OSAN AIR BASE (AB) DRINKING WATER SYSTEM CONSUMER CONFIDENCE REPORT (CCR) 2011

이 보고서에는 귀하의 식수에 대한 중요한 내용이 실려있습니다. 그러므로 이 보고서를 이해할 수 있는 사람한테 번역해 달라고 부탁하시기 바랍니다.

This report contains information about the Osan AB drinking water system, which is operated and maintained by the 51st Civil Engineer Squadron (CES). The quality of the water produced, sample collection, sample results, and all other data pertaining to these systems is collected and maintained by the Bioenvironmental Engineering Flight of the 51st Aerospace Medicine Squadron. For questions about this report, please contact the 51st Fighter Wing Public Affairs Office at 784-4044.

Sampling to ensure your water quality

Bioenvironmental Engineering performs water monitoring year round to ensure your drinking water is the same quality that you would expect in the US. Your tap water met all US Environmental Protection Agency (EPA) and Korean Environmental Governing Standards (KEGS) for drinking water in calendar year (CY) 2010.

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 from 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.

In order to ensure that tap water is safe to drink, the EPA prescribes regulations that limit the amount of certain contaminants in drinking 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. More information about contaminants and potential health effects can be obtained by calling the EPA Safe Drinking Water Hotline (1-800-426-4791).

Vulnerable individuals

Some people may be more vulnerable to the effects of 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 with HIV/AIDS or other immune system disorders, some elderly, and infants can be at greater risk from infections. These people 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 Water Drinking Hotline (800-426-4791).

Osan AB water sources

The primary water source for Osan AB is the Han River upstream from Seoul. Water is pumped directly from a collection point outside of Seoul to the Sungnam Water Treatment Plant, where the water is treated prior to entry onto Osan AB. This treatment includes: settling, chemical mixing with powdered activated carbon, flocculation, sedimentation, filtration, and chlorination. Aluminum sulfate and lime are used in the chemical mixing process during the summer months to aid in coagulation. Additionally, at the Osan AB Water Treatment Plant the water undergoes membrane filtration and further disinfection with chlorine before distribution to the base.

What about the taste and color of my water?

Representative sampling of the water distribution system is performed weekly; thus not all buildings on base are routinely sampled. 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 should be followed before contacting Bioenvironmental Engineering to conduct sampling and analysis at individual buildings.

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 rusty water 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 rusty water by flushing their taps until the water appears clear (usually 30 - 60 seconds) prior to use.**

2. Cloudy/Milky water: Gases (usually air or carbon dioxide) can become dissolved in water that is under pressure in pipes. 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 gas bubbles. Please notify your facility managers who should call Bioenvironmental Engineering to have the water checked.

3. Dirty water coolers/drinking fountains: Water coolers can become unsightly and unsanitary if they are 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 all lead to unpleasant tasting water. Facility managers should ensure that the outer surfaces of all water coolers are

cleaned regularly, and that the water cooler drains are not clogged. In-line filters are sometimes placed on water coolers but should rarely be necessary. If a filter is installed on the water cooler, the filter needs to be replaced according to the manufacturer's recommendations.

The Bioenvironmental Engineering Flight (784-2623) is ready to help with any drinking water issues, however, sampling and analysis is expensive. Before contacting our office, please work with your facility manager to conduct routine preventative maintenance on your building's plumbing.

Frequently asked questions about lead

Where does the lead come from?
Lead is a common metal 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 damage 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 obvious signs of lead poisoning.

Blood lead 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 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 to 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 to remain below 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 prior to consumption after the faucet has remained unused for 4 or more hours.**

Monitored contaminants

During calendar year (CY) 2010, Bioenvironmental Engineering collected 496 samples and monitored for 94 different contaminants. In addition, chlorine levels are monitored daily by CES and weekly by Bioenvironmental Engineering. Table 1 lists all of the contaminants that were monitored in 2010 and the required monitoring frequency for each contaminant group.

Table 1. CY 2010 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
Nitrate, Nitrite, Total Nitrate/Nitrite	3	--	Quarterly
Volatile Organic Compounds	21	Benzene, toluene, trichloroethylene (TCE), etc.	Quarterly
Synthetic Organic Compounds	33	Pesticides, polychlorinated biphenyls (PCBs), etc.	Annually
Special Case SVOCs	2	Di(2-ethylhexyl)adipate, phthalate	Quarterly
Total Trihalomethanes	4	Bromoform, chloroform, etc.	Quarterly
Haloacetic acids (HAA5)	5	Monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, etc.	Quarterly
Lead and Copper	2	--	Semi-annually and periodic as needed

Table 2 lists the microbial contamination results for CY 2010. No microbial contaminants were detected in any drinking water samples.

Table 2. CY 2010 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 all of the drinking water contaminants that were detected in CY 2010. 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. So if a single sample exceeds the MCL, as long as the average of all the readings for that year is less than the MCL, then the system is in compliance.

Table 3. CY 2010 Detected Water Contaminants

<table>
<tr><th rowspan="2">CONTAMINANTS</th><th colspan="2">EPA</th><th>KEGS</th><th colspan="2">Your Water</th><th rowspan="2">Met Standard?</th><th rowspan="2">Typical Source</th></tr>
<tr><th>MCLG</th><th>MCL</th><th>MCL</th><th>Low</th><th>High</th></tr>
<tr><td colspan="8">Inorganic Contaminants</td></tr>
<tr><td>Barium in ppm</td><td>2</td><td>2</td><td>2</td><td>0.0214</td><td>0.0214</td><td>Yes</td><td>Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits</td></tr>
<tr><td>Nitrate
[measured as Nitrogen in ppm]</td><td>10</td><td>10</td><td>10</td><td>1.46</td><td>1.82</td><td>Yes</td><td>Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits</td></tr>
<tr><td>Total Nitrate and Nitrite in ppm</td><td>10</td><td>10</td><td>10</td><td>1.46</td><td>1.82</td><td>Yes</td><td>Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits</td></tr>
<tr><td>Fluoride in ppm</td><td>4</td><td>4</td><td>4</td><td>0.4</td><td>0.4</td><td>Yes</td><td>Erosion of natural deposits; water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories</td></tr>
<tr><td>Sodium in ppm</td><td>NR</td><td>NR</td><td>NR</td><td>10.3</td><td>10.3</td><td>Yes</td><td>Erosion of natural deposits</td></tr>
<tr><td colspan="8">Synthetic Organic Contaminants</td></tr>
<tr><td>Di(2-ethylhexyl)phthalate in ppb</td><td>0</td><td>6</td><td>6</td><td>ND</td><td>4.4</td><td>Yes</td><td>Discharge from rubber and chemical factories</td></tr>
<tr><td colspan="8">Total Trihalomethanes</td></tr>
<tr><td rowspan="3">Total Trihalomethanes in ppb</td><td rowspan="3">NA</td><td rowspan="3">80 (annual average)</td><td rowspan="3">80 (annual average)</td><td>31.1</td><td>94.3</td><td rowspan="3">Yes</td><td rowspan="3">By-product of drinking water chlorination</td></tr>
<tr><td colspan="2">Annual average</td></tr>
<tr><td colspan="2">52.2</td></tr>
<tr><td colspan="8">Haloacetic Acids</td></tr>
<tr><td rowspan="3">Haloacetic Acids in ppb</td><td rowspan="3">NA</td><td rowspan="3">60 (annual average)</td><td rowspan="3">60 (annual average)</td><td>14.2</td><td>45.3</td><td rowspan="3">Yes</td><td rowspan="3">By-product of drinking water chlorination</td></tr>
<tr><td colspan="2">Annual average</td></tr>
<tr><td colspan="2">27.6</td></tr>
</table>

See Appendix for explanation of terms and abbreviations

Table 4 lists the lead and copper results for CY 2010. In CY 2010 there were two locations on base, buildings 1349 and 1446, which exceeded the lead action level. The standard for lead and copper is that no more than 10% of samples collected exceed the action level. In other words, the 90th percentile value listed in table 4 means that 90% of the samples taken in 2010 contained less than 4.09 parts per billion (ppb) of lead. Therefore, Osan AB was in compliance with the lead standard in CY 2010. There were no exceedances of the copper action level in CY 2010.

Table 4. CY 2010 Lead and Copper Sample Results

Contaminant	EPA		KEGS	# of sample sites exceeding action level	90th percentile value	Met standard?	Potential Source of Contaminant
	MCLG	AL	AL				
Lead in ppb	0	15	15	2 of 49 sites	4.09	*Yes*	Corrosion from household plumbing systems; erosion of natural deposits.
Copper in ppb	1300	1300	1300	0 of 49 sites	521	*Yes*	Corrosion from household plumbing systems; erosion of natural deposits.

See Appendix 1 for explanation of terms and abbreviations

Where can I get more information?

For more information please contact Osan's Bioenvironmental Engineering office at 784-2623 if you have any specific questions regarding this CCR or would like additional information on your drinking water.

This CCR was prepared by Bioenvironmental Engineering (51 AMDS/SGPB) and will be posted on the Osan AB homepage (http://www.osan.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 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

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.