2023 Annual Consumer Confidence Report
Commander, Fleet Activities Chinhae (CFAC)

Your Water is Fit for Human Consumption!

Commander, Fleet Activities Chinhae (CFAC) is pleased to provide this annual Consumer Confidence Report (CCR) for the CFAC Drinking Water System. Our goal is to provide to you a safe and dependable supply of drinking water. This report is based on the results of our monitoring for the period of January 1 to December 31, 2023. If you have any questions about the quality of water at CFAC or would like more information on the Overseas Drinking Water Program, please contact the Public Works Department, Environmental Division at 763-8752.

Source of Water

Our drinking water comes from groundwater that lies deep under the earth's surface and consists mostly of rain and melting snow that has filtered through hundreds of feet of soil and rock. This water fills spaces between rocks and soils and creates an aquifer. Aquifers are underground bodies of water that can be located in underground soils or can occur in fractured bedrock deep underground. CFAC draws this water from four (4) groundwater wells located within the Installation.

Water Treatment & Distribution System

The Public Works Department (PWD) Chinhae operates the water treatment and distribution system servicing this Installation. A 95,000-gallon underground concrete raw water storage tank receives water from the groundwater wells. Pumps transfer the raw groundwater from the raw water tank into the water treatment plant (WTP). The groundwater is treated by four multimedia filters arranged in a series-parallel configuration. Following filtration to remove sediments, the raw groundwater is disinfected by an on-site chlorine treatment that kills potentially harmful bacteria and viruses. The water is then treated by an air stripping tower that removes dissolved carbon dioxide and reduces corrosivity. The treated water is held in large storage tanks before entering the distribution system to the customers' tap.

Overseas Drinking Water Program

U.S. Navy overseas installations are required to meet or exceed the National Primary Drinking Water regulations promulgated under the Safe Drinking Water Act of 1974, adopted in Commander, Navy Installations Command (CNIC) Manual 5090 Series, to ensure safe drinking water. CFAC is also required to meet all criteria established in the Korea Environmental Governing Standards (KEGS) to protect the quality of drinking water at the U.S. installations.

The Installation Commanding Officer has established an Installation Water Quality Board (IWQB) tasked with ensuring there is a reliable supply of drinking water for all persons using CFAC facilities. IWQB is currently taking steps to meet all requirements of the Navy's Overseas Drinking Water (ODW) program. The Regional Water Quality Board (RWQB) granted CFAC a Conditional Certificate To Operate (CTO) for its water system. CFAC is expected to receive a Full CTO when a significant deficiency identified from the 2023 Sanitary Survey are corrected. All deficiencies have either been corrected or are in the process of implementing corrective actions.

Source Water Assessment

In June 2023, the Navy Water Quality Oversight Council (WQOC) conducted a comprehensive sanitary survey of the CFAC drinking water system. Sanitary surveys are performed every three years and evaluate eight elements of an ODW system for the adequacy of the drinking water source, treatment, distribution system, finished water storage, facilities, monitoring & reporting, operation & maintenance, and operators for producing and distributing safe drinking water. CFAC is continually improving the drinking water system based on the recommendations contained in the 2023 sanitary survey report. The next sanitary survey is to be conducted in year of 2026.

Potential Contaminants

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 can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include bacteria, organic and inorganic chemicals, and radionuclides. 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 Center 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. In 2023, our drinking water met health standards established by both U.S. EPA regulations and KEGS for all listed contaminants.

Other Potential Contaminants

Coliforms in Drinking Water

Coliforms are bacteria that are naturally present in the environment and used as an indicator for other potentially harmful bacteria that may be present in drinking water. It is a warning of potential problems if coliforms are found in more water samples than allowed. Information on total coliforms in drinking water is available at https://www.epa.gov/dwreginfo/revised-total-oliform-rule-and-total-coliform-rule.

Lead

Elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. To take extra precaution in avoiding possible lead contamination, when water has been sitting for several hours, you can further minimize the potential for lead exposure by flushing the tap for 30 seconds to two minutes before using water for drinking or cooking. Information on lead in drinking water is available at http://www.epa.gov/safewater/lead.

Lead in Priority Areas

For the safety and wellness of youth at the Youth Center, all drinking water outlets were tested every five years or whenever outlets are added or replaced. In 2019, a five-year recurring sampling was conducted and drinking water samples were collected from outlets at the Youth Center. All sampling results were reported below the EPA recommended screening level of 15 ppb for lead.

Nitrate/Nitrite

Nitrates are naturally present in soil, water, and food. Nitrates themselves are relatively nontoxic. However, when swallowed, they are converted to nitrites that can react with hemoglobin in the blood creating methemoglobin. This methemoglobin cannot transport oxygen thus causing conditions of shortness of breath and blue baby syndrome. Information on Nitrate in drinking water is available at http://water.epa.gov/drink/contaminants/basicinformation/nitrate.cfm.

Per- and Polyfluoroalkyl Substances (PFAS)

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 United States, 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 (aqueous film-forming foam or AFFF) used for fighting petroleum fires at airfields and in industrial fire suppression processes because they rapidly extinguish fires, saving lives and protecting property. PFAS chemicals are persistent in the environment and some are accumulative and persistent in human body. Information on PFAS in drinking water is available at https://www.epa.gov/pfas/our-current-understanding-human-health-and-environmental-risks-pfas

Total Trihalomethanes (TTHM) and Halo acetic Acids (HAA5)

TTHM and HAA5 are groups of chemicals formed when the naturally occurring organic materials in raw water reacts with the chlorine which is added as disinfectant. Potential health effects from exposure to TTHM and HAA5 depend on a variety of factors, including concentration of the chemicals, and duration and frequency of exposure. Some people who drink water containing TTHMs in excess of the MCL over many years may experience liver, kidney or central nervous system problems and increased risk of cancer. Information on the byproducts is available at https://www.epa.gov/your-drinking-water/table-regulated-drinking-water-contaminants#Byproducts

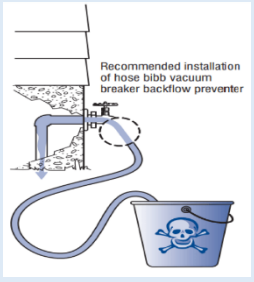
Frequently Asked Questions

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. If hot tap water is rusty, the water heater may need to be flushed. Users can report hot tap water that is rusty to Family Housing or to the building manager.

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 install a home water filter. Please keep in mind that filters require regular maintenance and replacement; if ignored, water taste, smell, or appearance issues may reoccur. Users can report taste, smell and appearance of water to Family Housing or to the building manager.

What is water hardness?
Water hardness is an aesthetic quality of water, and is caused mostly by the minerals calcium and magnesium, but is classified or measured based on the level of concentration of calcium carbonate. CFAC water is moderately hard, containing approximately 80 mg/L. Generally, 0-75 mg/L is soft, 75-150 mg/L is moderately hard, 150-300 mg/L is hard, and 300 mg/L or more is very hard.

Is it okay to drink from a garden hose?
The water coming out of the tap and into the hose is safe but a garden hose is treated with special chemicals that make it flexible. Those chemicals are not good for you and neither are the bacteria that may be growing inside the hose.



An ordinary garden hose submerged in a bucket of water or swimming pool can result in backflow contamination. To protect our water supply, a simple screw-on vacuum breaker (photo) must always be attached to the faucet when a garden hose is used.


VACUUM BREAKER

Is there a regulation for PFAS in drinking water?
On April 10, 2024, the US EPA established MCLs for a subset of PFAS chemicals.

Compound	MCL	Hazard index (MCL)
PFOA	4 ppt	-
PFOS	4 ppt	-
PFHxS	10 ppt	1 (unitless)
PFNA	10 ppt	
Gen X (HFPO-DA)	10 ppt	
PFBS	-	

EPA requires implementation of sampling in accordance with the new MCLs within three years of the publication date and implementation of any required treatment within five years. These limits did not apply for the 2023 calendar year because they had not been published. However, the DoD proactively promulgated policies to monitor drinking water for PFAS at all service owned and operated water systems at a minimum of every two years. The DoD policy states that if water sampling results confirm that drinking water contains PFOA and PFOS at individual or combined concentrations greater than the 2016 EPA health advisory (HA) level of 70 ppt, water systems must take immediate action to reduce exposure to PFOS or PFAS. For levels less than 70 ppt but above the 4 ppt level (draft at the time of policy publication), DoD committed to planning for implementation of the levels once EPA's published MCLs take effect.

Has CFAC tested its water for PFAS?
Yes. In December 2023 samples were collected from the WTP, B802. We are informing you that 3 of the 29 PFAS compounds covered by the sampling method were detected above the method reporting limit (MRL). The results are provided in the below table. EPA does not have a health advisory (HA) level or MCL for all of these compounds at this time. PFOA, PFOS, PFNA, PFHxS, PFBS, and Gen X were all below the MRL. As the regulated chemicals were all below the MRL, there is no immediate cause for concern, but we will continue to monitor the drinking water closely.

Water Quality Monitoring

CFAC uses Navy Operator Certification Authority (NOCA) approved laboratory methods to analyze our drinking water for the following potential contaminants at the frequencies required by regulation.

Group	Potential Contaminants	Frequency of Sampling
Micro-organisms	Total Coliform	Monthly
Disinfectants	Residual Chlorine	Hourly, Daily, Monthly
Disinfection By products	TTHM, HAA5	Annually
Inorganic Chemical	Metals, Nitrate/Nitrite, Lead & Copper	Every 3 years, Annually, Annually
Organic Chemical	Synthetic (Volatile and Pesticides)	Quarterly
Radionuclides	Alpha Particles, Radium, Uranium	Every 4 years

2023 Water Quality Data

In 2023, PWD Chinhae tested CFAC's drinking water for many possible contaminants. The following table lists the categories with which a particular contaminant is associated. The below results show that CFAC's drinking water complies with all the pertinent standards.

REGULATORY CRITERIA – KEGS & CNIC M 5090.1				LABORATORY RESULTS		
Contaminant	Typical Sources	Unit	MCL, AL, TT or MRDL	Results		Violation
				Low	High	
MICROBIOLOGICAL						
Total Coliform	Naturally present in the environment	NA	No more than one positive sample per month	Negative	Negative	**No**
DISINFECTANT RESIDUAL AND DISINFECTANT/DISINFECTION BYPRODUCTS						
Residual Chlorine	Water additive used to control microbes	mg/L	MRDL = 4.0	1.03	0.26	**No**
Halo Acetic Acids (HAA5)	Byproduct of drinking water disinfection	mg/L	Annual average 0.06	ND	ND	**No**
Total Trihalomethanes (TTHM)		mg/L	Annual average 0.08	0.0021	0.0024	**No**
INORGANIC CHEMICALS						
Nitrate (as N)	Runoff from fertilizer use; leaking from septic tanks; Sewage; Erosion of natural deposits	mg/L	10	2.21		**No**
Nitrite (as N)		mg/L	1	ND		**No**

Lead	Corrosion of household plumbing systems; erosion of natural deposits.	µg/L	15 based on 90th percentile results exceeding AL	0.95		**No**
Copper		µg/L	1,300 based on 90th percentile results exceeding AL	115		**No**
SYNTHETIC ORGANIC CHEMICALS (SOCs)						
Semi Volatile Organics & Pesticides /PCB	Run off from landfills; discharge of waste chemicals; runoff from herbicide used on crops and soil fumigants	mg/L	$3x10^{-8}$ to 0.7	ND	ND	**No**
Volatile Organics	Discharge from industrial and agricultural chemical factories	mg/L	0.002 to 10	ND	0.00085	**No**

PFAS Contaminant		Typical Sources	* Health Advisory Level (ppt)	Results (ppt)	Action
PFOA	Perfluoro-n-octanoic acid	Food packaging, stain resistant, nonstick products, water repellents, waxes, paints, cleaning products, firefighting foams	70	ND	**No Action Needed**
PFOS	Perfluorooctane sulfonic acid		70	ND	
N-EtFOSAA	N-Ethyl perfluorooctanesulfonamidoacetic acid		NA	ND	
N-MeFOSAA	N-Methyl perfluorooctanesulfonamidoacetic acid		NA	ND	
PFTeDA	Perfluorotetradecanoic acid		NA	ND	
PFTrDA	Perfluorotridecanoic acid		NA	ND	
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid		NA	ND	
4:2 FTS	1H, 1H, 2H, 2H-Perfluorohexanesulfonic Acid		NA	ND	
6:2 FTS	1H, 1H, 2H, 2H-Perfluorooctanesulfonic Acid		NA	34	
8:2 FTS	1H, 1H, 2H, 2H-Perfluorodecanesulfonic Acid		NA	ND	
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid		NA	ND	
ADONA	4,8-Dioxa-3H-perfluorononanoic acid		NA	15	
HFPO-DA	Hexafluoropropylene oxide dimer acid		NA	ND	
NFDHA	Nonafluoro-3,6-dioxaheptanoic Acid		NA	ND	
PFBS	Perfluorobutanesulfonic acid		NA	ND	
PFDA	Perfluorodecanoic acid		NA	ND	
PFHxA	Perfluorohexanoic acid		NA	9.4	
PFBA	Perfluorobutanoate		NA	ND	
PFEESA	Perfluoro(2-ethoxyethane) Sulfonic Acid		NA	ND	
PFHpS	Perfluoroheptane Sulfonate		NA	ND	
PFMBA	Perfluoro-4-methoxybutanoic Acid		NA	ND	
PFMPA	Perfluoro-3-methoxypropanoic Acid		NA	ND	
PFPeA	Perfluoropentanoate		NA	ND	
PFPeS	Perfluoropentane Sulfonic Acid		NA	ND	
PFDoA	Perfluorododecanoic acid		NA	ND	
PFHpA	Perfluoroheptanoic acid		NA	ND	
PFHxS	Perfluorohexanesulfonic acid		NA	ND	
PFNA	Perfluorononanoic acid		NA	ND	
PFUnA	Perfluoroundecanoic acid		NA	ND	

* The EPA Health Advisory Level for PFOA and PFOS is set at 70 ppt, individually or in combination.

Terms and Abbreviations

You may find unfamiliar terms and abbreviations in the tables below and throughout the document. To help you better understand these terms we've provided the following definitions:

Data Table Key: Unit Descriptions

mg/L	milligrams per liter, or parts per million (ppm)
µg/L	micrograms per liter, or parts per billion (ppb)
ppt	ppt: parts per trillion, or nanograms per liter (ng/L)
NA	Not Applicable
ND	Not Detected

Important Drinking Water Definitions

MCLG	Maximum Contaminant Level Goal: 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: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLG as feasible using the best available treatment technology.
TT	Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.
AL	Action Level: The concentration of a contaminant that, if exceeded, triggers treatment or other requirements that a water systems must follow.
MRDL	Maximum Residual Disinfectant Level: The highest level of a disinfectant allowed in drinking water (4 mg/L of chlorine). There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
90^{th} percentile	Represents the highest value found out of 90 percent of the samples taken. If the 90th percentile value is greater than the AL, a treatment evaluation and/or mitigation actions must be conducted on the water system.