

2014 Water Quality Report

Is Guam's Drinking Water Safe to Drink?

Yes, today, Guam's drinking water is definitely safe to drink! Guam's water system is tested continuously to ensure the safety of our drinking water. The routine microbiological tests we perform on the distribution system look for the presence of indicator organisms called coliform bacteria. If these indicator organisms are detected, there is a potential that other pathogenic (disease causing) organisms may be present. Our system is well protected against microbial contamination and the water you drink contains a small amount of chlorine in it to maintain a disinfectant capability. Guam EPA and USEPA supply us with guidelines or Maximum Contaminant Levels (MCLs) for these bacteria. The MCL for coliform bacteria is none detected in 95% of the samples tested per month. Our water system performs very well with respect to this standard.

In 2014, GWA conducted more than 2000 tests for over 100 contaminants that may be in our drinking water. The results show that the water provided by GWA meets the MCLs established for the regulated contaminants, as required by the Guam Primary and Secondary Safe Drinking Water Regulations and the Federal Safe Drinking Water Act (see **2014 Water Quality Data** included in this report). On the rare occasions where contaminants have been tested at levels approaching or exceeding the standards in individual samples, either the source has been taken off line, treatment has been installed to meet the standard, or the levels have fluctuated and the system has met the standard on the annual average result, as required by the regulations. For more information about your drinking water, please call the GWA Laboratory Services Division at **(671) 632-9697 or (671) 637-2895**.

What is the Source of Your Drinking Water?

The main source of Guam's drinking water is groundwater pumped from an underground aquifer, by over 121 wells, into the water distribution system. Surface sources used by GWA include an intake from the Ugum River plus water purchased from the US Navy Water System (FENA). Spring water from Santa Rita 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, but also 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. Copies of the Guam Water Data Management System reports are available at GEPA and at WERI and on their web sites.

Why are there Monitored Contaminants in the Water?

Drinking water, including bottled water, may reasonably be expected to contain at least trace amounts of some monitored compounds of natural origin. The presence of these components in drinking water does not necessarily indicate that the drinking water poses a health risk. More information about monitored compounds/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) 300-4796**.

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

- **Microbial contaminants**, such as viruses and bacteria, which may be native to the tropical soils, may come from sewage spills, septic systems, agricultural livestock operations or wildlife.
- **Inorganic contaminants**, such as salts and metals, which can be naturally occurring, result from stormwater runoff, commercial wastewater discharges, or farming.
- **Pesticide and herbicide contaminants**, which may come from a variety of sources such as agriculture, urban stormwater runoff, and home 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 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. If you would like a complete listing of GWA test results, or if you have any questions regarding this report, please call **Carmen Sian-Denton**, at our Laboratory Services Division at **(671)632-9697 or (671) 637-2895** 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 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.

Is our Water System Meeting other Rules that Govern our Operations?

Disinfection By-Products Regulations: Where disinfection is used in the treatment of drinking water, disinfectants combine with organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBP's). EPA sets standards for controlling the levels of disinfectants and DBP's in drinking water including trihalomethanes (THM's) and haloacetic acids (HAA5's). We are pleased to report that as of November 2014, **all** of GWA's Distribution Systems are in compliance with the DBP regulations.

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 GPSSDWR 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.

A copy of the **"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 need more information on the CO, please call **Paul Kemp**, GWA Assistant General Manager for Compliance and Safety at **(671) 300-6885**.

FREQUENTLY ASKED QUESTIONS



"My water looks dirty. Why?"

Reddish brown material that settles to the bottom of a glass may be precipitated iron from rusty pipes. High levels of dissolved iron and manganese may yield red and black precipitates at the tap and may cause staining on laundry and bathroom fixtures. Neither component is a significant health hazard.

"My water tastes weird. Why?"

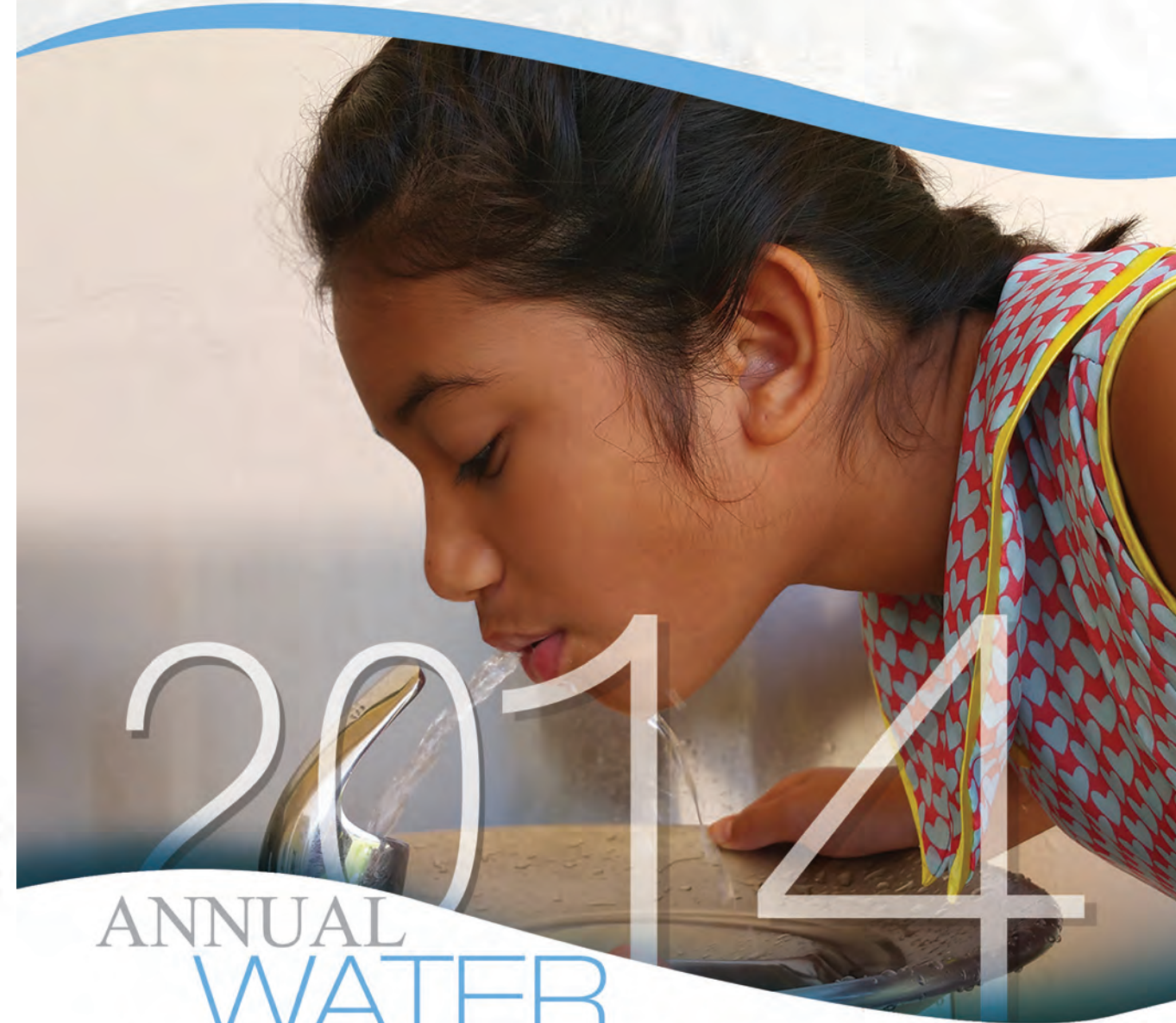
Naturally high calcium levels in Guam's groundwater impart a characteristic mineral taste. Many consumers object to the taste of chlorine used to disinfect drinking water. However, neither calcium or chlorine pose a significant threat to human health.

"Does our hard water cause kidney stones?"

Contrary to popular belief, the calcium in hard water does not cause kidney stones. In fact, the average person would need to drink around thirty 8 oz. glasses of Guam's drinking water just to satisfy his/her daily calcium requirement. More often than not, kidney stones are caused by not drinking enough water to replenish lost body fluids. This is especially so in the tropics.



IS GUAM'S WATER SAFE TO DRINK? HUNGGAN! YES GUAM'S WATER IS SAFE TO DRINK



ANNUAL WATER QUALITY REPORT

Postal Customer

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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 VOCs Trichloroethylene (TCE) (ppb)	0	5	0 - 0.73	0.73	nd	nd	nd	nd	Discharge from metal degreasing sites
Regulated SOCs Chlordane (ppb) Endrin (ppb)	0 0	2 2	nd - 1.4 nd - 0.03	1.4 0.03	nd nd	nd nd	nd nd	nd nd	Banned termiticide residue Banned insecticide residue
Regulated IOCs Antimony (ppb)1	6	6	nd - 1.7	1.7	nd	nd	nd	nd	Discharge from petroleum refineries; ceramics; electronics
Arsenic (ppb)1	0	10	nd - 4.4	4.4	nd	nd	nd	nd	Erosion of natural deposits
Barium (ppb)1	2000	2000	nd - 35	35.0	nd - 5.6	5.6	nd - 12.0	12.0	Erosion of natural deposits
Chromium (ppb)1	100	100	nd - 23.0	23	nd	nd	nd	nd	Erosion of natural deposits
Fluoride (ppm)1	4	4	nd - 0.2	0.02	nd - 0.061	0.06	nd - 0.73	0.73	Water additive; naturally occurring
Nitrate-N (ppm)	10	10	0.8 - 4.8	4.80	<0.2	<0.2	0.23 - 2.7	2.1	Runoff from fertilizer use; leaching from sewage
Selenium (ppb)1	50	50	nd - 11	11.00	nd	nd	nd	nd	Discharge from petroleum refs; erosion of natural deposits
Radionuclides1 Radium 226 (pCi/l) Radium 228 (pCi/l) Gross Alpha Activity (pCi/l) Gross Beta Activity (pCi/l)	0 0 0 0	5 5 15 50*	<1 - 2.2 <1.00 <3 - 9.03 <3 - 7.3	2.2 <1.00 9.03 7.30	<1.00 <1.00 <3.00 <3.00	<1.00 <1.00 <3.00 <3.00	<1 - 1.4 <1.00 <3 - 6.0 <3 - 5.6	1.4 <1.00 6.0 5.6	Erosion of natural deposits Erosion of natural deposits Erosion of natural deposits Decay of natural and man-made deposits

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

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)2	1300	AL=1300	160	0	205	0	103.5	0	Corrosion of household plumbing; erosion of natural deposits
Lead (ppb)2	0	AL=15	4.3	0	2.85	0	1.7	0	

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	
Total Coliform (TC) Fecal coliform (FC) or E. coli	0 0	5% See Note 1	No No	1.0% 0	No No	0.0% 0	No No	0.0% 0	Naturally present in environment Human and animal fecal waste

Note 1: MCL = a routine sample and a repeat sample are TC positive, and one is also FC or E. coli positive

CONTAMINANT (units)	MCLG	MCL	NORTHERN		CENTRAL		SOUTHERN		Major Sources of Contaminant
			Violation	RV	Violation	RV	Violation	RV	
HAA5 (Five Haloacetic Acids) (ppb)2 Total Trihalomethanes (ppb)2	n/a n/a	60 80	No No	2.6 5.8	No No	23.5 61.0	No No	19.5 40.5	By-product of drinking water chlorination By-product of drinking water chlorination
Chlorine (ppm)²	MRDLG 4	MRDL 4							Water additive to control microbes

CONTAMINANT (units)	MCLG	MCL	UGUM WATER		FENA WATER		Major Sources of Contaminant
			RV	Violation	RV	Violation	
Turbidity (ntu)	n/a	TT See Note 2	100.0%	No	99.94%	No	Soil ruoff

UNREGULATED CONTAMINANTS (MONITORING REQUIRED)**

CONTAMINANT (units)	MCLG	MCL	GROUND WATER		UGUM WATER		FENA WATER	
			Range	RV	Range	RV	Range	RV
Unregulated VOCs Bromodichloromethane (ppb) Bromoform (ppb) Chlorodibromomethane (ppb) Chloroform (ppb)	ns ns ns ns	ns ns ns ns	nd - 4 nd - 11 nd - 7.9 nd - 9.5	4 11 7.9 9.5	nd - 11 nd - 0.94 nd - 4.8 nd - 15	11 0.94 4.8 15	nd - 4.5 nd - 2.8 nd - 3.4 nd - 11	4.5 2.8 3.4 11
Unregulated SOCs Dieldrin (ppb)	ns	ns	nd - 1.5	1.5	nd	nd	nd	nd
Unregulated IOCs Sulfate (ppm)1	ns	250	3.2 - 64	64	nd - 13	13	nd - 15	15

** Unregulated contaminant monitoring helps EPA to determine where certain contaminants occur and whether there is a need to regulate those contaminants.

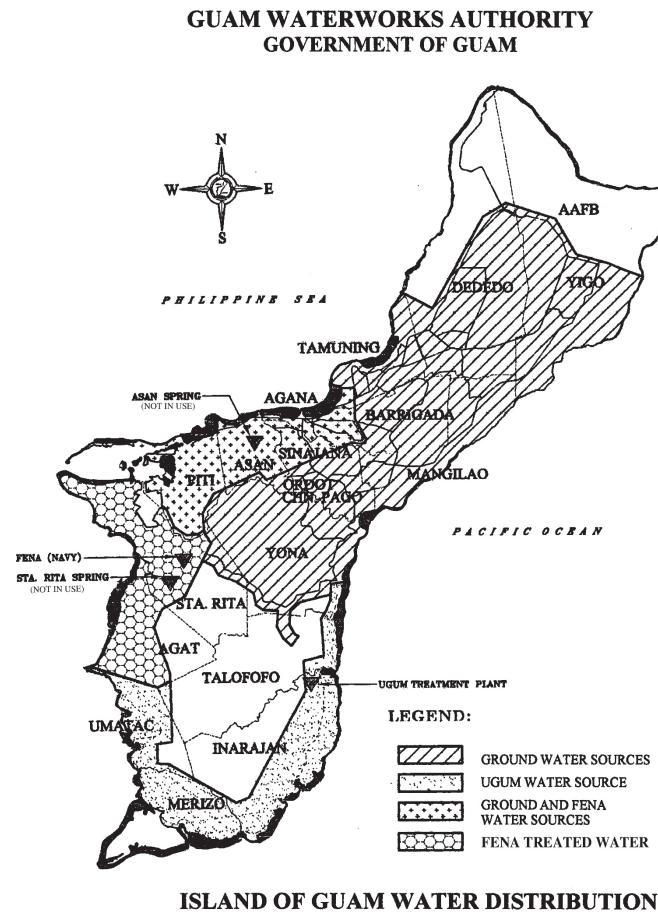
UNREGULATED CONTAMINANTS (MONITORING REQUIRED)**

CONTAMINANT (units)	MCLG	MCL	GROUND WATER		UGUM WATER		FENA WATER	
			Range	RV	Range	RV	Range	RV
Chloride (ppm) Conductivity (mmho/cm) pH (units)	n/a n/a n/a	250 1600 6.5 - 8.5	25 - 591 281 - 2350 6.96 - 8.00		24 - 32 111 - 163 7.48 - 7.79		35 - 40 224 - 317 7.27 - 7.93	

*** 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	RV	Range	RV	Range	RV
Alkalinity as CaCO3 (ppm) Sodium (ppm) Hardness as CaCO3 (ppm)	n/a n/a n/a	n/a n/a n/a	115 - 326 9.4 - 280 178 - 503		25 - 47 nd - 9.9 38 - 50		62 - 100 nd - 16 76 - 104	



About the Data:

1. Data presented in these tables list the results of tests done between Jan 1 – Dec 31, 2014. 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 Carmen M. Sian-Denton, GWA's Monitoring Laboratory Services Administrator at (671) 632-9697 or (671) 637-2895.
 2. Microbial, lead and copper, haloacetic acid (HAA5), and total trihalomethane (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).
- **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 IOCs 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