



Contact:
Bill Walker (415) 561-6698
Zev Ross (415) 561-6699

November 1999

Tap Water in 38 Central Calif. Cities Tainted With Banned Pesticide -- Some Bottle-Fed Infants May Exceed 'Safe' Dose Before Age 1

Executive Summary

The tap water of about 1 million Californians, mostly in the San Joaquin Valley, is contaminated with a long-banned pesticide that is one of the most potent carcinogens known, according to an Environmental Working Group (EWG) analysis of state data. Yet California's current drinking water standards for the compound allow exposure to 100 times the "safe" adult dose and almost 300 times the "safe" dose for infants and children.

EWG's computer-assisted analysis of water utility test results for DBCP in finished water leaving treatment plants found that DBCP contaminates tap water in 38 water systems in nine counties. Fresno, Riverside, Clovis, Lodi and Madera are the largest communities with serious contamination problems (Table 1).

In all 38 of these communities, the tap water delivered to homes, schools and businesses contains levels of DBCP well above the levels considered safe by the state for other cancer-causing compounds -- the so-called negligible, or one in one million, risk level. In 31 communities, average DBCP contamination levels for 1996 through 1998 were from 10 to 200 times the amount associated with a "negligible" risk of cancer (Spath 1988).

DBCP is a potent carcinogen and perhaps the most powerful testicular toxin ever made. The pesticide causes genetic mutations and cancer in every species of animal on which it has been tested, in both sexes and by all routes of exposure -- ingestion, contact with the skin, and inhalation. It is classified as a probable human carcinogen by the U.S. Environmental Protection Agency, and the World Health Organization classifies it as "having sufficient evidence of carcinogenicity." According to University of California researchers, DBCP can "abolish" testicular function in test animals that are administered just a single dose of the compound (Reed et al. 1987).

Infants and children at highest risk

The current legal limit for DBCP in California tap water does not protect infants and children. For example, the risk assessments used by the state to establish safe exposure limits do not acknowledge that bottle-fed babies drink seven times more water relative to their size than adults. EWG corrected the state's risk estimates to account for infants who drink contaminated tap water mixed in their formula and also bathe in DBCP-tainted water. We found that the current legal contamination limit, or MCL, allows 285 times more DBCP in tap water than would normally be considered safe for infants.

Table 1: Thirty-eight California communities where DBCP levels exceed cancer risk standards.

Water System	City	Population Served	Avg. DBCP Conc (ppb) 1996-98	Multiple of Safe Adult Dose	Multiple of Safe Child Dose
Carrillo Water System	Shafter	50	0.434	217	620
Sun World International Inc.-Com Center	Bakersfield	250	0.194	97	277
Tulco Water Company	Visalia	720	0.184	92	263
U C Shafter Research Station	Shafter	26	0.181	91	259
Malaga County Water District	Fresno	1,000	0.166	83	237
Madera-City	Madera	35,515	0.138	69	197
Exeter City of	Exeter	8,131	0.116	58	166
Parlier City of	Parlier	10,000	0.113	57	161
Lindsay City of	Lindsay	8,970	0.091	46	130
Bakman Water Company	Fresno	8,500	0.088	44	126
Lodi City of	Lodi	53,903	0.084	42	120
Clovis City of	Clovis	70,535	0.074	37	106
LSID - Tonyville	Lindsay	400	0.071	36	101
Cutler PUD	Cutler	4,000	0.058	29	83
Riverside City of	Riverside	245,000	0.057	29	81
City of Sanger	Sanger	17,380	0.055	28	79
Delhi CWD	Delhi	3,280	0.048	24	69
Fresno City of	Fresno	390,350	0.045	23	64
Reedley City of	Reedley	21,000	0.043	22	61
Wasco City of	Wasco	13,774	0.037	19	53
Delano Grower's Grape Products	Delano	43	0.033	17	47
Earlimart PUD	Earlimart	6,500	0.030	15	43
Ceres City of	Ceres	30,038	0.028	14	40
Ripon City of	Ripon	8,200	0.025	13	36
Visalia - California Water Service	San Jose	82,300	0.025	13	36
Kingsburg City of	Kingsburg	8,335	0.023	12	33
Ivanhoe Public Utility Dist	Ivanhoe	5,000	0.023	12	33
City of Hughson	Hughson	3,381	0.022	11	31
Delano City of	Delano	29,944	0.020	10	29
Vaughn WC Inc	Bakersfield	11,906	0.020	10	29
Modesto City of	Modesto	180,320	0.020	10	29
California Water Service - Selma	San Jose	16,250	0.016	8	23
Lamont PUD	Lamont	12,690	0.015	8	21
Tulare City of	Tulare	39,800	0.012	6	17
Dinuba City of	Dinuba	14,192	0.010	5	14
Caruthers Comm Serv Dist	Caruthers	1,660	0.005	3	7
City of Modesto De Hillcrest	Modesto	805	0.004	2	6
Orosi Public Utility District	Orosi	5,486	0.004	2	6
Total		1,343,343			
Average			0.069	34	98

SOURCE: Environmental Working Group, from water suppliers' test results, 1996-98

Based on current levels of contamination, all of which are legal, EWG estimates that in 19 California communities including Fresno, Riverside, Clovis, Madera and Lodi, the average bottle-fed infant who drinks formula reconstituted with tap water receives a lifetime's dose of DBCP by his or her first birthday (Table 2). By the time these children are one year old, their cancer risk from DBCP exceeds the one in one million level of risk generally deemed acceptable by state and federal regulators. In 11 communities these bottle-fed infants receive a lifetime dose in the first six months of life.

Twenty years after it was banned, DBCP is still found in the tap water of at least 1 million Californians at levels that present a high degree of risk. Because it takes 140 years for DBCP to completely degrade under average groundwater conditions in California, for all practical purposes DBCP will remain in the drinking water of these communities until action is taken to clean it up or bring alternative water supplies to the affected areas.

Table 2: Formula-fed children in 19 communities get a lifetime dose of DBCP by age one

Water System	City	Population Served	Age of child at one in a million cancer risk (months old)
Carrillo Water System	Shafter	50	1.0
Sun World International Inc.-Com Center	Bakersfield	250	2.2
Tulco Water Company	Visalia	720	2.3
U C Shafter Research Station	Shafter	26	2.3
Malaga County Water District	Fresno	1,000	2.5
Madera-City	Madera	35,515	3.0
Exeter City of	Exeter	8,131	3.6
Parlier City of	Parlier	10,000	3.7
Lindsay City of	Lindsay	8,970	4.8
Bakman Water Company	Fresno	8,500	5.0
Lodi City of	Lodi	53,903	5.3
Clovis City of	Clovis	70,535	6.2
LSID - Tonyville	Lindsay	400	6.5
Cutler PUD	Cutler	4,000	8.1
Riverside City of	Riverside	245,000	8.3
City of Sanger	Sanger	17,380	8.7
Delhi CWD	Delhi	3,280	10.2
Fresno City of	Fresno	390,350	10.9
Reedley City of	Reedley	21,000	11.4
Wasco City of	Wasco	13,774	14.0
Delano Grower's Grape Products	Delano	43	16.0
Earlimart PUD	Earlimart	6,500	18.6
Ceres City of	Ceres	30,038	20.3
Ripon City of	Ripon	8,200	22.8
Visalia - California Water Service	San Jose	82,300	23.2
Kingsburg City of	Kingsburg	8,335	26.2
Ivanhoe Public Utility Dist	Ivanhoe	5,000	25.6
City of Hughson	Hughson	3,381	27.0
Delano City of	Delano	29,944	30.6
Vaughn WC Inc	Bakersfield	11,906	30.1
Modesto City of	Modesto	180,320	30.8
California Water Service - Selma	San Jose	16,250	39.8
Lamont PUD	Lamont	12,690	45.0
Tulare City of	Tulare	39,800	56.2
Dinuba City of	Dinuba	14,192	68.1
Caruthers Comm Serv Dist	Caruthers	1,660	197.6
City of Modesto De Hillcrest	Modesto	805	222.9
Orosi Public Utility District	Orosi	5,486	282.9
Total		1,349,634	
Average			34

SOURCE: Environmental Working Group, from water suppliers' test results, 1996-98

State health standards for DBCP are incredibly weak. They do virtually nothing to protect Californians, but instead, legalize unsafe levels of exposure to the pesticide. They allow 100 times more DBCP in tap water than is generally considered a safe level of exposure to carcinogens, and nearly 300 times the generally recognized safe level when state estimates are corrected to accurately reflect infant exposure via tap water and bathing.

Recommendations

- The state must set a legal contamination limit, or MCL, for DBCP that reflects a safe level of exposure. EWG recommends an MCL of 0.001 parts per billion (ppb).

But this alone will not solve the problem. People in the affected communities deserve clean tap water, as it was before the actions of the pesticide industry and state regulators combined to pollute it with DBCP. To achieve that goal EWG recommends:

- The state must immediately provide funds to the affected communities to either treat water with advanced carbon and pollutant separation techniques to remove DBCP from finished tap water, or obtain new sources of drinking water that are not contaminated with any amount of DBCP.
- The state should take legal action against the manufacturers of DBCP to recoup all costs associated with cleanup, securing alternative water sources and monitoring for all communities with any amount of DBCP in their tap water.
- The manufacturers should also be forced to compensate all property owners served by water systems contaminated with DBCP for any decrease in property values associated with DBCP contamination drinking water.
- Manufacturers should also pay all costs incurred by individuals with private wells to clean up, filter or reduce DBCP contamination or to obtain a new clean supply of drinking water.

Failures by the state

Two actions by the State of California produced this weak health standard for DBCP in tap water. The first was the decision that the cost of cleaning up the water did not justify the health protections that it would provide to the people who drink and bathe in it. The second is the fact that infants and children are ignored in the process of setting a safe exposure level.

Documents from the California Department of Health Services show that the state never seriously considered setting an enforceable limit for DBCP contamination at a point that would provide the normal level of health protection for the public that is typically applied to potent cancer causing substances. DHS risk assessments from the late 1980s show that the lowest level considered (and ultimately rejected) as a maximum contaminant limit was fifty times higher than what the DHS described at that time as the level that would normally be considered a safe dose — the one in one million cancer risk level (Spath 1988).

Part of the reason that DHS never seriously considered a truly safe health standard for DBCP is that DBCP is such a potent pesticide that it is not possible to detect an amount small enough to be safe. Any detection carries risks that are above the traditional one in one million negligible risk level.

The safe level calculated by DHS, 0.002 parts per billion, is five times smaller than the lowest detectable amount, 0.010 ppb. Even so, the state could have provided a much greater safety margin for the public by setting the safe level at the limit of detection. Regulators rejected this option because in their judgment the additional public health protections were not worth the money.

This illustrates a major breakdown in environmental law and regulation. Under current policy, both the health risks and the full cost of cleanup are shouldered by the public, even though the public is the only truly innocent party in the process. The manufacturer who produced it, farmers who used it and state regulators who licensed it can all walk away from the problem. Only the people who had nothing to do with it are faced with the prospect of drinking and bathing in contaminated water, or paying tens of millions of dollars to clean it up. Notably, the communities drinking contaminated water were never given the option to decide whether they wanted to spend the money to clean up their tap water.

No protections for infants and children

The most glaring error in the risk assessment used by the state to set the current MCL for DBCP is the assumption that an individual consumes a constant amount of water over a lifetime, when measured in milligrams of water per kilograms of body weight. This assumption is severely out of step with contemporary risk assessment techniques, and greatly off target in terms of what infants and children really drink. By using this assumption, DHS assumes a water consumption level for infants that is less than what 99 percent of all bottle fed babies actually drink. Put another way, DHS fails to protect 99 percent of all bottle fed babies drinking formula made with tap water from DBCP during the critical first four months of life.

By using these outdated assumptions, DHS overlooks the fact that many children get a lifetime dose of DBCP in their first years of life. Using infant tap water consumption data reported by the U.S. Department of Agriculture for 1994 through 1996, EWG estimates that in 19 California communities, an average bottle fed baby drinking formula reconstituted with tap water will get a lifetime dose of DBCP by his or her first birthday. In 11 towns, bottle fed babies will get a lifetime dose of DBCP by six months of age.

DBCP is a potent carcinogen and perhaps the most powerful testicular toxin ever made. The pesticide causes genetic mutations and cancer in every species of animal on which it has been tested, in both sexes and by all routes of exposure (ingestion, dermal contact, and inhalation). It is classified as a probable human carcinogen by the U.S. EPA, and is considered to have sufficient evidence of carcinogenicity by the World Health Organization. According to the University of California researchers, DBCP can “abolish” testicular function in test animals administered just a single dose of the compound (Reed et al. 1987).

Dangers during crucial developmental periods

Boys run serious risk of reproductive damage if DBCP exposure occurs during critical periods of development: in utero, during infancy, and again during puberty. Everyone exposed is at risk from the carcinogenic effects of the compound, but children are generally

recognized as being more susceptible than adults to potent carcinogens like DBCP. Childhood cancer rates have risen steadily over the past 30 years, and exposure to cancer causing environmental contaminants like DBCP is now considered by many experts to be part of the cause of this increase.

After correcting the DHS risk estimates to include DBCP exposure via tap water used to reconstitute infant formula during the first four months of life, EWG estimates that current safeguards allow 285 times more DBCP in tap water than would normally be considered safe by the state of California. But even this estimate does not include any adjustment for the increased vulnerability of infants and children to carcinogens.

A recent review of proposed revisions to the federal cancer risk assessment guidelines by scientists at the University of California, published in the National Institute of Health, Environmental Health Perspectives, characterized the flaws in the current cancer risk assessment methods this way:

Risk assessment methods for carcinogens have not considered the timing of doses of carcinogens during a human lifetime. Models used to estimate dose and response do not consider the age at which doses are applied. A given dose of a carcinogen counts the same at 70 years of age as it does at five. Because there is considerable evidence that doses received earlier in life are more likely to result in development of cancer than doses received late in life, this approach would be expected to underestimate risks of doses received during childhood.

There is no evidence to suggest that exposure standards based on assumptions about adult toxicity, susceptibility, and exposure will adequately protect infants and children. Quite the contrary, there is sufficient evidence for some agents to believe they may not. The proposed carcinogen risk assessment guidelines should incorporate language that will provide infants and children with needed protection (Buffler and Kyle 1999).

The DHS risk assessment assumes that a dose of DBCP consumed at one month of age presents the same risk as a dose at age 60. It also assumes that relative to their size, infants and children, even bottle fed babies, are exposed to the same amount of DBCP as adults. Both of these assumptions are wrong, and both undermine what little protection the current MCL provides to the public.

References

Buffler, Patricia A. and Amy D. Kyle. 1999. Carcinogen risk assessment guidelines and children. Environmental Health Perspectives. 107(6). P. A 286.

Reed et al. 1987, Health Risk Assessment of 1,2, dibromo-3-chloropropane (DBCP) in California Drinking Water, Department of Environmental Toxicology, University of California, Davis. State of California Contract number 84-84571.

Spath, Dave. 1988. MCL for Dibromochloropropane (DBCP). Memo to Peter A. Rogers, Chief, Public Water Supply Branch, California Department of Health Services. October 19, 1988.