



Department of Pesticide Regulation

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MEMORANDUM

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SUBJECT: SUMMARY OF IMIDACLOPRID GROUNDWATER DETECTIONS IN 2021

This memorandum summarizes the ten detections of imidacloprid in groundwater by the Department of Pesticide Regulation's (DPR) Groundwater Protection Program (GWPP) since the request to proceed with the pesticide detection response process for imidacloprid (Pham, 2021). The GWPP continually monitors for numerous pesticides and degradates on the Groundwater Protection List ([GWPL](#)) (Title 3 California Code of Regulations § 6800), including imidacloprid. The well water samples described in this memorandum were collected by the GWPP in 2021 and were analyzed by the California Department of Food and Agriculture, Center for Analytical Chemistry, using the updated Multi-Analyte Screen (CDFA, 2020). The updated method included new reporting limits (RL) and method detection limits (MDL) for all analytes. The updated RL and MDL for imidacloprid were 0.02 ppb and 0.00323 ppb, respectively.

In 2021, the GWPP detected imidacloprid in ten wells. Primary and backup samples were collected and analyzed for each of the ten wells (Table 1).

- Five wells had imidacloprid concentrations above the RL of 0.02 ppb in both samples. The concentrations ranged from 0.022 to 0.126 ppb.
- One well had imidacloprid concentrations near the RL of 0.02 ppb in both samples.
- Three wells had trace concentrations of imidacloprid below the RL but above the MDL of 0.00323 ppb in both samples.
- One well had a trace concentration near the MDL in one sample.

The concentrations of the imidacloprid detections in 2021 were in the same range as the detections previously reported (Table 1; Pham, 2021). All the detections above the RL were in sections that had previous detections of imidacloprid and these sections were included in the Legal Agricultural Use Determination (Aggarwal, 2021; Davalos, 2021).

Eight of the wells with imidacloprid detections were sampled as part of Study 228, the Well Network (Table 1; Davalos, 2021). Since 1999, the GWPP has monitored pesticide concentrations in a network of domestic wells located in Fresno and Tulare counties. Wells within this network are located in Ground Water Protection Areas (GWPA), which are areas vulnerable to groundwater contamination from the agricultural use of pesticides (Troiano et al., 2013). Since 2014, the GWPP has analyzed some of the well water samples with the Multi-Analyte Screen which includes imidacloprid. Due to the COVID-19 pandemic, DPR had to reduce chemical analyses. In 2021, the GWPP chose a subset of wells to analyze with the updated Multi-Analyte Screen (CDFA, 2020). Ten wells that had prior detections of analytes on this screen were chosen for analysis. One of these wells (Location Code 23) was not available for sampling this year because it was broken. A neighboring well was sampled as a replacement (Location Code 23B). Eight out of the ten wells analyzed for imidacloprid had detectable concentrations ranging from trace levels (0.009 ppb) to 0.126 ppb. All six of the imidacloprid detections above the RL in 2021 occurred in the wells from this study. Two of the wells had trace detections of imidacloprid.

Two new wells sampled in 2021 had trace concentrations of imidacloprid (Table 1). One well sampled in Siskiyou County for Study 330 (Kocis, 2021) had a trace imidacloprid detection (0.00686 ppb) in the backup sample. One well sampled as a part of Study Z598, a small-scale groundwater monitoring study in response to a reported detection of methoxyfenozide in a Fresno County well by another agency (Wong, 2013), had trace imidacloprid detections in the primary (0.012 ppb) and backup samples (0.0118 ppb).

Table 1. Summary of imidacloprid detections in 2021.

Study	County	Location ^a	Location Code	Previous Imidacloprid Detection ^b	Imidacloprid Concentrations ^c in 2021 (ppb)	
					Primary	Backup
228	Fresno	13S/22E-33	2	Trace (<0.05 ppb)	0.022	0.024
228	Fresno	14S/21E-13	5	Trace (<0.05 ppb)	Trace ^d (0.011)	Trace (0.01)
228	Fresno	14S/22E-14*	15	0.106 ppb	0.126	0.121
228	Fresno	14S/23E-34*	22	Trace (<0.05 ppb)	Trace (0.009)	Trace (0.01)
228	Fresno	14S/23E-35*	23B	NS	Trace (0.0194)	0.0253
228	Fresno	15S/21E-03*	24	0.112 ppb	0.088	0.082
228	Fresno	15S/21E-09*	26	0.053 ppb	0.0348	0.0342
228	Fresno	15S/22E-03*	29	0.053 ppb	0.045	0.046
330	Siskiyou	44N/06W-27	W127	NS	ND	Trace (0.00686)
Z598	Fresno	14S/21E-13	10-3	NS	Trace (0.012)	Trace (0.0118)

a. Meridian, township, range, and section of the well. A section is approximately one square mile.

b. Previous imidacloprid detections in these wells were included in Aggarwal (2021) and Davalos (2021).

c. Data in these columns apply only to the wells that have had at least one sample with an imidacloprid concentration above the method detection limit (0.00323) using method EMON-SM-05-032 Rev 1 (CDEA, 2020).

d. Trace = concentrations between the method detection limit (0.00323 ppb) and the reporting limit (0.02 ppb).

NS = well not previously sampled.

ND = non-detect = below the method detection limit (0.00323 ppb).

* Previous imidacloprid detections in these sections were used to make the Legal Agricultural Use determination (Aggarwal, 2021).

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