Marine Corps Base Quantico
Mainside Water System
(PWSID 6153675)

2023 Annual Drinking Water Consumer Confidence Report

"In 2023, drinking water quality from Marine Corps Base Quantico Mainside Water System met or exceeded all federal and state requirements."

Message from the Public Works Officer

Dear MCBQ Water Customer,

The Public Works Branch (PWB) of the Marine Corps Base Quantico (MCBQ) G-F, Installation and Environment Division, is proud to present this years (2023) Annual Water Quality Report that showcases the outstanding quality of the MCBQ Mainside Water System. The MCBQ PWB Utilities Section routinely conducts drinking water quality monitoring through numerous water quality tests in accordance with State and Federal regulations. This report summarizes our water quality monitoring results during the 2023 calendar year.

Public health and consumer safety is our top priority and our mission is to provide you with a consistently safe and dependable supply of drinking water. In order to meet this objective, our Water System Working Group (WSWG) Team with personnel from the Water Treatment Plant, Facilities Maintenance \ Utilities Section, Engineering Section, and Natural Resources & Environmental Affairs Branch meet periodically and brainstorm process improvements to proactively address water quality concerns and issues throughout the year.
We have continued to successfully execute our water system flushing and management programs to systematically and comprehensively flush the Mainside water distribution system to reduce water age (water retention) and further ensure water quality in the Mainside system through the following water programs:

- Utilities Infrastructure Condition Assessment Program
- Cross-Connection and Backflow Prevention Program
- Biannual Uni-direction Flushing (UDF) Program
- Periodic Spot Flushing Program on dead-end areas
- Water Storage Tank Turnover Program
- Comprehensive Water Tank Inspection and Cleaning Program
- Raw Water Line Flushing Program
- Water sampling/testing tracking program for successful completion of all samples on time and in compliance during 2023

As a result of our efforts, **our team is proud to announce that we have not had a single drinking water quality violation** (i.e., fully in compliance with all water quality parameters). **In April 2023, our Mainside Water Treatment Plant was awarded the "2022 Silver Water Treatment Plant Performance Award" by Office of Drinking Water in Virginia Department of Health (VDH).** Our utilities team including our boots-on-ground Utility Shop Maintenance personnel, 24/7 Plant operators, and assistant staff will continue to strive to provide safe drinking water of the highest quality to our families and the Quantico community.

CDR Calvin Warren P.E.
Public Works Officer, Marine Corps Base Quantico

We Want To Hear From You

In order to meet increasingly stringent water quality requirements, we are constantly planning and funding projects to address many water-related issues including source water protection, system operation and maintenance improvement, and timely upgrade and replacement of water system infrastructure (pipes, pump stations and tanks) and treatment plant facility. We value your inputs on our water quality and water system related issues. You can call us at 703-432-2466 (PWB Water Commodities Manager) for any water related questions and inputs. To stay informed on important water related public notifications, please visit us on line at https://www.quantico.marines.mil/water-quality/

GF-Public Works Branch, Utilities MCBQ
Public Works Customer Service Desk
(703) 784-2072

Regarding This Report

This report contains summarized information on all regulated contaminants found in your drinking water based on water quality tests performed for a variety of contaminants. An explanation of the results is included in a data table at the end of this report.

Maximum Contaminant Levels (MCL's) are set at very stringent levels by the US Environmental Protection Agency (USEPA). In developing the standards, USEPA assumes that the average adult drinks 2 liters of water each day throughout a 70-year lifespan. USEPA generally sets MCL's at levels that will result in no adverse health effects for some contaminants or a one-in-ten-thousand to one-in-a-million chance of having the described health effect for other contaminants.

Sources of Water

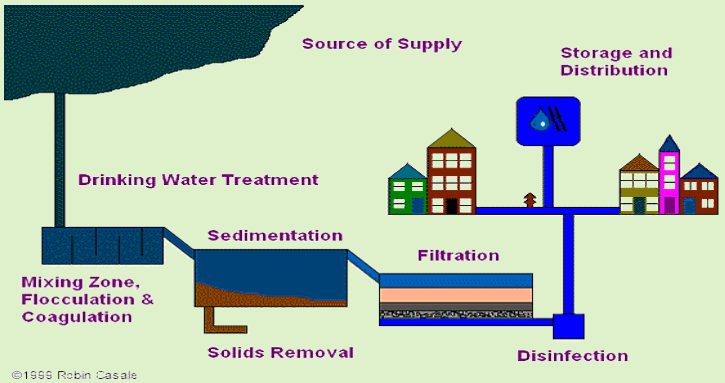
All of the water sources for MCBQ Mainside System are located within of the installation boundary and protected from general public access. If, however, you do witness any illegal activities (e.g., illegal dumping) in or around the base waterways, please report your observations to MCBQ Security Battalion at 703-784-2251.

Source Water Assessment

In 2002 the Virginia Department of Health (VDH) conducted a water source assessment to determine the relative susceptibility of the source water to activities within the watershed. MCBQ source water was calculated to have a high susceptibility to contamination due to ongoing Base activities, and we routinely check and mitigate runoff potential. There was no evidence of contamination of the water source in any of our testing in 2023.

Mainside Water Treatment Plant

Our Mainside water system its treatment plant utilizes protected surface water sources and a conventional treatment process (coagulation, flocculation, precipitation, filtration and disinfection process) to deliver potable water to the Base's Mainside customers.



The Mainside Water Treatment Plant (with a design capacity of 3.17 million gallons per day) provided an average of approximately 1.0 million gallons per day in 2023 through approximately 59 miles of water line. Recently upgraded/modernized our treatment chemical feed systems and control systems have enabled our highly qualified operators to more reliably monitor and operate treatment process.

Potential Sources of Water Contaminants

The principal source of water for the Mainside Water System is within the boundaries of MCBQ and an area of ~ 17.4 square miles of land feeds into our Reservoir. 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. Contaminants 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, and wildlife.
- ***Inorganic contaminants***, such as salts and metals, which 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, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
- ***Radioactive contaminants***, which can be naturally occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, USEPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. U.S. Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water. Drinking water, including bottled water, may reasonably be expected to contain at least a small amount of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about drinking water contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking water Hotline at 1-800-426-4791 or visiting their website at **https://www.epa.gov/ground-water-and-drinking-water**

Microbial Analysis

Total Coliform: *Coliforms* are bacteria that are present naturally in the environment and are used as an indicator that other potentially harmful bacteria may be present. When Coliform bacteria are found, special follow-up tests are done to determine if harmful bacteria are present in the water supply. If the limit is exceeded, the water supplier must notify the public by newspaper, radio, or television. All of coliform samples collected in 2023 were negative for both total coliform and *E.coli*. **We are proud to announce that we did not have any samples test present for total coliform and *E. Coli* (i.e., no *E. coli* MCL violation) during the 2023 calendar year.**

Disinfection Byproducts

MCBQ Mainside Water System collects disinfection byproducts samples (including Total Trihalomethanes and Haloacetic Acids samples) from 4 different locations every quarter.

During 2023 (all four quarters of monitoring events), none of annual running averages from all required disinfection byproducts samples exceeded Total Trihalomethanes (TTHM) MCL (80 ppb) and Halo acetic Acids (HAA5) MCL (60 ppb). In other words, **MCBQ Mainside Water system is in compliance with TTHM and HAA5 MCLs throughout 2023**.

Throughout the year, we've continuously performed disinfection byproducts reduction measures (including the uni-directional flushing program, water storage tank turn-over practice, water storage tank inspection & cleaning, spot flushing) and these recent operational efforts improved our water quality (i.e., TTHM and HAA5 reduction).

Lead and Copper

During 2022, we completed all required testing for lead and copper. Based on our triennial lead and copper sampling schedule, we are scheduled to conduct next lead and copper testing in 2025. No action levels (ALs) for both lead and copper were exceeded from the 2022 sampling event (i.e., in compliance). More information about drinking water contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline at 1-800-426-4791 or visiting their website at *https://water.epa.gov/drink/index.cfm*

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 old service lines and home plumbing. MCBQ 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, until it becomes cold or reaches a steady temperature before using the 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 USEPA's Safe Drinking water Hotline at 1-800-426-4791 or visit: *https://www.epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water*

Unregulated Contaminant Monitoring Rule

The Safe Drinking Water Act (SDWA), as amended in 1996, requires the USEPA to establish criteria for a program to monitor unregulated contaminant and publish a list of contaminants to be monitored every five years.

USEPA published the first set of contaminants in 1999. The fifth Unregulated Contaminant Monitoring Rule (UCMR 5) requires us to collect 30 chemical contaminants between 2023 and 2025 using analytical methods developed by EPA and consensus organizations.

SDWA requirement mandated publishing the next set of unregulated contaminants to be monitored and the requirements for such monitoring. Implementation of this final rule benefits the environment by providing USEPA and other interested parties with scientifically valid data on the occurrence of the contaminants in drinking water; thereby, permitting the assessment of the population potentially being exposed and the levels of exposure. These results are the primary resource of occurrence and provide exposure data for the USEPA to determine whether to regulate these contaminants.

To view fact sheets about the UCMR5 testing, go to:

https://www.epa.gov/system/files/documents/2022-02/ucmr5-factsheet.pdf

Cryptosporidium in Source Water

Cryptosporidium testing from MCBQ Mainside Water System source water was completed in October 2018 and results indicate that MCBQ Raw Source Water is safe to consume once treated. EPA/CDC guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the USEPA's Safe Drinking Water Hotline (1-800-426-4791).

Should Some People Take Special Precautions?

Some people may be more vulnerable to contaminants in drinking water than the general population. Immune system compromised persons, such as persons 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 partially at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/CDC guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the USEPA Safe Drinking Water Hotline at 1-800-426-4791.

We strongly recommend that our customers not use water from the hot water tap for consumption. Any contaminants found in the water may accumulate in your hot water tank. This would be true anywhere, regardless of the water source, and does not mean that there is anything wrong with our drinking water. All water tests are conducted on water from the cold-water tap. Our concern is that the water quality is unknown when water from the hot-water tap is consumed. We believe you are better served by heating cold-water for the purpose of cooking and consumption.

Information about Per– and Polyfluoroalkyl Substances (PFAS)

What are per- and polyfluoroalkyl substances and where do they come from?

Per- and polyfluoroalkyl substances (PFAS) are a group of thousands of man-made chemicals. PFAS have been used in a variety of industries and consumer products around the globe, including in the U.S. since the 1940s. PFAS have been used to make coatings and products that are used as oil and water repellents for carpets, clothing, paper packaging for food, and cookware. They are also contained in some foams (aqueous film-forming foam or AFFF) currently used for fighting petroleum fires at airfields and in industrial fire suppression processes. PFAS chemicals are persistent in the environment and some are persistent in the human body – meaning they do not break down and they can accumulate over time.

Is there a regulation for PFAS in drinking water?

On April 10, 2024, the US EPA established MCLs for a subset of PFAS chemicals as shown in the Table below:

EPA Final Regulated Constituents	Maximum Containment Level (MCL)	Mainside WTP
PFOA	4 ng/L	Non detect*
PFOS	4 ng/L	Non detect
PFNA	10 ng/L	Non detect
PFHxS	10 ng/L	Non detect
HFPO-DA (GenX)	10 ng/L	Non detect
PFBS**	2000 ng/L	Non-detect
Mixture of 2 or more of PFNA, PFHxS, HFPO-DA, and PFBS	Hazard index *** of 1 (unitless)	0
PFBA	No MCL	2.2 ng/L

*Non detect: Tested results were less than the detection limit of the lab method.

** PFBS limit is only included as part of the Hazard Index calculation with PFNA, PFHxS, and PFPO-DA.

***Hazard Index (HI): The Hazard Index is a long-established approach that EPA regularly uses to understand health risk from a chemical mixture (i.e., exposure to multiple chemicals). The HI is made up of a sum of fractions. Each fraction compares the level of each PFAS measured in the water to the health-based water concentration.

EPA requires implementation of sampling in accordance with the new MCLs within three years (2027) of the publication date and implementation of any required treatment within five years (2029).

These limits did not apply for the 2023 calendar year, but the DoD proactively promulgated policies to monitor drinking water for PFAS at all service owned and operated water systems at a minimum of every two years.

The DoD policy states that if water sampling results confirm that drinking water contains PFOA and PFOS at individual or combined concentrations greater than the 2016 EPA health advisory (HA) level of 70 ppt, water systems must take immediate action to reduce exposure to PFOS or PFAS. For levels less than 70 ppt but above the 4 ppt level (draft at the time of policy publication), DoD committed to planning for implementation of the levels once EPA's published MCLs take effect.

Has Marine Corps Base Quantico tested its water for PFAS in 2023?

Yes. In August 2023, PFAS samples were collected from the Mainside Water Treatment Plant point of entry. We are informing you that one (PFBA) of the 29 PFAS compounds covered by the sampling method were detected above the Method Repor□ng Limit (MRL). The results are provided in the Table above. EPA does not have a HA or MCL for all of these 29 PFAS compounds at this □me (other than PFOA, PFOS, PFNA, PFHxS, PFBS, and Gen X as shown in the table above).

PFOA, PFOS, PFNA, PFHxS, PFBS, and Gen X (that have MCL) were not detected (i.e., less than MRL). As the regulated PFAS chemicals were below the new MCLs, there is no immediate cause for concern; however, we will con□nue to monitor the drinking water closely.

Conclusion

All of our Public Works Utilities Team members work around the clock to provide top quality water to our families, co-workers, and the Quantico Community.

In order to meet your needs of a safe and dependable water supply, we will continue to make improvements to our treatment facility and supply lines that benefit all of our customers. During our biannual uni-directional flushing events, water mains and fire hydrants are flushed through our systematic uni-directional flushing program. This may cause temporary water discoloration which can be resolved by running the tap until the water is clear. Please assist us in our goal of ensuring a safe and sustainable water system by careful use of this resource: it is vital to our community, our way of life and our children's future.

Learn About Your Drinking Water

To stay informed on important water related public notifications, please visit us on line at https://www.quantico.marines.mil/water-quality/.

More information about drinking water contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking water Hotline at 1-800-426-4791 or visiting their website at **https://www.epa.gov/ground-water-and-drinking-water**.

Please visit Virginia Department of Health (VDH) Office of Drinking Water (ODW) website for VDH drinking water compliance information.:
https://www.vdh.virginia.gov/drinking-water/

For any questions about our drinking water, call at 703-432-2466 (MCBQ GF-Public Works Branch FMS Utilities and Energy Management Section).

Quantico Marine Corps Base Water Quality Report Mainside 2023

Primary Regulated Contaminants

Microbiological Results	MCLG	MCL	No. of Samples Indicating Presence of Bacteria	Number of Monthly Samples	Violation	Major source in drinking water.
Total Coliform Bacteria	0	NA*	0	20	No	Naturally present in the environment and Human & animal fecal waste
E. Coli	0	A routine sample & a repeat sample are coliform positive & one is also fecal coliform positive. **	0	20	No	Naturally present in the environment and Human & animal fecal waste

* Two or more total coliform positive samples per month will trigger Level 1 assessments and corrective actions accordingly. ** Any E.coli MCL vilocation triggers Level 2 assessment and corrective actions accordingly.

Lead & Copper (Metals) (Customer's Tab)	MCLG	Action Level	90th Percentile	Number of sites tested	No. of Sites Exceeding action level	Range Low to Highest	Viloation	Source
Copper (ppm)	0	1.3 ppm	0.36 ppm	30	1	0.02 ppm to 2.16 ppm	No	Corrosion of household plumbing systems
Lead (ppb)	0	15 ppb	4 ppb	30	2	<2.0 ppb to 56 ppb	No	Corrosion of household plumbing systems

MCB Quatnico Mainside Water System is on reduced monitoring for these parameters based upon historical results (as granted by the State). The results above are collected from the most recent monitoring period **in 2022**. The next lead and copper monitoring is scheduled in 2025.

Substance (units)	MCLG	MCL	Average (ppm)	Range Low to High		Violation	Source
				Minimum (ppm)	Maximum (ppm)		
Fluoride (ppm) Results from distribution.	4	4	0.80	0.55	2.69	No	Added to the drinking water to promote dental health; erosion of natural deposits; discharge from fertilizer and aluminum factories.
Chlorine (ppm) Results from distribution system.	MRDLG = 4	MRDL^ = 4	1.73	0.10	3.20	No	Added to drinking water as a disinfectant.
Nitrate-Nitrite (ppm) Sample from entry point.	MCLG	10	One test below detection level	Non-detect (<0.1 mg/L)	Non-detect (<0.1 mg/L)	No	Leaching from septic tanks, fertilizer, erosion of natural deposits.
Barium (ppm)	2	2	0.021	Only 1 sample collected/tested		No	Erosion of natural deposits.

^ MRDL: Maximum Residual Disinfection Level (in mg/L or ppm)

Disinfection By-Products	MCLG	MCL	Highest Locational Running Annual Average # (During CY 2023)	Range Low to High		Violation	Source
				Minimum (ppb)	Maximum (ppb)		
Trihalomethane THM (ppb)	0	80 ppb	72 ppb	39	87	No	By-product of drinking water disinfection.
Haloacetic Acids Group HAA5 (ppb)	0	60 ppb	56 ppb	32	83	No	By-product of drinking water disinfection.

During CY 2023, none of annual running averages from all required disinfection byproducts samples exceeded Total Trihalomethanes (TTHM) MCL (0.080 mg/L) and Halo acetic Acids (HAA5) MCL (0.060 mg/L).

Total Organic Carbons (TOC)	MCLG	MCL	Quartly Running Annual Average of monthly TOC Range Low to High		Combined Filtered Water TOC in mg/L Range Low to High		Violation	Source
			Minimum Ratio	Maximum Ratio	Minimum (ppm)	Maximum (ppm)		
Treatment Technique (TT)	N/A	TT & QRQQ ≥1	1.26	1.58	0.55	*4.26*	No	Naturally present in environment

& Treatment Technique (TT) Compliance with treatment technique is a removal ratio of 1.0 and higher and is based upon a Quarterly Running Annual Average (QRAA) of the monthly ratios of actual Total Organic Carbon removal between the source water and the treated water in a calendar year (not based on an individual result). The ratio of removal is calcuated as "the actual TOC removal percent (between the source water and treated water) devided by the required TOC removal (based on source water TOC and alkaklinity). Total Organic Carbon (TOC) has no health effects. However, it provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes and haloacetic acids. Compliance with the treatment technique reduces the formation of these disinfection byproducts.

Turbidity (NTU)	MCLG	MCL	Annual avg.	Range Low to High	Highest single measurement	Month with lowest average*	Source
Nephelometric (NTU)	N/A	TT	0.08	0.01 to 0.70	0.70	99% in January	Soil runoff.

* Turbidity levels are measured during the treatment process after the water has been filtered, but before disinfection. The turbidity level of filtered water shall be less than or equal to 0.3 NTU in at least 95 percent of the monthly measurements, and shall at no time exceed 1 NTU.

Secondary Regulated Contaminants

Secondary Contaminants (units)	PMCL	SMCL	Results (From One Test)	Violation	Source
Aluminum (mg/L)	N/A	0.05 to 0.2 ppm	0.047	No	Naturally present in environment
Iron (mg/L)	N/A	0.3 ppm	0.03	No	Naturally present in environment
Chloride (mg/L)	N/A	250ppm	6.12	No	Naturally present in environment
Sulfate (mg/L)	N/A	250ppm	43.7	No	Naturally present in environment
Manganese (mg/L)	N/A	0.050 ppm	0.093	No	Naturally present in the environment; addition of water treatment substances.
Total Dissolved Solid (mg/L)	N/A	500ppm	128	No	Naturally present in environment
Color (CU)	N/A	15 CU	10	No	Naturally occuring organics.
Sodium (mg/L)	N/A	N/A	28	No	Salt water intrusion, leaching from soil, chemicals used in water treatment.
Zinc (mg/L)	N/A	5 ppm	0.015	No	Naturally present in environment; runoff/leaching from natural depositis and industrial wastewastes

Key to acronyms and abbreviations.

Non-Detects (ND)	Laboratory analysis indicates that the constituent is below the detection level.
Parts per million, (ppm) & Milligrams per liter (mg/L)	Parts per million (ppm) and milligrams per liter (mg/L) are the same. One part per million corresponds to one minute in two years, or a penny in $10,000.
Parts per billion (ppb) & Micrograms per liter (µg/L)	Parts per billion (ppb) and micrograms per liter (µg/L) are the same. One part per billion corresponds to one minute in 2000 years, or a penny in $10,000,000.
Picocuries per liter (pCi/L)	Picocuries per liter (pCi/L) is a measure of the radioactivity in the water.
Nephelometric (NTU) Turbidity unit measurement	Nephelometric turbidity unit (NTU) is a measure of the clarity of water. Turbidity in excess of 5 NTU is just visibly cloudy with the naked eye.
Action Level (AL)	Concentration of a contaminant which, if exceeded, triggers treatment or other requirements a water system must follow.
Treatment Techniques (TT)	A treatment technique is a required process intended to reduce level of contaminant in drinking water
Maximum Contaminant Level (MCL)	The highest level of a contaminate that is allowed in drinking water. MCL's are set as close to the MCLG's as feasible using the best available treatment technology
Maximum Contaminant Level Goal (MCLG)	The "Maximum Contaminant Level Goal" (MCLG) is the level of a contaminant in drinking water below which there is no known or expected risk to MCLG's allow for a margin of safety.
Maximum Residual Disinfection Level (MRDL)	The highest level of disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfection is necessary for control of microbial contaminants.
Maximum Residual Disinfection Level Goal (MRDLG)	The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLG does not reflect the benefits of the use of disinfectants.
No Regulatory Limit (NRL)	A substance or chemical constituent that is of interest but currently does not have a regulatory limit or concentration.