CONSUMER CONFIDENCE REPORT 2011

DRINKING WATER

NSA BAHRAIN

MAY 2012

We constantly strive to provide hygienically safe and pure drinking water of highest quality to our personnel

Lonestar Technical Services, P.O. Box 8817, Dubai, U.A.E. Phone 971-4-324-3888, website: www.lonestar-lab.com

EXECUTIVE SUMMARY

This Consumer Confidence Report (CCR) for 2011 confirms that water samples collected from NSA Bahrain and Department of Defense Dependent School (DoDDS) during the year 2011 are safe and meet or exceed the requirements of US Department of Defense Final Governing Standards (FGS). Laboratory tests conducted by an internationally accredited laboratory indicate the water from NSA Bahrain and DoDDS is safe for drinking.

NSA BAHRAIN

DRINKING WATER CONSUMER CONFIDENCE REPORT 2011

Why is safe drinking water essential?

Clean drinking water is a basic human need. One in six people around the world still lack reliable access to this precious resource.

At NSA Bahrain drinking water that is supplied is hygienically safe and fit for human consumption. We are proud to support the Navy's commitment to provide safe and reliable drinking water to our personnel and their families year after year. This Consumer Confidence Report for the year 2011 contains basic facts and information that is significant to educate everyone about our water source(s), treatment processes, standard requirements, and other details to help assure you that our water is safe to drink.

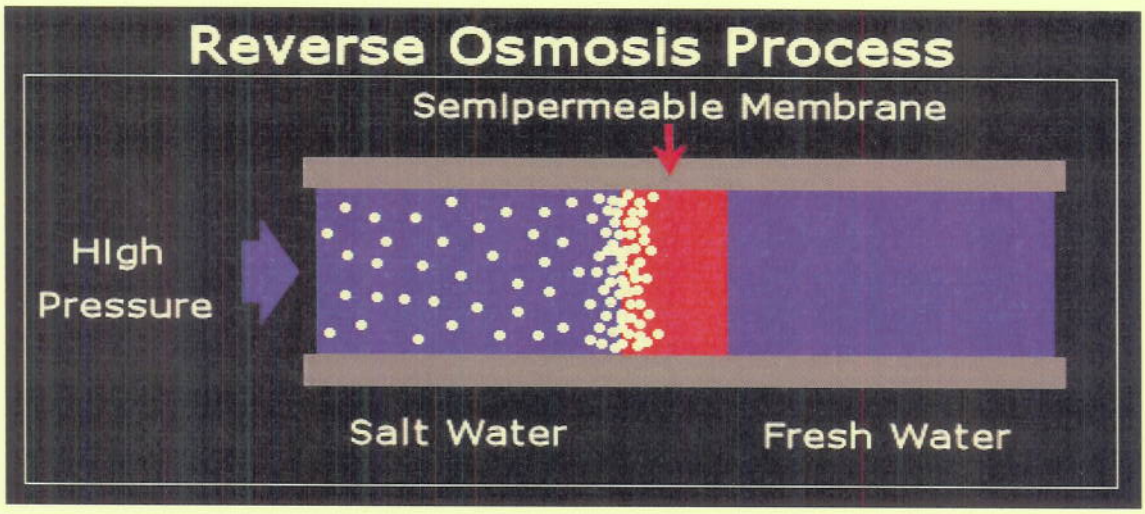
Our drinking water meets the requirements of DoD's Final Governing Standards (FGS), which are derived from U.S. Environmental Protection Agency (EPA) and Bahraini drinking water standards. The FGS prescribes regulations that limit the amount of contaminants in water provided by our water systems, and our results show that all chemical analyses are below the maximum allowed contaminant levels. A detailed list of constituents found in our drinking water is included in this report, along with a comparison to the maximum levels considered safe for the general public by these standards.

Source of our water and how is it treated?

In September 2009, the Naval Facilities Engineering Command conducted a comprehensive sanitary survey of NSA Bahrain drinking water system. This survey, required every 3 years, provided an evaluation of the adequacy of the drinking water source, facilities, equipment, operation and maintenance for producing and distributing safe drinking water.

The PWD contractor operates two Reverse Osmosis (RO) plants that supply clean and safe drinking water to the consumers at the Base and Department of Defense Dependent School (DoDDS). The main treatment facility for NSA Bahrain has a processing capacity of 288,000 gallons per day (gpd) and the RO facility has a processing capacity of 10,000 gpd.

NSA Bahrain purchases treated water from the City of Manama. This water comes from the ocean and is treated at the Al Hidd Water Plant, a multi-stage flash distillation plant. Distillation of ocean water for human consumption is a common practice worldwide. Water received from the City of Manama is further treated at NSA Bahrain facility using appropriate anti-scalant and sodium meta-bisulfite prior to purification by the reverse osmosis. Disinfection of the water is achieved by chlorination. This potable water is stored in secured and controlled access tanks at each facility for direct distribution to various outlets throughout NSA's water distribution network.



What is in our drinking water?

Drinking water, including bottled water irrespective of the treatment process, may reasonably be expected to contain at least trace amounts of some contaminants. Bahrain's drinking water source is distilled; however, distillation is not 100% effective in removing all contaminants because: 1) droplets of un-vaporized liquid can be carried with the steam prior to distillation, and 2) some contaminants have boiling points similar to water and will be vaporized and condensed with the distilled water. Due to this, some substances may be present in source drinking water, such as:

- ***Inorganic contaminants***: Naturally occurring igneous and sedimentary rocks that form the earth crust. Water traveling over the earth surface dissolves salts and minerals
- ***Organic contaminants***: Most of these contaminants are from industrial, chemical, petroleum and waste generating facilities. The chemicals compounds may be low boiling Organic chemical, high boiling point organic, cosmetic industry by–products
- ***Pesticides and herbicides*** : Common household pest control chemicals, agricultural and garden chemicals, chemicals for killing herbs and weeds and chemical used to stimulate flowering in many edible plants
- ***Microbial contaminants***: Even though most viruses and bacteria are extremely sensitive to temperature and pressure, there are a few that are immune. Source of these bacteria
- and viruses maybe from livestock, sewage treatment plants, medical or animal waste incinerators
- ***Radionuclide***: Certain radionuclide are naturally occurring and form a part of the earth crust. Others radionuclide may be present as contaminants due to their use as tracers in the oil fields

The presence of the above contaminants does not necessarily indicate that water poses a health risk. In order to ensure that tap water is safe to drink, regulations limit the amount of certain contaminants in water provided by public water systems. You can learn more about contaminants and any potential health effects by visiting the EPA's Drinking Water Standards web site:

http://permanent.access.gpo.gov/lps21800/www.epa.gov/safewater/standards.html or by calling their Safe Drinking Water Hotline: 1-800-426-4791.

What standards apply to drinking water overseas?

Drinking water is deemed to be safe for human consumption if the levels of pollutants are below the Maximum contaminant levels or below those recommended by DoD. Drinking water systems distributed on the base must meet the requirement of Final Governing Standards (FGS). FGS are developed after a comprehensive review and comparison of U.S. EPA's Safe Drinking Water Act (SDWA) and Bahraini drinking water standards. When Bahraini and U.S. standards differ, the *most protective* requirement is adopted into the FGS.

NSA Bahrain's drinking water is monitored frequently for various parameters to ensure consumer's health and safety. Regular sampling is conducted to detect:

- Bacteriological
- Inorganic and Organic Compounds
- Pesticides and PCBs
- Total Trihalomethanes (disinfection by-products)
- Radionuclide

Some people must use special precautions

There are people who 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 with HIV/AIDS or other immune system 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/Centers 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's Safe Drinking Water Hotline: 800-426-4791.

This report is produced in accordance with the requirements of OPNAV Instruction 5090.1C, Navy Environmental and National Resource Program Manual.

Water Quality Data Table

The table below lists drinking water contaminants and relevant data collected during 2011 sampling (unless otherwise noted). The presence of contaminants in the water does not necessarily indicate that the water poses a health risk. All substances detected in NSA Bahrain's drinking water are below allowed Maximum Contaminant Levels (MCL) and meet FGS requirements.

Water produced at NSA Bahrain and DoDDS after the RO process is tested daily at the base for pH, chlorine, conductivity and total dissolved solids (TDS). During the year 2011, samples of water were tested for physical, inorganic and organic chemicals semi-annually. Additionally, numerous samples were analyzed semi-annually for lead and copper. Water samples from sinks, faucets and taps collected at NSA Bahrain and DoDDS were analyzed monthly for Coliform Bacteria.

NSA Bahrain Water Treatment Facility					
Contaminant	**Possible Source**	**MCL**	**Annual Range**	**Units**	**Compliance**
Copper	Corrosion or erosion of copper plumbing, faucets, taps and natural deposits	1.3	Up to 0.03	mg/L	Yes
Fluoride	Discharge from Aluminum smelters, fertilizers and water treatment additive	4	Not detected	mg/L	Yes
Nitrates	Agricultural and garden fertilizer usage, septic tanks and erosion of rocks	10	Not detected	mg/L	Yes

DoDDS (Bahrain School) Water Treatment Facility					
Contaminant	**Possible Source**	**MCL**	**Annual Range**	**Units**	**Compliance**
Copper	Corrosion or erosion of copper plumbing, faucets, taps and natural deposits	1.3	Up to 0.11	mg/L	Yes
Fluoride	Discharge from Aluminum smelters, fertilizers and water treatment additive	4	Not detected	mg/L	Yes
Nitrates	Agricultural and garden fertilizer usage, septic tanks and erosion of rocks	10	Not detected	mg/L	Yes

Lead in Drinking Water System						
Contaminant	**Possible Source**	**Action Level**	**90th Percentile**	**Annual Range**	**Units**	**Compliance**
Lead	Solders, fittings, flux and plumbing lines	15	N/A	Not detected	µg/L	Yes

Contaminants and their Possible Sources

In the table below various contaminants and their possible sources are identified. These components are health hazards when they exceed certain levels.

Contaminant	Possible Sources	NSA & DoDDS water
		Compliance
Inorganic contaminants	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits Infiltration through soil, sediment and rock that form earth crust. Water travelling over the earth surface dissolves salts and minerals. Direct flow through improperly built wells that become conduits for contamination. Cross contamination below the ground surface from other aquifers through the casings of improperly built wells.	**YES**
Organic contaminants	Most of these contaminants are from industrial, chemical, petroleum and waste generating facilities. The chemicals compounds may be low boiling Organic chemical, high boiling point organic, cosmetic industry by -products	**YES**
Pesticides and herbicides	Pesticides are carried in rainwater runoff from farm fields, suburban lawns, or roadside embankments into the nearest creeks and streams. Occasionally they are even intentionally sprayed into waterways as part of a pest-control effort also enter environment as herbicides, insecticides, fungicides, rodenticides, and algicides.	**YES**
Volatile organic compounds	Enter environment when used to make plastics, dyes, rubbers, polishes, solvents, crude oil, insecticides, inks, varnishes, paints, disinfectants, gasoline products, pharmaceuticals, preservatives, spot removers, paint removers, degreasers, and many more.	**YES**
Microbial contaminants	Even though most viruses and bacteria are extremely sensitive to temperature and pressure, there are a few that are immune. Occur naturally in the environment from soils and plants and in the intestines of humans and other warm-blooded animals.	**YES**
Radionuclide	Certain radionuclide (example Barium and Strontium) are naturally occurring and form a part of the earth crust. Others radionuclide may be present as contaminants due to their use as tracers in the oil fields	**YES**

Unit Descriptions	
Term	**Definition**
ppm	Parts Per Million, or milligrams per liter (mg/L)
ppb	Parts Per Billion, or micrograms per liter (µg/L)
pCi/L	Pico-curies per liter (a measure of radioactivity)
NA	Not Applicable
ND	Not Detected
NR	Monitoring Not Required, but recommended.

Important Drinking Water Definitions	
Term	**Definition**
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 MCLGs 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 system must follow.
Variances and Exemptions	State or EPA permission not to meet an MCL or a treatment technique under certain conditions.
MRDLG	Maximum residual disinfection level goal. The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
MRDL	Maximum residual disinfectant level. The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
MNR	Monitored Not Regulated
MPL	State Assigned Maximum Permissible Level

What Commands and Departments are involved in providing safe drinking water? What are their responsibilities?	
NAVFAC Bahrain Public Works Department (PWD) – Utilities	• Operation and maintenance of drinking water treatment and distribution systems including cleaning of tanks, system disinfection, flushing, and backflow prevention. Note: PWD contracts with INTERCOL to operate and maintain the reverse osmosis treatment system. • Coordinate with Environmental Division to update the master plans.
NAVFAC SWA Environmental Program	• Overall compliance with FGS (includes EPA and Bahraini Drinking Water Standards). • Coordination of drinking water sampling and laboratory analysis. • Recordkeeping. • Source water surveys, master plans, sanitary surveys, and laboratory contract services
US Naval Branch Health Clinic Bahrain (Cognizant Medical Authority)	• Certification of base drinking water systems as potable. • Bacteriological monitoring. • Health effects advice and implementation of protective measures associated with any instances of non-compliance.
Naval Facilities Engineering Command	• Treatment plant construction/upgrades
NSA Bahrain Public Affairs Office	• Public notification of any non-compliance issues associated with on-base drinking water systems. Public notification covers potential adverse health effects/risks, corrective actions, alternative water supplies and protective measures. • Public notification of any non-compliance issues associated with off-base systems in the surrounding community which may affect station personnel. • Issuance of CCR's. • Community Outreach.
NSA Bahrain Housing Office	• Coordination of drinking water issues relating to base housing

If you have any questions regarding this report or about the drinking water processes, please contact Awni M. Almasri Regional Environmental Director, Commercial Phone +973-1785-4603,DSN:439-4603.

Awni M. Almasri
Regional Environmental Director

+973-1-785-4603

awni.almasri@me.navy.mil