



# 2020 Annual Consumer Confidence Report Commander, Naval Forces Korea (CNFK) Headquarters (HQ) Busan



This report meets Commander, Navy Installations Command Policy Letter 5200, Ser N4/13U84441, 15 Oct 13.

This report reflects monitoring data collected in 2020 is updated annually by July 1st.

이 보고서는 귀하의 식수에 대한 중요한 내용이 실려 있습니다. 그러므로 이 보고서를 이해할 수 있는 사람에게 번역해 달라고 부탁하시기 바랍니다.

## Your Water is Fit for Human Consumption!

Commander, Fleet Activities Chinhae (CFAC) is pleased to provide this annual Consumer Confidence Report (CCR) of the Drinking Water supplied to your facility on the Republic of Korea (ROK) Navy Base Busan.

This report is designed to inform you about the quality of water and services we deliver to you every day. 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, 2020. If you have any questions about the quality of water at CNFK HQ Busan or would like more information on the Overseas Drinking Water Program, please contact the CFAC Public Works Department, Environmental Division at 763-8814.

### Source of Water

The drinking water comes from surface water (such as reservoirs, lakes, ponds, rivers). The source water for CNFK HQ Busan is supplied from the ROK Naval Base Busan, which comes from the surface water source of the Nak-Dong River.

For everyone's protection, Public Works Department (PWD) Chinhae monitors the drinking water for a wide variety of impurities to verify the water provided to our community meets both U.S. Federal and Korean standards.

### Water Treatment & Distribution System

The Hwamyong Water Treatment Plant (WTP) collects the source surface water of the Nak-Dong River into a holding tank for treatment. This plant utilizes conventional treatment techniques of coagulation, flocculation, sedimentation, filtration, and disinfection. The water is filtered to remove sediments and treated with chlorine and ozone to kill potentially harmful bacteria, viruses and pathogens. The treated water is then distributed to the ROK Navy Base Busan which operates the water distribution system servicing the CNFK HQ Busan facility. Additionally in 2020, a chlorine booster pump was installed at Yongho storage tank located around 2 km from the ROK Naval base to supply adequate chlorine residual levels.

### 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, and are the same standards used in the U.S. to ensure safe drinking water. CNFK HQ Busan is also required to meet all criteria established in the Korean Environmental Governing Standards (KEGS) to ensure Department of Defense (DoD) activities and installations in Korea protect human health and the natural environment through the promulgation of specific environmental compliance criteria.

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 CNFK HQ Busan facilities. IWQB is currently taking steps to meet all requirements of the Navy's Overseas Drinking Water (ODW) program. And the Regional Water Quality Board (RWQB) granted CNFK HQ Busan a Conditional Certificate To Operate (CTO) for its water system in 2020. CNFK HQ Busan received Full Certificate to Operate on 19 Mar 2021.

### Source Water Assessment

In Jun 2019, the Navy Water Quality Oversight Council (WQOC) conducted a comprehensive sanitary survey of the CNFK HQ Busan drinking water system including Hwamyong WTP. 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 operator for producing and distributing safe drinking water. CNFK HQ Busan is continually improving the drinking water system based on the recommendations contained in the 2019 sanitary survey report.

## Educational Information

### Potential Contaminants

The 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 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 particularly 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.

### Other Potential Contaminants

#### Coliforms in Drinking Water

Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other potentially harmful bacteria 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/updated-total-coliform-rule-and-total-coliform-rule>

#### 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. Our tap water did not exceed the Nitrate/Nitrite drinking water health standards required by the KEGS. Information on Nitrate in drinking water is available at <http://water.epa.gov/drink/contaminants/basicinformation/nitrate.cfm>

### 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. Our tap water did not exceed the lead drinking water health standards required by the KEGS. 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>

### Copper

Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. Information on copper in drinking water is available at

<http://water.epa.gov/drink/contaminants/basicinformation/copper.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 persistent in the human body – meaning they do not break down and they can accumulate over time.

Information on PFAS in drinking water is available at <https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos>

### Total Trihalomethanes (TTHM) and Haloacetic 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. The source of organic materials in raw water is though

decaying vegetation. Potential health effects from exposure to THM 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

### What should I do, if I'm concerned about presence of the COVID-19 virus in drinking water?

Hwamyong WTP includes filtration and disinfectants such as chlorine and ozone that remove or kill viruses, bacteria and pathogens before they reach the tap.

### 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.

### 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.

### 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.

### Is there a regulation for PFAS in drinking water?

There is currently no established federal water quality regulation for any PFAS compounds. In May 2016, the EPA established a health advisory (HA) level at 70 ppt for individual or combined concentrations of perfluorooctanoic acid (PFOA) and perfluoro-octane sulfonic acid (PFOS). Both chemicals are types of PFAS. Out of an abundance of caution for your safety, the Department of Defense's (DoD) PFAS testing and response actions go beyond EPA Safe Drinking Water Act requirements. In 2020 the DoD promulgated a policy to obtain drinking water results for PFAS at all purchased water systems.

The EPA's health advisory states that if water sampling results confirm that drinking water contains PFOA and PFOS at individual or combined concentrations greater than 70 ppt, water systems should quickly undertake additional sampling to assess the level, scope, and localized source of contamination to inform next steps.

### Has CNFK HQ Busan tested its water for PFAS?

Yes. In December 2020, samples were collected from B600, CNFK HQ building. We are informing you that 8 of the 18 PFAS compounds covered by the sampling method were detected above the method reporting limit (MRL). PFOA and PFOS were below the EPA HA level. The results are provided in the table on page 5. As PFOA and PFOS were below the EPA HA, there is no immediate cause for concern.

## Water Quality Monitoring

CNFK HQ Busan uses Navy Operator Certification Authority (NOCA) approved laboratory methods to analyze our drinking water and monitors drinking water for the following constituents.

Group	Potential Contaminants	Frequency of Sampling
Micro-organisms	Total Coliform	Monthly
Disinfectants	Residual Chlorine	Monthly
Disinfection Byproducts	TTHM, HAA5 Bromate	Annually Quarterly
Inorganic Chemical	Metals, Nitrate/Nitrite Lead & Copper	Annually Quarterly Biannually
Organic Chemical	Synthetic (Volatile, Pesticides)	Quarterly

## 2020 Water Quality Data

In 2020, PWD Chinhae tested CNFK HQ Busan’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 CNFK HQ Busan’s drinking water complies with all the pertinent standards and as such is:

### Fit for Human Consumption

REGULATORY CRITERIA – KEGS & CNIC M 5090.1				LABORATORY RESULTS		
Contaminant	Typical Sources	Unit	MCL, AL, TT or MRDL	Results		Violation
				Low	High	
<b>MICROBIOLOGICAL</b>						
<b>Total Coliform</b>	Naturally present in the environment	NA	No more than one positive sample per month	Negative	Negative	<b>No</b>
<b>DISINFECTANT RESIDUAL AND DISINFECTANT/DISINFECTION BYPRODUCTS</b>						
<b>Residual Chlorine</b>	Disinfectant water additive to control microbes	mg/L	MRDL = 4.0	0.13 <sup>1</sup>	0.37	<b>No</b>
<b>Bromate</b>	Byproduct of drinking water disinfection	mg/L	0.010	ND	ND	<b>No</b>
<b>Halo Acetic Acids (HAA5)</b>		mg/L	Annual average 0.06	0.0099	0.0099	<b>No</b>
<b>Total Trihalomethanes (TTHM)</b>		mg/L	Annual average 0.08	0.050	0.050	<b>No</b>
<b>INORGANIC CHEMICALS</b>						
<b>Nitrate (as N)</b>	Runoff from fertilizer use; Leaking from septic tanks; Sewage; Erosion of natural deposits	mg/L	10	1.5	2.4	<b>No</b>
<b>Nitrite (as N)</b>		mg/L	1	ND	ND	<b>No</b>
<b>Heavy Metal</b>	Erosion of natural deposits	mg/L	0.0002 to 2.0	ND	0.020	<b>No</b>
<b>Fluoride</b>	Discharge from plastic and fertilizer factories; Discharge from steel/metal factories;	mg/L	4.0	0.064	0.064	<b>No</b>
<b>Cyanide</b>		mg/L	0.2	ND	ND	<b>No</b>
<b>Lead</b>	Corrosion of household plumbing systems; erosion of natural deposits.	mg/L	0.015 based on 90 <sup>th</sup> percentile results exceeding AL	ND	ND	<b>No</b>
<b>Copper</b>		mg/L	1.3 based on 90 <sup>th</sup> percentile results exceeding AL	0.070	0.33	<b>No</b>
<b>SYNTHETIC ORGANIC CHEMICALS (SOCs)</b>						
<b>Semi Volatile Organics &amp; Pesticides /PCB</b>	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	<b>No</b>
<b>Volatile Organics</b>	Discharge from industrial and agricultural chemical factories	mg/L	0.002 to 10	ND	ND	<b>No</b>

Contaminant	Typical Sources	Unit	Health Advisory Level	Results	Action
<b>Per-and Polyfluoroalkyl Substances (PFAS)</b>					
<b>PFOA</b>	Food packaging, stain resistant, nonstick products, water repellents, waxes, paints, cleaning products, firefighting foams	ng/L	70 for PFOA, PFOS or PFOS + PFOA	15	<b>No Action needed</b>
<b>PFOS</b>				3.1	
<b>PFBS</b>			NA	3.6	
<b>PFHxS</b>			NA	2.0	
<b>PFDA</b>			NA	0.87 <sup>2</sup>	
<b>PFHpA</b>			NA	6.8	
<b>PFHxA</b>			NA	21	
<b>PFNA</b>			NA	2.2	
PFDoA			NA	ND	
PFTeDA			NA	ND	
PFTTrDA			NA	ND	
PFUdA			NA	ND	
9Cl-PF3ONS			NA	ND	
11Cl-PF3ONS			NA	ND	
GenX			NA	ND	
ADONA			NA	ND	
EtFOSAA	NA	ND			
MeFOSAA	NA	ND			

Note:

1. The Surface Water Treatment Rule requires a disinfectant residual of 0.2 mg/L be present at the entry point to the distribution system. Chlorine residuals only need to be measurable at the ends of the distribution system. No bacteria has ever been detected in the drinking water. Also in 2020, chlorine booster pump was installed at Youngho storage tank to increase the chlorine residuals level.

2. PFDA is *positively identified*, but the reported numerical result is an estimated value. It is less than the method reporting limit (MRL, 1.7 ng/L) but greater than or equal to the method detection limit (MDL, 0.70 ng/L).

## 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	mg/L: number of milligrams of substance in one liter of water
ppb	ppb: parts per billion, or micrograms per liter
ppt	ppt: parts per trillion, or nanograms per liter
NA	NA: not applicable
ND	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 which, if exceeded, triggers treatment or other requirements which 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.

### Full name of PFAS (Per-and Polyfluoroalkyl Substances)

PFOA	Perfluoro-n-octanoic acid	PFTeDA	Perfluoro-n-tetradecanoic acid
PFOS	Perfluorooctane sulfonic acid	PFTrDA	Perfluoro-n-tridecanoic acid
PFBS	Perfluoro-1-butane sulfonic acid	PFUdA	Perfluoro-n-undecanoic acid
PFHxS	Perfluorohexane sulfonic acid	9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid
PFDA	Perfluoro-n-decanoic acid	11Cl-PF3ONS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
PFDoA	Perfluoro-n-dodecanoic acid	GenX	Hexafluoropropylene oxide dimer acid
PFHpA	Perfluoro-n-heptanoic acid	ADONA	4,8-dioxa-3H-perfluorononanoic acid
PFHxA	Perfluoro-n-hexanoic acid	EtFOSAA	N-ethylperfluoro-1-octanesulfonamidoacetic acid
PFNA	Perfluoro-n-nonanoic acid	MeFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid