
Annual
WATER
QUALITY
REPORT

Reporting Year 2013



Presented By
City of Cambridge
Municipal Utilities Comm.

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There When You Need Us

We are once again proud to present our annual water quality report covering all testing performed between January 1 and December 31, 2013. Over the years, we have dedicated ourselves to producing drinking water that meets all state and federal standards. We continually strive to adopt new methods for delivering the best-quality drinking water to you. As new challenges to drinking water safety emerge, we remain vigilant in meeting the goals of source water protection, water conservation, and community education while continuing to serve the needs of all our water users.

Please remember that we are always available to assist you should you ever have any questions or concerns about your water.

Community Participation

You are invited to participate in our public forum and voice your concerns about your drinking water. We meet the fourth Thursday of each month beginning at 6:30 p.m. at the Municipal Utilities Office, 410 Academy, Cambridge, MD.

Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised 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 may be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The U.S. EPA/CDC (Centers for Disease Control and Prevention) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline at (800) 426-4791 or <http://water.epa.gov/drink/hotline>.

Lead in Home Plumbing

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 service lines and home plumbing. We are responsible for providing high-quality drinking water, but we 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 or at www.epa.gov/safewater/lead. The MUC is scheduled for testing of lead and copper in 2014.

Water Treatment Process

Due to the high-quality well water we use, the treatment process consists of just two steps. First, raw water is drawn from our wells and sent to an aeration tray, which allows for oxidation of the low iron levels that are present in the water. The water then goes to a holding tank. Chlorine is then added for disinfection. (We carefully monitor the amount of chlorine, adding the lowest quantity necessary to protect the safety of your water without compromising taste.) Finally, the water is pumped from the pumpage facilities to sanitized water towers and into your home or business. Our certified water production operators monitor samples 365 days a year at different points in the system to ensure the quality of the water.

QUESTIONS?

For more information about this report, or for any questions relating to your drinking water, please call Jane Dorman, Water Resource Administrator, or Kevin Johnson Sr., Superintendent, at (410) 228-5440.

Water Conservation

You can play a role in conserving water and save yourself money in the process by becoming conscious of the amount of water your household is using and by looking for ways to use less whenever you can. It is not hard to conserve water. Here are a few tips:

- Automatic dishwashers use 15 gallons for every cycle, regardless of how many dishes are loaded. So get a run for your money and load it to capacity.
- Turn off the tap when brushing your teeth.
- Check every faucet in your home for leaks. Just a slow drip can waste 15 to 20 gallons a day. Fix it and you can save almost 6,000 gallons per year.
- Check your toilets for leaks by putting a few drops of food coloring in the tank. Watch for a few minutes to see if the color shows up in the bowl. It is not uncommon to lose up to 100 gallons a day from an invisible toilet leak. Fix it and you save more than 30,000 gallons a year.
- Use your water meter to detect hidden leaks. Simply turn off all taps and water-using appliances. Then check the meter after 15 minutes. If it moved, you have a leak.

Benefits of Chlorination

Disinfection, a chemical process used to control disease-causing microorganisms by killing or inactivating them, is unquestionably the most important step in drinking water treatment. By far, the most common method of disinfection in North America is chlorination.

Before communities began routinely treating drinking water with chlorine (starting with Chicago and Jersey City in 1908), cholera, typhoid fever, dysentery, and hepatitis A killed thousands of U.S. residents annually. Drinking water chlorination and filtration have helped to virtually eliminate these diseases in the U.S. Significant strides in public health are directly linked to the adoption of drinking water chlorination. In fact, the filtration of drinking water plus the use of chlorine is probably the most significant public health advancement in human history.

How chlorination works:

Potent Germicide Reduction in the level of many disease-causing microorganisms in drinking water to almost immeasurable levels.

Taste and Odor Reduction of many disagreeable tastes and odors like foul-smelling algae secretions, sulfides, and odors from decaying vegetation.

Biological Growth Elimination of slime bacteria, molds, and algae that commonly grow in water supply reservoirs, on the walls of water mains, and in storage tanks.

Chemical Removal of hydrogen sulfide (which has a rotten egg odor), ammonia, and other nitrogenous compounds that have unpleasant tastes and hinder disinfection. It also helps to remove iron and manganese from raw water.

Where Does My Water Come From?

The City of Cambridge Municipal Utilities Commission customers are fortunate because we enjoy an abundant water supply from ten wells, withdrawing from three different aquifers. We have six wells pumping from the Piney Point aquifer, two wells in the Magothy aquifer, and two wells withdrawing from the Patapsco (Raritan) aquifer.

Piney Point Formation

The Piney Point aquifer is used by eight of the nine community water systems in the area. The thickness of the Piney Point Formation is variable, and ranges from a few feet to about 160 feet. The formation consists of medium- to course-grained, olive-green to black slightly glauconitic sand with interbedded clayey layers. The top of the Piney Point Formation ranges about 340 feet below sea level at Cambridge. Transmissivity values in Cambridge range from 25,000 to 45,000 gallons per day (gpd) per foot. The Piney Point aquifer is overlain by the Chesapeake Group Formations that function as multiple confining and leaky confining beds to this aquifer. The Piney Point aquifer does not outcrop at the ground surface, and therefore is not directly recharged by precipitation. Recharge is derived from lateral and vertical leakage through adjacent beds.

Magothy Formation

This formation consists of medium- to course-grained white, yellow, and gray sands with irregular lenses of dark clay containing lignite. The thickness ranges from 30 to 139 feet. The top of the Magothy Formation is at about 900 feet below sea level in Cambridge. Transmissivity values at Cambridge are between 8,000 and 15,000 gpd per foot. The formation is overlain unconformably by the Matawan Formation that functions as a confining unit in Dorchester County.

Patapsco (Raritan) Formation

The Patapsco Formation consists of fine- to medium-grained greenish gray sand, with layers of mottled, tough clay. The sands occur in four beds ranging in thickness from 15 to 40 feet. The top of the Patapsco Formation ranges from about 1000 to 1500 feet below sea level in Dorchester County. Cambridge's wells have a transmissivity of over 16,000 gpd per foot. The Patapsco aquifer is overlain by multiple, younger aquifers and confining units of variable thickness. The outcrop area extends from Washington, D.C., to Elkton, Maryland, in a band of varying width. Between Washington and Baltimore, the outcrop area is between 10 and 20 miles wide.

To meet our daily demand, we are currently operating three or four of the wells with the others in reserve. The wells pump water into ground storage tanks located at our four pumping stations. The stations are located on Stone Boundary Road, Nathans Avenue, Glasgow Street, and Brohawn Avenue. Water is pumped from our pumping stations into the distribution system, which consists of approximately 80 miles of pipe supported by our two elevated storage tanks with a capacity of 1.5 million gallons. We provide our customers with roughly 1.5 million gallons of good, safe drinking water every day.

Substances That Could Be in Water

To ensure that tap water is safe to drink, the U.S. EPA prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. U.S. Food and Drug Administration regulations establish limits for contaminants in bottled water that must 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 these contaminants does not necessarily indicate that the water poses a health risk.

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, in some cases, radioactive material, and substances resulting from the presence of animals or from human activity. Substances that may be present in source water include:

Microbial Contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, or wildlife;

Inorganic Contaminants, such as salts and metals, which can be naturally occurring or may result from urban stormwater 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 stormwater runoff, and residential uses;

Organic Chemical Contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production and may also come from gas stations, urban stormwater runoff, and septic systems;

Radioactive Contaminants, which can be naturally occurring or may be the result of oil and gas production and mining activities.

For more information about contaminants and potential health effects, call the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.

Sampling Results

During the past year, we have taken hundreds of water samples in order to determine the presence of any radioactive, biological, inorganic, volatile organic, or synthetic organic contaminants. The table below shows only those contaminants that were detected in the water. The state requires us to monitor for certain substances less often than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data are included, along with the year in which the sample was taken.

REGULATED SUBSTANCES							
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Alpha Emitters ¹ (pCi/L)	2012	15	0	8.6	NA	No	Erosion of natural deposits
Antimony ¹ (ppb)	2012	6	6	4.6	NA	No	Discharge from petroleum refineries; Fire retardants; Ceramics; Electronics; Solder
Arsenic (ppb)	2012	10	0	1.5	1 - 1.5	No	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes
Beta/Photon Emitters ^{1,2} (pCi/L)	2012	50	0	6.6	4.5–6.6	No	Decay of natural and man-made deposits
<i>E. coli</i> [at the groundwater source] (# positive samples)	2013	NA	0	0	NA	No	Human and animal fecal waste in untreated groundwater
Fluoride (ppm)	2012	4	4	0.86	0.76 - 0.98	No	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Haloacetic Acids [HAAs]–Stage 1 ³ (ppb)	2013	60	NA	0.93	ND–0.001	No	By-product of drinking water disinfection
Haloacetic Acids [HAA]–Stage 2 ³ (ppb)	2013	60	NA	1.75	1–3	No	By-product of drinking water disinfection
Nitrate (ppm)	2013	10	10	<0.5	nd–<0.5	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
TTHMs [Total Trihalomethanes]–Stage 1 ³ (ppb)	2013	80	NA	3.74	1–7.1	No	By-product of drinking water disinfection
TTHMs [Total Trihalomethanes]–Stage 2 ^{3,0} (ppb)	2013	80	NA	7.13	5.3–8.1	No	By-product of drinking water disinfection

Tap water samples were collected for lead and copper analyses from sample sites throughout the community¹

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AL	MCLG	AMOUNT DETECTED (90TH%TILE)	SITES ABOVE AL/ TOTAL SITES	VIOLATION	TYPICAL SOURCE
Copper (ppm)	2011	1.3	1.3	0.09	0/33	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2011	15	0	0	0/33	No	Corrosion of household plumbing systems; Erosion of natural deposits

UNREGULATED SUBSTANCES				
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Sodium (ppm)	2012	115	82 - 147	Naturally occurring

¹ Was not reported in 2012 CCR. The omissions in 2013 CCR resulted in a reporting violation

² The MCL for beta particles is 4 mrem/year. U.S. EPA considers 50 pCi/L to be the level of concern for beta particles.

³ On October 1, 2013, our system transitioned from the Stage 1 Disinfection By-products (DBP) Rule to the Stage 2 DBP Rule. The Stage 2 DBP Rule has different monitoring and reporting requirements than Stage 1 DBP Rule. Stage 1 DBP data shown above (for Total Trihalomethanes (TTHM) and Haloacetic Acids (HAA5)), reflect the system-wide averages of each contaminant group, and the detected ranges for the system, from the first three quarters of 2013. The Stage 2 DBP data shown above reflect the range of monitoring results from all Stage 2 TTHM and HAA5 monitoring locations from the fourth quarter of 2013. Subsequent consumer confidence reports will include only Stage 2 DBP Rule data.

Definitions

MCL (Maximum Contaminant Level): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

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 allow for a margin of safety.

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.

NA: Not applicable

ND (Not detected): Indicates that the substance was not found by laboratory analysis.

ppb (parts per billion): One part substance per billion parts water (or micrograms per liter).

ppm (parts per million): One part substance per million parts water (or milligrams per liter).