



# WATER QUALITY REPORT

## Ripot I Qualidat Hanom

### 2004

#### Dear Customer:

The following report is provided as a public service to our customers. We want to keep you informed about the water we delivered to you over the past year. Our primary commitment is, and always will be, to provide you with a safe and dependable water supply. Please read and share the report with other occupants of your residence.

In 2004, GWA conducted tests for more than 100 substances, and conducted thousands of measurements and tests throughout the treatment and distribution systems to ensure your safety. This report contains the results of those tests performed on samples collected from January 1 through December 31, 2004. If a contaminant is not listed, then it was not detected. Throughout 2004, the tap water met or surpassed all federal and state drinking water standards (see **2004 Water Quality Data** included in this report). On the occasions where contaminants have 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. If you have any questions regarding this report, please call Carmen Sian-Denton, at our Laboratory Support Services Division at **(671) 632-9697** or **637-2895** during normal business hours.

#### What is the Source of Your Drinking Water?

The main source of Guam's drinking water is groundwater pumped from an underground aquifer, by 100 wells, into the water distribution system. Surface sources used by GWA include an impoundment on the Ugum River plus water purchased from the US Navy Water System (FENA). Spring water from Asan and Santa Rita is used to supplement the water supply for the villages of Asan, Piti, Anigua, and Santa Rita. The Asan source was discontinued early in the year due to bacteriological contamination and lack of adequate disinfection.

#### Why are there Contaminants in the Water?

Drinking water, including bottled water, may reasonably be expected to contain at least small 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 GÉPA's Safe Drinking Water Program at **(671) 475-1660/1**.

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.

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

- **Microbial contaminants**, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- **Inorganic contaminants**, such as salts and metals, which can be naturally occurring or result from stormwater runoff, wastewater discharges, or farming.
- **Pesticide and herbicide contaminants**, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- **Organic chemical contaminants**, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can, also come from gas stations, urban stormwater runoff and septic systems.
- **Radioactive contaminants**, which can be naturally occurring or be the result of improper disposal of radioactive waste.

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

#### **Stipulated Order for Preliminary Relief**

In December 2002, a civil suit was filed against GWA and the Government of Guam by the United States seeking to address compliance issues in GWA's wastewater and drinking water systems. In June 2003, Federal EPA, GWA and the Government of Guam negotiated the terms of a Stipulated Order (SO) by which GWA, under EPA oversight, will undertake 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 include the management and organizational structure of GWA, independent operations and financial administration, construction and rehabilitation projects, and training at GWA. There are reporting requirements and notice provisions incorporated in the SO. For the most part, EPA has been satisfied with GWA's progress with the SO mandates. GWA is working closely with both federal

EPA and GEPA in order to achieve the goals of the SO. A drinking water and wastewater master plan, an interim disinfection program, an interim chlorine residual level monitoring program, a leak detection and response program, and a water meter improvement program are only some of the projects to be implemented under the terms of the SO, with guidelines and schedules that carry penalty provisions for failure to meet deadlines.

### **Non-Compliance with Total Coliform Rule (TCR) in the Central Water System**

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, and people with severely compromised immune systems.

In January 2004 GWA failed to provide chlorination for water from the Asan Spring. As a result, several water samples collected in Asan indicated the presence of total and fecal coliform in the distribution system and at the source water. The absence of the required chlorine residual in the distribution system indicated a potentially serious health threat. A Boil Water Notice was issued on January 23, 2004 for the village of Asan to include parts of Piti. The Boil Water Notice was lifted on Feb 2, 2004. The Asan Spring has been taken off-line and is not being used as a water source until GEPA approves a disinfection system, to prevent this problem from happening again.

In June 2004, GWA's Distribution System II exceeded the 5% MCL for Total Coliform. System II was also in violation for the presence of *E. coli* in water samples taken from Santa Rita and Agat on June 29th. A boil water notice was issued for the villages of Agat and Santa Rita on June 30th. A public notification for the *E. coli* violation was published in the Pacific Daily News (PDN) on July 1st. The boil water notice was lifted on July 9th. Upon investigation, GWA found that a number of residents, in Agat and in the Santa Ana Subdivision, were connected to water from a spring in Agat and also connected to GWA's water

system without proper backflow preventers. This type of dual connection is called a cross connection. Cross connections are not allowed on GWA's water system without a reduced pressure backflow preventer to protect GWA's customers when other sources are connected to the same system. The customers with cross connections were disconnected from GWA's system immediately to prevent continued contamination to the distribution system. Those customers will have to provide plans for review and acceptance by GWA's Permits & Inspection Division prior to having the required reduced pressure backflow preventers installed and these have to be installed in order to have their water meters reinstated.

### **Non-Compliance with MCL Requirements**

GWA routinely monitors for the presence of drinking water contaminants. Analytical test results of water samples collected in January, February, March and April, 2004 showed that the GWA Northern Water System exceeded the standard or Maximum Contaminant Level (MCL) for Total Trihalomethanes (TTHMs). The standard for TTHMs is an annual running average (ARA) of 80 parts per million (ppm). The test results indicated the ARA to be 266 ppm. The unacceptable results were from the NAS-1 well (located in Tiyan). This well was immediately taken out of production and will not be placed back into operation until the granulated activated carbon (GAC) system, used to filter groundwater at the well-head for known contaminants, has been replaced; and a new memorandum of agreement between GWA and GIAA, for the operation and maintenance of the well and the GAC system, is in place. A public notification for the MCL violation was published in the PDN on May 28, 2004. Trihalomethanes (THMs) are a byproduct of drinking water disinfection. Some people who drink water containing THMs **in excess of the MCL for many years** may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer. Please consult your doctor if you have specific health concerns.

Analytical test results of water samples collected in February, June and September, 2004 showed that water entering the Northern Water System from Well M-14 (located between Harmon and Dededo between Route 16 and Route 27) exceeded the standard or MCL for chlordane. The standard for chlordane is an ARA of 2.0 parts per billion (ppb). The test results indicated the ARA to be 2.25 ppb. Well M-14 was physically disconnected from the water system and will not be placed back into operation unless chlordane levels go below the MCL and GEPA approves the use of water from this well; or until a remediation system is installed with proper GEPA approval. GWA is currently monitoring well M-14, and other wells close to it, on a monthly basis to make certain there is no risk to other water system sources. A public notification for the MCL violation was published in the PDN on October 26, 2004. A public meeting was conducted at the Dededo Senior Center on October 27 to provide information regarding this violation to all interested persons. Chlordane, once popularly used as a termiticide in construction, and also used as an insecticide on food crops, is a probable human carcinogen. All uses of chlordane were banned by USEPA in 1988. However, once in the environment, chlordane degrades very slowly, binds to the soil, and can travel through soil to groundwater. Some people who ingest water containing chlordane **in excess of the MCL for many years** may experience problems with their liver or nervous system, and may have an increased risk of getting cancer. Please consult your doctor if you have specific health concerns.

- If you need more information on the violations, please call Paul Kemp, GWA Environmental and Safety Compliance Specialist at **(671) 647-2605**, Carmen Sian-Denton, GWA Monitoring Laboratory Services Administrator at **(671) 632-9697 or 637-2895**, or Angel Marquez, Guam EPA Safe Drinking Water Program Manager at **(671) 475-1638**.

## 2004 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		
<b>Regulated VOCs</b>										
Tetrachloroethylene (PCE) (ppb)	0	5	nd - 6.7	3.3	nd	nd	nd	nd	Leaching from PVC pipes, discharge from dry cleaners Discharge from textile finishing factories Discharge from metal degreasing sites By-product of drinking water chlorination By-product of drinking water chlorination	
1,2,4-Trichlorobenzene (ppb)	70	70	nd	nd	nd	nd	nd - 0.90	0.90		
Trichloroethylene (TCE) (ppb)	0	5	nd - 1.4	1.32	nd	nd	nd - 1.21	1.21		
HAA5 (Five Haloacetic Acids) (ppb) <sup>2</sup>	n/a	60	nd - 9.7	2.4	nd - 42	26.8	nd - 61	37.5		
Total Trihalomethanes (ppb) <sup>2</sup>	n/a	80	nd - 1510	<b>266</b>	nd - 85	47.8	nd - 51	42.8		
<b>Regulated SOCs</b>										
Atrazine (ppb)	0	3	nd - 0.7	0.7	nd	nd	nd	nd	Runoff from herbicide use Banned termiticide residue Runoff from herbicide use Discharge from rubber and chemical factories Banned insecticide residue Banned termiticide residue Runoff from insecticide use Runoff from herbicide use	
Chlordane (ppb)	0	2	nd - 3.4	<b>3.4</b>	nd	nd	nd - 1.04	1.04		
Dalapon (ppb)	200	200	nd	nd	nd	nd	nd - 1.04	1.0		
Di(2-ethylhexyl)phthalate (ppb)	0	6	nd	nd	nd	nd	nd - 0.67	0.67		
Endrin (ppb)	2	2	nd - 0.06	0.02	nd	nd	nd - 0.05	0.05		
Heptachlor epoxide (ppt)	0	200	nd - 0.03	0.03	nd	nd	nd - 15	15		
Methoxychlor (ppb)	40	40	nd	nd	nd	nd	nd - 0.16	0.16		
Simazine (ppb)	4	4	nd	nd	nd	nd	nd - 0.08	0.08		
<b>Regulated IOCs</b>										
Arsenic (ppm) <sup>1</sup>	0	10	nd - 1.9	1.9	nd	nd	nd - 1.10	1.10		Erosion of natural deposits Occurs naturally Erosion of natural deposits Water additive; naturally occurring which promotes strong teeth Runoff from fertilizer use; leaching from sewage
Barium (ppb) <sup>1</sup>	2000	2000	nd - 66	66	2.9	2.9	nd - 2.5	2.5		
Chromium (ppb) <sup>1</sup>	100	100	nd - 11	11	nd	nd	nd - 10.0	10.0		
Fluoride (ppm) <sup>1</sup>	4	4	nd - 0.15	0.15	0.8	0.8	0.13 - 0.64	0.64		
Nitrate-N (ppm)	10	10	0.13 - 4.8	4.8	nd	nd	0.06 - 2.77	2.77		
<b>Radionuclides<sup>1</sup></b>										
Gross Alpha Activity (pCi/l)	0	15	nd - 7.3	7.30	nd	nd	nd	nd	Erosion of natural deposits	
Gross Beta Activity (pCi/l)	0	50*	nd - 2.6	2.60	nd	nd	nd - 2.6	2.6	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 Contaminants<sup>2</sup>

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	4.4%	<b>YES</b> <b>Jan</b> <b>June</b>	<b>5.7%</b> <b>15.4%</b>	No	0	Naturally present in environment
Fecal coliform (FC) or <i>E. coli</i>	0	See Note 1	No	0	<b>YES</b> <b>Jan</b> <b>June</b>	<b>2</b> <b>2</b>	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

### 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.
- **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

### 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	96.9%	No	99.4%	No	Soil runoff

Note 2: TT = 95 % of samples measured every 4 hours < 0.5 ntu

### Unregulated Contaminants (Monitoring Required)\*\*

CONTAMINANT (units)	MCLG	MCL	GROUND WATER		UGUM WATER		FENA WATER	
			Range	RV	Range	RV	Range	RV
<b>Unregulated VOCs</b>								
Bromodichloromethane (ppb)	ns	ns	nd - 3.7	3.7	5.2 - 11	8.2	7.5 - 13	10
Bromoform (ppb)	ns	ns	nd - 22	22	nd - 0.5	0.5	nd - 0.6	0.6
Chlorodibromomethane (ppb)	ns	ns	nd - 8	5.8	1.8 - 4.0	2.8	1.9 - 4.0	3.1
Chloroform (ppb)	ns	ns	nd - 1.5	1.5	9.3 - 18	14.1	15 - 23	19
<b>Unregulated SOCs</b>								
Dieldrin (ppb)	ns	ns	nd - 0.8	0.26	nd	nd	nd	nd
<b>Unregulated IOCs</b>								
Nickel (ppm) <sup>1</sup>	n/a	n/a	nd - 22	22.0	7.2	7.2	nd	nd
Sulfate (ppm) <sup>1</sup>	ns	ns	3.3 - 73	73	10	10	4.56 - 53.8	53.8

\*\* 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	16 - 736	23 - 50	23 - 92
Conductivity (µmho/cm)	n/a	1600	121 - 1942	101 - 154	166 - 266
pH (units)	n/a	6.5 - 8.5	7.01 - 8.03	7.05 - 7.17	7.06 - 7.20

\*\*\* 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 <sub>3</sub> (ppm)	n/a	n/a	121 - 352	27 - 50	75 - 101
Sodium (ppm)	n/a	n/a	7.9 - 270	13	9.4 - 150
Hardness as CaCO <sub>3</sub> (ppm)	n/a	n/a	35 - 400	43 - 121	66 - 118

### About the Data:

1. Data presented in these tables list the results of tests done between Jan 1 – Dec 31, 2004. 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.

## GUAM WATERWORKS AUTHORITY GOVERNMENT OF GUAM



ISLAND OF GUAM WATER DISTRIBUTION