

2022 CONSUMER CONFIDENCE WATER QUALITY REPORT



At Guam Waterworks Authority our mission is to provide outstanding customer service by delivering excellent water and wastewater services in a safe, reliable, responsible and cost-effective manner. As part of that effort, we publish this annual Water Quality Report, which provides information about where your water comes from, what it contains, and how it compares to our Guam and Federal standards. Most importantly, it confirms that in 2022, our water met or surpassed all standards set by the U.S. Environmental Protection Agency (EPA) and the Guam Environmental Protection Agency (GEPA) to protect public health. We believe that keeping our public informed about the quality of its drinking water is an important part of our job. Because the health of all Guam's people depends on safe drinking water, it is truly our most precious resource and therefore, every water user needs to actively participate in the conservation and protection of our drinking water sources.

Annually the Water Quality Report for Guam Waterworks Authority is mailed to all customers. Also known as the Consumer Confidence Report (CCR), it contains a wealth of information about your water supply! This water report identifies the source that supplies water for your location. It reports only detected contaminants or elements in the water that ensures your drinking water meets all safe drinking water standards. It describes any treatment process used, if necessary, to make your water safe to drink. This also explains terms used in the regulation of drinking water and tells you where to go for additional information. Except where indicated otherwise, this water quality report is based on the results of GWA monitoring for the period of January 1, 2022 to December 31, 2022.

GWA's drinking water sources contain low levels of a variety of chemicals. Some are of natural origin and some are man-made. Lots of chemicals occur naturally in water and while many are beneficial to human health, some of these can be undesirable if found at levels that may have impacts on your health. Levels of these naturally occurring chemicals are normally so low that they pose no health concern or known risk. Fluoride is one of those naturally occurring chemicals and it is only found at very low levels that poses no known health risks. However, fluoride is also used as an additive which is believed by some officials to promote cavity resistance in a young person's growing teeth but has been found to negatively impact learning ability in young people (Fluoride In Water Linked To Lower IQ In Children (wateronline.com)). GWA does not add fluoride to our water systems, but the US Navy Water System (FENA) does so by federal regulation.

It's not always the presence of a chemical that is as important as the

amount of a chemical that is present in the water. For example, some of the heavy metals, e. g., lead, cadmium and mercury, occur naturally in water, but are present at such a low level that they do not pose a health risk. Treatment becomes necessary when the amount of any contaminant approaches or exceeds the "Maximum Contaminant Level" (MCL), a level of concentration that the EPA has determined may put some persons at risk of adverse health effects. When this situation is found, GWA has chosen to discontinue the use of such a source or install and operate treatment facilities to remove the contaminants.

We continue to look more closely at drinking water quality as our capabilities improve and as new chemicals of concern come to light as the body of scientific knowledge grows. One of the ways that is used is the "Unregulated Contaminant Monitoring Rule" (UCMR) under the "Safe Drinking Water Act" (SDWA). An example of this is the emerging concern of man-made "Per/PolyFluoro-Alkyl Substances (PFAS) which came to light during the third round of the UCMR3 in 2015. USEPA has issued a lifetime exposure health Advisory Level (AL) for some of these chemicals for potential risks if there is lifetime exposure in drinking water to levels that exceed 70 ng/L (70 parts per trillion). GWA in agreement with Guam EPA (GEPA); has chosen to protect our island by complying with this and no water is allowed to enter the Public Water Distribution System that exceeds this AL. Wherever it has been found, the source has been provided with GAC treatment to remove the compound or the use of the contaminated source has been terminated until adequate treatment can be installed.

Nature does an excellent job in providing us with abundant drinking water. However, nature needs our active participation in order to maintain its clarity and purity. Use water wisely. Illegal dumping, soil erosion resulting from grassland fires/poachers, and poorly maintained septic systems all pose threats to our drinking water. Dispose of waste properly, protect our watersheds from arson and poachers, and support recycling. **Protecting our water resources begins with protecting our environment.**

Sources of Our Drinking Water

Our water is derived from several sources including ground, surface and spring water. The island's principal source of potable water is our abundant rainfall, most of which becomes groundwater contained in the aquifer beneath the northern half of the island. Groundwater is pumped from 120 wells in this deep underground aquifer into the

water distribution system. Surface sources used by GWA include an intake from the Ugum River and water purchased from the Navy’s Fena System. Spring water from Santa Rita Spring is used to supplement the water supply from Fena for the villages of Asan, Piti, Anigua, Agat, Santa Rita and sometimes as far as Mongmong-Toto-Maite.

It has long been recognized that our water sources need protection, and GWA is determined to protect our very high-quality water against contamination, not only from percolation and runoff of surface pollution, septic system discharges, water softener and reverse osmosis waste streams but also from salt-water intrusion due to over-pumping of the aquifer. We are working with the Guam Environmental Protection Agency (GEPA) and the Water and Environmental Research Institute of the Western Pacific, University of Guam (WERI) to determine the vulnerability of our water sources to contamination. More information on the water quality of our island is available on the GEPA and WERI web sites.

Why are there Contaminants in the Water?

All drinking water, including bottled water, may reasonably be expected to contain at least trace amounts of some contaminants of natural origin. The presence of substances dissolved in drinking water does not usually indicate that the drinking water poses a health risk, and many naturally occurring ingredients are beneficial to human health. 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 GEPA’s Safe Drinking Water Program at (671) 300-4779/9026.

In compliance with the Guam Primary Safe Drinking Water Regulations (GPSDWR), our drinking water is monitored for all regulated contaminants and unregulated constituents as it leaves our drinking water sources and enters the distribution system. The contaminants measured include:

- **Microbial contaminants**, such as viruses and bacteria, which are native to tropical soils, or may come from sewage spills, septic systems, agricultural livestock operations or wildlife or from illegal dumping.
- **Inorganic contaminants**, such as salts and metals, which are naturally occurring, or may result from stormwater runoff, commercial wastewater discharges, RO and water softener waste streams, farming or from illegal dumping.
- **Pesticide and herbicide contaminants**, which may come from a variety of sources such as home and garden use, agriculture or urban stormwater runoff.

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 people, and infants can be particularly at risk from infections. These people should seek advice, about drinking water, from their primary health care providers. EPA/Center for Disease Control 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 1-800-426-4791.

- **Organic chemical contaminants**, including synthetic and volatile organic chemicals, which are by-products of industrial processes, (e.g. PFAS) and petroleum production or use, and can also come from gas stations, commercial spills, urban stormwater runoff, and septic systems.
- **Radioactive contaminants**, which can be naturally occurring or be the result of improper disposal of radioactive waste.

This report shows **ONLY** the contaminants that have been detected at levels of interest. If you would like a complete listing of contaminants monitored by GWA, or if you have any questions regarding this report, please call **Jennifer O. Cruz** at our Certified Compliance Monitoring Laboratory Services Division at **(671) 300-6360** during normal business hours.

Other Information

Stipulated Order for Preliminary Relief and the 2011 Court Order

In December 2002, a civil suit was filed against GWA and the Government of Guam by the United States Department of Justice (DOJ) seeking to address Public Health compliance issues in GWA’s wastewater and drinking water systems. In June 2003, Federal DOJ, USEPA, GWA and the Government of Guam negotiated the terms of the Stipulated Order for Preliminary Relief; Civil Case No. 02-0035 (SO). With it GWA, under CCU and EPA oversight, undertook a broad initiative to restore its facilities and to provide safe, reliable service to the island while meeting all regulations. The compliance issues to be addressed under the SO included drinking water focused construction and rehabilitation projects, and training of GWA personnel. There were reporting requirements and notice provisions incorporated in the SO that were more stringent than normal regulatory reporting. A full-scale Water Resources Master Plan was also produced.

USEPA has been satisfied with GWA’s progress with the SO mandates and USEPA & Guam EPA concur that GWA’s drinking water now meets or exceeds the SDWA and GPDWR requirements.

On October 10, 2011, the SO was replaced by a District Court Order (CO) which recognizes GWA’s progress in providing reliable and safe drinking water and which is focused more on environmental issues and the need to work through the projects identified in the Water Resources Master Plan. GWA is working closely with both USEPA and Guam EPA in order to achieve or exceed the goals of the CO, and has completed over 98% of the required projects under the CO as of 2022.

A copy of the updated “**Water Resources Master Plan**” and the “**Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035**” are posted on the GWA web site at:<http://guamwaterworks.org/compliance-and-safety/>. If you want more information on the CO, please call **Paul Kemp**, GWA Assistant General Manager--Compliance and Safety at **(671) 300-6885**.

Sanitary Survey

As part of the SDWA, Guam EPA conducted a review of GWA’s water systems to assess our ability to supply safe drinking water. There were eight areas surveyed: source, treatment, distribution system, finished water storage, pumps, monitoring and reporting, management and operation, and operator compliance. Any deficiencies found are addressed and those pending corrections are identified in this report. GWA diligently aims to complete all necessary corrections.

FREQUENTLY ASKED QUESTIONS

Should I be concerned about metals, such as lead, in my water?
All GWA systems meet the Safe Drinking Water Act and Guam Primary Drinking Water Regulation for metals. In fact, majority of the regulated metals are not detected while those detected are at very low levels, well below that which is considered safe.

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. GWA is responsible for providing high quality drinking water, but cannot control the variety of materials used in customer plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 15 to30 seconds 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 1-800-426-4791) or www.epa.gov/safewater/lead.

What are Per/PolyFluoro-Alkyl Substances (PFAS)?
Per/PolyFluoro-Alkyl Substances (PFAS) are chemical compounds which contain fluorine to make them water, fire and/or stain resistant. The most familiar forms are Teflon which is used as a lining of cookware, or the coating on the inside of some food packaging, most commonly in microwave popcorn bags. Recent studies of this class of compounds have brought to light potentially adverse health effects of some chemicals in this group for a lifetime of exposure to us. During the third round of the Unregulated Contaminant Monitoring Rule, UCMR3 (in 2015) levels of some of these compounds in drinking water were first monitored. In June 2022, EPA released an interim updated health advisories for PFOA (0.004 ppt) and PFOS (0.02 ppt). It also released an interim health advisory for PFBS (2000 ppt) and Genx (10 ppt). GWA has begun screening drinking water sources for these chemicals and levels at points of entry into the distribution system are reported in this document. In addition, GWA is currently preparing to screen the remaining untested drinking water sources for PFAS in order to plan for appropriate corrective action, as needed.

PFAS remains an emerging field of study, the safe levels for exposure to us are under further evaluation. Up to date information can be obtained by calling the USEPA Safe Drinking Water “Hot Line” at: **1-800-426-4791**.

Sanitary Survey Significant Deficiencies Summary

SYSTEM	CATEGORY	SIGNIFICANT DEFICIENCY	LOCATION	CORRECTIVE ACTION
Northern	Production Wells	Air release valve (ARV) is broken or not pointing/facing down, and lacks a screen or the screen is broken.	D1, D2, D4, D7, D8, D25, F1, F2, F12, F13, F15, F17, F18, F20, F8, GH501, HGC2, Y1,Y2, Y3, Y5, Y6, Y9, Y10, Y14, Y16, Y19, Y20, Y21A, Y22	Repair is ongoing.
Northern	Production Wells	Air vent is open/not secured	NAS1, EX11, D23, AG1, D10, D11, D12, D226, D28, AG2A, D1, D19, D6, D7, D8, F10, F11, F12, F13, F15, F16, F2, F20, F3, F4, F8, GH501, HGC2, M1, Y1, Y10, Y12, Y14, Y18, Y19, Y20, Y22, Y3, Y5, Y6, Y7, Y9, D20, D21, M20A, M12, M14, M23, M18	Repair is ongoing.
Northern	Production Wells	An open conduit that seems to be an air vent at the wellhead is open that needs to be secured.	YL4	Repair is ongoing.
Northern	Production Wells	ARVs are not U-bend and have no screens.	M2, M3, M4, M5, M6, M7, M8, M12, M14, M17A, M18, M23	Repair and screen installation is ongoing.
Northern	Production Wells	Chlorine cylinders are not chained. Cracks on the concrete cover of the disconnected wellhead that was capped at the ground	A7	This deficiency has been corrected as of May 2023.
Northern	Production Wells	Defective flow meter.	A8, A9, A15, A17, A18, D16	Repair and/or replacement is ongoing.
Northern	Production Wells	Defective Water Meters (DWM)	A-8, A-15, M1, M4, M5, M15, M7	Project is part of on-going Capital Improvement Project (CIP)
Northern	Production Wells	Defective pressure gauge	D17B, M8	This deficiency has been corrected as of May 2023.
Northern	Production Wells	Diesel secondary containment drains are not secured.	D13, D14, D17B, H1, M2, M3, M4, M5, M7, M8, M9, M12, M14, M18	Security measures implementation is ongoing.
Northern	Production Wells	Electrical conduit is not	M9	This deficiency has been corrected as of May 2023.

SYSTEM	CATEGORY	SIGNIFICANT DEFICIENCY	LOCATION	CORRECTIVE ACTION
Northern	Production Wells	secured/open at the wellhead		
Northern	Production Wells	Insufficient sanitary seal.	A29, A23, A25	This deficiency has been corrected as of May 2023.
Northern	Production Wells	Leaks are found on different parts of the wellhead and at the well chlorination system.	EX11, F1, D19, D15, Y16, Y21A, F12, F16, Y2, D9, Y10, D15, Y12, F20, D7, F10, D10, D11, A19, M8, M2, M4, D14, D18B, M7, M6	Replacement of piping materials - ongoing
Northern	Production Wells	No cap on detached well distribution pipe	A3	Replacement of piping materials - ongoing
Northern	Production Wells	No lockable cover of the fuel secondary containment drain valve.	A13, A14, A15, A18, A19, A21, A23, A25, A26, A28, A29, A4, A9	Repair is ongoing.
Northern	Production Wells	No proper screen for wellhead air vent.	A21, A3, A31, A23, A25, A26, A29, A4	Installation is ongoing.
Northern	Production Wells	No sanitary seal on wellhead cover nuts.	D14	This deficiency has been corrected as of May 2023.
Northern	Production Wells	No security lock on the drain valve of the fuel secondary containment.	AG1, AG2A, D10, D11, D12, D15, D20, D26, D7, D9, F1, F10, F11, F12, F2, F3, F4, F8, GH501, M1, Y2, Y3, Y4A, Y5, Y6, Y7, Y9	Repair is ongoing.
Northern	Production Wells	No wellhead air vent.	A10, A29, A32, A4, A5	Installation is ongoing.
Northern	Production Wells	Not abandoned properly.	A2	Deep Well A-2 is part of a well rehabilitation project.
Northern	Production Wells	Not enough sanitary seal on wellhead cover.	M17A, M5, M15, M18, M14, M3, M2, M4	This deficiency has been corrected as of May 2023.
Northern	Production Wells	Not protected against trespass/vandalism.	M5, M14, M2	This deficiency has been corrected as of May 2023.
Northern	Production Wells	Traces of an oil spill at the generator rooms.	D14, M12, M18, M2, M3, M4, M20A, M8, AG1, D9, D2, D25, D27, D28, D6, D7, D8, F16, F2, F20, F8, GH501, M1, Y10, Y2, Y20, Y3, Y4A, M5	Repair of leaking equipment is ongoing.
Northern	Production Wells	Open conduit at the wellhead pedestal.	A21	This deficiency has been corrected as of May 2023.
Northern	Production Wells	Pressure gauge not working or defective.	D28, D7, F3, M6, M7, Y18	This deficiency has been corrected as of May 2023.
Northern	Production Wells	The discharge pipe has a hole at the side; the discharge pipe's cover has a hole; the electrical conduit at the wellhead is open/not protected;	D23	This deficiency has been corrected as of May 2023.
Northern	Production Wells	Wellhead cover is not secured.	D23, D13	This deficiency has been corrected as of May 2023.
Northern	Production Wells	Well not secured.	A10, A14, A23, A25, A26, A29, A9, AG1, AG2A, D10, D19, D25, D26, D28, D7, D8, F1, F10, F11, F12, F13, F15, F19, F2, F8, M15, M4, M7, Y1, Y10, Y16, Y18, Y19, Y2, Y20, Y21A, Y3, Y5, Y6, Y7, Y9, M20A, M17A	Security measures implementation is ongoing.
Northern	Production Wells	Unstable/shaky air vent.	A8	This deficiency has been corrected as of May 2023.
Northern	Production Wells	Water flow meter is not working or defective.	D15, F1, M1, M15	Replacement is ongoing.
Northern	Production Wells	Wellhead casing cover has insufficient sanitary seal.	AG2, D1, D11, D28, D7, F11, F13, F17, F18, F19, F2, F20, F4, F8, M1, M17B, M20A, M23, M6,M7,M8, Y10, Y12, Y14, Y16, Y18, Y19, Y20, Y21A, Y22, Y5, Y6, Y7, Y9, Y2, EX11	This deficiency has been corrected as of May 2023.
Northern	Treatment	Defective equipment/parts.	A1, A12, A13, A8, A4, Y18, A18, A26, A5, A8, A9	Repair and/or replacement is ongoing.

SYSTEM	CATEGORY	SIGNIFICANT DEFICIENCY	LOCATION	CORRECTIVE ACTION
Northern	Treatment	No automatic switch over (ASO).	A10, D25, F1, F11, M15, Y18	This deficiency has been corrected as of May 2023.
Northern	Treatment	Unsecured chlorine cylinder/ building.	A9, A12, A13, A15, A17, A23, A32, A9, D16	This deficiency has been corrected as of May 2023.
Northern	Distribution	Broken ARV	Carnation PRV	This deficiency has been corrected as of May 2023.
Northern	Distribution	Leaking PRV	Route 3 PRV	This deficiency has been corrected as of May 2023.
Northern	Finished Water Storage	Significant corrosion of access ladder inside the tank	Mangilao #2	GWA will conduct additional inspection. Will need CIP to address corrosion inside tank, to be completed by 2023.
Northern	Pumps, Pump Stations, Pump Facilities	Pump unsecured	Mataguac Pump #3	Repair is ongoing.
Northern	Pumps, Pump Stations, Pump Facilities	Unprotected from entry and vandalism.	Carnation	This deficiency has been corrected as of May 2023.
Northern	Pumps, Pump Stations, Pump Facilities	Leaks	Brigade	This deficiency has been corrected as of May 2023.
Central	Distribution system	Low pressure at FH	Top of Umang -Agat	To be completed as part of 2018 Guam Water Resources Master Plan - Pipe Replacement and Pressure Zone Alignment Projects
Central	Distribution system	No chlorine residual in the distribution system.	Mariner Avenue, Tiyan	To be completed as part of 2018 Guam Water Resources Master Plan - Pipe Replacement and Pressure Zone Alignment Projects. Regular fire hydrant flushing implemented.
Central	Finished Water Storage	Opening at water level indicator end pipe.	Airport Tank, Agat #1 & #2	Repair is ongoing.
Central	Pumps, Pump Stations, Pump Facilities	Needs ground maintenace	Nimitz Hill	Ongoing monthly maintenance
Central	Pumps, Pump Stations, Pump Facilities	Not secured from unauthorized entry and vandalism; leaks	Sta. Rita Spring	Security fencing repaired and facility is secured as of May 2023.
Southern	Pumps, Pump Stations, Pump Facilities	Not secured from unauthorized entry and vandalism	Camacho, Pigua	Project is part of ongoing CIP.
Southern	Distribution System	Low pressure on residential hose bib (HB)	House #379 D. Quinene Road, Merizo	To be completed as part of 2018 Guam Water Resources Master Plan - Pipe Replacement and Pressure Zone Alignment Projects.
Southern	Distribution System	Broken ARV	FH top of Pigua, Merizo	This deficiency has been corrected as of May 2023.
Southern	Distribution System	Brown water	FH top of Pagachao, FH Talofofo/ Rt 4	Implemented flushing schedule.
Southern	Distribution System	Chlorine residual not detected and lack of system flushing	FH across Jeff's Pirate Cove;FH top of Dandan/Pigua, Merizo; HB House #202 Demetrio Meno St.	Implemented flushing schedule.
Southern	Distribution System	Not secured intake facility.	Ugum River Facility	Appropriate signage will be installed to advise the public.
Southern	Distribution System	No screen at reservoir overflow end pipe.	Ugum Reservoir	Installation is ongoing.
Southern	Distribution System	Low pressure at FH	Top of Quinene Road; Malojloj tank; HB at House #379 D. Quinene Rd.	To be completed as part of 2018 Guam Water Resources Master Plan - Pipe Replacement and Pressure Zone Alignment Projects.
Southern	Finished Water Storage	Opening at water level indicator end pipe.	Malojloj, Pigua, Umatac Substation	Repair is ongoing.
Southern	Pumps, Pump Stations, Pump Facilities	Not secured from unauthorized entry and vandalism; leaks	Sta. Rita Spring	Security measures implementation is ongoing.

2022 Water Quality Data

PRIMARY STANDARDS: Mandatory Health-Related Standards¹

CONTAMINANT <i>(units)</i>	MCLG	MCL	NORTHERN				CENTRAL				SOUTHERN				Major Sources of Contaminant
			Range	RV	Yr. Sampled	Violation	Range	RV	Yr. Sampled	Violation	Range	RV	Yr. Sampled	Violation	
Regulated SOCs															Banned termiticide residue Canceled pesticide residue Breakdown of the banned pesticide heptachlor
Chlordane <i>(ppb)</i>	0	2	nd - 1.3	1.3	2022	No	nd	nd	2021	No	nd	nd	2021	No	
Endrin <i>(ppb)</i>	2	2	nd - 0.027	0.027	2022	No	nd	nd	2021	No	nd	nd	2021	No	
Heptachlor Epoxide <i>(ppb)</i>	0	0.2	nd - 0.019	0.019	2022	No	nd	nd	2021	No	nd	nd	2021	No	Erosion of natural deposits Erosion of natural deposits Erosion of natural deposits Erosion of natural deposits Erosion of natural deposits Erosion of natural deposits Runoff from fertilizer use; leaching from septic tank sewage Runoff from fertilizer use; leaching from septic tank sewage
Regulated IOCs															
Antimony <i>(ppb)</i>	6	6	nd - 2.3	2.3	2021	No	nd	nd	2021	No	nd	nd	2021	No	
Arsenic <i>(ppb)</i>	N/A	10	nd - 3.5	3.5	2021	No	nd	nd	2021	No	nd	nd	2021	No	
Barium <i>(ppb)</i>	2000	2000	nd - 8.6	8.6	2021	No	2.5 - 4.3	4.3	2021	No	4.1	4.1	2021	No	
Chromium <i>(ppb)</i>	100	100	nd - 7.5	7.5	2021	No	nd	nd	2021	No	nd	nd	2021	No	
Copper <i>(ppb)</i>	1300	AL=1300	nd - 350	350	2021	No	2.4 - 41	41	2021	No	40	40	2021	No	
Lead <i>(ppb)</i>	0	AL=15	nd - 5.1	5.1	2021	No	nd - 0.54	0.54	2021	No	nd	nd	2021	No	
Nitrate-N <i>(ppm)</i>	10	10	0.55 - 4.5	4.5	2022	No	0.2 - 0.6	0.60	2021	No	nd	nd	2022	No	
Nitrite-N <i>(ppm)</i>	1	1	<0.005 - 0.013	0.013	2022	No	<0.005	<0.005	2022	No	0.007	0.007	2022	No	
Radionuclides															Erosion of natural deposits Erosion of natural deposits Erosion of natural deposits Decay of natural and man-made deposits Erosion of natural deposits
Radium 226 <i>(pCi/l)</i>	0	5	<1.00 - 4.00	4.00	2021	No	<1.00	<1.00	2021	No	<1.00	<1.00	2021	No	
Radium 228 <i>(pCi/l)</i>	0	5	<1.00	<1.00	2021	No	<1.00	<1.00	2021	No	<1.00	<1.00	2021	No	
Gross Alpha Activity <i>(pCi/l)</i>	0	15	<3.0 - 15.0	15.00	2021	No	<3.00	<3.00	2021	No	<3.00	<3.00	2021	No	
Gross Beta Activity <i>(pCi/l)</i>	0	50 ^a	<3.0 - 8.8	8.80	2021	No	<3.00 - 5.9	5.9	2021	No	<3.00	<3.00	2021	No	
Uranium <i>(µg/L)</i>	0	30	<1.0 - 4.5	4.50	2021	No	<1.00	<1.00	2021	No	<1.00	<1.00	2021	No	

^a The MCL for beta particles is 4 mrem/year. However, EPA considers 50 pCi/l to be the level of concern for beta particles.

Lead and Copper Rule²

CONTAMINANT <i>(units)</i>	MCLG	MCL	NORTHERN				CENTRAL				SOUTHERN				Major Sources of Contaminant
			90th Percentile Level	Samples above AL	Year Sampled	Violation	90th Percentile Level	Samples above AL	Year Sampled	Violation	90th Percentile Level	Samples above AL	Year Sampled	Violation	
Copper <i>(ppb)</i> Lead <i>(ppb)</i>	1300 0	AL=1300 AL=15	160 1.5	0 0	2022 2022	No No	240 1.5	0 0	2022 2022	No No	53 .83	0 0	2022 2022	No No	Corrosion of household plumbing

Microbial Contaminants²

CONTAMINANT <i>(units)</i>	MCLG	MCL	NORTHERN			CENTRAL			SOUTHERN			Major Sources of Contaminant
			RV	Year Sampled	Violation	RV	Year Sampled	Violation	RV	Year Sampled	Violation	
Total Coliform <i>(TC)</i> Fecal coliform <i>(FC)</i> or <i>E. coli</i>	0 0	5% ^b 0	1.2% 0	2022 2022	No No	5 positive samples 2 positive samples	2022 2022	Yes* Yes*	1 positive sample 0	2022 2022	No No	Naturally present in environment Human and animal fecal waste

^b MCL for Central and Southern systems: 2 positive samples per month

* On April 27, 2022, routine distribution system sampling in Agat resulted in four total coliform positive samples, two of which tested positive for E. coli. On April 28, 2002, GWA issued a Boil Water Notice to the affected area and posted at the Agat Mayor’s Office. Preventative measures and corrective action were taken immediately including repeat sampling, increased flushing, and subsequent sampling to confirm the system was clear. In-depth assessment revealed the potential cause was a main water line break, which caused fluctuations in the system pressure that may have introduced the contaminant in the system.
Preventataive Measure. GWA will increase the amount of flushing in the area after any main waterline break, issue a precautionary Boil Water Notice to affected areas, make efforts to keep the pressure above the minimum requirement, and continue pipe replacement and other critical water system upgrades.
Health Effects. Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

Disinfection Byproducts (DBPs) and Disinfection Residuals²

CONTAMINANT <i>(units)</i>	MCLG	MCL	NORTHERN				CENTRAL				SOUTHERN				Major Sources of Contaminant
			Range	RV	Year Sampled	Violation	Range	RV	Year Sampled	Violation	Range	RV	Year Sampled	Violation	
HAA5 (Five Haloacetic Acids) <i>(ppb)</i> Total Trihalomethanes <i>(ppb)</i>	n/a n/a	60 80	nd - 7.4 nd - 21.0	2.4 15.3	2022 2022	No No	nd - 13.0 5.5 - 51.0	19.8 51.5	2022 2022	No No	8.9 - 23.0 24.0 - 44.0	20.5 37.5	2022 2022	No No	By-product of drinking water chlorination By-product of drinking water chlorination
Chlorine <i>(ppm)</i>	MRDLG	MRDL													
	4	4	0.2 - 3.5	1.6	2022	No	0.2 - 3.3	1.3	2022	No	0 - 2.5	1.1	2022	No	Water additive to control microbes

MCLG: Maximum Contaminant Level Goal, or 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.

MCL: Maximum Contaminant Level, or the highest level of a contaminant allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technique.

MRDL: Maximum Residual Disinfectant Level, or the level of a disinfectant that may not be exceeded at the consumer’s tap without as unacceptable possibility of health effects.

MRDLG: Maximum Residual Disinfectant Level Goal, or the maximum level of a disinfectant added to the water treatment at which no known or anticipated adverse health effect would occur. MRDLGs allow for a margin of safety.

AL: Action Level, or the concentration of a contaminant which, when exceeded triggers treatment or other requirements that a water system must follow. Copper AL = 1300 ppb; Lead AL = 15 ppb.

LHAL: Lifetime Health Advisory Level. Concentration level of a contaminant in drinking water at which adverse health effects are not anticipated to occur over a lifetime of exposure.

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

RV: Reporting Value, or that used for determining compliance with the MCL, and is the highest average value for any single source tested. For VOCs and SOCs, RV= the highest annual average. For ICs and radionuclides, RV= the highest value detected. If the RV is below the MCL, the water is meeting the health and safety-based standards.

Range: range of values actually detected in samples from all the water tested

VOC: Volatile Organic Chemical

SOC: Synthetic Organic Chemical

IOC: Inorganic Chemical

NTU: nephelometric turbidity units

ppm: parts per million, or milligrams per liter

ppb: parts per billion, or micrograms per liter

ppt: parts per trillion, or nanograms per liter

pCi/l: picocuries per liter, a measure of radioactivity

mrem/yr: millirems per year, a measure of radioactivity

nd: not detectable at testing limits

n/a: not applicable

ns: no standard

PFBS: Perfluorobutane sulfonic acid

PFOA: Perfluorooctanoic acid

PFOS: Perfluorooctane sulfonic acid

GenX (HFPO-DA): Hexafluoropropylene oxide dimer acid

Turbidity as Indicator of Filtration Performance

CONTAMINANT (units)	MCLG	MCL	UGUM WATER			FENA WATER			Major Sources of Contaminant
			RV	Violation	Sample Year	RV	Violation	Sample Year	
Turbidity (ntu)	n/a	TT = 1 NTU	0.100	No	2022	0.182	No	06/07/22	Soil runoff
		TT ^c	100.0%	No	2022	100.0%	No	2022	

^c TT = 95 % of samples measured every 4 hours < 0.3 ntu

Unregulated Contaminants (Monitoring Required)^d

CONTAMINANT (units)	MCLG	MCL	NORTHERN			CENTRAL		
			Range	RV	Sample Year	Range	RV	Sample Year
Unregulated HAAs Groups								
Total HAA5 (ppb)	ns	ns	2.2 - 3.8	3.8	2021	1.4 - 33	33	2021
Total HAA6Br (ppb)	ns	ns	2.9 - 4.7	4.7	2021	2.0 - 23	23	2021
Total HAA9 (ppb)	ns	ns	2.9 - 5.8	5.8	2021	2.3 - 50	50	2021
Unregulated IOCs								
Manganese (ppb)	ns	ns	nd - 1.91	1.91	2021	0.72 - 110	110	2021
Unregulated DBPs Indicators								
Bromide (ppb)	ns	ns	nd - 1460	1460	2021	n/a	n/a	
Total Organic Carbon (ppm)	ns	ns	nd - 1.36	1.36	2021	n/a	n/a	

^d Unregulated contaminant monitoring helps EPA to determine where certain contaminants occur and whether there is a need to regulate those contaminants. (UCMR 4 Data)

Secondary Standards - Consumer Acceptance Limits^e

CONTAMINANT (units)	MCLG	MCL	GROUND WATER		UGUM WATER		FENA WATER	
			Range	Sample Year	Range	Sample Year	Range	Sample Year
Chloride (ppm)	n/a	250	10 - 481	2022	10 - 20	2022	8.75 - 22.0	2022
Conductivity (µmho/cm)	n/a	1600	363 - 2480	2022	132 - 169	2022	289 - 424	2022
Fluoride (ppm)	n/a	2.0	nd - 0.15	2021	0.059	2021	0.22 - 0.28	2021
pH (units)	n/a	6.5 - 8.5	7.00 - 8.00	2022	7.64 - 7.71	2022	7.41 - 8.19	2022
Sulfates (ppm)	n/a	250	2.5 - 58	2021	1.5	2021	28	2021

^e Secondary MCL monitoring helps GWA to determine areas in need of adjustment, additional maintenance or rehabilitation in order to provide a high quality water that appeals to the consumer.

Additional Constituents Analyzed

CONTAMINANT (units)	MCLG	MCL	GROUND WATER		UGUM WATER		FENA WATER	
			Range	Sample Year	Range	Sample Year	Range	Sample Year
Alkalinity as CaCO ₃ (ppm)	n/a	n/a	161 - 381	2022	44 - 64	2022	111 - 200	2022
Hardness as CaCO ₃ (ppm)	n/a	n/a	138 - 520	2022	44 - 58	2022	110 - 216	2022
Nickel (ppm)	n/a	n/a	nd - 0.0074	2021	nd	2021	nd	2021
Dieldrin (ppb)	n/a	n/a	nd - 1.9	2021-2022	nd	2021	nd	2021
Sodium (ppm)	n/a	n/a	nd - 220	2022	12	2022	13 - 15	2022
PFAS	LHAL (thru Jun'22)	LHAL (after Jun'22)						
PFOS (ppt)	70	0.02	nd - 56	2022	n/a	-	2.3 - 3.4	2021
PFOA (ppt)	70	0.004	nd - 7.6	2022	n/a	-	nd	2021
PFBS (ppt)	n/a	2000	nd - 31	2022	n/a	-	n/a	-
GenX (ppt)	n/a	10	nd	2022	n/a	-	n/a	-

About the Data:

1. Data presented in these tables list the results of tests done between Jan 1 - Dec 31, 2022. Tables list only the contaminants detected. Detection does not necessarily mean a violation or exceedence of an MCL or Treatment Technique. GWA monitors for some constituents less than once per year because they are not expected to vary significantly from year to year. Therefore, some of the water quality data reported, although representative, may be more than one year old. If you have questions about this water quality report, please contact Jennifer O. Cruz, GWA's Compliance Monitoring Laboratory Administrator at (671) 300-6360.

2. Microbial, lead and copper, haloacetic acids (HAA5), and total trihalomethanes (TTHM) samples were taken from the distribution system, not from source waters. Compliance for chlorine is based on annual running average (ARA) calculated monthly (highest average). Compliance with MCL for HAA5 and TTHM monitoring is based on LRAA (locational running annual average) calculated quarterly. Required number of monitoring sites are as follows: Northern - 6 sites; Central - 4 sites; Southern - 2 sites.