

2021 CONSUMER CONFIDENCE WATER QUALITY REPORT



 GUAM WATERWORKS AUTHORITY

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 2021, 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, 2021 to December 31, 2021.

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 much 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 when 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 UCMR4 in 2015. USEPA has issued an 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 wastes 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 some areas of Barrigada and 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, 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 the 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.
- **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 Laboratory Services Division at **(671) 300-6360** during normal business hours.

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.

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 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 2021.

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 to 30 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.

Definitions and Abbreviations:

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 an 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.

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

Sanitary Survey Significant Deficiencies Summary

| SYSTEM | CATEGORY | SIGNIFICANT DEFICIENCY | LOCATION | CORRECTIVE ACTION |
|----------|------------------------|---|------------------------------------|---|
| Northern | Production Wells | Chlorine analyzer is not working | D4 | Replacement of chlorine analyzer - ongoing |
| Northern | Production Wells | Defective Water Meters (DWM) | A-8, A-15, M1, M4, M5, M15, M7 | Project is part of ongoing Capital Improvement Project (CIP) |
| Northern | Production Wells | Leaks are found on different parts of the wellhead and at the well chlorination system. | D7 | Replacement of piping materials - ongoing |
| Northern | Finished Water Storage | No tank roof maintenance. | Astumbo#2, Yigo #1, Yigo #2 | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |
| Northern | Finished Water Storage | Leakage at the tank | Kaiser Reservior | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |
| Northern | Finished Water Storage | Leak at Inlet | Kaiser Reservior | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |
| Northern | Finished Water Storage | Corroded nuts/bolts | Kaiser Reservior | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |
| Northern | Finished Water Storage | Opening at the end of water level indicator device | Kaiser Reservior | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |
| Northern | Finished Water Storage | Open end of unknown pipe at the tank roof | Sinfa | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |
| Northern | Finished Water Storage | No lockable cover for the cage access ladder | Sinfa | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |
| Northern | Finished Water Storage | Excessive corrosion of the tank anchor bolts | Sinfa | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |
| 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 | Finished Water Storage | No security or broken fence | Agat #2, Air Port Tank, Mangenggon | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |

| SYSTEM | CATEGORY | SIGNIFICANT DEFICIENCY | LOCATION | CORRECTIVE ACTION |
|----------|---------------------------------------|---|---|---|
| Central | Finished Water Storage | No lock at roof access hatches | Agat#2 | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |
| Central | Finished Water Storage | Excessive corrosion of exterior surfaces, valves, inlet and outlet | Agat #2, Manenggon | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |
| Central | Finished Water Storage | Maintenance required on the drain and overflow outlets. | Agat#2 | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |
| Central | Finished Water Storage | Access ladder is not caged/no lockable cover | Mannenggon | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |
| Central | Finished Water Storage | No perimeter fence | Mannenggon | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |
| Central | Finished Water Storage | No tank roof maintenance | Air Port, Barrigada #2, Mangilao #1, Mangilao #2, Ninitz Hill | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |
| Central | Finished Water Storage | Significant corrosion of access ladder inside the tank | Mangilao #2 | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |
| Central | Finished Water Storage | Valves submerged and obstructed | Santa Rita Springs | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |
| Central | Finished Water Storage | Gaps in the galvanized roof of the concrete tank. | Santa Rita Springs | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |
| Southern | Pumps, Pump Stations, Pump Facilities | Not secured from unauthorized entry and vandalism | Camacho, Pigua | Project is part of ongoing CIP |
| Southern | Pumps, Pump Stations, Pump Facilities | Unsafe electrical panels, wirings, and pump controls that are exposed to weather due to no building enclosure | Camacho, WBP1 | 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 |

| SYSTEM | CATEGORY | SIGNIFICANT DEFICIENCY | LOCATION | CORRECTIVE ACTION |
|----------|------------------------|---|-----------------------------|---|
| Southern | Distribution System | Low pressure at FH | Top of Quinene Road | To be completed as part of 2018 Guam Water Resources Master Plan - Pipe Replacement and Pressure Zone Alignment Projects |
| Southern | Finished Water Storage | Excessive corrosion of exterior surfaces, valves, inlet and outlet. | Malojloj, Pigua | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |
| Southern | Finished Water Storage | Excessive corrosion of tank anchor bolts | Malojloj, Umatac Substation | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |
| Southern | Finished Water Storage | Maintenance required on the drain and overflow outlets. | Malojloj, Pigua | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |
| Southern | Finished Water Storage | No screens on the drain and overflow end pipe. | Malojloj | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |
| Southern | Finished Water Storage | Leaks | Umatac Substation | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |
| Southern | Finished Water Storage | No security of broken fence | Umatac Substation | On- going projects listed as part of "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-0035" |

2021 Water Quality Data

PRIMARY STANDARDS: Mandatory Health-Related Standards

| CONTAMINANT (units) | MCLG | MCL | GROUND WATER | | UGUM WATER | | FENA WATER | | Major Sources of Contaminant |
|------------------------------|------|-----------------|--------------|-------|------------|-------|-------------|-------|--|
| | | | Range | RV | Range | RV | Range | RV | |
| Regulated SOCs | | | | | | | | | |
| Chlordane (ppb) | 0 | 2 | nd - 1.6 | 1.6 | nd | nd | nd | nd | Banned termiticide residue |
| Endrin (ppb) | 2 | 2 | nd - 0.03 | 0.03 | nd | nd | nd | nd | Canceled pesticide residue |
| Heptachlor Epoxide (ppb) | 0 | 0.2 | nd - 0.03 | 0.03 | nd | nd | nd | nd | Breakdown of the banned pesticide heptachlor |
| Pentachlorophenol (ppb) | 0 | 1.0 | nd - 2.7 | 2.7a | nd | nd | nd | nd | Banned wood preservative |
| Regulated IOCs | | | | | | | | | |
| Antimony (ppb) | 6 | 6 | nd - 2.3 | 2.3 | nd | nd | nd | nd | Erosion of natural deposits |
| Arsenic (ppb) | N/A | 10 | nd - 3.5 | 3.5 | nd | nd | nd | nd | Erosion of natural deposits |
| Barium (ppb) | 2000 | 2000 | nd - 8.6 | 8.6 | 4.1 | 4.1 | 2.5 - 4.3 | 4.3 | Erosion of natural deposits |
| Chromium (ppb) | 100 | 100 | nd - 7.5 | 7.5 | nd | nd | nd | nd | Erosion of natural deposits |
| Copper (ppb) | 1300 | AL=1300 | nd - 350 | 350 | 40 | 40 | 2.4 - 41 | 41 | Corrosion of household plumbing; erosion of natural deposits |
| Lead (ppb) | 0 | AL=15 | nd - 5.1 | 5.1 | nd | nd | nd - 0.54 | 0.54 | Corrosion of household plumbing; erosion of natural deposits |
| Nitrate-N (ppm) | 10 | 10 | 0.59 - 4.4 | 4.40 | nd | nd | 0.11 | 0.11 | Runoff from fertilizer use; leaching from sewage |
| Radionuclides | | | | | | | | | |
| Radium 226 (pCi/l) | 0 | 5 | <1.00 - 4.00 | 4.00 | <1.00 | <1.00 | <1.00 | <1.00 | Erosion of natural deposits |
| Radium 228 (pCi/l) | 0 | 5 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | Erosion of natural deposits |
| Gross Alpha Activity (pCi/l) | 0 | 15 | <3.0 - 15 | 15.00 | <3.00 | <3.00 | <3.00 | <3.00 | Erosion of natural deposits |
| Gross Beta Activity (pCi/l) | 0 | 50 ^b | <3.0 - 8.8 | 8.80 | <3.00 | <3.00 | <3.00 - 5.9 | 5.9 | Decay of natural and man-made deposits |
| Uranium (µg/L) | 0 | 30 | <1.0 - 4.5 | 4.50 | <1.00 | <1.00 | <1.00 | <1.00 | Erosion of natural deposits |

^a This value is based on a single sample detection, which does not constitute a MCL violation.

^b 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 (units) | MCLG | MCL | NORTHERN | | CENTRAL | | SOUTHERN | | Major Sources of Contaminant |
|------------------------|------|---------|-----------------------|------------------|-----------------------|------------------|-----------------------|------------------|--|
| | | | 90th Percentile Level | Samples above AL | 90th Percentile Level | Samples above AL | 90th Percentile Level | Samples above AL | |
| Copper (ppb) | 1300 | AL=1300 | 180 | 0 | 130 | 0 | 90 | 0 | Corrosion of household plumbing; erosion of natural deposits |
| Lead (ppb) | 0 | AL=15 | 1.9 | 1 of 59 | 1.2 | 0 | <1.0 | 0 | |

Microbial Contaminants²

| CONTAMINANT (units) | MCLG | MCL | NORTHERN | | CENTRAL | | SOUTHERN | | Major Sources of Contaminant |
|--------------------------------|------|------------------|-----------|------|-----------|------|-----------|----|--|
| | | | Violation | RV | Violation | RV | Violation | RV | |
| Total Coliform (TC) | 0 | 5 % | No | 0.8% | No | 0.5% | No | 1% | Naturally present in environment Human and animal fecal waste |
| Fecal coliform (FC) or E. coli | 0 | See ^c | No | 0 | No | 0 | No | 0 | |

^c MCL = a routine sample and a repeat sample are TC positive, and one is also FC or E. coli positive

Disinfection Byproducts (DBPs) and Disinfection Residuals²

| CONTAMINANT (units) | MCLG | MCL | NORTHERN | | | CENTRAL | | | SOUTHERN | | | Major Sources of Contaminant |
|------------------------------------|-------|------|-----------|-----|-----------|------------|------|-----------|-------------|------|-----------|--|
| | | | Range | RV | Violation | Range | RV | Violation | Range | RV | Violation | |
| HAA5 (Five Haloacetic Acids) (ppb) | n/a | 60 | nd - 2.5 | 0.8 | No | nd - 29 | 22.3 | No | 3.9 - 28.0 | 22.7 | No | By-product of drinking water chlorination By-product of drinking water chlorination |
| Total Trihalomethanes (ppb) | n/a | 80 | nd - 13.0 | 6.3 | No | 4.9 - 63.0 | 54.7 | No | 25.0 - 44.0 | 38.3 | No | |
| | MRDLG | MRDL | | | | | | | | | | |
| Chlorine (ppm) | 4 | 4 | 0.2 - 3.5 | 1.7 | No | 0.2 - 3.5 | 1.7 | No | 0 - 2.0 | 1.3 | No | Water additive to control microbes |

Turbidity as Indicator of Filtration Performance

| CONTAMINANT (units) | MCLG | MCL | UGUM WATER | | FENA WATER | | Major Sources of Contaminant |
|------------------------|------|-----------------|------------|-----------|------------|-----------|---------------------------------|
| | | | RV | Violation | RV | Violation | |
| Turbidity (ntu) | n/a | TT ^d | 100.0% | No | 100.0% | No | Soil runoff |

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

Unregulated Contaminants (Monitoring Required)^e

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

^e 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^f

| CONTAMINANT (units) | MCLG | MCL | GROUND WATER | UGUM WATER | FENA WATER |
|------------------------|------|-----------|--------------|-------------|-------------|
| | | | Range | Range | Range |
| Chloride (ppm) | n/a | 250 | 10 - 465 | 15 - 25 | 10 - 35 |
| Conductivity (mmho/cm) | n/a | 1600 | 248 - 2330 | 122 - 180 | 276 - 409 |
| Fluoride (ppm) | n/a | 2.0 | nd - 0.15 | 0.059 | 0.22 - 0.28 |
| pH (units) | n/a | 6.5 - 8.5 | 6.91 - 7.97 | 7.71 - 8.07 | 7.32 - 7.80 |
| Sulfates (ppm) | n/a | 250 | 2.5 - 58 | 1.5 | 28 |

^f 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 | Range | Range |
| Alkalinity as CaCO ₃ (ppm) | n/a | n/a | 165 - 365 | 39 - 67 | 95 - 207 |
| Sodium (ppm) | n/a | n/a | 8.5 - 220 | 12 | 13 - 15 |
| Hardness as CaCO ₃ (ppm) | n/a | n/a | 174 - 518 | 34 - 50 | 110 - 220 |
| PFAS (ppb) | n/a | n/a | nd - 0.05 | n/a | n/a |

About the Data:

1. 1. Data presented in these tables list the results of tests done between Jan 1 - Dec 31, 2021. 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 Monitoring Laboratory Services 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 with MCL for HAA5 and TTHM monitoring is based on ARA (annual running average) calculated quarterly. Compliance for chlorine is based on ARA calculated monthly (highest average).