



# City of Vacaville 2011 Drinking Water Quality Report to Consumers

2011 Drinking Water Quality Report to Consumers  
Distributed to all Postal Customers



## THE CITY OF VACAVILLE:

wants you, our customers, to know that your water system has met all water quality standards established by the U.S. Environmental Protection Agency (USEPA) and the California State Department of Public Health (DPH) and is a safe and reliable supply. In 2011 Vacaville distributed over 5.2 billion gallons of drinking water. This water was subjected to extensive testing, not only for regulated contaminants, but also for non-regulated. More than 7,000 analyses were performed on water samples in 2011.

In order to ensure that tap water is safe to drink, the USEPA and the DPH prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. DPH regulations also establish limits for contaminants in bottled water that provide the same protection for public health. 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 at (1-800-426-4791), or visit the web site at <http://www.epa.gov/safewater/>.

For a full table of analyses of Vacaville's water and other facts, see our web site at <http://www.cityofvacaville.com>. We would like to hear your comments on this report and invite you to join our source water protection efforts. Please contact the City of Vacaville Water Quality Lab Supervisor, Therese Spence by phone at (707) 469-6400 or by email at [tspence@cityofvacaville.com](mailto:tspence@cityofvacaville.com).

## SOURCES OF WATER & CONTAMINANTS:

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. Vacaville's water supply consists of two surface water sources and 12 deep groundwater wells. Lake Berryessa surface water, conveyed through Putah South Canal (PSC), provided 28% of the City's total consumption; and Sacramento Delta surface water, from the North Bay Aqueduct (NBA), provided an additional 41% in the year 2011. Groundwater from the 12 deep wells made-up the balance (31%) of our water needs. Treatment for surface water is divided between the Vacaville Water Treatment Plant (VWTP), located on Allison Drive and the North Bay Regional Water Treatment Plant (NBR), located on Peabody Road. The VWTP treats PSC source water only, while the NBR plant, which is jointly-owned by the cities of Vacaville and Fairfield, treats both PSC and NBA source waters. The deep groundwater wells are located on or near Elmira Road, Orange Drive, and Vaca Valley Parkway.

### POLICY ON NONDISCRIMINATION ON THE BASIS OF DISABILITY

In accordance with the requirements of Title II of the Americans with Disabilities Act of 1990, the City of Vacaville ("City") does not discriminate against qualified individuals with disabilities on the basis of disability in the City's services, programs or activities, or employment. Information, comments, requests for accommodations or barrier removal, and/ or complaints concerning the accessibility of City programs, services or activities to persons with disabilities should be directed to the City's ADA Coordinator, 650 Merchant Street, 449-5409, 449-5162 (TTY), or [ada@cityofvacaville.com](mailto:ada@cityofvacaville.com).



## CONTAMINANTS THAT MAY BE PRESENT IN SOURCE 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 stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming;
- Pesticides and herbicides that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses;
- Organic chemical contaminants, including synthetic and volatile organic chemicals, that are by-products of industrial processes and petroleum production and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems; and
- Radioactive contaminants that can be naturally-occurring or be the result of oil and gas production and mining activities.





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## SOURCE WATER ASSESSMENTS AND VULNERABILITY SUMMARIES:

A Source Water Assessment evaluates the quality of water that is used in a community drinking water supply. It is also used to determine the Potential Contributing Activities (PCAs) that occur nearby and within a source water supply. The PCAs are then compiled into a Vulnerability Summary report. The latest Vulnerability Summary report for the Sacramento Delta, including the Barker Slough North Bay Aqueduct (NBA), was completed in 2006. The source was considered to be most vulnerable to cattle and sheep grazing activities in the watershed associated with turbidity, total organic carbon, and coliform bacteria detected in the water supply. Approximately 85% of the watershed is grazing land or irrigated pastures. The cities treating NBA water, in conjunction with the Solano County Water Agency, have implemented watershed management practices to improve water quality and reduce the significance of the potential contaminant sources. The latest Vulnerability Summary report for Putah South Canal (PSC) was completed in 2006. PSC was determined to have a physical barrier effectiveness rating of "low." The results of the assessment survey indicated that PSC is most vulnerable to illegal activities/unauthorized dumping and herbicide application. Management measures along the canal have been implemented that mitigate the risk for each of these PCAs. The Vulnerability Summaries for Vacaville's groundwater wells were performed in 2002, 2003, and 2005. The wells are considered most vulnerable to automobile gas stations, chemical and petroleum processing and storage, dry cleaners, septic systems, sewer collection systems, agricultural drainage and agricultural and irrigation wells. The wells offer various levels of protection from PCAs due to factors such as characteristics of the aquifer, deep water table intakes, well construction features and physical barriers. A copy of the Source Water Assessment(s) and Vulnerability Summaries can be obtained through the California DPH, Drinking Water Field Operations Branch, San Francisco District Office, 850 Marina Bay Parkway, Bldg P, 2nd Floor, Richmond, California 94804. You may request that a summary be sent to you by contacting Betty Graham, District Engineer, California Department of Public Health, at (510) 620-3474.

## LEAD IN DRINKING WATER:

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with older service lines and home plumbing. The City of Vacaville is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline at 800-426-4791 or at <http://www.epa.gov/safewater/lead>.

## Protect Your Water Supply

Polluted stormwater potentially affects drinking water sources, which can affect public health and increase drinking water treatment costs. Please help protect your water supply by controlling household, landscaping and automotive products that contain toxic chemicals. Reduce the use of toxic chemicals wherever possible (including fertilizers and pesticides) and be sure to properly recycle or dispose of waste. Everything that goes down a storm drain or sewer may potentially affect your local water. Never dispose of household, landscaping or automotive products and chemicals down the storm drain or in the sewer.

## MONITORING

The City monitors your drinking water for more than 100 different constituents. Some constituents are tested daily to ensure the water is safe to drink. Only those constituents detected are reported in the tables. More information can be obtained about monitoring requirements, contaminants and potential health effects by calling the USEPA's Safe Drinking Water Hotline (800-426-4791) or by visiting the EPA's web site at [www.epa.gov/safewater/hfacts.html](http://www.epa.gov/safewater/hfacts.html).

## ARSENIC IN DRINKING WATER:

### Vacaville Meets the Limit

While arsenic levels in your drinking water are less than the current USEPA standard of 10 ppb, the groundwater does contain low levels of arsenic. Results in this report are from samples taken in 2011. The standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. The USEPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.



## HEALTH RELATED INFORMATION

### PRECAUTIONS FOR PEOPLE WITH WEAKENED IMMUNE SYSTEMS:

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised people such as those with cancer undergoing chemotherapy, people 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. USEPA and Center for Disease Control guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants can be obtained by calling USEPA's Safe Drinking Water Hotline (800-426-4791) or visiting the web site at [www.epa.gov/](http://www.epa.gov/).



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## Substances Reported in Calendar Year 2011

### Primary Standards: Health-Related Standards

GROUND WATER						
CLARITY	UNITS	MCL	PHG (MCLG)	Range	Average	DRINKING WATER SOURCES
Turbidity	ntu	TT	NA	0.09 - 0.5	0.106	Soil runoff.
INORGANIC CHEMICALS						
Aluminum	ppb	1000	600	ND - 88	8	Erosion of natural deposits; residue from some surface water treatment processes.
Arsenic	ppb	10	0.004	ND - 7.6	2.7	Erosion of natural deposits, glass and electronics production waste.
Barium	ppm	1	2	0.72 - 0.140	0.10	Erosion of natural deposits.
Chromium	ppb	50	100	1.7 - 22	10	Discharge from chrome plating and erosion of natural deposits.
Fluoride	ppm	2	1	0.15 - 0.36	0.19	Erosion of natural deposits.
Lead	ppb	AL= 15	0.2	ND - 0.97	0.14	Erosion of natural deposits.
Nitrate (as N)	ppm	10	10	0.4 - 5.2	2.0	Runoff and leaching from fertilizer use; leaching from septic tanks; erosion of natural deposits.
Perchlorate	ppb	6	6	ND - 4.3	0.39	Perchlorate is an inorganic chemical used in solid rocket propellant, fireworks, explosives, flares, matches, and a variety of industries. It usually gets into drinking water as a result of environmental contamination from historic aerospace or other industrial operations that used or use, store, or dispose of perchlorate and its salts.
RADIOACTIVITY						
Gross Beta Activity	pCi/L	50	0	ND - 5.0	ND	Decay of natural and man-made deposits.
Uranium	pCi/L	20	0.43	1.1 - 3.2	1.7	Erosion of natural deposits.
SURFACE WATER - NBR						
CLARITY	UNITS	MCL	PHG (MCLG)	Highest Detection	Percent in Compliance (<0.5 ntu)	DRINKING WATER SOURCES
Turbidity (a)	ntu	TT	NA	0.08	100%	Soil runoff.
ORGANIC CHEMICALS						
Total Trihalomethanes	ppb	80	NA	4.8 - 12	8.9	Byproduct of drinking water disinfection.
INORGANIC CHEMICALS						
Aluminum	ppb	1000	600	21 - 98	48	Erosion of natural deposits; residue from some surface water treatment processes.
Barium	ppm	1000	2000	0.034 - 0.044	0.041	Erosion of natural deposits.
Fluoride	ppm	2	1	0.11 - 0.15	0.13	Erosion of natural deposits.
Nitrate (as N)	ppm	10	10	ND - 1.7	0.9	Runoff and leaching from fertilizer use and septic tanks; erosion of natural deposits.
SURFACE WATER - VWTP						
CLARITY	UNITS	MCL	PHG (MCLG)	Highest Detection	Percent in Compliance (<0.5 ntu)	DRINKING WATER SOURCES
Turbidity (a)	ntu	TT	NA	0.2	100%	Soil runoff.
ORGANIC CHEMICALS						
Total Trihalomethanes	ppb	80	none	30	30	Byproduct of drinking water disinfection.
INORGANIC CHEMICALS						
Arsenic	ppb	10	0.004	2	2	Erosion of natural deposits, glass and electronics production waste.
Barium	ppm	1000	2000	0.042	0.042	Erosion of natural deposits.
Fluoride	ppm	2	1	0.077	0.077	Erosion of natural deposits.

#### HOW TO READ THE TABLES:

The test results are divided into the following tables: Health-Based Primary Standards; Aesthetic-Based Secondary Standards; and Unregulated Constituents.

Monitoring unregulated constituents helps USEPA and DPH to determine where contaminants occur and whether to regulate them. To read the tables, start with the far left column titled Constituent Detected and read across the row. Units express the amount measured. MCL shows the highest amount of constituent allowed. PHG (MCLG) is the goal amount for that constituent, which may be a lower amount than the amount allowed. The Range reports the lowest and highest amounts detected and the Avg is the annual average. Major Sources in Drinking Water describes where the substance usually originates. To better understand the report, use the Legend that defines the terms used.



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City of Vacaville Water Treatment Plant

## LEGEND:

MCL (Maximum Contaminant Level): 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.

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

PHG (Public Health Goal): 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.

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

MRDL (Maximum Residual Disinfectant Level): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

MRDLG (Maximum Residual Disinfectant Level Goal): The level of a drinking water disinfectant below which there is no known or expected risk to health, MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

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

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

NA: Not applicable or Not available at this time.

ND: Not Detected.

ntu: Nephelometric Turbidity Units. This is the standard unit for turbidity measurement.

pCi/L: Pico Curies per Liter.

µS/cm: unit of measure for conductance.

ppm: Parts Per Million or Milligrams Per Liter (mg/L). (30 seconds in 1 year)

ppb: Parts Per Billion or Micrograms Per Liter (ug/L). (3 seconds in 100 years).

ton: Total Odor Number.

(a): Range is maximum monthly value; 100% represents the lowest percentage of samples which meet monthly compliance limit of 0.5 ntu. Turbidity is a measure of water cloudiness. It is a good indicator of filtration effectiveness.

(b): This is the State action level for samples collected from inside homes.

(c): The 90th percentile reflects the concentration of lead or copper at which 90% of the samples tested were found to have not exceeded. Household lead and copper results are from 2011.

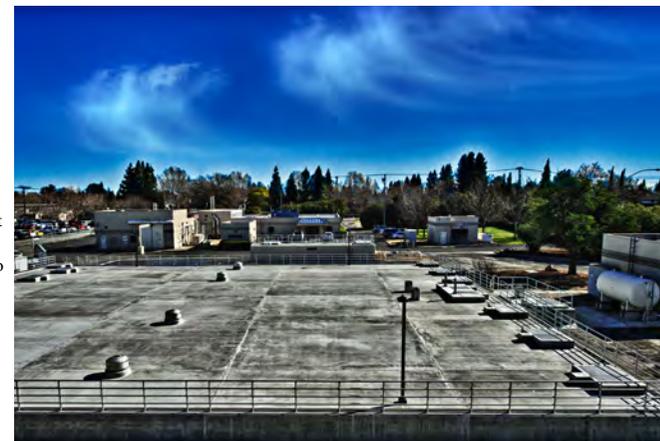
The next sampling is scheduled for 2014.

(d): Not possible to differentiate between groundwater and surface water source.

(e): Added as required for dental health protection. Standard depends upon temperature.

(f): Compliance is based on a running annual average of samples collected quarterly.

(g): To convert hardness data from ppm to grains per gallon, divide by 17.



DE Filtration Tank



North Bay Regional Water Treatment Plant

In 2011, one well was reported as having a detectable level of perchlorate, an inorganic chemical used in solid rocket propellant, fireworks, explosives, flares, matches, and a variety of industries. It usually gets into drinking water as a result of environmental contamination from historic aerospace or other industrial operations that used or use, store, or dispose of perchlorate and its salts. Groundwater samples taken prior to 2011 and samples taken in 2012 have been non detect for perchlorate, suggest the one result was a lab error. There is also no source for "rocket fuel" in the area of the affected well. We will continue to monitor for perchlorate at this well until the State is assured that there is no risk to our customers from this compound. Perchlorate, in general, has been shown to interfere with the functioning of thyroid gland, leading to adverse affects associated with inadequate hormone levels. Thyroid hormones are needed for normal prenatal growth and development of the fetus, as well as for normal growth and development in the infant and child. In adults, thyroid hormones are needed for normal metabolism and mental function.



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## Secondary Standards Aesthetic - Related

		GROUND WATER	SURFACE WATER NBR		SURFACE WATER VWTP			
SUBSTANCE	UNITS	MCL	Range	Average	Range	Average	Range	Average
Aluminum	ppb	200	ND - 88	8	21 - 98	48	ND	ND
Chloride	ppm	250	8 - 37	18	13 - 27	19	7	7
Copper	ppb	1	ND - 24	2	ND	ND	3	3
Color	units	15	ND	ND	ND	ND	5	5
Iron	ppb	300	ND - 89	12	ND	ND	ND	ND
Manganese	ppb	50	ND - 3.8	1	ND	ND	3	3
Odor - Threshold	ton	3	ND - 1	0.5	1 - 2	2	1	1
Sulfate	ppm	250	25 - 68	41	49 - 56	52	22	22
Specific Conductance	µS/cm	1600	460 - 820	588	324 - 438	383	340	340
Total Dissolved Solids	ppm	1000	290 - 540	367	192 - 243	222	200	200
Additional Substances Analyzed								
Alkalinity	ppm	No Std	200 - 330	232	92 - 166	137	150	150
Boron	ppb	AL = 1000	110 - 280	190	20 - 270	167	180	180
Calcium	ppm	No Std	13 - 81	43	15 - 28	22	18	18
Hardness (g)	ppm	No Std	81 - 310	190	88 - 191	153	170	170
Magnesium	ppm	No Std	12 - 27	20	12 - 30	24	31	31
pH	units	No Std	7.3 - 8.1	7.7	7.8 - 8.2	8.0	8.4	8.4
Potassium	ppm	No Std	1.5 - 5.6	3.5	1.5 - 2.3	1.8	1.2	1.2
Sodium	ppm	No Std	41 - 75	55	23 - 48	34	10	10
Vanadium	ppb	AL = 50	6 - 27	17	ND - 3.5	1.7	3	3
Molybdenum	ppb	No Std	ND - 3	0.5	ND - 1.4	0.4	ND	ND



## Disinfection and Disinfection By-Products (DBP)

SUBSTANCE	UNITS	MCL or MRDL	MCLG or MRDLG	LEVEL DETECTED			DRINKING WATER SOURCES
				Avg	Max	Min	
Disinfectants and Disinfection By-Products (DBP)							
Total Trihalomethanes (d)(f)	ppb	80	NA	20	67	ND	By-product of drinking water chlorination.
Halo-Acetic Acids (d)(f)	ppb	60	NA	7.9	29	ND	By-product of drinking water chlorination.
Chlorine	ppm	4	4	0.74	1.5	0.02	Drinking water disinfectant added for treatment.
Bromate	ppb	10	0	1.5	3.5	ND	Drinking water disinfectant added for treatment.
Control of DBP Precursors (TOC)	mg/L	TT	-	1.4	2.6	ND	Various natural and manmade sources.

## Primary Constituents Reported in the distribution system

SUBSTANCE	UNITS	MCL	PHG (MCLG)	RANGE	DRINKING WATER SOURCES
Lead (b)(c)	ppb	AL = 15	0.2	2.5 ppb reflect the 90th percentile. Of the 31 samples analyzed, none exceeded the action level. Data is from the last required sampling in September 2011.	Erosion of natural deposits; Internal corrosion of household water plumbing systems.
Copper (b)(c)	ppm	AL = 1.3	0.30	0.20 ppm reflect the 90th percentile. Of the 31 samples analyzed, none exceeded the action level. Data is from the last required sampling in September 2011.	
Fluoride (d)(e)	ppm	0.7 - 1.3	0.8	Distribution system-wide highest monthly average = 0.8 ppm with a minimum of 0.4 ppm and a maximum of 1.0 ppm.	Erosion of natural deposits; Water additive that promotes strong teeth.
Total Coliform Bacteria (Total Coliform Rule)	MPN/100 mL	5%	(0)	Distribution system-wide highest monthly value = 0 % (1352 samples taken in 2011.)	Naturally present in the environment.