



MADISON WATER UTILITY

Annual Water Quality Report

A SUMMARY OF WATER TESTING CONDUCTED IN 2021

PARA ESPAÑOL
HAGA CLIC AQUÍ

This annual report complies with federal and state drinking water regulations, which require us to provide water quality information to our customers each year. Unless otherwise noted, results are based on testing conducted in 2021. We are pleased to report that we continue to supply high quality water that meets or exceeds all federal and state standards for health and safety. Test results are summarized on page 3. Visit our website, madisonwater.org, to learn about Water Utility programs and projects.

Quality & Reliability Since 1882

YOUR WATER SOURCE

Madison's drinking water comes from a deep sandstone aquifer that sits hundreds of feet below the city. The water originates as rain or snow that slowly soaks into the ground and is filtered through layers of soil and rock. This natural filtration process produces excellent water for us to enjoy.

WHICH WELL SERVES MY ADDRESS?

The Madison water system consists of 21 active wells and over 900 miles of interconnected pipes. Most locations receive water from one to three wells. Our website has an application that can tell you which wells supply water to your home or business. There are links to detailed reports with the latest water quality test results. For more information, call the Water Utility or go to madisonwater.org/myWells.

WHAT KEEPS OUR WATER SAFE?

The high quality aquifer supplying our drinking water requires little treatment. Madison Water Utility disinfects the water with chlorine to reduce the risk of microbial contamination. A small amount of chlorine kills bacteria and viruses that can be present in groundwater. Chlorine also travels with the water and is ready to kill microbes that it might encounter in the system. Our goal is to maintain a chlorine residual above 0.1 milligrams per liter (mg/L) at all points in the distribution system. Typical concentrations range from 0.2 to 0.4 mg/L.

HOW ELSE IS MY WATER TREATED?

Fluoride is added to Madison drinking water to improve dental health and reduce tooth decay. The US Centers for Disease Control and Prevention (CDC) and Wisconsin Department of Health Services recommend maintaining an average fluoride level of 0.7 mg/L. Water from each well is tested daily to achieve this target. In 2021, the system-wide average of 6,653 tests was 0.66 mg/L.

Three wells have filters that remove more than 95% of the iron and manganese before it enters the piping system. These filters reduce the occurrence of rust-colored water.

DO I NEED TO TAKE SPECIAL PRECAUTIONS?

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as those 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/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Environmental Protection Agency's Safe Drinking Water Hotline at 800-426-4791.

Cryptosporidium and *Giardia*, two organisms commonly linked to water-borne illness, are found primarily in surface waters such as lakes and rivers. Because Madison's drinking water comes from a deep groundwater aquifer, these organisms do not pose a significant health risk in Madison tap water.

Do Your Part To Protect Our Local Waters

- » Use no more than the recommended amount of road salt on sidewalks and driveways, wisaltwise.com
- » Properly dispose of household hazardous chemicals through Clean Sweep, danecountycleansweep.com
- » Promote healthy lawns and gardens without the use of harmful chemicals, learningstore.extension.wisc.edu
- » Find and use PFAS-free alternatives, pfascentral.org
- » Use non-toxic or biodegradable cleaning products

General Information

- Water Utility General Manager: Krishna Kumar
- Water Utility Board President: Eugene McLinn
- Water Utility General Inquiries: 608-266-4651
- Water Quality Department For Report Questions: 608-266-4654
- Certified Drinking Water Laboratories in Madison, WI:
 - » Public Health Madison & Dane County: 608-266-4821
 - » Wisconsin State Laboratory of Hygiene: 608-224-6202

POTENTIAL CONTAMINANTS IN DRINKING WATER AND THEIR LIKELY SOURCES

Sources of drinking water, both tap water and bottled water, include rivers, lakes, springs, and wells. As water travels over the surface of the land and 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. Types of potential contaminants and their likely sources include:

- **Microbial contaminants**, such as viruses and bacteria, may come from leaky sewer pipes, septic systems, agricultural livestock operations, and wildlife.
- **Inorganic contaminants**, including metals, minerals, nutrients, and salts, can occur naturally or they may result from urban stormwater runoff, industrial wastewater discharges, mining, or farming activities.
- **Organic contaminants**, including synthetic and volatile organic compounds, are by-products of industrial processes that can come from chemical spills, gas stations, urban stormwater runoff, and septic systems.
- **Pesticides and herbicides** may come from a variety of sources such as agriculture, urban stormwater runoff, and residential use.
- **Radioactive substances** may occur naturally in rock formations and groundwater.

In order to ensure that tap water is safe, EPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. Routine monitoring helps to ensure that drinking water concentrations of any substance remain at safe levels.

MICROBIOLOGICAL TESTING

Bacteria – To ensure drinking water safety, routine bacteriological tests are conducted. Over 200 distribution samples are collected each month from representative locations. Samples are tested for coliform bacteria, indicators of potential contamination. In 2021, the Water Utility collected 2,787 distribution samples. None tested positive for coliform bacteria. The absence of coliform positive samples reflects good source water quality and adequate disinfection maintained in the distribution system.

THE EPA ON DRINKING WATER CONTAMINANTS

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 Environmental Protection Agency's (EPA) Safe Drinking Water Hotline, 800 426 4791.

Lead and Copper

The landmark Lead Service Replacement program helped our community remove or replace nearly 8,000 lead pipes between 1995 and 2011. Water quality tests conducted in 2020 (see table) show that lead and copper corrosion have been minimized.

	Ideal Goal (MCLG)	Action Level (AL)	90th Percentile	Range	Samples Above AL
Lead (ppb)	zero	15	3.2	0.2 - 8.8	0 of 51
Copper (ppb)	1300	1300	168	68 - 207	0 of 51

Elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water primarily comes from lead service pipes and household plumbing components. While Madison Water Utility has removed all known lead services, we cannot control the materials found in household plumbing components. Some faucets, fixtures, and pipes in your house could still contain lead. The longer water has been standing in the plumbing system, the more lead it may contain. You can minimize the potential for lead exposure by running water from a faucet for 2 to 3 minutes before using it for drinking or cooking. For more information on lead safety, go to www.epa.gov/safewater/lead.

Are you concerned about lead? Test your water. Contact a certified lab to get lead testing information: **Public Health Madison & Dane County**, 608-266-4821; **State Laboratory of Hygiene**, 608-224-6202.

How to Read the Water Quality Data Table

The EPA and Wisconsin Department of Natural Resources (WDNR) establish the safe drinking water regulations that limit the amount of contaminants allowed in drinking water. The table shows the concentrations of detected substances in comparison to the regulatory limits. Substances not detected are not included in the table.

Maximum Contaminant Level (MCL)

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 technology.

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 allow for a margin of safety.

Action Level (AL)

The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a public water system shall follow.

Units in the Table

- One milligram per liter (mg/L) equals one part per million (ppm)
- One microgram per liter (µg/L) equals one part per billion (ppb)
- One milligram per liter equals 1,000 micrograms per liter
- One part per billion is equal to 1,000 parts per trillion (ppt)
- One ppb is analogous to one second in 32 years
- Picocurie per liter (pCi/L) is a measure of radioactivity
- nd = non-detect

IMPORTANT NOTE ABOUT THE TABLE: The table reports the maximum and minimum concentrations for each substance found in at least one well. Several substances are found only in a few wells. Contaminant levels reported in the table may not be representative of the water quality at your home. Visit madisonwater.org or call 608-266-4654 to get more information about water quality for the well that serves your home or business.

Water Quality Table

Substance Detected (units)	Ideal Goal (MCLG)	Highest Level Allowed (MCL)	Median Level Found	Range of Results	Violation (Yes/No)	Wells with Detections	Typical Source of Substance
Regulated Substances							
Antimony (ppb)	6	6	0.1	nd - 0.1	NO	Well 9	Discharge from petroleum refineries; fire retardants, ceramics, electronics
Arsenic (ppb)	zero	10	non-detect	nd - 0.5	NO	8, 19, 24, 30	Erosion of natural deposits; Glass & electronics production
Atrazine (ppb) - 2020	3	3	0.03	0.03 - 0.04	NO	Wells 14 and 29	Runoff from herbicide used on row crops
Barium (ppb)	2000	2000	22	7.3 - 66	NO	All Wells	Erosion of natural deposits; Discharge from metal refineries
Chromium, Total (ppb)	100	100	0.5	nd - 2.1	NO	Sixteen Wells	Erosion of natural deposits; Discharge from steel and pulp mills
1,2-Dichloroethylene, cis (ppb)	70	70	non-detect	nd - 0.4	NO	Well 11	Discharge from industrial chemical factories; Biodegradation of PCE and TCE
Fluoride (ppm)	4	4	0.7	0.7 - 0.9	NO	All Wells	Erosion of natural deposits; Added to promote strong teeth
Nickel (ppb)	n/a	100	1.0	0.6 - 2.5	NO	All Wells	Erosion of natural deposits; Electroplating, stainless steel and alloy products
Nitrate (ppm)	10	10	0.8	nd - 4.0	NO	Fifteen Wells	Fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Nitrite (ppm)	1	1	0.2	nd - 0.3	NO	All Wells Except 14	Fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Selenium (ppb)	50	50	non-detect	nd - 1.4	NO	6, 9, 11, 13, 14, 16, 25, 29	Erosion of natural deposits; Petroleum and metal refineries
Tetrachloroethylene [PCE] (ppb)	zero	5	non-detect	nd - 3.7	NO	6, 7, 9, 11, 14, 18	Discharge from factories, dry cleaners, and auto shops
Thallium (ppb)	0.5	2	non-detect	nd - 0.2	NO	11, 12, 17, 19, 27	Ore processing sites; Electronics, glass, and drug factories
Xylene, Total (ppb)	10000	10000	non-detect	nd - 1.4	NO	Well 24	Discharge from petroleum and chemical factories
Radionuclides							
Gross Alpha (pCi/L) - 2020	zero	15	2.4	0.7 - 11	NO	All Wells	Erosion of natural deposits
Gross Beta (pCi/L) - 2020	zero	50	4.2	0.2 - 10	NO	All Wells	Decay of natural and man-made deposits
Radium, 226+228 (pCi/L)	zero	5	3.0	2.3 - 5.3	NO	7, 8, 19, 24, 27, 28, 30	Erosion of natural deposits
Uranium (ppb) - 2020	zero	30	0.7	0.3 - 1.4	NO	Wells Sampled: 19, 24, and 27	Erosion of natural deposits
Disinfection By-Products (Distribution)							
Haloacetic Acids [HAA5] (ppb)	60	60	1.0	0.4 - 2.2	NO	n/a	By-product of drinking water chlorination
Haloacetic Acids [HAA9] (ppb) - 2019	n/a	n/a	non-detect	nd - 3.8	NO	n/a	By-product of drinking water chlorination
Total Trihalomethanes [TTHM] (ppb)	zero	80	5.0	1.7 - 8.1	NO	n/a	By-product of drinking water chlorination
Unregulated Substances							
Bromide (ppb) - 2019	n/a	n/a	39	nd - 60	NO	7, 9, 11, 13, 15, 29	Erosion of natural deposits
Chromium, Hexavalent (ppb)	n/a	n/a	0.5	nd - 2.0	NO	Thirteen Wells	Erosion of natural deposits; Chrome plating, leather tanning, wood preservation
1,4-Dioxane (ppb)	n/a	n/a	non-detect	nd - 0.3	NO	Wells 11, 14, and 18	Discharge from chemical factories; Cosmetics and detergents
Metolachlor (ppb) - 2020	n/a	n/a	0.01	nd - 0.01	NO	Well 14	Runoff from herbicide used on row crops
PFOA + PFOS (ppt)	n/a	n/a	0.4	nd - 2.1	NO	Eleven Wells	Firefighting foam; Landfills, food packaging, clothing, fabrics, upholstery
Strontium (ppb)	n/a	n/a	75	48 - 101	NO	All Wells	Erosion of natural deposits
Trichlorofluoromethane (ppb)	n/a	n/a	non-detect	nd - 0.8	NO	Well 11	Discharge from industrial chemical factories; Degreaser, propellant, refrigerant
Other Substances							
Aesthetic Goal							
Chloride (ppm)	250	14	2.3 - 164	NO	All Wells	Erosion of natural deposits; Road salt application	
Iron (ppm)	0.3	0.01	nd - 0.62	NO	All Wells except 20	Erosion of natural deposits	
Manganese (ppb)	50	2.7	nd - 52	NO	All Wells except 14	Erosion of natural deposits	
Sodium (ppm)	n/a	7.0	2.2 - 60	NO	All Wells	Erosion of natural deposits; Road salt application	
Sulfate (ppm)	250	18	7.0 - 40	NO	All Wells	Erosion of natural deposits	

Unregulated Contaminants Monitoring

Once every five years, US EPA prepares a list of unregulated contaminants for required testing by large utilities. In 2018 and 2019, twenty-two Madison wells were tested for 20 of these chemicals. Results for manganese, bromide, and the haloacetic acid group are reported in the Water Quality Table. In 2018, two other chemicals were found in one well – 2-methoxyethanol (Well 26: 0.5 ppb) and 1-butanol (Well 28: 8.0 ppb). Later testing did not find either chemical at any well. Madison regularly tests for other unregulated substances including 1,4-dioxane, hexavalent chromium, PFAS, and strontium. Results of these tests are included in the Water Quality Table.

TESTING FOR PFAS COMPOUNDS

In 2021, Madison Water Utility tested all of its active wells for 33 PFAS (per- and polyfluoroalkyl substances). This testing is not required by US EPA or the State of Wisconsin. At least one PFAS was found in twelve wells. All active Madison wells meet groundwater standards recommended by the WI Dept. of Health Services (DHS) for 18 types of PFAS, and they meet every PFAS standard set by any other US state.

Most regulation focuses on two types of PFAS: PFOA and PFOS. In 2019, Wisconsin DHS recommended a health-based standard for groundwater at 20 parts per trillion (ppt) for combined PFOA + PFOS. In 2021, Wisconsin DNR proposed a matching drinking water standard. Testing by Madison Water Utility in 2021 found PFOA or PFOS in eleven wells with PFOA + PFOS levels ranging from <1 part per trillion up to 2.1 parts per trillion. Other detected PFAS are reported in the table below. The Utility will test all active wells for PFAS twice in 2022.

PFAS	DHS Guidance#	Range of Results	Wells(s) with Detections
PFOA	20	<0.44 - 1.4	6, 7, 8, 9, 13, 14, 16, 17, 26, 27
PFOS	20	<0.24 - 1.3	8, 9, 11, 14, 16, 17, 26, 27
PFBA	10,000	<1.0 - 26	9, 11, 13, 14
PFPeA	n/a	<0.22 - 1.9	6, 8, 9, 13, 14, 16, 27
PFHxA	150,000	<0.12 - 1.9	6, 8, 9, 11, 13, 14, 16, 17, 27
PFHpA	n/a	<0.10 - 0.45	8, 9, 14, 26, 27
PFBS	450,000	<0.14 - 37	6, 9, 11, 13, 14, 16, 18*, 26, 27
PFPeS	n/a	<0.08 - 0.43	6, 9, 27
PFHxS	40	<0.33 - 4.4	6, 7, 8, 9, 11, 13, 14, 16, 17, 26, 27
6:2 FTSA	n/a	<0.15 - 0.17	8

#Health Advisory Level (HAL): the concentration of a contaminant which, if exceeded, poses a health risk and may require a system to post a public notice.

*PFBS was not detected at Well 18 upon re-testing.

PFAS are a widely-used class of chemicals found in non-stick cookware, food packaging, water-resistant clothing, furniture, carpeting, and firefighting foams. Thousands of types of PFAS compounds have been manufactured and many are still being used. These chemicals are not regulated under the Safe Drinking Water Act. Drinking water is one way that people can be exposed to PFAS. PFAS can enter water from places that make or use PFAS and releases from certain types of waste in landfills.

Madison Water Utility first discovered PFAS in two Madison wells in 2017. One of those wells, Well 15 on East Washington Avenue, has been out of service since March 2019 because of concern about the levels detected there. You can find more information and sign up for our PFAS updates email list at madisonwater.org/PFAS.

CONNECT WITH MADISON WATER UTILITY

- Website: madisonwater.org
- Facebook: facebook.com/madisonwater
- Twitter: twitter.com/MadWaterUtility
- Instagram: instagram.com/madison_water
- Updates on drinking water quality or water main flushing: sign-up at my.cityofmadison.com

LANGUAGE SERVICES

- Usted tiene derecho a recibir servicio gratuito de intérprete. Por favor llame al teléfono 608-266-4651 para mayor información.
- Koj muaj tvoj cai tau kev pab txhais lus pub dawb. Thov hu rau 608-266-4651.
- You have the right to free language services. Please call 608-266-4651 for more information.

GET INVOLVED

- Visit our [Projects](#) web page to learn about Madison Water Utility public works projects and provide input.
- Water Utility Board: Monthly meetings currently are conducted virtually or in person at 119 E. Olin Ave., Madison, WI, 53713.

2022 dates:*

June 28	September 20
July 26	October 25
August 23	November 22

*Meeting dates are subject to change; check the calendar at

madison.legistar.com/Calendar.aspx