GIMHAE AB HOSPITAL DRINKING WATER SYSTEM CONSUMER CONFIDENCE REPORT (CCR) 2016 (Covering CY 2015)

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 report contains information about Gimhae AB's hospital water system, which is operated and maintained by a contractor, Hanwha 63 City at 787-4309. The Bioenvironmental Engineering Flight of the 51st Aerospace Medicine Squadron collects and maintains all data concerning the quality of the water, including sample procedure and results. For questions about this report, please contact the Osan AB Bioenvironmental Engineering Flight at 784-2623.

Sampling to Ensure Your Water Quality

The Bioenvironmental Engineering Flight and Hanwha 63 City perform water testing to ensure your drinking water is the same quality that you would expect to have in the US. Your tap water met all US Environmental Protection Agency (EPA) and Korean Environmental Governing Standards (KEGS) for drinking water during CY 2015.

Note that this report applies only to the hospital area on Gimhae AB. The facilities outside of the hospital area (Bear, ROKAF buildings, etc.) connect to a separate distribution system which is operated by ROKAF personnel. The ROKAF system has not been tested by Hanwha 63 City personnel or Bioenvironmental Engineering, so we cannot make any statements about the water quality in those areas.

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 dissolves naturally occurring minerals and, in some cases, radioactive material, and substances resulting from the presence of animals or human activity. Contaminants that may be present in source water 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 stormwater 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, stormwater 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 stormwater 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. 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).

Gimhae AB Water Sources

The primary water source for Gimhae AB is the Nakdong River. The Nakdong River feeds the Mae-ri Reservoir. The reservoir supplies water to the Deoksan water treatment plant (WTP). The WTP provides pre-ozonation, flocculation, settling, filtration, post-ozonation, filtration again with granulated activated carbon (GAC), and chlorination to the water before it supplies Gimhae AB. The hospital area has a dedicated WTP, which filters and disinfects the water through the addition of chlorine. For contingency purposes, the hospital area WTP has the capability to perform coagulation, flocculation, and sedimentation of off base raw water from the Nakdong River.

What About the Taste and Color of My Water?

Hanwha 63 City performs weekly representative sampling of the water distribution system; thus, Hanwha 63 does 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. These routine maintenance practices are necessary actions that must occur before contacting Bioenvironmental Engineering for sampling and analysis.

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. <u>This condition is unsightly but is not a health problem</u>. 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. **<u>Consumers also can minimize the effects by flushing their faucets until the water appears clear (usually 30 - 60 seconds) before use.</u>**

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 it is not caused by gas bubbles. Please notify your facility managers who should call Bioenvironmental Engineering to arrange for checking the water.

3. Dirty water coolers/drinking fountains: Water coolers can become unsightly and unsanitary if not regularly cleaned. 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.

The Bioenvironmental Engineering Flight (784-2623) is ready to help with any drinking water issues, but to save yourselves some time, please work with your facility manager to conduct routine preventative maintenance on your building's plumbing before contacting our office.

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, food, 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.

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 the 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 visible 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 also can 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 in the facility plumbing. These materials include lead-based solder used to join copper pipe, in addition to lead 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. **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.**

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 and 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. **<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 4 or more hours.</u>**

Why is copper a health concern?
Some people who drink water containing copper in excess of the action level may, with short-term exposure, experience gastrointestinal distress, and with long-term exposure may suffer liver or kidney damage. Individuals with Wilson's Disease should consult their personal doctor if the amount of copper in their water exceeds the action level.

The above information on the health effects of copper 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 (Environmental Protection Agency) regulatory standards.

Monitored Contaminants

During the calendar year (CY) 2015, Hanwha 63 City and the Osan AB Bioenvironmental Engineering collected 98 samples and monitored them for 85 different contaminants. Also, Hanwha 63 City monitored chlorine levels daily and Bioenvironmental Engineering monitored chlorine levels weekly. Table 1 lists all of the contaminants monitored in CY 2015 and the required monitoring frequency for each contaminant group.

Table 1. CY 2015 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
Total Trihalomethanes (TTHMs)	4	Bromoform, chloroform, etc.	Annually
Haloacetic acids (HAA5)	5	Monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, etc.	Annually
Lead and Copper	2	--	Every 3 years; last sampled in CY 2014
Asbestos	1	-	Every 9 years; last sampled in CY 2007
Radiological Compounds	4	Gross alpha, uranium, radium 226/228, etc.	Not required to sample as classified Non-Transient Non-Community; last samples in CY 2011

Table 2 lists the microbial contamination detected in CY 2015. No microbial contaminants detected in any drinking water samples.

Table 2. CY 2015 Biological Sampling Results

Contaminant	MCLG	MCL	Level Detected	Met 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 1 for explanation of terms and abbreviations

Table 3 lists drinking water contaminants detected in CY 2015. The presence of contaminants in the water does not necessarily indicate that the water poses a health risk.

Table 3. CY 2015 Detected Water Contaminants

CONTAMINANTS	EPA		KEGS	Your Water	Met Standard?	Typical Source
	MCLG	MCL	MCL			
Inorganic Contaminants						
Barium in ppm	2	2	2	0.028	***Yes***	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Fluoride in ppm	4	4	2.0	0.126	***Yes***	Erosion of natural deposits; discharge from fertilizer and aluminum factories Fluoride is a water additive which promotes strong teeth
Nitrate [measured as Nitrogen in ppm]	10	10	10	1.55	***Yes***	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Total Nitrate and Nitrite in ppm	10	10	10	1.55	***Yes***	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Sodium in ppm	NR	NR	NR	23	***Yes***	Erosion of natural deposits
Trihalomethanes						
Total Trihalomethanes in ppb	NR	80	80	52.7	***Yes***	By-product of drinking water chlorination
Haloacetic Acids						
Haloacetic Acids	NR	60	60	10.2	***Yes***	By-product of drinking water chlorination

See Appendix 1 for explanation of terms and abbreviations
BE tested for Semi-Volatile Organic Chemicals (SVOCs) and Volatile Organic Chemicals (VOCs) but did not detect any.

Table 4 lists the lead and copper results for CY 2014. The result presented in the report is from the most recent testing conducted in accordance with the KEGS: the monitoring frequency of Lead and copper contaminants for Gimhae AB is every 3 years The standard for lead and copper is that no more than 10% of samples collected exceed the action level.

Table 4. CY 2014 Lead and Copper Sampling Results

Contaminant	EPA		KEGS	# of sample sites exceeding action level	90th percentile values	Met standard?	Potential Source of Contaminant
	MCLG	AL	AL				
Lead in ppb	0	15[1]	15[1]	0 of 6 sites	ND	***Yes***	Corrosion of household plumbing systems; erosion of natural deposits.
Copper in ppb	1300	1300[1]	1300[1]	0 of 6 sites	41	***Yes***	Corrosion from household plumbing systems; erosion of natural deposits.

See Appendix 1 for explanation of terms and abbreviations

Table 5 lists regulated radiological contaminants that were detected in CY 2011. The results presented in the report are from the most recent testing done in accordance with the KEGS. The monitoring frequency of radiological contaminants is every 4 years; however, Gimhae AB is currently classified as a Non-Transient Non-Community (NTNC) water system. Per KEGS guidance dated 18 June 2012, NTNC water systems are not required to be monitored for radiological contaminants. Though the presence of regulated radiological contaminants is in the water it does not pose a health risk.

Table 5. CY 2011 Detected Radiological Contaminants

Contaminant	EPA		KEGS MCL	Your Water		Meets Standards?	Likely Source of Contaminant
	MCLG	MCL		Low	High		
Gross Alpha in pCi/L	0	15	15	0.3	1.4	***Yes***	Erosion of natural deposits
Combined Radium 226 and 228 in pCi/L	0	5	5	0.12	0.77	***Yes***	Erosion of natural deposits
Uranium in ppb	0	30	30	0.07	0.33	***Yes***	Erosion of natural deposits

See Appendix 1 for explanation of terms and abbreviations

Table 6 lists asbestos that was detected in CY 2007. The result presented in this report is from the most recent testing done 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 2007 Detected Asbestos Contaminant

Contaminant	EPA		KEGS MCL	Your Water	Meets Standards?	Likely Source of Contaminant
	MCLG	MCL				
Asbestos MFL	7	7	7	<0.186	***Yes***	Decay of asbestos cement water mains; Erosion of natural deposits

See Appendix 1 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.kowaco.or.kr/.

APPENDIX 1

DEFINITIONS

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

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 very small amounts of contaminants in our environment. They are measures of concentration, the amount of one material in a larger amount of another material; for example, the weight of a toxic chemical in a certain volume of water. If you divide a liter of water into a million parts, then each part would be very small and would represent a millionth of the total liter or one part per million of the original liter.