

Memorandum

To : Kean S. Goh
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1020 N Street, Room 161
Sacramento, California 95814-5624

Date : August 21, 1996

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

Subject: SUMMARY OF RESULTS FOR FY 1995-96 GROUND WATER PROTECTION
LIST MONITORING

BACKGROUND

In 1992, a group of 45 pesticide active ingredients (ai's) on the Ground Water Protection List [Title 3, California Code of Regulations, Section 6800 (b)] were prioritized for monitoring as previously described (1) and four of the ai's were monitored in seven counties (2). Those ai's were among 24 ai's in the first priority group of ai's requiring that 25-40 wells be sampled (1). As a continuation of that effort, six of the 20 ai's remaining in the first priority group were monitored during FY 1992-93 (3), five ai's were monitored in FY 1993-94 (4), and three were monitored in FY 1994-95 (5). This memorandum summarizes information on monitoring locations and analytical results for each of four ai's monitored during FY 1995-96.

METHODS

The ai's monitored were carbofuran, metalaxyl, oxydemeton-methyl, and propyzamide. Carbofuran was not listed in the ai's on the Ground Water Protection List in the 1992 memorandum (1). 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 Ground Water Protection List (6) (Table 1). Since 25-40 wells must be sampled for each ai according to the Ground Water Protection List monitoring protocol, additional wells remained to be sampled for each of these ai's.

Areas surveyed for potential well sampling locations were selected based on pesticide use reports for either 1992 or 1993. Sampling crews drove through preselected sections of land in each county with the goal of sampling one well per section. At each well site, six water samples were collected for the appropriate ai, consisting of one primary, one field blank, and four backup samples. The minimum detection limit (MDL) was 0.1 part per billion (ppb) for carbofuran, metalaxyl and oxydemeton-methyl and 0.05 ppb for propyzamide. Water samples from each well were also subjected to analytical screens which included nine herbicides: atrazine, bromacil, diuron, prometon, prometryn and simazine each with an MDL of 0.05 ppb and cyanazine, hexazinone, and metribuzin each with an MDL of 0.2 ppb.

RESULTS

A total of 115 wells were sampled in 20 counties (Table 1). Thirty-five wells were sampled for carbofuran, 27 for metalaxyl, 28 for oxydemeton-methyl, and 25 for propyzamide. None of the wells contained residues of those ai's. Atrazine was verified in one well in Butte County; simazine was verified in one well in Kern County and two wells in Sutter County; bromacil was verified in one well each in Kern, Monterey, and San Joaquin Counties. There was one unverified detection of diuron each in Monterey County and Kern County, and an unverified detection of simazine in Sutter County.

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Based on the data presented in Table 1, all required Ground Water Protection List well monitoring has been completed for carbofuran, metalaxyl, oxydemeton-methyl, and propyzamide. None of those ai's was detected in well water. No additional monitoring will be conducted unless a report of ground water contamination by one of those ai's are received.

REFERENCES CITED

1. Weaver, Don. March 9, 1992. Memorandum to John Sanders: Prioritization of chemicals on the ground water protection list.
2. Weaver, Don and Joe Marade. July 15, 1992. Memorandum to Kean Goh: Summary of results for FY 1991-92 ground water protection list monitoring.
3. Weaver, Donald J. and Joe Marade. August 23, 1993. Memorandum to John S. Sanders: Summary of results for FY 1992-93 ground water protection list monitoring.
4. Weaver, Don J. and Joe Marade. August 19, 1994. Memorandum to Kean S. Goh: Summary of results for FY 1993-94 ground water protection list monitoring.
5. Weaver, Donald J. and Joe Marade. June 30, 1995. Memorandum to Kean S. Goh: Summary of results for 1994-95 ground water protection list monitoring.
6. Johnson, B. R. et al. 1992. A test of procedures for determining the ground water protection list. EHAP Report EH 92-06.

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

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Table 1. Wells sampled for four Ground Water Protection List active ingredients during FY 1995-96.

County	Number of wells sampled for:			
	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		1
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			
FY 1995-96 Totals	35	27	28	25
Sampled 1990-91	0	6	6	0
Cumulative Total	35	33	34	25

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select coname, substr(chname,1,19) chemical, count (unique well) wells, sy
from widata, county, wichem
where chem in ('00106','02132', '00382','00694')
and widata.co=county.conum
and widata.chem=wichem.chnum
and agency='4323'
group by coname, substr(chname,1,19), sy
order by coname, substr(chname,1,19), sy

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CONAME	CHEMICAL	WELLS	SY
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Butte	CARBOFURAN	5	96
Colusa	CARBOFURAN	4	96
Contra Costa	CARBOFURAN	2	85
Fresno	CARBOFURAN	44	85
Fresno	METALAXYL	3	91
Fresno	OXYDEMETON-METHYL	1	96
Fresno	PROPYZAMIDE	3	96
Glenn	CARBOFURAN	33	86
Glenn	CARBOFURAN	1	96
Kern	CARBOFURAN	32	85
Kern	CARBOFURAN	2	96
Kern	METALAXYL	5	96
Kern	OXYDEMETON-METHYL	2	96
Kern	PROPYZAMIDE	1	96
Kings	CARBOFURAN	12	85
Lake	CARBOFURAN	1	86
Madera	CARBOFURAN	10	85
Merced	CARBOFURAN	19	85
Merced	METALAXYL	3	96
Monterey	CARBOFURAN	22	85
Monterey	CARBOFURAN	4	96
Monterey	METALAXYL	1	91
Monterey	METALAXYL	4	96
Monterey	OXYDEMETON-METHYL	10	96
Monterey	PROPYZAMIDE	4	96
Riverside	CARBOFURAN	10	85
Sacramento	CARBOFURAN	3	96
Sacramento	PROPYZAMIDE	3	96
San Benito	OXYDEMETON-METHYL	2	96
San Benito	PROPYZAMIDE	2	96
San Bernardino	CARBOFURAN	12	85
San Joaquin	CARBOFURAN	21	85
San Joaquin	CARBOFURAN	7	92
San Joaquin	CARBOFURAN	6	96
San Joaquin	METALAXYL	2	91
San Joaquin	METALAXYL	3	96
San Joaquin	OXYDEMETON-METHYL	3	91
San Joaquin	PROPYZAMIDE	1	96

CONAME	CHEMICAL	WELLS	SY
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San Luis Obispo	CARBOFURAN	2	85
San Luis Obispo	OXYDEMETON-METHYL	1	96
San Luis Obispo	PROPYZAMIDE	2	96
San Mateo	OXYDEMETON-METHYL	1	96
Santa Barbara	CARBOFURAN	6	85
Santa Barbara	METALAXYL	2	96
Santa Barbara	OXYDEMETON-METHYL	4	96
Santa Barbara	PROPYZAMIDE	3	96
Santa Clara	OXYDEMETON-METHYL	1	96
Santa Cruz	CARBOFURAN	7	85
Santa Cruz	OXYDEMETON-METHYL	2	96
Santa Cruz	PROPYZAMIDE	3	96
Stanislaus	CARBOFURAN	13	85
Sutter	CARBOFURAN	5	96
Sutter	METALAXYL	4	96
Tulare	CARBOFURAN	25	85
Tulare	CARBOFURAN	3	95
Tulare	CARBOFURAN	3	96
Tulare	OXYDEMETON-METHYL	3	91
Tulare	OXYDEMETON-METHYL	2	96
Ventura	METALAXYL	3	96
Ventura	OXYDEMETON-METHYL	2	96
Ventura	PROPYZAMIDE	3	96
Yolo	CARBOFURAN	1	96
Yolo	METALAXYL	3	96
Yuba	CARBOFURAN	1	96

Table 1. 1995 -1996 Ground Water Protection List Well Monitoring Results For Carbofuran In Butte, Colusa, Glenn, Kern, Monterey, Sacramento, San Joaquin, Sutter, Tulare, Yolo, and Yuba Counties during June and August 1995.

County	T/R-S ^a	Loc	Concentration (ppb) ^b					
			Carbofuran	Atrazine	Simazine	Diuron	Prometon	Bromacil
Butte	20N02E08	C0401	ND ^c	0.08 0.05	ND ND	ND ND	ND ND	ND ND
Butte	20N01E22	C0402	ND	ND	ND	ND	ND	ND
Butte	19N02E24	C0403	ND	ND	ND	ND	ND	ND
Butte	19N03E06	C0404	ND	ND	ND	ND	ND	ND
Butte	20N02E25	C0405	ND	ND	ND	ND	ND	ND
Colusa	15N03W21	C0601	ND	ND	ND	ND	ND	ND
Colusa	17N03W34	C0602	ND	ND	ND	ND	ND	ND
Colusa	17N03W07	C0603	ND	ND	ND	ND	ND	ND
Colusa	15N02W07	C0604	ND	ND	ND	ND	ND	ND
Glenn	20N02W14	C1101	ND	ND	ND	ND	ND	ND
Kern	31S/30E-21	C1501	ND	ND	ND	ND	ND	ND
Kern	25S/26E-34	C1502	ND	ND	ND	ND	ND	ND
Monterey	19S/07E-05	C2701	ND	ND	ND	ND	ND	ND
Monterey	17S/06E-26	C2702	ND	ND	ND	ND	ND	ND
Monterey	16S/05E-16	C2703	ND	ND	ND	ND	ND	ND
Monterey	14S/02E-13	C2704	ND	ND ND	ND ND	0.05 ND	ND ND	ND ND
Sacramento	10N04E32	C3401	ND	ND	ND	ND	ND	ND
Sacramento	07N06E23	C3402	ND	ND	ND	ND	ND	ND
Sacramento	07N07E09	C3403	ND	ND	ND	ND	ND	ND

Table 1. 1995 -1996 Ground Water Protection List Well Monitoring Results For Carbofuran In Butte, Colusa, Glenn, Kern, Monterey, Sacramento, San Joaquin, Sutter, Tulare, Yolo, and Yuba Counties during June and August 1995.

County	T/R-S ^a	Loc	Concentration (ppb) ^b					
			Carbofuran	Atrazine	Simazine	Diuron	Prometon	Bromacil
San Joaquin	04N08E24	C3901	ND	ND	ND	ND	ND	ND
San Joaquin	04N08E24	C3902	ND	ND	ND	ND	ND	ND
San Joaquin	03N07E20	C3903	ND	ND	ND	ND	ND	ND
San Joaquin	03N06E19	C3904	ND	ND ND	ND ND	ND ND	ND ND	0.06 0.078
San Joaquin	01S08E08	C3905	ND	ND	ND	ND	ND	ND
San Joaquin	02N09E19	C3906	ND	ND	ND	ND	ND	ND
Sutter	17N02E34	C5101	ND	ND	ND	ND	ND	ND
Sutter	16N02E24	C5102	ND	ND ND	0.08 0.059	ND ND	ND ND	ND ND
Sutter	15N02E36	C5103	ND	ND ND	0.12 0.086	ND ND	ND ND	ND ND
Sutter	12N04E10	C5104	ND	ND	ND	ND	ND	ND
Sutter	13N04E34	C5105	ND	ND ND	0.06 ND	ND ND	ND ND	ND ND
Tulare	23S/26E-12	C5401	ND	ND	ND	ND	ND	ND
Tulare	24S/27E-21	C5402	ND	ND	ND	ND	ND	ND
Tulare	24S/26E-03	C5403	ND	ND	ND	ND	ND	ND
Yolo	09N01W02	C5701	ND	ND	ND	ND	ND	ND
Yuba	16N04E22	C5801	ND	ND	ND	ND	ND	ND

- a. T/R-S = Township / Range - Section.
- b. ppb = parts per billion.
- c. None detected at the minimum detection limit of 0.1 ppb for carbofuran and 0.05 ppb for all other chemicals.

Table 2. 1995 -1996 Ground Water Protection List Well Monitoring Results For Metalaxyl In Kern, Merced, Monterey, San Joaquin, Santa Barbara, Sutter, Ventura, and Yolo Counties during September 1995.

County	T/R-S ^a	Location	Concentration (ppb) ^b					
			Metalaxyl	Atrazine	Simazine	Diuron	Prometon	Bromacil
Kern	27S25E19	M1501	ND ^c	ND	ND	ND	ND	ND
Kern	27S25E33	M1502	ND	ND	ND	ND	ND	ND
Kern	30S29E29	M1503	ND	ND ND	0.10 0.10	ND 0.05	ND ND	0.614 0.46
Kern	30S29E26	M1504	ND	ND	ND	ND	ND	ND
Kern	28S25E03	M1505	ND	ND	ND	ND	ND	ND
Merced	09S11E13	M2401	ND	ND	ND	ND	ND	ND
Merced	06S11E02	M2402	ND	ND	ND	ND	ND	ND
Merced	05S11E35	M2403	ND	ND	ND	ND	ND	ND
Monterey	20S08E06	M2701	ND	ND	ND	ND	ND	ND
Monterey	15S04E28	M2702	ND	ND	ND	ND	ND	ND
Monterey	14S03E11	M2703	ND	ND	ND	ND	ND	ND
Monterey	15S03E07	M2704	ND	ND	ND	ND	ND	ND
San Joaquin	01S07E08	M3901	ND	ND	ND	ND	ND	ND
San Joaquin	03S07E03	M3902	ND	ND	ND	ND	ND	ND
San Joaquin	01S08E06	M3903	ND	ND	ND	ND	ND	ND
Santa Barbara	10N26W23	M4201	ND	ND	ND	ND	ND	ND
Santa Barbara	10N25W30	M4202	ND	ND	ND	ND	ND	ND

Table 2 continued. 1995 -1996 Ground Water Protection List Well Monitoring Results For Metalaxyl In Kern, Merced, Monterey, San Joaquin, Santa Barbara, Sutter, Ventura, and Yolo Counties during September 1995.

County	T/R-S ^a	Location	Concentration (ppb) ^b					
			Metalaxyl	Atrazine	Simazine	Diuron	Prometon	Bromacil
Sutter	12N02E23	M5101	ND	ND	ND	ND	ND	ND
Sutter	12N02E10	M5102	ND	ND	ND	ND	ND	ND
Sutter	14N01E08	M5103	ND	ND	ND	ND	ND	ND
Sutter	13N02E08	M5104	ND	ND	ND	ND	ND	ND
Ventura	01N21W03	M5601	ND	ND	ND	ND	ND	ND
Ventura	01N21W22	M5602	ND	ND	ND	ND	ND	ND
Ventura	02N20W08	M5603	ND	ND	ND	ND	ND	ND
Yolo	11N02E24	M5701	ND	ND	ND	ND	ND	ND
Yolo	10N01E25	M5702	ND	ND	ND	ND	ND	ND
Yolo	10N02E04	M5703	ND	ND	ND	ND	ND	ND

a. T/R-S = Township / Range - Section.

b. ppb = parts per billion.

c. None detected at the minimum detection limit of 0.1 ppb for metalaxyl and 0.05 ppb for all other chemicals.

Table 3 . 1995-1996 Ground Water Protection List Well Monitoring Results For Oxydemeton-Methyl In Fresno, Kern, Monterey, San Benito, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, Tulare, and Ventura Counties during April 1996. All wells were tested for oxydemeton-methyl, atrazine, simazine, diuron, prometon, and bromacil.

County	T/R-S ^a	Loc	Concentration (ppb) ^b					
			Oxydemeton-methyl	Atrazine	Simazine	Diuron	Prometon	Bromacil
Fresno	15S17E-23	10-01	ND ^c	ND	ND	ND	ND	ND
Kern	11N/22W-09	15-01	ND ^c	ND	ND	ND	ND	ND
Kern	29S/23E-25	15-02	ND	ND	ND	ND	ND	ND
Monterey	20S/08E-05	27-01	ND ^c	ND	ND	ND	ND	ND
Monterey	19S/06E-01	27-02	ND	ND	ND	ND	ND	ND
Monterey	18S/06E-01	27-03	ND	ND	ND	ND	ND	ND
Monterey	16S/05E-19	27-04	ND	ND	ND	ND	ND	ND
Monterey	17S/05E-36	27-05	ND	ND	ND	ND	ND	ND
Monterey	15S/03E-35	27-06	ND	ND	ND	ND	ND	ND
Monterey	15S/04E-07	27-07	ND	ND	ND	ND	ND	ND
Monterey	14S/03E-10	27-08	ND	ND	ND	ND	ND	0.08 0.088
Monterey	12S/02E-31	27-09	ND	ND	ND	ND	ND	ND
Monterey	14S/02E-26	27-10	ND	ND	ND	ND	ND	ND
San Benito	12S/05E-23	35-01	ND ^c	ND	ND	ND	ND	ND
San Benito	13S/04E-02	35-02	ND	ND	ND	ND	ND	ND
San Luis Obispo	10N/35W-04	40-01	ND ^c	ND	ND	ND	ND	ND
San Mateo	08S/05W-09	41-01	ND ^c	ND	ND	ND	ND	ND
Santa Barbara	10N/34W-21	42-01	ND ^c	ND	ND	ND	ND	ND
Santa Barbara	10N/35W-10	42-02	ND	ND	ND	ND	ND	ND
Santa Barbara	10N/35W-16	42-03	ND	ND	ND	ND	ND	ND
Santa Barbara	10N/33W-30	42-04	ND	ND	ND	ND	ND	ND

Table 3 . 1995-1996 Ground Water Protection List Well Monitoring Results For Oxydemeton-Methyl In Fresno, Kern, Monterey, San Benito, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, Tulare, and Ventura Counties during April 1996. All wells were tested for oxydemeton-methyl, atrazine, simazine, diuron, prometon, and bromacil.

County	T/R-S ^a	Loc	Concentration (ppb) ^b					
			Oxydemeton-methyl	Atrazine	Simazine	Diuron	Prometon	Bromacil
Santa Clara	11S/04E-21	43-01	ND ^c	ND	ND	ND	ND	ND
Santa Cruz	12S/01E-11	44-01	ND ^c	ND	ND	ND	ND	ND
Santa Cruz	11S/02E-35	44-02	ND	ND	ND	ND	ND	ND
Tulare	23S/24E-09	54-01	ND ^c	ND	ND	ND	ND	ND
Tulare	21S/26E-22	54-02	ND	ND	ND	ND	ND	ND
Ventura	02N/22W-30	56-01	ND ^c	ND	ND	ND	ND	ND
Ventura	01N/21W-08	56-02	ND	ND	ND	ND	ND	ND

a. T/R-S = Township / Range - Section.

b. ppb = parts per billion.

c. None detected at the minimum detection limit of 0.1 ppb for oxydemeton-methyl and 0.05 ppb for all other chemicals.

Table 4. 1995-1996 Ground Water Protection List Well Monitoring Results For Propyzamide In Fresno, Kern, Monterey, Sacramento, San Benito, San Joaquin, San Luis Obispo, Santa Barbara, Santa Cruz, and Ventura Counties During October and November 1995. All wells were tested for propyzamide, atrazine, simazine, diuron, prometon, and bromacil.

County	T/R-S ^a	Location	Concentration (ppb) ^b					
			Propyzamide	Atrazine	Simazine	Diuron	Prometon	Bromacil
Fresno	21S16E02	P01	ND ^c	ND	ND	ND	ND	ND
Fresno	21S17E06	P02	ND	ND	ND	ND	ND	ND
Fresno	20S18E32	P03	ND	ND	ND	ND	ND	ND
Kern	31S28E24	P01	ND	ND	ND	ND	ND	ND
Monterey	18S06E06	P01	ND	ND	ND	ND	ND	ND
Monterey	14S03E31	P02	ND	ND	ND	ND	ND	ND
Monterey	15S03E03	P03	ND	ND	ND	ND	ND	ND
Monterey	14S03E09	P04	ND	ND	ND	ND	ND	ND
Sacramento	06N/07E02	P01	ND	ND	ND	ND	ND	ND
Sacramento	06N/07E18	P02	ND	ND	ND	ND	ND	ND
Sacramento	05N/07E03	P03	ND	ND	ND	ND	ND	ND
San Benito	12S04E33	P01	ND	ND	ND	ND	ND	ND
San Benito	12S04E36	P02	ND	ND	ND	ND	ND	ND
San Joaquin	02S06E04	P01	ND	ND	ND	ND	ND	ND
San Luis Obispo	11N35W25	P01	ND	ND	ND	ND	ND	ND
San Luis Obispo	32S13E28	P02	ND	ND	ND	ND	ND	ND

Table 4 continued. 1995-1996 Ground Water Protection List Well Monitoring Results For Propyzamide In Fresno, Kern, Monterey, Sacramento, San Benito, San Joaquin, San Luis Obispo, Santa Barbara, Santa Cruz, and Ventura Counties During October and November 1995. All wells were tested for propyzamide, atrazine, simazine, diuron, prometon, and bromacil.

County	T/R-S ^a	Location	Concentration (ppb) ^b					
			Propyzamide	Atrazine	Simazine	Diuron	Prometon	Bromacil
Santa Barbara	10N34W07	P01	ND	ND	ND	ND	ND	ND
Santa Barbara	07N35W26	P02	ND	ND	ND	ND	ND	ND
Santa Barbara	10N35W09	P03	ND	ND	ND	ND	ND	ND
Santa Cruz	11S02E28	P01	ND	ND	ND	ND	ND	ND
Santa Cruz	12S02E02	P02	ND	ND	ND	ND	ND	ND
Santa Cruz	12S02E08	P03	ND	ND	ND	ND	ND	ND
Ventura	02N20W09	P01	ND	ND	ND	ND	ND	ND
Ventura	02N21W34	P02	ND	ND	ND	ND	ND	ND
Ventura	01N21W21	P03	ND	ND	ND	ND	ND	ND

a. T/R-S = Township / Range - Section.

b. ppb = parts per billion.

c. None detected at the minimum detection limit of 0.05 ppb for all chemicals.