



# USAG Daegu Drinking Water Quality Report CY2023



## In this Report, you will find:

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

Unit #15746  
APO AP 96218-5746

DSN: 763-5361  
763-2196

- *Where Your Water Comes From*
- *How Your Water Is Treated*
- *How Your Water Is Tested*
- *What Is In Your Water*
- *Frequently Asked Questions*



# Dedicated to Providing Clean Water

## *“Serving Those Who Serve”*

The United States Environmental Protection Agency (EPA), through the Safe Drinking Water Act of 1974, requires drinking water suppliers to provide an Annual Water Quality Report. United States Army Garrison Daegu (USAG Daegu) adopted this requirement as a method to report compliance with United States Forces Korea (USFK) Regulation 201-1, Environmental Governing Standards. This report provides our community information about their drinking water produced between 1 Jan and 31 Dec 2023, including water sources; any detected contaminants in drinking water; health effects of contaminants when violations occur; and likely sources of drinking water contaminants.

USAG Daegu Directorate of Public Works (DPW) operates and maintains drinking water systems at USAG Daegu and is dedicated to producing quality drinking water that meets the EPA and USFK regulatory standards. We continually monitor water quality in accordance with the regulations and strive to deliver the highest quality drinking water to the Soldiers, Family Members, Civilians and Local Nationals at USAG Daegu.

Our staff of engineers and certified Drinking Water Treatment Plant operators from the DPW Environmental Division and Operations and Maintenance Division work together to ensure the safe delivery of all potable water. Commitment to protect every drop of water is our priority.

USAG Daegu is pleased to present you with this annual water quality report and inform you that your drinking water is of high quality and meets all drinking water standards. Please remember that we are always available to assist and 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.

The drinking water for Camp Henry, Camp George, Busan Storage Complex (BSC) and Pier 8 consists of water purchased from the cities of Daegu, and Busan and then supplied to their respective WTP at each installation. 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 USFK Reg.201-1 Environmental Governing Standards (EGS). 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 Defense Health Agency Environmental Health collect drinking water samples and analyze them in our in-house laboratories. For certain analyses that we cannot perform in-house, we send samples to the Public Health Command Laboratory at Camp Zama, Japan and 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 particularly 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.

# CY2023 Water Test Results

During calendar year (CY) 2023, USAG Daegu DPW collected bacteriological, inorganic, and organic chemical samples from the installations. Samples were analyzed for 118 different contaminants in accordance with the USFK Environmental Governing Standards (EGS) 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		Test results range Busan		
					Camp Henry	Camp Walker	Camp Carroll	Carroll FOS	Pier 8	BSC	
<b>Inorganic Chemical (Nitrate/Fluoride)</b>											
Nitrate (as N)	ppm	10	10	NO	1.28~2.62	1.22~1.53	3.80~5.62	0.59	1.93~2.60	1.60~1.69	Runoff from fertilizer use; Erosion of natural deposits
Fluoride	ppm	4	4	NO	0.00~2.10	0.43~0.90	0.65~0.72	0.36	ND	ND	Water additive which promotes strong teeth; discharge from fertilizer and aluminum factories
<b>Inorganic Chemical (Primary Metals)</b>											
Antimony	ppm	6	6	NO	ND	ND	ND	ND	1.1	ND	Erosion of natural deposits; runoff from orchards, glass and electronics production wastes
Barium	ppm	2000	2000	NO	0.046	94	40	ND	18	27	Discharge from fire retardants; ceramics; electronics; solder
Arsenic	ppm	10	10	NO	ND	4.1	ND	ND	ND	ND	Erosion of natural deposits; runoff from orchards, runoff from glass and electronics production wastes
Nickel	ppm	100	100	NO	2.0	1.3	ND	ND	2.9	3.0	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		Test results range, Busan		
					Camp Henry	Camp Walker	Camp Carroll	Carroll FOS	Pier 8	BSC	
<b>Volatile Organic Compounds (VOCs)</b>											
Carbon tetrachloride	ppb	0	5	NO	ND	ND	0.86	ND	ND	ND	Discharge from chemical plants and other industrial activities
1,1-dichloroethylene	ppb	0	7	NO	ND	ND	3.0	ND	ND	ND	Discharge from chemical plants and other industrial activities
c-1,2-dichloroethylene	ppb	70	70	NO	ND	ND	1.0	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	ND	ND	ND	ND	Discharge from petroleum refineries
Trichloroethylene	ppb	0	5	NO	ND	ND	1.6	ND	ND	ND	Discharge from metal degreasing sites and other factories
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 Area		Test results range, Busan		
					Camp Henry	Camp Walker	Camp Carroll	Carroll FOS	Pier 8	BSC	
<b>Disinfection Byproducts and Disinfectants</b>											
Total Trihalomethanes (TTHMs)*	ppb	N/A	80	NO	22.8-63.0	0.0-2.5	2.2-16.1	ND	23.7-26.4	51.4-54.5	Byproduct of drinking water disinfection
Total Haloacetic (HAA5) *	ppb	N/A	60	NO	0-18.0	ND	ND	ND	20.0-22.0	6.1-12.0	Byproduct of drinking water disinfection
Bromate	ppm	0	0.01	NO	0.0019 -0.0045	0.0000 -0.0028	ND	N/A	0.0000 -0.0023	0.0000 -0.0010	Byproduct of drinking water disinfection
Residual Chlorine	ppm	4	0.2-4.0	NO	0.5-1.4	0.9-1.1	0.8-1.4	0.5-1.0	0.5-1.0	0.9-1.6	Water additive which used to control microbes
<b>Lead and Copper: Tap Water Samples</b>											
Lead	ppb	0	{15}	NO	NA	NA	NA	0.00248 ~ 0.00994	NA	NA	Corrosion of household plumbing systems; erosion of natural deposits
Copper	ppb	1300	{1300}	NO	NA	NA	NA	0.0104 ~ 1.078	NA	NA	

Note: Drinking Water samples were collected from various taps to be representative at both the customer's tap water & distribution system quality. \* Annual average.

## 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 Area		Test results range, Busan		
				Camp Henry	Camp Walker	Camp Carroll	Carroll FOS	Pier 8	BSC	
pH	None	[6.5-8.5]	NO	7.2-7.6	7.1-7.5	7.1-7.6	7.8-8.5	7.0-7.5	7.0-7.5	pH is a measure of acid/base properties
Turbidity	NTU	5*	NO	0.042-0.158	0.03-0.19	0.02-0.09	0.04-0.15	0.055-0.243	0.165-0.269	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. Turbidity MCL changed 5 to 0.3 since 30 Jul 20 per USFK Reg 201-1 Revision. \*\*Negative in 95% or more of monthly samples.

## PFOS/PFOA in the Water Leaving the Treatment Plant

Detected substance	Unit	EPA's Recommended Limits	Violation Yes/No	Treatment plant						Common Source of Chemicals (Examples)
				Test results range, Daegu		Test results range, Waegwan		Test results range, Busan		
				Camp Henry	Camp Walker	Camp Carroll	Carroll FOS	Pier 8	BSC	
PFOS	ppt	70	NO	ND	0-0.46	2.5-11.0	ND	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	2.4-6.9	0-2.3	0.0-12.0	1.7-4.4	2.5-3.0	2.1-5.1	
PFOS+PFOA	ppt	70	NO	2.4-6.9	0-2.76	2.5-23.0	1.7-4.4	2.5-3.0	2.1-5.1	

## 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 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 particularly at risk from infections. These people should seek advice about drinking water from their health care providers. (40 CFR 141.154(a))