

## VOLUNTARY TESTS SHOW NO LINK BETWEEN DRINKING WATER AND BREAST CANCER

Although decades of testing have shown that our water is free of contamination, we have expanded our efforts using leading-edge analytical technologies to address local concerns about drinking water and breast cancer. The results continue to show no link between breast cancer and our drinking water. We will continue to do our part to help find a science-based answer, sharing our findings with researchers and the community.

Environmental toxins that may contribute to breast and other cancers include herbicides, pesticides and similar organic chemicals. Some of these toxins act like hormones on humans. They are known as "endocrine disruptors" and, along with hormones, are the focus of our expanded test program. One of the new tests, called E-Screen Assay, uses human breast cancer cells to detect any estrogenic endocrine-disrupting chemicals. The best feature of the E-Screen Assay is that it can detect any chemical that behaves like an estrogenic endocrine disruptor, including ones that have yet to be named or discovered. All of our testing continues to show no contamination of our drinking water. For more information on our expanded test program visit the water quality section of our web site: [www.marinwater.org](http://www.marinwater.org)

### SPECIAL NOTICE for IMMUNO-COMPROMISED PERSONS

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

**Atención, consumidores que hablan español:** Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien. Para mas informacion en Español, llame 415-945-1568.

**Attention Landlords and Other Property Managers:** We recommend that landlords and other property managers display this report in a public location such as a lobby, laundry room or community room. If you would like to receive additional copies of this report, please call MMWD's Water Quality Laboratory at 415-945-1550.



MARIN MUNICIPAL  
WATER DISTRICT

**PUBLIC MEETINGS** MMWD's Board of Directors meets at 7:30 PM on the first and third Wednesdays of every month in the District Board Room, 220 Nellen Ave., Corte Madera. All board meetings are open to the public.

Cover art: *Sylvia Verange, Mt. Tamalpais – Bon Tempe Lake 2*  
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# WATER 2008 ANNUAL *Quality* REPORT



MARIN MUNICIPAL  
WATER DISTRICT

# MMWD'S Drinking Water SOURCES

In 2007, 72 percent of the potable water we distributed came from rainfall captured in MMWD's seven reservoirs. Five of these reservoirs are located within 18,500 acres of protected watershed on Mt. Tamalpais, while the other two reservoirs are in the grassy hills of west Marin. The remaining 28 percent was supplied through a contract with the Sonoma County Water Agency (SCWA). The source is groundwater wells and Russian River water that is filtered naturally through 60 feet of riverbed sand and gravel. Regardless of origin, the water we deliver surpasses state and federal health standards.

## Drinking Water Source Assessment for MMWD Surface Water Reservoirs

In April 2003 the California Department of Public Health conducted a Drinking Water Source Assessment of MMWD's drinking water sources. The purpose of this assessment is to identify potential sources of contamination if any exist and to communicate the findings to you, the customer.

The main findings of the drinking water source assessment are summarized below:

For the five reservoirs on the Mt. Tamalpais watershed (Lagunitas, Bon Tempe, Alpine, Kent and Phoenix), the surrounding watershed is described as "pristine and forested." These sources are considered to be the most vulnerable from recreation use in the area. However, no contaminants associated with this activity were detected in the drinking water.

For Nicasio Reservoir, the surrounding watershed is described as grassy hills and classified as agricultural and rural residential. This source is considered most vulnerable to concentrated animal feeding operations (i.e., local dairy operations). However, no contaminants associated with this activity were detected in the drinking water.

For Soulaajule Reservoir, the surrounding watershed is described as grassy hills and classified as agricultural and rural residential. This source is considered most vulnerable to historic mining operations. However, no contaminants associated with this activity were detected in the drinking water.

Soulaajule is the site of an old mercury mine, but regular testing has shown that there is no detectable mercury in the reservoir water. Even though there is no mercury in the water, there are signs in the area warning people about mercury levels in some species of fish due to something called bioaccumulation. This occurs not just in Soulaajule, but in Tomales Bay, San Francisco Bay, the Pacific Ocean, and other water bodies around the world. This is how bioaccumulation works: Minute amounts of mercury in the sediment are ingested by tiny plants and animals that live in or near the sediment. They become food for small aquatic creatures, which are eaten by larger ones. The most active predators accumulate the most mercury, which can be amplified by 1 million or more times as it passes up the food chain.

## Drinking Water Source Assessment for SCWA Groundwater Supply

In January 2001, Coastland Engineering, on behalf of the California Department of Public Health, conducted a drinking water source assessment for SCWA's water sources. The purpose of this assessment is to identify potential sources of contamination if any exist and to communicate the findings to you, the customer.

SCWA's source water is extracted from the groundwater table, or aquifer, via 15 separate wells, located at Wohler and Mirabel roads. This aquifer is recharged by subsurface flows and Russian River water filtering down through the gravel riverbed. The Agency's three wells in the Santa Rosa Plain extract water from another groundwater table.

Most of the SCWA water supply comes from wells at Wohler and Mirabel roads adjacent to the Russian River. These sources are considered to be the most vulnerable from wastewater treatment and gravel mining in the area. However, no contaminants associated with these activities were detected in the drinking water.

SCWA also operates three groundwater wells on the Santa Rosa Plain near Occidental Road, Todd Road and Sebastopol Road. These sources are considered to be the most vulnerable from animal feeding operations. However, no contaminants associated with this activity were detected in the drinking water.

Copies of both complete assessments may be viewed at the California Department of Public Health, Drinking Water Field Operations Branch, 50 D Street, Suite 200, Santa Rosa, CA 95404. You may request a summary of the assessments by contacting the office at 707-576-2145 (voice) or 707-576-2722 (fax).



## UNDERSTANDING THIS REPORT

To help you better understand this report, key definitions are shown below.

**Maximum Contaminant Level (MCL):** The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste and appearance of drinking water.

**Maximum Contaminant Level Goal (MCLG):** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the US Environmental Protection Agency.

**Public Health Goal (PHG):** The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

**Maximum Residual Disinfectant Level (MRDL):** The level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap.

**Maximum Residual Disinfectant Level Goal (MRDLG):** The level of a disinfectant added for water treatment below which there is no known or expected risk to health. MRDLGs are set by the US Environmental Protection Agency.

**Primary Drinking Water Standard (PDWS):** MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements and water treatment requirements.

**Treatment Technique (TT):** A required process intended to reduce the level of a contaminant in drinking water.

**Regulatory Action Level (AL):** The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

*This information is provided in compliance with requirements established by the California Department of Public Health and the US Environmental Protection Agency and as a policy of the Marin Municipal Water District to inform customers of the contents of their drinking water and water quality standards.*

*This report and additional water quality information is available on our web site: [www.marinwater.org](http://www.marinwater.org)*



everything  
starts  
with water

### Federally Required General Information about Drinking Water

*Federal regulations require us to include the following information in this report. Because it is general information, it does not necessarily apply to the drinking water provided by MMWD. Information specific to MMWD's drinking water can be found in the tables below.*

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (1-800-426-4791).

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

In order to ensure that tap water is safe to drinking, the US Environmental Protection Agency (USEPA) and the State Department of Health Services (Department) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. Department regulations also establish limits for contaminants in bottled water that must provide the same protection for public health.

### Federally Required Information About Potential Drinking Water Contaminants

Contaminants that may be present in source (untreated) water include:

- Microbial contaminants, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.
- Inorganic contaminants, such as salts and metals, that can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.
- Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals, that are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, agricultural applications and septic systems.
- Radioactive contaminants, which can be naturally occurring or can be the result of oil and gas production and mining activities.



*Corte Madera Creek with Mt. Tam*

### Cryptosporidium and Giardia

Cryptosporidium and giardia are microscopic waterborne protozoa that can cause serious illness in immuno-compromised individuals. Neither one of these microbial parasites has ever been detected in MMWD's drinking water.

To further safeguard our customers from these microbes, MMWD has participated in a voluntary national program called the Partnership for Safe Water. The program, managed jointly by the EPA and the American Water Works Association, consists of a rigorous self-assessment and peer-review of treatment operations with the goal of improving water quality and reducing the risk from cryptosporidium and giardia.

In addition, MMWD and other Bay Area water agencies sponsored a program developed by the California Department of Health Services to monitor cryptosporidiosis infections. The average number of cryptosporidiosis cases in all of Marin County from 1996 to 2002 is five per year. Since cryptosporidiosis may be contracted from a variety of sources besides drinking water, these data suggest that the risk of contracting these microbes from the public water supply is extremely low. However, people with immune system disorders should discuss with their physicians ways to further reduce this risk, or call the EPA's Safe Drinking Water Hotline (1-800-426-4791).



*Cabin above Phoenix Lake*

**DETECTED CONSTITUENTS WITH PRIMARY MCL, AL, or TT**

DISTRIBUTION SYSTEM (blend of reservoir and SCWA waters)							
CONSTITUENT	UNITS	MCLG (PHG)	MCL	AVERAGE	RANGE	NO. SAMPLES	SOURCE
Coliform Bacteria	% presence	0	5	0.2	0-0.7	NA	Naturally present in the environment
Copper	mg/L	(0.17)	1.3 [1]	0.1[2]	ND-0.14	50	Internal corrosion of household plumbing systems
Lead	ug/L	(2)	15 [1]	ND [2]	ND-23	50	Internal corrosion of household plumbing systems
Haloacetic Acids	ug/L	NA	60	16 [4]	ND-47	NA	By-product of drinking water disinfection
Total Trihalomethanes	ug/L	NA	80 [3]	31 [4]	7-64	NA	By-product of drinking water disinfection
Chloramines	mg/L	4 [5]	4 [5]	1.37	ND-3.1	NA	Drinking water disinfectant
Uranium	pCi/L	(0.43)	20	ND	ND-2.3	24	Erosion of natural deposits

- [1] Action level for 90th percentile value.
- [2] The sixth highest value out of 50 values (90th percentile) is listed. One of these 50 samples exceeded 15 mg/L.
- [3] Compliance is based on the four quarter running average of distribution system samples.
- [4] Highest of the four running annual averages in 2007.
- [5] Maximum Disinfection Residual Level (MRDL) is a term used for disinfectants such as chloramine; in contrast to Maximum Contaminant Level (MCL) used for other parameters. Maximum Residual Disinfectant Level Goal (MRDLG) is the same as MCL. Disinfectants provide protection from viruses and bacteria, such as E. coli.

SOURCE WATER							
CONSTITUENT	SOURCE	UNITS	MCLG (PHG)	MCL (AL)	AVERAGE	RANGE	SOURCE
Radium 228	Reservoirs	pCi/L	0	NA	ND [1]	ND-1.1	Erosion of natural deposits
Fluoride	SCWA	mg/L	(1)	2	0.1	ND-0.17	Erosion of natural deposits
	Reservoirs	mg/L	(1)	2	ND	ND-0.1	Erosion of natural deposits
Boron	SCWA	mg/L	NA	(1)	0.29	0.29	Erosion of natural deposits

[1] 2007 data. NOTE: An additional 19 inorganic parameters and 318 synthetic organic compounds were monitored in 2007. None were detected.

CONSTITUENT	UNITS	PHG	TT	Minimum % meeting turbidity limits		SOURCE
					RANGE	
Reservoir Water	NTU	NA	0.3 [1]	100%	0.05 - 0.09	Soil runoff
Reservoir Water	NTU	NA	1 [2]	100%	0.05 - 0.09	Soil runoff

- [1] 95% of all readings shall be less than or equal to this value.
- [2] No single reading shall exceed 1 NTU.

**OTHER DETECTED CONSTITUENTS INCLUDING THOSE WITH SECONDARY MCLS (SMCL)**

CONSTITUENT	UNITS	Reservoir Water		SCWA Water		SOURCE	
		SMCL	AVERAGE	RANGE	AVERAGE		RANGE
Odor	TON	3	ND	ND	ND	ND-1	Naturally occurring organic materials
Chloride	mg/L	500	27	21-34	8	8-9	Runoff/leaching of natural deposits
Specific Conductance	uS/cm	1,600	206	181-260	288	258-310	Substances that form ions in water
Sulfate	mg/L	500	7	4-18	13	11-15	Runoff/leaching of natural deposits, treatment chemicals
Total Dissolved Solids	mg/L	1,000	116	97-132	161	157-165	Runoff/leaching of natural deposits
Turbidity	NTU	5	0.08	0.05-0.14	0.1	0.06-0.24	Soil runoff
Zinc	mg/L	5	0.42	0.28-0.55	0.28	0.28-0.30	Corrosion inhibitor
Sodium	mg/L	NA	18	14-24	20	19-21	
Hardness [1]	mg/L	NA	62	52-70	104	94-110	
Hardness	grains/gal	NA	3.6	3.0-4.1	6.1	5.5-6.4	
Alkalinity [1]	mg/L	NA	56	47-72	123	114-135	
Radon*	pCi/L	NA	NA	NA	145	ND-450	See note below

\*Radon is a naturally occurring radioactive gas of geologic origin that is found throughout the United States. It can migrate into indoor air through soil or cracks in foundations. Tap water contributions to indoor air are small by comparison. Breathing air containing radon can lead to lung cancer. Drinking water containing radon may also cause increased risk of stomach cancer. The radon data in the table above is measured at individual wells operated by SCWA. The radon level in water entering the MMWD system from the SCWA system is lower and averaged 144 pCi/L in 2007. These levels are far

below the regulatory limit of 300 and 4000 pCi/L once proposed and later withdrawn by USEPA. For additional information, contact USEPA's radon hotline (800-767-7236). If you are concerned about radon, test the air in your home. Fix your home if the level of radon in your air is 4 pCi/L or higher. USEPA data for radon in the North Bay: Average outdoor air is 0.4 pCi/L and average indoor air is 2 pCi/L.

[1] Expressed as Calcium Carbonate or CaCO3.

**DISTRIBUTION SYSTEM FLUORIDE**

UNITS	TT	AVERAGE	RANGE
mg/L	0.7-1.3	0.9	0.8-1.1

Fluoride occurs naturally in almost all surface and ground waters. Following a voter initiative passed by MMWD customers in 1972 to fluoridate the water, the fluoride level is maintained at 0.9 mg/L, the optimum level for cavity prevention. Extensive research over the past 50 years has shown that individuals who drink fluoridated water have fewer dental caries. Adding fluoride to drinking water is one of the most cost-effective ways of inhibiting tooth decay.


**ABBREVIATIONS**

- mg/L ..... Milligrams per liter (equals parts per million)
- ug/L ..... Micrograms per liter (equals parts per billion)
- TON ..... Threshold Odor Number
- NA ..... Not Applicable
- ND ..... Not Detected
- CU ..... Color Units
- pCi/L ..... PicoCuries per liter
- uS/cm ..... microSiemens per centimeter
- NTU ..... Nephelometric Turbidity Units
- SCWA ..... Sonoma County Water Agency


### What is 1 mg/L?

**One milligram per liter = one part per million.**


Here are some equivalent ratios to help you understand the figures in this report more easily.



one cent  
in \$10,000



one minute  
in 2 years




one inch  
in 16 miles

ON THE COVER: SYLVIA VERANGE  
**MT. TAMALPAIS, BON TEMPE LAKE #2**

*"I create paintings that express a classical sense of beauty in a contemporary format, focusing on the spirit of place to present images of tranquility and peace.*

*I am concerned with the interplay of shapes and colors, often abstracting forms of the natural world. I work in several different mediums, including pastels, charcoal, pencils, and watercolors..."*



Verange's paintings hang in over 100 corporate and private collections across the US and Europe. See more of this local artist's work at [SylviaVerange.com](http://SylviaVerange.com)