

GWA PROUDLY INTRODUCES THE 2012 WATER QUALITY REPORT

This report is designed to provide a closer look at our water quality. GWA's number one goal is to provide you and your family a safe and dependable supply of drinking water. Our 320 employees strive to deliver a quality product and protect the island's precious water resources. To ensure the safety of our water, GWA laboratory and water production staff collects and test water samples from throughout the system several times a day. These tests ensure that the proper chemical levels are maintained and that the water remains free of unwanted contaminants. These tests are overseen by various federal and local regulatory agencies. Except where indicated otherwise, this water quality report is based on the results of GWA monitoring for the period of January 1, 2012 to December 31, 2012.

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 some of these can be undesirable, if found in large quantities. Levels of these naturally occurring chemicals are normally so low that they pose no health problem. Fluoride is one of those naturally occurring chemicals, only found at really low levels, and poses no health problems. Fluoride is also used as an additive to promote strong teeth. GWA does not add fluoride to our water systems, but the US Navy Water System (FENA) does. It's not really the presence of the chemical that is important. What is important is how much of the chemical is present. For example, some of the heavy metals, such as lead, cadmium and mercury, occur naturally in water, but their presence is at such a low level that most of the time they are not a problem. Treatment becomes necessary when the amount of the contaminant approaches or exceeds the "Maximum Contaminant Level" (MCL). When this situation develops, GWA has opted to take the source off line or install and operate treatment facilities to remove the contaminants.

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. Dispose of wastes properly 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 comes from groundwater contained in the aquifer beneath the northern half of the island. Groundwater is pumped from this underground aquifer into the water distribution system by over 121 wells. Surface sources used by GWA include an intake from the Ugum River and water purchased from 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.

OUR COMMITMENT TO YOU: SAFE, RELIABLE DRINKING WATER

Why are there Contaminants in the Water?

Drinking water, including bottled water, may reasonably be expected to contain at least trace amounts of some contaminants of natural origin. The presence of contaminants in drinking water does not necessarily indicate that the drinking water poses a health risk. 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) 300-4796/4751**.

In compliance with the Guam Primary Safe Drinking Water Regulations (GPSDWR), 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 leaks/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, farming, 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 **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 five specific haloacetic acids (HAA's). The Northern Distribution System (PWS ID GU0000006) reported one violation for THMs in the 2nd quarter of 2012. The system has since recovered and the problem no longer exists there.

Monitoring of THM's and HAA5's still show violations in the Annual Running Average for some locations in the Central Distribution System (PWS ID GU0000003) which is served by water purchased from the Navy and supplemented by water from Santa Rita Springs. The Navy water system is petitioning for additional time to meet the requirements of Stage II of the DBP regulations. As of 2012, the Navy water System is still operating under Stage I of the DBP regulations. **Corrective action is required of the water purveyor (FENA Water Treatment Plant).** GWA elected to comply earlier than necessary with the Stage II DBP regulations for the benefit of our users and will continue to report water quality on that basis.

In 2012, the UGUM Water Treatment Plant was under construction as part of the public water systems capital improvement program projects, and as a result of process changes at the plant, the Southern distribution system had THM and HAA results higher than allowed by the DBP Stage 2 regulations. Construction at UGUM is expected to be finished in 2013 and the DBP problems in the Southern system should be resolved by then.

Do You Need to Take Special Precautions?

Some people who drink water containing THM's in excess of the MCL over **many** years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer. Some people who drink water containing HAA5's in excess of the MCL over **many** years may have an increased risk of getting cancer. Additional information is also available by calling GEPA at **(671) 300-4796/4751**.

Other Information: Stipulated Order for Preliminary Relief

In December 2002, a civil suit was filed against GWA and the Government of Guam by the United States Department of Justice (DOJ) and USEPA seeking to address Public Health compliance issues in GWA's wastewater and drinking water systems. In June 2003, Federal DOJ and USEPA, GWA and the Government of Guam negotiated the terms of the Stipulated Order for preliminary Relief; Civil Case No. 02-0035 (SO) by which GWA, under EPA oversight, undertook a broad initiative to restore and/or upgrade its facilities to provide safe, reliable service to the island while meeting all regulations. In 2006 the SO was amended and expanded to additional projects. On 11/10/2011 The SO was further amended and expanded under the direction of District Court Chief Judge Frances M. Tydingco-Gatewood. This Court Order (CO) is posted on the GWA web site: <http://www.guamwaterworks.org/>. Progress reports, of the work done on CO projects are given to the USEPA and the Court in Quarterly Compliance Progress Reports. If you need more information on the CO, please call **Paul Kemp**, GWA Assistant General Manager for Compliance and Safety at **(671) 647-2605**.



2012 ANNUAL WATER QUALITY REPORT

GUAM WATERWORKS AUTHORITY

Hunggan!
Yes! *Guam's Water is safe to drink*



2012 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	
<u>Regulated VOCs</u>									
Tetrachloroethylene (PCE) (ppb)	0	5	0 - 6.7	0.67	nd	nd	nd	nd	Leaching from PVC pipes, discharge from dry cleaners Discharge from metal degreasing sites
Trichloroethylene (TCE) (ppb)	0	5	0.67-1.2	1.2	nd	nd	nd	nd	
<u>Regulated SOCs</u>									
Chlordane (ppb)	0	2	0.01-0.2	1.1	nd	nd	nd - 0.5	0.5	Banned termiticide residue Residue of banned insecticide Runoff/leaching from insecticide use on cattle, lumber, gardens
Endrin (ppb)	0	2	0.01-0.02	0.15	nd	nd	nd	nd	
Lindane (ppt)	0	200	nd - 0.2	0.02	nd	nd	nd	nd	
<u>Regulated IOCs</u>									
Arsenic (ppb) ¹	0	10	nd - 1.1	1.1	nd	nd	nd	nd	Erosion of natural deposits
Barium (ppb) ¹	2000	2000	nd - 6.8	6.8	nd - 2.6	2.6	nd - 10.0	10.0	Erosion of natural deposits
Chromium (ppb) ¹	100	100	nd - 12.0	12	nd	nd	nd - 11.0	11.0	Erosion of natural deposits
Fluoride (ppm) ¹	4	4	nd - 0.2	0.02	nd	nd	nd - 1.0	1.00	Water additive; naturally occurring which promotes strong teeth
Nitrate-N (ppm)	10	10	0.8 - 5.0	5.00	nd	nd	0.34 - 3.5	3.5	Runoff from fertilizer use; leaching from sewage
<u>Radionuclides¹</u>									
Radium 226 (pCi/l)	0	5	<1.00	<1.00	<1.00	<1.00	<1 - 1.4	1.4	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 - 5.2	5.20	<3.00	<3.00	<3.00	<3.00	Erosion of natural deposits
Gross Beta Activity (pCi/l)	0	50*	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	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.

Microbial Contaminants²

CONTAMINANT (units)	MCLG	MCL	NORTHERN		CENTRAL		SOUTHERN		Major Sources of Contaminant
			Violation	RV	Violation	RV	Violation	RV	
Total Coliform (TC) (% positive/month)	0	5 %	No	0%	No	4.4%	No	0.0%	Naturally present in environment
Fecal coliform (FC) or <i>E. coli</i>	0	See Note 1	No	0	No	0	No	0	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

Disinfection Byproducts and Disinfection Residuals²

CONTAMINANT (units)	MCLG	MCL	NORTHERN		CENTRAL		SOUTHERN		Major Sources of Contaminant
			Violation	RV	Violation	RV	Violation	RV	
HAA5 (Five Haloacetic Acids) (ppb) ²	n/a	60	No	14.3	Yes	70.5	Yes	75.3	By-product of drinking water chlorination
Total Trihalomethanes (ppb) ²	n/a	80	Yes	82.5	Yes	147.5	Yes	89.8	By-product of drinking water chlorination
Chlorine (ppm) ²	MRDLG	MRDL							Water additive to control microbes
	4	4	1.1 - 1.3	1.2	1.0 - 1.2	1.1	0.7 - 1.4	1.0	

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 See Note 2	100.0%	No	99%	No	Soil runoff

Note 2: TT = 95 % of samples measured every 4 hours < 0.3 ntu

Unregulated Contaminants (Monitoring Required)**

CONTAMINANT (units)	MCLG	MCL	GROUND WATER		UGUM WATER		FENA WATER	
			Range	RV	Range	RV	Range	RV
<u>Unregulated VOCs</u>								
Bromodichloromethane (ppb)	ns	ns	0.55-0.81	0.81	nd - 8.6	8.6	nd - 7.7	7.7
Bromoform (ppb)	ns	ns	nd - 0.96	0.96	nd	nd	nd - 2.6	2.6
Chlorodibromomethane (ppb)	ns	ns	nd - 0.53	0.5	nd - 1.1	1.1	nd - 4.3	4.3
Chloroform (ppb)	ns	ns	nd,5-10	10	nd - 50	50	nd - 31	31
<u>Unregulated SOCs</u>								
Dieldrin (ppb)	ns	ns	nd - 2.0	2	nd	nd	nd	nd
<u>Unregulated IOCs</u>								
Sulfate (ppm) ¹	ns	250	1.5 - 15	15	nd - 1.5	2	nd - 15	15

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

Secondary Maximum Contaminant Levels - Consumer Acceptance Limits***

CONTAMINANT (units)	MCLG	MCL	GROUND WATER	UGUM WATER	FENA WATER
			Range	Range	Range
Chloride (ppm)	n/a	250	31 - 638	21 - 46	29 - 165
Copper (ppb) ¹	n/a	1000	nd - 23	nd	nd
Conductivity (µmho/cm)	n/a	1600	376 - 2623	100 - 145	274 - 344
pH (units)	n/a	6.5 - 8.5	7.05 - 7.91	7.39 - 7.62	7.16 - 7.95

*** 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	153 - 312	24 - 66	95 - 127
Sodium (ppm)	n/a	n/a	8.6 - 330	nd - 9.3	nd - 16
Hardness as CaCO ₃ (ppm)	n/a	n/a	183 - 518	44 - 69	104 - 119

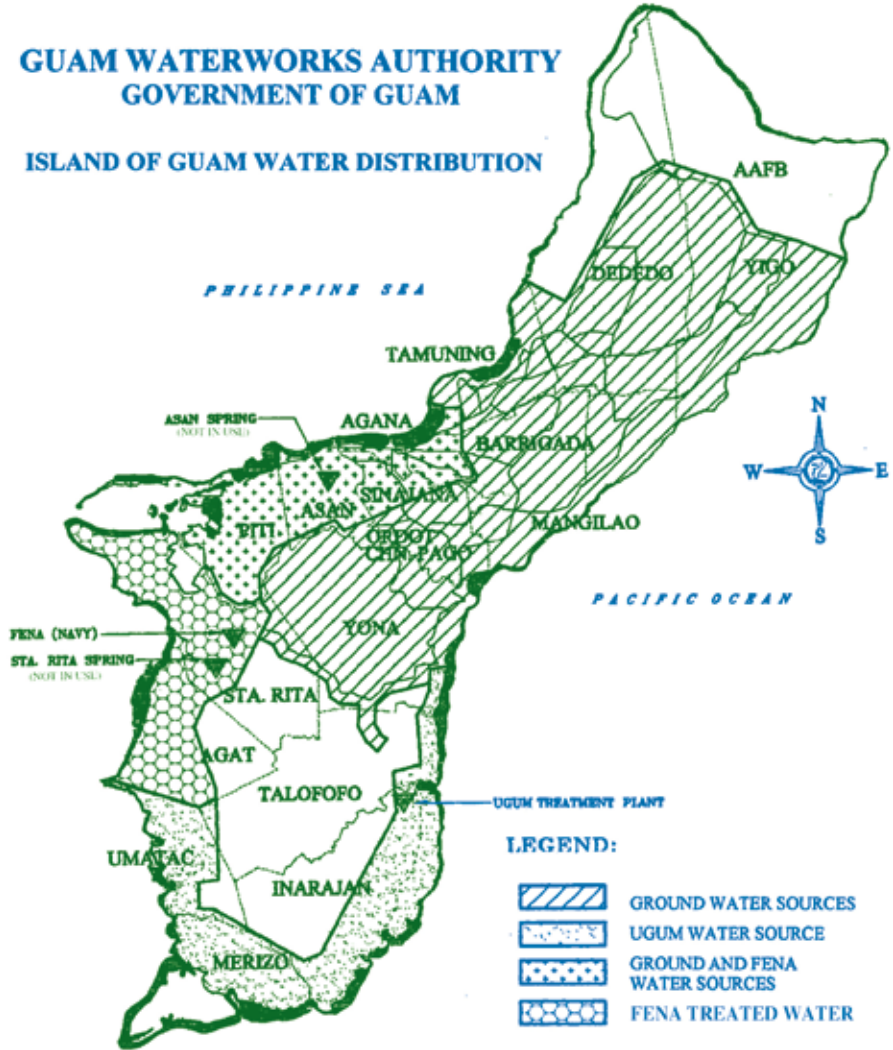
About the Data:

1. Data presented in these tables list the results of tests done between Jan 1 – Dec 31, 2012. 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 632-9697 or 637-2895.

2. Microbial, 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).

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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 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.

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