DAEGU AB DRINKING WATER SYSTEM CONSUMER CONFIDENCE REPORT (CCR) 2024
(Covering CY 2023)

이 보고서에는 귀하의 식수에 대한 중요한 내용이 실려있습니다. 그러므로 이 보고서를 이해할 수 있는 사람한테 번역해달라고 부탁하시기 바랍니다. 보고서에 대한 질문은 오산 생물환경공학과 784-2623로 문의하시기 바랍니다.

This consumer confidence report provides the 2023 drinking water quality information for Daegu Air Base. This report is based on the data collected, assessed and documented by the Bioenvironmental Engineering Flight of the 51st Operational Medical Readiness Squadron. It also includes information on how the 607th Materiel Maintenance Squadron's contractor, Global Systemized Industry (DSN: 766-4651), operates and maintains the drinking water system. Please review this report for your information. If you have any questions, please call the Bioenvironmental Engineering Flight at 784-2623.

Sampling to Ensure Your Water Quality

Bioenvironmental Engineering and your local independent duty medical technicians (IDMTs) perform water testing to ensure your drinking water is the same quality that you would expect to have in the US. Your tap water has met all US Environmental Protection Agency (EPA) and Korean Environmental Governing Standards (KEGS) for drinking water in the calendar year (CY) 2023.

Drinking Water Contaminants and Your Health

Sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it collects contaminants such as naturally occurring minerals, naturally occurring radioactive material, or substances from human or animal activities. The contaminants that may be present in any water source 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 urban storm water runoff, 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 runoff, and residences.
- Organic chemical contaminants - including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, can also come from gas stations, urban storm water runoff, and septic systems.
- Radioactive contaminants - can be naturally occurring or be the result of oil and gas production and mining activities.

To ensure that tap water is safe to drink, the EPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water that must provide the same protection for public health.

Drinking water, including bottled water, may reasonably be expected to contain small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. You can call the EPA Safe Drinking Water Hotline (1-800-426-4791) for more information about contaminants and potential health effects.

Vulnerable Individuals

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 living with HIV/AIDS or other immune system disorders, some elderly, and infants can be at greater risk of infections. These individuals should seek advice about drinking water from their health care providers. The EPA and the Centers for Disease Control (CDC) provide guidelines to lessen the risk of infection by Cryptosporidium and other microbial contaminants. These guidelines are available from the Safe Drinking Water Hotline (1-800-426-4791).

Daegu AB Water Sources

The primary water source for Daegu AB is the Kumho River. The Kumho River is a branch of the Nakdong River. The Kumho River feeds the Unman Dam Reservoir which, in turn, supplies water to the Kosan Water Treatment Plant (WTP). The Kosan WTP provides flocculation, settling, filtration and chlorination water treatments before supplying Daegu AB with water. The Daegu AB Water Treatment Plant adds chlorine to provide additional disinfection. In addition, some facilities also have installed point of use water filtration units at water faucets and ice machines.

What about the Taste and Color of My Water?

Local independent duty medical technicians (IDMTs) perform weekly representative sampling of the water distribution system; thus, IDMTs do not routinely sample all buildings on base. It is possible that the plumbing in individual buildings can affect water palatability (i.e., taste). Facility managers and building occupants can often minimize these effects through routine maintenance practices. The Bioenvironmental Engineering Flight (784-2623) is ready to help with any drinking water issue. In the interest of time, please work with your facility manager to conduct routine preventive maintenance on your building’s plumbing before contacting our office.

Some common water palatability issues and corresponding routine maintenance practices are listed below:

1. Rusty pipes: Older metal pipes can rust, resulting in water with reddish-brown color or occasionally small solid particles. This condition is unsightly, but is not a health problem. Rusty pipes affect water most often when water is stagnant, e.g., when water sits in pipes over a long weekend. Facility managers can minimize the effects by flushing affected pipes (running the water for 30-60 seconds) first thing in the morning, especially after long holiday weekends. **Consumers also can minimize the effects by flushing their faucets until the water appears clear (usually 30 - 60 seconds) before use.**

2. Cloudy/Milky water: Pressure in pipes dissolves gasses (usually air or carbon dioxide) in the water. When water comes out of the tap, the pressure is reduced and the dissolved air forms tiny bubbles, giving the water a cloudy appearance. To determine if gas bubbles are causing cloudy water, fill a glass with water and watch it for a minute. If the cloudiness gradually rises to the top of the glass and the water clears, the cloudiness was caused by gas bubbles and is harmless. If the cloudiness persists for more than two minutes or settles to the bottom of the glass, then gas bubbles are not the source of the issue and more investigation is needed to determine the cause of the cloudy/milky water.

3. Dirty water coolers/drinking fountains: Water coolers can become unsightly and unsanitary if not cleaned regularly. Water contains natural minerals that can precipitate near the fountain-head. Since the water cooler surface is often wet, bacteria can grow on the outer surface. This can lead to unpleasant tasting water. Facility managers must maintain cleanliness of the outer surfaces of all water coolers and ensure the water cooler drains are not clogged. In-line filters are sometimes placed on water coolers, but should rarely be necessary. Filters installed on the water coolers must be replaced according to the manufacturer's recommendations.

Frequently Asked Questions about Lead

Where does the lead originate?
Lead is a common metal that can be found throughout our environment in the air, lead-based paint, soil, household dust, and food. It can also be found in certain types of pottery, porcelain, and pewter. Lead is also present in plumbing fixtures made of brass and in solder used by plumbers before 1987. The installation is responsible for providing high quality drinking water but cannot control the variety of materials used in plumbing components.

Why is lead a health concern?
Lead is a toxic material, known to be harmful to human health if ingested or inhaled. Lead in the body can cause damage to the brain, kidneys, nervous system, and red blood cells. Children, infants, pregnant women, and their unborn children are especially vulnerable to lead. In children, lead has been associated with impaired mental and physical development as well as hearing problems. The harmful effects of lead in the body can be subtle and may occur without any obvious signs of lead poisoning.

Blood levels as low as 10 micrograms per deciliter (ug/dL) are associated with harmful effects on children’s learning and behavior. Minimizing sources of exposure to lead can help reduce the number of children with elevated blood lead levels.

Although lead in drinking water is not typically the primary source of lead exposure in children, it can contribute to total lead exposure. Lead can also be introduced into the body through soil and air, which contributes to the total amount of lead exposure. In response, the EPA has set a cumulative blood lead level of less than 10 ug/dL. Therefore, reducing the amount of lead in the drinking water is an important part of reducing a child’s overall exposure to lead in the environment.

Why do some faucets have high lead levels?
Lead is unusual among drinking water contaminants because it seldom occurs naturally in water supplies like rivers and lakes. Lead enters drinking water as a result of corrosion or wearing away of materials containing lead used in the facility’s plumbing system. Lead materials can be found in lead-based solder used to join copper pipe or in brass and chrome plated brass faucets. In 1986, Congress banned the use of lead solder containing more than 0.2% lead and restricted the lead content of faucets, pipes, and other plumbing materials to 8.0%. When water stands in lead pipes or plumbing containing lead for several hours or more, the lead may dissolve into the water. This means the first water drawn from the tap for the day can contain elevated levels of lead. **<u>As a precaution, consumers are encouraged to flush water from their faucets for 60 seconds before consumption after the faucet has remained unused for four or more hours.</u>**

Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the safe drinking water hotline or at www.epa.gov/lead

Frequently Asked Questions about Copper

How does copper get into my drinking water? The primary sources of copper in drinking water are corrosion of household plumbing systems and erosion of natural deposits. Copper enters the water ("leaches") through contact with the plumbing. Copper leaches into water through corrosion – a dissolving or wearing away of metal caused by a chemical reaction between water and your plumbing. Copper can leach into water primarily from pipes, but fixtures, faucets (brass), and fittings can also be a source. The amount of copper in your water also depends on the types and amounts of minerals in the water, how long the water stays in the pipes, the amount of wear in the pipes, the water's acidity and its temperature. When water stands in copper pipes or plumbing containing copper for several hours or more, the copper may dissolve into the water. This means the first water drawn from the tap for the day can contain elevated levels of copper. **As a precaution, consumers are encouraged to flush water from their faucets for 60 seconds before consumption after the faucet has remained unused for 4 or more hours.**

Why is copper a health concern?
Some people who drink water containing copper in excess of the recommended level may experience gastrointestinal distress with short-term exposure or may suffer liver or kidney damage with long-term exposure. People with Wilson's Disease are extra sensitive to copper as their bodies are not able to get rid of extra copper easily.

The above information on the health effects of copper is not intended to catalog all possible health effects for copper. Rather, it aims to inform consumers about the possible health effects associated with copper in drinking water relevant to the EPA regulatory standards.

PFAS Contaminant Monitoring

What are per-and polyfluoroalkyl substances and where do they come from?
Per- and polyfluoroalkyl substances (PFAS) are a group of thousands of man-made chemicals. PFAS have been used in a variety of industries and consumer products around the globe, including in the U.S., since the 1940s. PFAS have been used to make coatings and products that are used as oil and water repellents for carpets, clothing, paper packaging for food, and cookware. They are also contained in some foams such as aqueous film-forming foam, or AFFF, used for fighting petroleum fires at airfields and in industrial fire suppression processes. PFAS compounds are persistent in the environment and some are persistent in the human body – meaning they do not break down and they can accumulate over time.

Is there a federal regulation for PFAS in drinking water?
During calendar year 2023 (i.e., the period covered by this report), there was no federal drinking water standard for any PFAS compounds. In May 2016, the Environmental Protection Agency (EPA) established a lifetime health advisory (LHA) level at 70 parts per trillion (ppt) for individual or combined concentrations of perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS). Both compounds are types of PFAS. On 10 April 2024, the EPA published new drinking water standards for certain PFAS under the Safe Drinking Water Act (SDWA). AF is reviewing the EPA's new rule now, and will incorporate these standards into future sampling and analysis efforts.

Out of an abundance of caution, DoD pursued PFAS testing and response actions beyond EPA SDWA requirements. In 2020, the DoD established a policy to monitor drinking water for 17 PFAS compounds at all service owned and operated water systems. If results confirmed the drinking water contained PFOA and PFOS at individual or combined concentrations greater than 70 ppt, water systems quickly took action to reduce exposures. While not a SDWA requirement, in 2023, DoD improved upon its 2020 PFAS drinking water monitoring policy by expanding the list of PFAS compounds monitored to 29, implementing continued monitoring of systems with detectable PFAS over the laboratory Method Reporting Limits (MRL), and requiring initial mitigation planning actions.

Has Daegu AB tested its water for PFAS?

Yes, In October 2023 samples were collected from the point of entry to drinking water system. 2 of the 29 PFAS compounds covered by the sampling method were detected above the Method Detection Limit (MDL). The result above the MDL is provided in Table 7, and public notification of the sample result was initially provided in December via Osan AB’s website. PFOA was detected but below 70 ppt and PFOS was not detected. As PFOA and PFOS were below the 70 ppt, there is no immediate cause for concern and we will continue to monitor the drinking water closely. In accordance with DoD policy, Osan AB’s Bioenvironmental Engineering will collect semi-annual samples for PFAS, and periodic updates are available at Osan AB’s website.

Monitored Contaminants

During the calendar year 2023, your local IDMTs and the Osan AB Bioenvironmental Engineering collected 364 samples to monitor for 118 different contaminants. Also, Global Systemized Industry monitored chlorine levels daily and the IDMT monitored chlorine levels weekly. Table 1 lists all of the contaminants monitored in CY 2023 and the required monitoring frequency for each contaminant group.

Table 1. CY 2023 Sample Contaminant Groups and Monitoring Frequencies

Contaminant Group	Number of Contaminants Monitored	Examples	Monitoring Frequency
Biological Contaminants	3	Total coliform, fecal coliform, etc.	Monthly
Inorganic Contaminants	16	Metals, fluoride, etc.	Annually
Nitrates, Nitrites	3	--	Annually
Volatile Organic Compounds (VOCs)	21	Benzene, toluene, trichloroethylene (TCE), etc.	Annually
Synthetic Organic Compounds (SOCs)	33	Pesticides, polychlorinated biphenyls (PCBs), etc.	Annually
Special Case Synthetic Organic Compounds (SOCs)	2	Dalapon, Di(2-ethylhexyl)phthalate,	Quarterly*
Total Trihalomethanes (TTHMs)	4	Bromoform, chloroform, etc.	Quarterly
Haloacetic acids (HHA5)	5	Monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, etc.	Quarterly
Lead and Copper	2	--	Semi-annually
Per- and polyfluoroalkyl substances (PFAS)	29	Perfluorooctane Sulfonate (PFOS), Perfluorooctanoic Acid (PFOA), etc.	Annually
Radiological Compounds	4	Gross alpha, uranium, radium 226/228, etc.	4 quarterly samples every 4 years; sampled from 2nd quarter of CY 2020 to 1st quarter of CY 2021**
Asbestos	1	-	Every 9 years; last sampled in CY 2019**

*Note: These two semi-volatile organic compounds were above the detection limit, but under the maximum contaminant level (MCL) in 2014 and 2019. Per the KEGS, increased monitoring is required until the water system is reliably and consistently below the MCL.
**Not sampled in CY 2023

Table 2 lists the microbial contamination results for CY 2023. No microbial contaminants were detected in any of the drinking water samples.

Table 2. CY 2023 Biological Sampling Results

Contaminant	MCLG*	MCL*	Level Detected	Meet Standard?	Potential Source of Contaminant
Total Coliform	0	0 positive sample/ month	0 positive samples	***Yes***	Naturally present in environment
Fecal Coliform and E. coli	0	0 positive samples/ month	0 positive samples	***Yes***	Human or animal fecal waste

*See Appendix for explanation of terms and abbreviations

Table 3 lists the lead and copper results for CY 2023. The standard for lead and copper is that no more than 10% of samples collected exceed the action level. Lead and Copper monitoring for Daegu AB met this requirement.

Table 3. CY 2023 Lead and Copper Sampling Results

Contaminant	EPA		KEGS*	# of sample sites exceeding action level	90th percentile values	Meet standard?	Potential Source of Contaminant
	MCLG*	AL*	AL*				
Lead in ppb	0	15	15	1 of 15 sites	3.87	***Yes***	Corrosion of household plumbing systems; erosion of natural deposits. Leaching from wood preservatives.
Copper in ppb	1300	1300	1000	0 of 15 sites	472	***Yes***	Corrosion of household plumbing systems; erosion of natural deposits. Leaching from wood preservatives.

*See Appendix for explanation of terms and abbreviations

Table 4 lists all of the drinking water contaminants that were detected in CY 2023. The presence of contaminants in the water does not necessarily indicate that the water poses a health risk. For total trihalomethanes and haloacetic acids, compliance is based on the running average of all samples collected over a year. Therefore, if a single sample exceeds the MCL, but the average of all the readings for that year is less than the MCL, then the system is in compliance.

Table 4. CY 2023 Detected Water Contaminants

CONTAMINANTS	EPA		KEGS*	Your Water	Meet standard?	Typical Source
	MCLG*	MCL*	MCL			
Inorganic Chemicals						
Barium in ppm	2	2	2	0.009	***Yes***	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chromium in ppm	0.1	0.1	0.1	0.002	***Yes***	Discharge from steel and pulp mill; Erosion of natural deposits
Fluoride in ppm	4	4	4	0.052	***Yes***	Erosion of natural deposits; Discharge from fertilizer and aluminum factories
Nitrate [measured as Nitrogen in ppm]	10	10	10	1.24	***Yes***	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Total Nitrate and Nitrite in ppm	NR	NR	10	1.24	***Yes***	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Sodium in ppm	NR	NR	NR	8.70	***Yes***	Erosion of natural deposits
Semi-Volatile Organic Chemicals						
Dalapon in ppb	200	200	200	1.00	***Yes***	Runoff from herbicide used on rights of way
Dinoseb in ppb	7	7	7	2.10	***Yes***	Runoff from herbicide used on soybeans and vegetables
Total Trihalomethanes						
Total Trihalomethanes in ppb	NR	80 (annual average)	80 (annual average)	**Low** 35.5, **High** 77.8 Annual average 52.7	***Yes***	By-product of drinking water chlorination
Haloacetic Acids						
Haloacetic Acids in ppb	NR	60 (annual average)	60 (annual average)	**Low** 5.1, **High** 41.6 Annual average 28.7	***Yes***	By-product of drinking water chlorination

*See Appendix for explanation of terms and abbreviations. Bioenvironmental Engineering tested for Volatile Organic Chemicals and detected none.

Table 5 lists regulated radiological contaminants results from 2nd quarter of CY 2020 to 1st quarter of CY 2021. The monitoring frequency of radiological contaminants is four quarterly samples every 4 years.

Table 5. 2nd quarter of CY 2020 – 1st quarter of CY 2021 Monitored Radiological Contaminants

Contaminant	EPA		KEGS* MCL	Your Water		Meet Standard?	Likely Source of Contaminant
	MCLG*	MCL*		Low	High		
Gross Alpha in pCi/L	0	15	15	ND	ND	***Yes***	Erosion of natural deposits
Combined Radium 226 and 228 in pCi/L	0	5	5	ND	ND	***Yes***	Erosion of natural deposits
Uranium in ppb	0	30	30	ND	ND	***Yes***	Erosion of natural deposits

*See Appendix for explanation of terms and abbreviations

Table 6 lists asbestos that detected in CY 2019. The result presented in this report is from the most recent testing conducted in accordance with the KEGS: the monitoring frequency of asbestos contaminant is every 9 years. The presence of regulated asbestos in the water does not necessarily indicate that the water poses a health risk.

Table 6. CY 2019 Detected Asbestos

Contaminant	EPA		KEGS* MCL	Your Water	Meet Standard?	Likely Source of Contaminant
	MCLG*	MCL*				
Asbestos MFL*	7	7	7	ND	***Yes***	Decay of asbestos cement water mains; Erosion of natural deposits

*See Appendix for explanation of terms and abbreviations

Table 7 lists Perfluorobutanesulfonic acid (PFBS) and Perfluorooctanoic Acid (PFOA) results for CY 2023, both substances are classified under PFAS. The presence of the substances in the water does not necessarily indicate that the water poses a health risk.

Table 7. CY 2023 PFAS Compounds above Detection Limit

Contaminant	**EPA**	**KEGS MCL**	**Your Water**	**Meet Lifetime Health Advisory?**	**Likely Source of Contaminant**
	Lifetime Health Advisory				
PFBS in ppt*	NA	NR*	1.92	***NA***	Component of aqueous film forming foam, a Firefighting foam
PFOA in ppt*	70	NR*	2.57	***Yes***	Component of aqueous film forming foam, a Firefighting foam

*See Appendix for explanation of terms and abbreviations

Where Can I Get More Information?

Currently, a routine public meeting for drinking water is not held at your installation. However, if you have any specific questions or concerns about your drinking water, please contact the Osan AB Bioenvironmental Engineering (BE) office at 784-2623. You can also contact the BE office for any additional information on drinking water or questions regarding this Consumer Confidence Report (CCR).

The Bioenvironmental Engineering Flight prepared this CCR and will post it on the 7th AF homepage (http://www.7af.pacaf.af.mil/).

Information about EPA water regulations can be found at http://www.epa.gov.

General information about Korean water sources in English and Korean can be found at: http://www.kwater.or.kr.

APPENDIX

DEFINITIONS

Action Level (AL): The level of lead or copper which, if exceeded, triggers treatment or other requirements that a water system must follow.

Calendar Year (CY): The period from January 1 to December 31.

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 treatment technology.

Maximum Contaminant Level Goal (MCLG): 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.

Non-detect (ND): The contaminant was not detected in the sample.

Not-Regulated (NR): The EPA and/or KEGS have not determined a regulatory limit for the contaminant in drinking water.

Safe Drinking Water Act (SDWA): The main federal law that ensures the quality of Americans' drinking water. Under SDWA, EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards.

Units

MFL: million fibers per liter (a measure of asbestos in drinking water)

pCi/L: picocuries per liter (a measure of radioactivity)

Parts per billion (ppb): A ppb is a thousandth of a ppm

Parts per million (ppm): Parts per million is the most commonly used term to describe minuscule amounts of contaminants in our environment. It is a measure of concentration that describes the amount of one material in a larger amount of another material. For example, the amount of a chemical in a volume of water. If you divide a liter of water into a million parts, then each part would be equal to "one part per million."

Parts per trillion (ppt): A ppt is a thousandth of a ppb.