in a GWPA. Six (6) wells not in GWPAs had detections that exeeded the DPR screening level. DPR is currently reviewing these results and is conducting further investigation.

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	†Drinking Water Quality Standards (ppb)					*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b)
				CA MCL	OEHHA PHG	U.S. EPA MCL	U.S. EPA MCLG	††Cancer Group	‡DPR Response to Detections (0.04 ppb screening level)
Azoxystrobin	1	0	0.002	---	---	---	---	---	This pesticide is on the GWPL, 3CCR section 6800(b). ----- No detections were over the DPR screening level.
Benefin (benfluralin)	3	0	0.002 - 0.003	---	---	---	---	---	This pesticide is not on the GWPL. ----- No detections were over the DPR screening level.
Bentazon (Basagran®)	4	0	0.002 - 0.015	18	200	---	---	E	This pesticide is on the GWPL, 3CCR section 6800(a), and listed in 3CCR section 6457. ----- No detections were over the DPR screening level.
Bromacil	31	22	0.001 - 5.48	---	---	---	---	C	This pesticide is on the GWPL, 3CCR section 6800(a). ----- Twenty-one (21) wells with detections over the DPR screening level are in GWPAs. One (1) well not in a GWPA had a detection that exeeded the DPR screening level. DPR is currently reviewing these results and is conducting further investigation.

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	†Drinking Water Quality Standards (ppb)					*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b) ‡DPR Response to Detections (0.04 ppb screening level)
				CA MCL	OEHHA PHG	U.S. EPA MCL	U.S. EPA MCLG	††Cancer Group	
Camphor	2	0	0.021 - 0.035	---	---	---	---	---	This pesticide is not on the GWPL. --- No detections were over the DPR screening level.
Captan	1	1	0.27	---	---	---	---	---	This pesticide is not on the GWPL. --- One (1) well had a detection that exeeded the DPR screening level. DPR is currently reviewing these results and is conducting further investigation.
Carbon disulfide	53	53	0.1 - 5.2	---	---	---	---	---	**Not registered for use in California since 1987.**
Chloropicrin	1	0	0.032	---	---	---	---	---	This pesticide is on the GWPL, 3CCR section 6800(b). --- No detections were over the DPR screening level.
Chlorpyrifos	2	0	0.001 - 0.003	---	---	---	---	D	This pesticide is not on the GWPL. --- No detections were over the DPR screening level.

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	†Drinking Water Quality Standards (ppb)					*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b)
				CA MCL	OEHHA PHG	U.S. EPA MCL	U.S. EPA MCLG	††Cancer Group	‡DPR Response to Detections (0.04 ppb screening level)
Chlorsulfuron	1	0	0.007	---	---	---	---	---	This pesticide is on the GWPL, 3CCR section 6800(b). --- No detections were over the DPR screening level.
Chlorthal dimethyl (dacthal/DCPA)	1	0	0.001	---	---	---	---	---	This pesticide is not on the GWPL. --- No detections were over the DPR screening level. In March 2018, this pesticide was submitted for evaluation under the formal review process. This decision was based on groundwater detections of the DCPA degradation products (dacthal acid degradates) monomethyl tetrachloroterephthalate (MTP) and 2,3,5,6-tetrachloroterephthalic acid (TPA). DPR completed the formal review process for the dacthal acid degradates and they were found not to pollute at the levels detected.

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	†Drinking Water Quality Standards (ppb)					*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b)
				CA MCL	OEHHA PHG	U.S. EPA MCL	U.S. EPA MCLG	††Cancer Group	‡DPR Response to Detections (0.04 ppb screening level)
DACT (diaminochlorotriazine) ***(degradate of simazine)***	106	99	0.001 - 5.05	---	---	---	---	---	Parent pesticide is on the GWPL, 3CCR section 6800(a). ----- Seventy-nine (79) wells with detections over the DPR screening level are in GWPAs. Twenty (20) wells had detections that exeeded the DPR screening level. DPR is currently reviewing these results and is conducting further investigation.
Dacthal acid degradates	22	22	0.1 - 1.1	---	---	---	---	---	This pesticide is not on the GWPL. ----- Twenty-two (22) wells had detections over the DPR screening level. DPR completed the formal review process for dacthal acid degradates in 2018. These degradates were found not to pollute at the levels detected.
Dalapon	1	1	83	200	790	200	200	D	**Not registered for use in California since 1990.**
DBCP (1,2-dibromo-3-chloropropane)	370	239	0.008 - 1.32	0.2	0.0017	0.2	0	B2	**Not registered for use in California since 1990.**

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	†Drinking Water Quality Standards (ppb)					*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b)
				CA MCL	OEHHA PHG	U.S. EPA MCL	U.S. EPA MCLG	††Cancer Group	‡DPR Response to Detections (0.04 ppb screening level)
DEA (deethyl-atrazine) ***(degradate of atrazine)***	101	20	0.002 - 0.276	---	---	---	---	---	Parent pesticide is on the GWPL, 3CCR section 6800(a). ----- Five (5) wells with detections over the DPR screening level are located in GWPAs. Fifteen (15) wells not in GWPAs had detections that exeeded the DPR screening level. DPR is currently reviewing these results and is conducting further investigation.
Dechlorometolachlor ***(degradate of metolachlor)***	3	0	0.001 - 0.003	---	---	---	---	---	Parent pesticide is on the GWPL, 3CCR section 6800(b). ----- No detections were over the DPR screening level.
Demethyl fluometuron ***(degradate of fluometuron)***	2	0	0.001	---	---	---	---	---	**Parent pesticide not registered for use in California since 1990.**
Desisopropyl desethyl atrazine ***(degradate of atrazine)***	3	0	0.001 - 0.011	---	---	---	---	---	Parent pesticide is on the GWPL, 3CCR section 6800(a). ----- No detections were over the DPR screening level.
Dieldrin	2	1	0.011 - 0.065	---	---	---	---	B2	**Not registered for use in California since 1986.**

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	†Drinking Water Quality Standards (ppb)					*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b)
				CA MCL	OEHHA PHG	U.S. EPA MCL	U.S. EPA MCLG	††Cancer Group	‡DPR Response to Detections (0.04 ppb screening level)
Diflubenzuron	1	0	0.002	---	---	---	---	---	This pesticide is not on the GWPL. --- No detections were over the DPR screening level.
Dimethenamid ESA ***(degradate of dimethenamid)***	1	0	0.01	---	---	---	---	---	Dimethenamid-P is on the GWPL, 3CCR section 6800(b). --- No detections were over the DPR screening level.
Diuron	35	21	0.002 - 0.189	---	---	---	---	L	This pesticide is on the GWPL, 3CCR section 6800(a). --- Fifteen (15) wells with detections over the DPR screening level are in GWPAs. Six (6) wells not in GWPAs had detections that exeeded the DPR screening level. DPR is currently reviewing these results and is conducting further investigation.
Diuron-desmethyl ***(degradate of diuron)***	23	0	0.001 - 0.023	---	---	---	---	---	Parent pesticide is on the GWPL, 3CCR section 6800(a). --- No detections were over the DPR screening level.

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	†Drinking Water Quality Standards (ppb)					*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b)
				CA MCL	OEHHA PHG	U.S. EPA MCL	U.S. EPA MCLG	††Cancer Group	‡DPR Response to Detections (0.04 ppb screening level)
DSMN (desmethyl norflurazon or demethylnorflurazon) ***(degradate of norflurazon)***	53	32	0.001 - 1.17	---	---	---	---	---	Parent pesticide is on the GWPL, 3CCR section 6800(a). ----- Thirty-one (31) wells with detections over the DPR screening level are in GWPAs. One (1) well not in a GWPA had a detection that exeeded the DPR screening level. DPR is currently reviewing these results and is conducting further investigation.
EPTC (S-ethyl-dipropylthiocarbamate)	3	0	0.007 - 0.015	---	---	---	---	---	This pesticide is on the GWPL, 3CCR section 6800(b). ----- No detections were over the DPR screening level.
Ethylene dibromide (EDB)	9	3	0.008 - 0.17	0.05	0.01++	0.05	0	L	**Not registered for use in California since 1987.**
Ethylene dichloride	3	3	0.09 - 0.26	0.5	0.4	5	0	---	**Not registered for use in California since 1987.**
Fipronil sulfide ***(degradate of fipronil)***	5	0	0.003 - 0.007	---	---	---	---	---	Parent pesticide is not on the GWPL. ----- No detections were over the DPR screening level.

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	†Drinking Water Quality Standards (ppb)					*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b)
				CA MCL	OEHHA PHG	U.S. EPA MCL	U.S. EPA MCLG	††Cancer Group	‡DPR Response to Detections (0.04 ppb screening level)
Fipronil sulfonate ***(degradate of fipronil)***	1	1	0.107	---	---	---	---	---	Parent pesticide is not on the GWPL. ----- One (1) well had a detection that exeeded the DPR screening level. DPR is currently reviewing these results and is conducting further investigation.
Fipronil sulfone ***(degradate of fipronil)***	1	0	0.003	---	---	---	---	---	Parent pesticide is not on the GWPL. ----- No detections were over the DPR screening level.
Fipronil-carboxamide ***(degradate of fipronil)***	1	0	0.003	---	---	---	---	---	Parent pesticide is not on the GWPL. ----- No detections were over the DPR screening level.
Fludioxonil	1	1	0.066	---	---	---	---	---	This pesticide is on the GWPL, 3CCR section 6800(b). ----- This is the first reported detection of this pesticide in California. DPR has confirmed the single (1) detection in this well and is conducting further investigation.
Fluometuron	2	0	0.01	---	---	---	---	D	**Not registered for use in California since 1990.**

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	†Drinking Water Quality Standards (ppb)					*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b)
				CA MCL	OEHHA PHG	U.S. EPA MCL	U.S. EPA MCLG	††Cancer Group	‡DPR Response to Detections (0.04 ppb screening level)
Glyphosate	1	1	50	700	900	700	700	D	This pesticide is not on the GWPL. ----- The SWRCB resampled the single (1) well with reported detections and found no subsequent residues. DPR will monitor future results from this well before taking further action.
Hexazinone	20	2	0.001 - 0.353	---	---	---	---	D	This pesticide is on the GWPL, 3CCR section 6800(b). ----- DPR completed the formal review process for hexazinone in 2010. These detections were found not to pollute at the levels detected.
Hydroxy monodemethyl fluometuron ***(degradate of fluometuron)***	1	0	0.009	---	---	---	---	---	**Parent pesticide not registered for use in California since 1990.**
Hydroxymetolachlor ***(degradate of metolachlor)***	4	0	0.001 - 0.005	---	---	---	---	---	Parent pesticide is on the GWPL, 3CCR section 6800(b). ----- No detections were over the DPR screening level.
Hydroxysimazine ***(degradate of simazine)***	1	0	0.003	---	---	---	---	---	Parent pesticide is on the GWPL, 3CCR section 6800(a). ----- No detections were over the DPR screening level.

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	†Drinking Water Quality Standards (ppb)					*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b) ‡DPR Response to Detections (0.04 ppb screening level)
				CA MCL	OEHHA PHG	U.S. EPA MCL	U.S. EPA MCLG	††Cancer Group	
Imazaquin	1	0	0.004	---	---	---	---	---	**Not registered for use in California. Detected concentration is below the Reporting Limit.**
Imazethapyr	1	0	0.005	---	---	---	---	---	Imazethapyr ammonium salt is on the GWPL, 3CCR section 6800(b). ----- No detections were over the DPR screening level.
Imidacloprid	9	7	0.006 - 5.97	---	---	---	---	---	This pesticide is on the GWPL, 3CCR section 6800(b). ----- Two (2) wells had detections reported by USGS that exeeded the DPR screening level. DPR is currently reviewing these results and is conducting further investigation. Five (5) wells with detections were sampled by DPR. DPR is expanding sampling for study GW17 to include additional areas with high imidacloprid use and shallow groundwater.
Linuron	2	0	0.001 - 0.002	---	---	---	---	---	This pesticide is on the GWPL, 3CCR section 6800(b). ----- No detections were over the DPR screening level.

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	†Drinking Water Quality Standards (ppb)					*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b)
				CA MCL	OEHHA PHG	U.S. EPA MCL	U.S. EPA MCLG	††Cancer Group	‡DPR Response to Detections (0.04 ppb screening level)
Malathion	1	0	0.004	---	---	---	---	S	This pesticide is on the GWPL, 3CCR section 6800(b). ----- No detections were over the DPR screening level.
Methoxyfenozide	16	2	0.001 - 0.286	---	---	---	---	---	This pesticide is not on the GWPL. ----- This is the first reported detection of this pesticide in California. Two (2) wells had detections that exeeded the DPR screening level. DPR is currently reviewing these results and is conducting further investigation.
Methyl iodide	1	1	0.04	---	---	---	---	---	**Not registered for use in California since 2012.**
Metolachlor	10	1	0.001 - 0.105	---	---	---	---	C	This pesticide is on the GWPL, 3CCR section 6800(b). ----- The single (1) detection over the DPR screening level is in a non-agricultural area, miles from any potential use sites. DPR is contacting USGS for confirmation of this detection. No field investigation is planned.

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	†Drinking Water Quality Standards (ppb)					*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b)
				CA MCL	OEHHA PHG	U.S. EPA MCL	U.S. EPA MCLG	††Cancer Group	‡DPR Response to Detections (0.04 ppb screening level)
Metolachlor ESA *(degradate of metolachlor)*	13	11	0.004 - 4.37	---	---	---	---	---	Parent pesticide is on the GWPL, 3CCR section 6800(b). ----- DPR completed the formal review process for metolachlor degradates in 2016. These degradates were found not to pollute at the levels detected.
Metolachlor OXA *(degradate of metolachlor)*	2	2	0.11 - 0.213	---	---	---	---	---	Parent pesticide is on the GWPL, 3CCR section 6800(b). ----- DPR completed the formal review process for metolachlor degradates in 2016. These degradates were found not to pollute at the levels detected.
Metribuzin	1	0	0.007	---	---	---	---	D	This pesticide is on the GWPL, 3CCR section 6800(b). ----- No detections were over the DPR screening level.
Molinate	1	0	0.004	20	1	---	---	---	**Not registered for use in California since 2009.**
Myclobutanil	1	0	0.01	---	---	---	---	---	This pesticide is on the GWPL, 3CCR section 6800(b). ----- No detections were over the DPR screening level.

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	†Drinking Water Quality Standards (ppb)					*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b)
				CA MCL	OEHHA PHG	U.S. EPA MCL	U.S. EPA MCLG	††Cancer Group	‡DPR Response to Detections (0.04 ppb screening level)
Nicosulfuron	1	0	0.001	---	---	---	---	---	This pesticide is not on the GWPL. ----- No detections were over the DPR screening level.
Norflurazon	26	16	0.001 - 0.374	---	---	---	---	---	This pesticide is on the GWPL, 3CCR section 6800(a). ----- Sixteen (16) wells with detections over the DPR screening level are in GWPAs.
Oryzalin	3	0	0.004 - 0.036	---	---	---	---	---	This pesticide is on the GWPL, 3CCR section 6800(b). ----- No detections were over the DPR screening level.
Oxamyl	1	0	0.001	50	26	200	200	N	This pesticide is not on the GWPL. ----- No detections were over the DPR screening level.
Oxydisulfoton *(degradate of disulfoton)*	1	0	0.003	---	---	---	---	---	**Parent pesticide not registered for use in California since 2011.**
p-Cresol	3	1	0.01 - 0.08	---	--	---	---	---	**Not registered for use in California since 1991.**

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	†Drinking Water Quality Standards (ppb)					*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b)
				CA MCL	OEHHA PHG	U.S. EPA MCL	U.S. EPA MCLG	††Cancer Group	‡DPR Response to Detections (0.04 ppb screening level)
Pendimethalin	1	0	0.011	---	---	---	---	---	This pesticide is not on the GWPL. ----- No detections were over the DPR screening level.
Prometon	24	2	0.002 - 0.151	---	---	---	---	N	This pesticide is on the GWPL, 3CCR section 6800(a). ----- Two (2) wells with detections over the DPR screening level are in GWPAs.
Propanil	2	1	0.005 - 0.06	---	---	---	---	---	This pesticide is on the GWPL, 3CCR section 6800(b). ----- One (1) well had a detection that exeeded the DPR screening level. DPR is currently reviewing these results and is conducting further investigation.
Propazine	4	0	0.001 - 0.006	---	---	---	---	N	**Not registered for use in California since 1988.**
Propiconazole	1	0	0.005	---	---	---	---	---	This pesticide is on the GWPL, 3CCR section 6800(b). ----- No detections were over the DPR screening level.
Propoxur	10	0	0.001 - 0.003	---	---	---	---	---	This pesticide is not on the GWPL. ----- No detections were over the DPR screening level.

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	†Drinking Water Quality Standards (ppb)					*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b) ‡DPR Response to Detections (0.04 ppb screening level)
				CA MCL	OEHHA PHG	U.S. EPA MCL	U.S. EPA MCLG	††Cancer Group	
Simazine	176	60	0.001 - 0.128	4	4	4	4	N	This pesticide is on the GWPL, 3CCR section 6800(a). ----- Forty-nine (49) wells with detections over the DPR screening level are in GWPAs. Eleven (11) wells had detections that exeeded the DPR screening level. DPR is currently reviewing these results and is conducting further investigation.
Sulfentrazone	1	0	0.002	---	---	---	---	---	This pesticide is on the GWPL, 3CCR section 6800(b). ----- No detections were over the DPR screening level.
Sulfometuron methyl	2	0	0.001 - 0.002	---	---	---	---	---	This pesticide is on the GWPL, 3CCR section 6800(b). ----- No detections were over the DPR screening level.
Sulfosulfuron	1	0	0.001	---	---	---	---	---	This pesticide is not on the GWPL. ----- No detections were over the DPR screening level.
Tebufenozide	1	0	0.001	---	---	---	---	---	This pesticide is not on the GWPL. ----- No detections were over the DPR screening level.

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	†Drinking Water Quality Standards (ppb)					*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b) ‡DPR Response to Detections (0.04 ppb screening level)
				CA MCL	OEHHA PHG	U.S. EPA MCL	U.S. EPA MCLG	††Cancer Group	
Tebuthiuron	18	4	0.002 - 0.121	---	---	---	---	D	This pesticide is on the GWPL, 3CCR section 6800(b). ----- Four (4) wells had detections that exeeded the DPR screening level. DPR is currently reviewing these results and is conducting further investigation.
Tetraconazole	3	0	0.001 - 0.037	---	---	---	---	---	This pesticide is not on the GWPL. ----- No detections were over the DPR screening level.
Thiobencarb	1	0	0.003	70	42	---	---	---	This pesticide is on the GWPL, 3CCR section 6800(b). ----- No detections were over the DPR screening level.
Trifloxystrobin	1	0	0.001	---	---	---	---	--	This pesticide is not on the GWPL. ----- No detections were over the DPR screening level.
Trifluralin	4	0	0.001 - 0.006	---	---	---	---	C	This pesticide is not on the GWPL. ----- No detections were over the DPR screening level.

† Drinking water quality standards: MCL: maximum contaminant level; MCLG: maximum contaminant level goal; PHG: public health goal. Other acronyms used include: California (CA); Office of Environmental Health Hazard Assessment (OEHHA); United States Environmental Protection Agency (U.S. EPA).

- California (State Water Resources Control Board) MCL values are available at: http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Documents/DWdocuments/MCLsEPAvsDWP_2018_10_02.pdf.
- Office of Environmental Health Hazard Assessment public health goals available at: https://oehha.ca.gov/water/public-health-goals-phgs.
- U.S. EPA MCL, MCLG, and cancer risk (descriptor) designations derived from the publication *2018 Edition of the Drinking Water Standards and Health Advisories Tables* available at: https://www.epa.gov/dwstandardsregulations/2018-drinking-water-standards-and-advisory-tables.
- All health standards not found at sources listed above were derived from the *SWRCB water quality goal search app* available at: https://www.waterboards.ca.gov/water_issues/programs/water_quality_goals/search.html.

†† Cancer Group (descriptor) acronyms (U.S. EPA): (A) human carcinogen; (B1) probable human carcinogen—indicates limited human evidence; (B2) probable human carcinogen—sufficient evidence in animals and inadequate or no evidence in humans; (C) possible human carcinogen; (D) not classifiable as to human carcinogenicity; (E) evidence of noncarcinogenicity for humans; (L) likely to be carcinogenic to humans; (N) not likely to be carcinogenic in humans; (S) suggestive evidence of carcinogenic potential.

* Pesticides on the Groundwater Protection List (GWPL) 3CCR section 6800(a) or (b) are those labeled for agricultural, outdoor institutional, or outdoor industrial use that have the potential to pollute groundwater. Section 6800(a) includes seven agricultural herbicides that are regulated as groundwater contaminants: atrazine, bentazon, bromacil, diuron, norflurazon, prometon, and simazine. Section 6800(b) includes 98 pesticides that have the potential to become groundwater contaminants based on their mobility, persistence, and legal uses. The GWPL is available at: http://www.cdpr.ca.gov/docs/legbills/calcode/040101.htm.

If the detected pesticide is regulated as a groundwater contaminant under 3CCR section 6800(a)—and the well is located in a GWPA where use of the pesticide is regulated—current regulation of use is believed to constitute an adequate response to new detections *unless* concentrations are high enough to indicate existing mitigation measures are not adequate to prevent *pollution*. ("Pollution" is defined in FAC section 13142 as "…the consequence of polluting," and "pollute" means "to introduce a pesticide product into the groundwaters of the state resulting in an active ingredient, other specified ingredient, or a degradation product of a pesticide above a level that does not cause adverse health effects, accounting for an adequate margin of safety.")

‡ DPR responds only to detections of pesticides over the 0.04 ppb screening level unless the drinking water quality standard (health advisory goal/standard) is low. DPR's policy relative to its response to reported detections is available at: https://www.cdpr.ca.gov/docs/emon/grndwtr/polprocd/gwp071202.pdf.

‡‡ DPR does not investigate detections within GWPAs for pesticides (or their degradates) that are on the 6800(a) list of known groundwater contaminants (Schuette, 2004). Applications of these pesticides in GWPAs are managed by County Agricultural Commissioners via the **Restricted Materials** permit program. This program requires applicators to modify their pesticide use practices based on soil properties of the GWPA.

++ The Public Health Goal (PHG) for ethylene dibromide (EDB) is listed in the SWRCB (not OEHHA) data table under "More about MCLS and PHGs" at the following web address: http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/MCLsandPHGs.shtml. This is a January 10, 2018 update document.

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