



NAVAL SUPPORT ACTIVITY BAHRAIN (NSA II) 2020 DRINKING WATER CONSUMER CONFIDENCE REPORT



Is our water safe to drink?

Yes. Bahrain's NSAI drinking water system provides water that is safe and Fit for Human Consumption (FFHC, or potable) as determined by the Installation Commanding Officer's Record of Decision dated 27-Oct-2014 and as routinely confirmed by laboratory sampling results (received monthly, quarterly, and yearly). We are proud to support the Navy's commitment to provide safe and reliable drinking water to our service members and their families. This annual Consumer Confidence Report includes general and mandatory information 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 fully complies with the Department of Defense's (DoD) Bahrain Final Governing Standards (FGS), which are derived from the U.S. DoD Overseas Environmental Baseline Guidance Document (OEBGD), U.S. Environmental Protection Agency (EPA) and Bahrain drinking water standards. When Bahrain and U.S. standards differ, the *most protective* requirement is adopted into the FGS. 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.

Where does our water come from and how is it treated?

Bahrain NSAI purchases treated water from the Kingdom of Bahrain Electricity & Water Authority (EWA). This water comes from the ocean and is treated at the Al Hidd Water Plant, a multi-stage flash distillation plant. Water received from the City of Manama - Hidd Plant is further treated by Naval Facilities Engineering Command (NAVFAC) Bahrain Public Works Department at Bahrain NSA II facility using 3-stage Reverse Osmosis (RO) units, to render the water potable. Disinfection of the water is achieved by chlorination. Potable water is stored in secured and controlled access tanks at each facility for direct distribution to various outlets throughout NSA II water distribution network.

Why are there contaminants in drinking water?

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. Bahrain NSAI 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. 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.

Consequently, some contaminants may be present in drinking water, such as:

- **Microbial contaminants**, such as viruses and bacteria, that may come from wildlife, sewage treatment plants, septic systems, and livestock;
- **Disinfection by-products**, such as chlorine and chloramine used to remove pathogens from the water;
- **Pesticides and herbicides**, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses;
- **Inorganic contaminants**, such as salts and metals, which can be naturally occurring or result from urban storm water runoff, industrial, or domestic wastewater discharges, oil and gas production, mining, or farming;

- **Organic chemical contaminants**, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems; and
- **Radioactive contaminants**, which can be naturally occurring or be the result of oil and gas production and mining activities.

The presence of 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. Regular sampling is conducted to detect the level of contaminants in the water system. If the results are above regulatory limits, you will be notified by Email and Public Notification. 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>

Source water assessment

In Jun 2018, NAVFAC together with the Navy and Marine Corps Public Health Center (NMCPHC) conducted a comprehensive sanitary survey of the NSA Bahrain drinking water system. This survey, conducted every three years, provides an evaluation of the adequacy of the drinking water source, facilities, equipment, operation and maintenance for producing and distributing safe drinking water. NAVFAC is continually improving the drinking water system based on the recommendations in the report.

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 webpage: www.epa.gov/safewater/sdwa.

Additional Information for Lead

If present, 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. NAVFAC NSA Bahrain Public Work Department is responsible for providing high-quality drinking water and has direct control over the materials used in plumbing components on the facility. This ensures that no lead service lines or components are used on the drinking water system. As a general safety practice, whenever - and wherever - you plan to use tap water for drinking or cooking, you can minimize the potential for lead exposure by flushing the tap for 30 seconds to 2 minutes prior to use. Information on lead in drinking water and steps you can take to minimize exposure is available from the EPA Safe Drinking Water website: www.epa.gov/safewater/lead

Water Quality Data Table

Table 1 below lists all of the drinking water contaminants and relevant sampling data collected during the 2020 calendar year. Unless otherwise included, the table below only lists the contaminants that were detected during calendar year 2020. The presence of contaminants in the water does not necessarily indicate that the water poses a health risk. All contaminants detected in Bahrain’s NSAI drinking water are below the Maximum Contaminant Levels (MCLs) allowed by FGS, DoD, and EPA applicable requirements.

Table 1

Contaminants	MCLG or MRD LG	MCL, TT, or MRDL	Your Water	Units	Sample Date	Violation	Typical Source
Inorganic Components							
Sodium	N/A	N/A	6.5	mg/L	22-Mar -2020	NO	Erosion of natural deposits; Leaching
Magnesium	N/A	N/A	0.79	mg/L	27-Oct -2020	NO	Erosion of natural deposits; Leaching
Silica	N/A	N/A	1.0	mg/L	30-Jul -2020	NO	Erosion of natural deposits; Leaching
Calcium	N/A	N/A	40	mg/L	30-Jul -2020	NO	Erosion of natural deposits; Leaching
Chlorides	N/A	N/A	10	mg/L	30-Jul -2020	NO	Erosion of natural deposits; Leaching
Sulfate	250	N/A	1.0	mg/L	30-Jul -2020	NO	Runoff/leaching from natural deposits
Copper	N/A	1.3	N/D	mg/L	30-Jul -2020	NO	Erosion of natural deposits; Leaching
Nitrates	N/A	10	N/D	mg/L	30-Dec-2020	NO	Byproduct of drinking water disinfection
Total Nitrite and Nitrate	N/A	10	N/D	mg/L	30-Dec-2020	NO	Byproduct of drinking water disinfection
Note: All other Inorganic Compounds, Organic Compounds, Pesticides, PCBs, Total Trihalomethanes and Radionuclides, Lead, Copper and Total Coliforms were not detected							

N/D= Not Detected, i.e below PQL

PQL= Practical Quantitation Limit of the best method

Unit Descriptions	
Term	Definition
mg/L	milligrams per liter
N/A	Not Applicable
N/D	Not Detected

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.
Variances and Exemptions	Variances and Exemptions. 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.

Violation(s) or Exceedance(s)/MISSED SAMPLING EVENTS:

There were no violations, exceedances, or missed sampling events during the year 2020 for any tests parameters for Bahrain NSA II.

However, this section also provides the Tier 3 notification requirements in accordance with Navy policy and EPA procedures. Tier 3 notifications do not have an impact on human health but are required to be reported. When water systems violate a drinking water standard that does not have a direct impact on human health (in this case failing to take a required sample on time) the water supplier has up to a year to provide a notice of this situation to its customers. For Bahrain NSAI, we never missed sampling events or any tests were exceeded during year 2020.

What are per- and polyfluoroalkyl substances and where do they come from?

Per- and polyfluoroalkyl substances (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.

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 parts per trillion (ppt) for individual or combined concentrations of perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS). Both chemicals are types of PFAS.

Out of an abundance of caution for your safety, the DoD’s PFAS testing and response actions go beyond EPA Safe Drinking Water Act requirements. In 2020 the DoD promulgated a policy to monitor drinking water for PFAS at all service owned and operated water systems at a minimum of every three years.

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 parts per trillion, water systems should quickly undertake additional sampling to assess the level, scope, and localized source of contamination to inform next steps.

Has NSAIL tested its water for PFAS?

Yes. In Oct 2020, samples were collected from NSAIL.

Below MRL

We are pleased to report that drinking water testing results in Table 2 were below the method Reporting Limit (RL) for all 18 PFAS compounds covered by the sampling method, including PFOA and PFOS. This means that PFAS were not detected in your water system. In accordance with DoD policy, the water system will be resampled every three years for your continued protection.

Table 2

Per- and polyfluoroalkyl substances (PFAS)			
Client Sample ID Number from PFAS Reports		NSAIL BAH-NSA2-Sample	
Analyte	Unit	Result	RL
Perfluorohexanoic acid	ng/L	<1.7	1.7
Perfluoroheptanoic acid	ng/L	<1.7	1.7
Perfluorooctanoic acid	ng/L	<1.7	1.7
Perfluorononanoic acid	ng/L	<1.7	1.7
Perfluorodecanoic acid	ng/L	<1.7	1.7
Perfluorotridecanoic acid	ng/L	<1.7	1.7
Perfluorotetradecanoic acid	ng/L	<1.7	1.7
Perfluorobutanesulfonic acid	ng/L	<1.7	1.7
Perfluorohexanesulfonic acid	ng/L	<1.7	1.7
Perfluorooctanesulfonic acid	ng/L	<1.7	1.7
NEtFOSAA	ng/L	<1.7	1.7
NMeFOSAA	ng/L	<1.7	1.7
Perfluoroundecanoic acid	ng/L	<1.7	1.7
Perfluorododecanoic acid	ng/L	<1.7	1.7
HFPODA	ng/L	<1.7	1.7
9Cl-PF3ONS	ng/L	<1.7	1.7
11Cl-PF3OUdS	ng/L	<1.7	1.7
DONA	ng/L	<1.7	1.7
ng/L: Nanogram/Liter			
RL: Reporting Limit			

Points of Contact

If you have any questions regarding this report or about the drinking water processes, please contact:

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