USAG Daegu
Drinking Water Quality Report
CY2024

Environmental Division
Directorate of Public Works
U.S. Army Garrison Daegu

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In this Report, you will find:

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- *How Your Water Is Treated*
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Dedicated to Providing Clean Water

"Serving Those Who Serve"

USAG Daegu Annual Water Quality Report – 2024

As part of our commitment to providing safe and reliable drinking water, United States Army Garrison Daegu (USAG Daegu) is pleased to share our 2024 Water Quality Report. This report is provided in accordance with both U.S. Environmental Protection Agency (EPA) regulations (Safe Drinking Water Act of 1974) and United States Forces Korea Manual 4715.05.

What you'll find in this report:

- Information about your drinking water sources
- Results of water quality testing from January 1 – December 31, 2024, including any detected contaminants
- Potential health effects of contaminants (if any violations occurred)
- Possible sources of detected contaminants

Our Commitment to Quality

The USAG Daegu Directorate of Public Works (DPW) operates and maintains our drinking water systems. Our dedicated team of Engineers and Certified Operators continuously monitors water quality to meet strict EPA and USFK standards. We are proud to deliver high-quality water to all members of our community – Soldiers, Families, Civilians, and Local Nationals.

Good News!

We are happy to report that your drinking water consistently meets or exceeds all required standards. We were the first to earn Microbiological Laboratory Certification among the USFK Army installations in July 2024.

The DPW is dedicated to protecting our water resources. Please don't hesitate to contact us if you have any questions or require assistance. Thank you for allowing us to serve you and your family!

Sincerely,

The USAG Daegu DPW Environmental Team

Where Your Water Comes From

The drinking water sources for Camp Walker, Camp Carroll and Carroll FOS come from groundwater that lie underneath the earth's surface. The source of the water consists primarily of rain and snow melt that has been filtered through hundreds of feet of soil. The water fills spaces between rocks and sand to create an aquifer. Groundwater wells at these installations were constructed to tap into these aquifer water supplies. The extracted groundwater (called raw water) is transferred from the wells to the Water Treatment Plant (WTP), where it is treated by specialized filters that remove sediments and harmful chemicals (if present). The raw water is then disinfected by chlorine treatment that kills potentially harmful bacteria and viruses. The treated water is then held in secured elevated storage tanks for eventual distribution to the customer's tap.

Camp Henry and Camp George receive drinking water purchased from the city of Daegu, and Busan Storage Center (BSC) and Pier 8 received drinking water purchased from the city of Busan, both supplied to their respective WTPs. Following additional filtration and disinfection of the purchased water, the treated water is then held in secured storage tanks for eventual distribution to the customer's tap.

How Your Water Is Treated

Step 1 Aeration:

Raw water from each well is drawn into an aeration tower. Aeration treatment consists of passing large amounts of air thru water and then venting the air outside. Aeration brings water and air in close contact to remove dissolved gases and oxidizes dissolved metals such as iron, hydrogen sulfide, and volatile organic chemicals.

2 Granulated Activated Carbon (GAC)

GAC is an effective adsorbent and commonly used for adsorbing various substances such as natural organic compounds, taste and odor compounds, and a wide range of contaminants in water. Its high porosity and large surface area make it an excellent material for adsorption. Adsorption is the process by which substances adhere to the surface of another material. The adsorption process of GAC involves both physical and chemical mechanisms by which a substance accumulates at the interface between liquid and solid phases.

3 Sedimentation:

Sedimentation is a physical water treatment process using gravity to remove suspended solids. Solid particles entrained by the turbulence of moving water are removed in clarifier tanks.

4 Filtration:

The water is then filtered through layers of fine, granulated sand and coal. As smaller, suspended particles are removed, turbidity diminishes, and clear water emerges.

5 Disinfection (Chlorination):

As protection against any bacteria, viruses and other microbes that might remain, disinfectant is added before the water flows into aboveground reservoirs throughout the distribution system and into your home or business. USAG Daegu carefully monitors the amount of disinfectant added to maintain quality of the water at the farthest reaches of the system.

The treatment process consists of following steps:

- Camp Carroll: Step 1, 2, 3, 4 and 5

- Camp Walker: Step 2, 4 and 5

- Camp Henry, Carroll FOS, Pier 8 and BSC: Step 4 and 5

How Your Water Is Tested

We routinely test for various chemicals and compounds in the water supply to ensure your water quality meets the standards set forth in the EPA regulations and USFKM 4715.05 Korea Environmental Governing Standards (KEGS). This testing also allows us to make sure that the treatment and distribution systems are operating effectively.

USAG Daegu DPW Engineers, Water Plant Operators and Sanitarian at USAG Daegu collect drinking water samples and analyze them in our in-house certified laboratories. For certain analyses that we cannot perform in-house, we send samples to either the Public Health Command Laboratory at Camp Zama, Japan or Defense Center for Public Health-Aberdeen (DCPH-A) for analyses. All analyses conducted follow U.S. EPA approved test methods and protocols.

What Is In Your Water

How to Read the Water Quality Data Table:

The EPA established the safe drinking water regulations that limit the amount of contaminant allowed in drinking water. There are 118 various contaminants we test for. Contaminants NOT detected in USAG Daegu's water supply are not included in the tables on pages 5-6.

When drinking water meets EGS standards, there may not be any health benefits to purchase bottle water or water purifying devices. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants, within acceptable ranges, does not necessarily pose a health risk concern.

Possible Source of Contaminants

As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals. It can also pick up other substances resulting from the presence of animals or human activity. Drinking water, including bottled water, may reasonably be expected to contain at least trace amounts of some contaminants.

The presence of contaminants does not necessarily indicate that the water poses a health risk. 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, persons with HIV/AIDS or other immune disorders, some elderly, and infants can be particularity at risk from infections. These people should seek advice about drinking water from their health care providers. EPA and the Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbial contaminants are available from the EPA Hotline at 1-800-426-4791.

CY2024 Water Test Results

During calendar year (CY) 2024, USAG Daegu DPW collected bacteriological, inorganic, and organic chemical samples from the installations. Samples were analyzed for 118 different contaminants in accordance with the USFKM 4715.05 Environmental Governing Standards (KEGS) and US EPA. In addition, chlorine, turbidity, and pH levels are monitored daily by USAG Daegu DPW laboratories. No microbial contaminants were detected in any of the USFK Daegu installations drinking water samples. Only detected contaminants are presented in the following tables.

Regulated Inorganic Substance Measured in the Water Leaving the Treatment Plant

Detected substance	Unit	MCLG	EGS's Allowable Limits	Violation Yes/No	Treatment Plant						Common Source of Chemicals (Examples)
					Test results range, Daegu		Test results range, Waegwan and Seongju		Test results range Busan		
			MCL		Camp Henry	Camp Walker	Camp Carroll	Carroll FOS	Pier 8	BSC	
Inorganic Chemical (Nitrate/Fluoride)											
Nitrate (as N)	ppm	10	10	NO	2.38	1.32	3.58	0.964	3.91	3.67	Runoff from fertilizer use; Erosion of natural deposits
Fluoride	ppm	4	4	NO	0.5~0.9	0.389~0.8	0.67~0.72	0.61	ND	ND	Water additive which promotes strong teeth; discharge from fertilizer and aluminum factories
Inorganic Chemical (Primary Metals)											
Antimony	ppm	0.006	0.006	NO	ND	ND	ND	ND	ND	ND	Erosion of natural deposits; runoff from orchards, glass and electronics production wastes
Barium	ppm	2	2	NO	0.02	0.089	0.048	0.033	0.0099	0.018	Discharge from fire retardants; ceramics; electronics; solder
Arsenic	ppm	0.01	0.01	NO	ND	0.0041	ND	ND	ND	ND	Erosion of natural deposits; runoff from orchards, runoff from glass and electronics production wastes
Nickel	ppm	0.1	0.1	NO	0.0013	0.0016	ND	ND	0.0016	0.0014	Discharge of drilling wastes; erosion of natural deposits

Note. ND: "Not Detected"

Regulated Organic Substance Measured in the Water Leaving the Treatment Plant

Detected substance	Unit	MCLG	EGS's Allowable Limits	Violation Yes/No	Treatment Plant						Common Source of Chemicals (Examples)
					Test results range, Daegu		Test results range, Waegwan and Seongju		Test results range, Busan		
			MCL		Camp Henry	Camp Walker	Camp Carroll	Carroll FOS	Pier 8	BSC	
Volatile Organic Compounds (VOCs)											
Carbon tetrachloride	ppb	0	5	NO	ND	ND	ND	ND	ND	ND	Discharge from chemical plants and other industrial activities
1,1-dichloroethylene	ppb	0	7	NO	ND	ND	ND	ND	ND	ND	Discharge from chemical plants and other industrial activities
c-1,2-dichloroethylene	ppb	70	70	NO	ND	ND	0~0.5	ND	ND	ND	Discharge from industrial chemical factories
Dichloromethane	ppb	0	5	NO	ND	ND	ND	ND	ND	ND	Discharge from petroleum refineries
Toluene	ppb	1000	1000	NO	ND	ND	0~1.0	ND	ND	ND	Discharge from petroleum refineries
Total Xylenes	ppb	10000	10000	NO	ND	ND	ND	ND	ND	ND	Discharge from metal degreasing sites and other factories

Regulated Substances Measured in the Distribution System

Detected substance	Unit	MCLG	EGS's Allowable Limits	Violation Yes/No	Various Point						Common Source of Chemicals (Examples)
					Test results range, Daegu		Test results range, Waegwan and Seongju		Test results range, Busan		
			MCL {AL}		Camp Henry	Camp Walker	Camp Carroll	Carroll FOS	Pier 8	BSC	
Disinfection Byproducts and Disinfectants											
Total Trihalomethanes (TTHMs)*	ppb	N/A	80*	NO	23.2~62.0	0.0~10.1	ND	ND	35.7~45.9	51.4~54.5	Byproduct of drinking water disinfection
Total Haloacetic (HAA5)	ppb	N/A	60*	NO	12.0~23.0	0.0~12.0	ND	ND	18.0~22.0	14.0	Byproduct of drinking water disinfection
Bromate	ppm	0	0.01*	NO	0.000 ~0.0017	ND	ND	ND	0.0000 ~0.012	0.0000 ~0.004	Byproduct of drinking water disinfection
Residual Chlorine	ppm	4	0.2~4.0	NO	0.9~1.9	0.9~1.1	0.9~1.4	0.5~0.8	0.7~1.7	0.4~1.6	Water additive which used to control microbes
Lead and Copper: Tap Water Samples											
Lead	ppm	0.015	{0.015}	NO	NA	NA	0.0000 ~0.0016	0.0000 ~ 0.0115	ND	0.001 ~0.0032	Corrosion of household plumbing systems; erosion of natural deposits
Copper	ppm	1.3	{1.3}**	NO	NA	NA	0.0024 ~0.27	0.0128 ~ 5.59	0.015 ~0.23	0.0013 ~0.12	

Note: Drinking Water samples were collected from various taps to be representative at both the customer's tap water & distribution system quality. * Annual average. **No more than 10% sample of total samples shall exceed 1.3.

pH, Turbidity and Total Coliform in the Various Locations

Detected substance	Unit	EGS's Allowable Limits	Violation Yes/No	Various Locations throughout the Distribution and Treatment Plant						Common Source of Chemicals (Examples)
				Test results range, Daegu		Test results range, Waegwan and Seongju		Test results range, Busan		
		MCL [SMCL]		Camp Henry	Camp Walker	Camp Carroll	Carroll FOS	Pier 8	BSC	
pH	None	[6.5~8.5]	NO	6.8~7.5	7.2~7.4	7.2~7.8	7.8~8.5	7.0~7.5	6.9~7.4	pH is a measure of acid/base properties
Turbidity	NTU	0.3*	NO	0.04~0.09	0.01~0.08	0.03~0.07	0.05~0.12	0.067~0.201	0.066~0.143	Turbidity is often caused by soil runoff
Total Coliform	N/A	Negative**	NO	Negative	Negative	Negative	Negative	Negative	Negative	Naturally present in the environment

Note: *5 or less in 5% of monthly samples. **Negative in 95% or more of monthly samples.

PFOS/PFOA in the Water Leaving the Treatment Plant

Detected substance	Unit	EGS's Allowable Limits	Violation Yes/No	Treatment plant						Common Source of Chemicals (Examples)
				Test results range, Daegu		Test results range, Waegwan and Seongju		Test results range, Busan		
		LHA		Camp Henry	Camp Walker	Camp Carroll	Carroll FOS	Pier 8	BSC	
PFOS	ppt	70*	NO	1.5	0~2.3	3.6~7.7	0.75~0.81	ND**	ND**	Synthetic fluorinated organic compounds, nonstick cookware, stain-resistant fabric and carpet, some food packaging and the firefighting agent Aqueous Film Forming Foam (AFFF).
PFOA	ppt	70*	NO	4.9	0~26	3.3~11	0.00~13	3.0**	5.1**	
PFOS+PFOA	ppt	70*	NO	6.4	0~28.3	11~14.6	2.0~13	3.0**	5.1**	

Note: *PFOS/PFOA Limits are valid by 2Q2029. **The most recent test results of CY2023

Glossary

Action Level (AL). The concentration of a contaminant which if exceeded triggers a treatment or other requirement that a water system must follow.

Life Health Advisory (LHA). Health advisories levels provide information on contaminants that can cause human health effects and are known or anticipated to occur in drinking water.

Maximum Contaminant Level Goal (MCLG). The maximum level of a contaminant in drinking water in which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Maximum Contaminant Level (MCL). The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available technology.

Nephelometric Turbidity Units *(NTU).* The unit used to measure that the turbidity of a fluid or the presence of suspended particles in water.

Parts Per Million (ppm). One part of a contaminant is present for every million parts of water.

Parts Per Billion (ppb). One part of a contaminant is present for every billion parts of water.

Parts Per Trillion (ppt). One part of a contaminant is present for every trillion parts of water.

Point-of-Use (POU) Treatment Device A treatment device applied to a tap to reduce contaminants in drinking water flowing from that tap.

Secondary Maximum Contaminant Level (SMCL). Non-enforceable guidelines regulating contaminants that may cause cosmetic or aesthetic effects (such as taste, color, and odor) in drinking water.

Frequently Asked Questions

Q. Why does the water sometimes look rusty?

Rusty or reddish tinted water may occur because of a sudden change in pressure which can cause rust in distribution piping to become dislodged. Iron causes the discoloration (rust is a secondary drinking water standard having mostly cosmetic or aesthetic effects) and it is not a health risk. If water looks rusty, flush the tap for three minutes or until clear before using water. Running the water will clear the piping system. If hot tap water is rusty, the water heater may need to be flushed.

Q. I don't like the taste/smell/appearance of my tap water. What's wrong with it?

Even when water meets standards, you may still object to its taste, smell, or appearance. Taste, smell, and appearance are also known as aesthetic characteristics and do not pose health risks. Common complaints about water aesthetics include temporary cloudiness (typically caused by air bubbles) or chlorine taste (which can be improved by letting the water stand exposed to the air). If you want to improve the taste, smell, and appearance of water, you can filter it easily by purchasing a POU treatment device (water filter) at the Exchange. Please keep in mind that filters require periodic replacement in accordance with the manufacturer's guidance; if ignored, water taste, smell, or appearance issues may reoccur.

EPA Required Statements

The EPA requires that a Consumer Confidence Report (CCR) as the name of Water Quality Report (WQR) contain the following statements. We have included these in this Water Quality Report for your information.

1. The sources of drinking water (both tap & bottled) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground it dissolves naturally occurring minerals and, in some cases, radioactive material and substances were resulting from the presence of animals or from animal activity. Contaminants that may be present in source water may 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, this can be naturally occurring or result from urban storm water run-off, industrial or domestic wastewater discharges, oil and gas production, mining or farming.

- **Pesticides and herbicides** - may come from a variety of sources such as agriculture, storm water run-off and residences.

- **Organic chemical contaminants** - including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, can come from gas stations, urban storm water run-off and septic systems.

- **Radioactive contaminants** - can be naturally occurring or be the result of oil and gas production and mining activities.

2. In order to ensure tap water is safe to drink, EPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. (40 CFR 141.153(h))

3. Drinking water, including bottled, may reasonably be expected to contain small amounts of some contaminants. The presence of contaminants does not necessarily indicate the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA Safe Drinking Water Hotline (1-800-426-4791) or visiting the website at http://www.epa.gov/sdwa. (40 CFR 141.153(h))

4. 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, persons with HIV/AIDS or other immune disorders, some elderly, and infants can be particularity at risk from infections. These people should seek advice about drinking water from their health care providers. (40 CFR 141.154(a))