



NAVAL SUPPORT ACTIVITY BAHRAIN (NSA I, BANZ, NSAIII (AV UNIT)) 2020 DRINKING WATER CONSUMER CONFIDENCE REPORT



Is our water safe to drink?

Yes. Naval Support Activity (NSA) I Bahrain's drinking water system provides water that is safe and Fit for Human Consumption (FFHC, or potable), although raw water received at BANZ warehouses area and NSAIII (AV Unit) remains Fit for Hand Washing and Showering purposes only as determined by the Installation Commanding Officer's Record of Decision dated 10-Feb-2014. Personnel at BANZ warehouses area and NSAIII (AV Unit) are authorized to use only bottle water for drinking purpose. 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, 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?

NSA Bahrain 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 using Reverse Osmosis (RO) to render the water potable and of high aesthetic quality. Disinfection of the water is achieved by chlorination. Potable water is stored in secured and controlled access tanks at each facility for direct distribution throughout the NSA I 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. NSA Bahrain 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 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. NSA Bahrain is continually improving the drinking water system based on the recommendations contained 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 Iron

Iron is regulated as a secondary contaminant by USEPA, because it may cause discolored water or aesthetic effects in drinking water, such as unpleasant odor or taste. Exceeding a secondary standard may cause people to stop using the water even though the water is actually safe to drink. Secondary standards are set to provide public water systems guidance on removing these chemicals to levels that are below what most people will find noticeable. Activities taken to reduce the iron concentration in NSA I drinking water include flushing the distribution system to remove settled particulates. Information on iron in drinking water and the steps you can take to minimize exposure is available from the USEPA Safe Drinking Water website: 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 –NSA I

Table 1 below lists all of the drinking water contaminants and relevant sampling data collected during the 2020 calendar year. Unless otherwise noted, 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 NSA I Bahrain’s drinking water are below the Maximum Contaminant Levels (MCLs) allowed by FGS, DoD, and EPA applicable requirements.

Table 1

| Contaminants | MCLG or MRDLG | MCL, TT, or MRDL | Your Water | Units | Sample Date | Violation | Typical Source |
|-----------------------------|---------------|------------------|------------|-------|-------------|-----------|---------------------------------------|
| Inorganic Components | | | | | | | |
| Sodium | N/A | N/A | 7.1 | mg/L | 30-Jul-2020 | NO | Erosion of natural deposits; Leaching |
| Boron | N/A | N/A | 0.02 | mg/L | 27-Oct-2020 | NO | Erosion of natural deposits; Leaching |
| Calcium | N/A | N/A | 0.94 | mg/L | 27-Oct-2020 | NO | Erosion of natural deposits; Leaching |

| Contaminants | MCLG or MRDLG | MCL, TT, or MRDL | Your Water | Units | Sample Date | Violation | Typical Source |
|---|---------------|------------------|------------|-------|-------------|-----------|---|
| Inorganic Components | | | | | | | |
| Copper | N/A | 1.3 | N/D | mg/L | 27-Oct-2020 | NO | Erosion of natural deposits; Leaching |
| Sulfate | 250 | N/A | 0.55 | mg/L | 31-May-2020 | NO | Runoff/leaching from natural deposits |
| Phosphate | N/A | N/A | 0.90 | mg/L | 30-Jul-2020 | NO | Erosion of natural deposits; Leaching |
| Magnesium | N/A | N/A | N/D | mg/L | 30-Jul-2020 | NO | Occurs naturally in the soil, sediments and ground water and some rocks |
| Chlorides | N/A | N/A | 3.1 | mg/L | 30-Jul-2020 | NO | Runoff/leaching from natural deposits |
| Total Nitrite and Nitrate | N/A | 10.0 | N/D | mg/L | 30-Jul-2020 | NO | Byproduct of drinking water disinfection |
| Note: All other Inorganic Compounds, Organic Compounds, Pesticides, PCBs, Radionuclides 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 | ppm: parts per million, or milligrams per liter (mg/L) |
| N/A | Not Applicable |
| N/D | Not detected |

INFORMATION ON ADDITIONAL FACILITIES MANAGED BY NSA:

NSAIII (AV UNIT):

The Aviation Unit, also formally referred to as “Air Logistics Department,” is located next to the Bahrain International Airport. The unit includes active duty military, military reservists, DOD civilians, and local national civilians. The source water from the City water distribution system is stored at the site in two above ground cylindrical storage tanks of 5,000 and 6,000 Gal capacities. The AV Unit facilities receive the non-potable water from these tanks via the onsite distribution system.

Currently NSA Bahrain AV Unit has no treatment facility. The analytical results of water supplied by the City is listed below:

| Location | Compliance Status |
|------------------|---|
| NSAIII (AV UNIT) | Remains Fit for hand washing and showering purpose only |

Water Quality Data Table – NSAIII (AV Unit)

Table 2 below lists all of the water contaminants and relevant sampling data collected during the 2020 calendar year. Unless otherwise noted, 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 AV Unit Tank water are below the Maximum Contaminant Levels (MCLs) allowed by FGS, DoD, and EPA applicable requirements.

Table 2

| Contaminants | MCLG or MRDLG | MCL, TT, or MRDL | Your Water | Units | Sample Date | Violation | Typical Source |
|-----------------------------|---------------|------------------|------------|-------|-------------|-----------|---|
| Inorganic Components | | | | | | | |
| Sodium | N/A | N/A | 8.1 | mg/L | 27-Dec-2020 | NO | Erosion of natural deposits; Leaching |
| Chlorides | N/A | N/A | 8.9 | mg/L | 5-Jul-2020 | NO | Erosion of natural deposits; Leaching |
| Silica | N/A | N/A | 0.09 | mg/L | 28-Oct-2020 | NO | Erosion of natural deposits; Leaching |
| Calcium | N/A | N/A | 44 | mg/L | 28-Mar-2020 | NO | Erosion of natural deposits; Leaching |
| Magnesium | N/A | N/A | 0.52 | mg/L | 28-Mar-2020 | NO | Erosion of natural deposits; Leaching |
| Sulfate | 250 | N/A | 1.3 | mg/L | 28-Oct-2020 | NO | Runoff/leaching from natural deposits |
| Potassium | N/A | N/A | N/D | mg/L | 27-Dec-2020 | NO | Erosion of natural deposits; Leaching |
| Iron | N/A | 0.3 | 0.02 | mg/L | 28-Oct-2020 | NO | Occurs naturally in the soil, sediments and ground water and some rocks |
| Copper | 1.3 | 1.3 | N/D | mg/L | 28-Oct-2020 | NO | Corrosion of household plumbing systems; erosion of natural deposits |
| Nitrates | N/A | 10.0 | N/D | mg/L | 27-Dec-2020 | NO | Runoff/leaching from natural deposits |

| Contaminants | MCLG or MRDLG | MCL, TT, or MRDL | Your Water | Units | Sample Date | Violation | Typical Source |
|---|---------------|------------------|------------|-------|-------------|-----------|--|
| Inorganic Components | | | | | | | |
| Total Nitrite and Nitrates | N/A | 10.0 | N/D | mg/L | 27-Dec-2020 | NO | Byproduct of drinking water disinfection |
| Note: All other Inorganic Compounds, Organic Compounds, Pesticides, PCBs, Radionuclides, 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 | ppm: parts per million, or milligrams per liter (mg/L) |
| N/A | not applicable |
| N/D | Not detected |

Reason for Non Potability of NSAIII (AV Unit) Water and Mitigation Measures:

The AV unit water distribution system is owned by the facility lessor and is currently used for hand washing and showering purpose only. The reasons for this status as per Bahrain FGS, March 2012 guidelines can be outlined as:

1. The source of water at the AV Unit is the Host Nation municipal water system. Despite presumption that the water in the Host Nation system has been treated and is potable, the water is by Navy overseas drinking water policy considered non-potable until approved for use. The Host Nation water may be contaminated after it has been treated through broken water lines or cross-connections in the storage and distribution systems that are not readily visible.
2. The raw water storage tanks in the AV unit do not have a Navy standard maintenance program, and lack a comprehensive cross connection and back flow prevention program for the distribution system.

As a risk mitigation measure, personnel at the AV unit are advised to purchase bottled water from local water bottling companies that have been certified by the US Army Veterinarian to meet US guidelines.

BANZ WAREHOUSES

The BANZ warehouse is the Navy leased facility owned and operated by BANZ Group B.S.C. It is located just southwest of NSA I. The BANZ warehouse facility receives water from the City directly supplied through two connections. There is no additional water treatment at the BANZ area. The water system consists of separate domestic, fire, and irrigation water distribution systems. NSA Bahrain PWD maintains

the fire systems. The source water is pumped from the City water distribution system to above ground storage tanks located onsite.

Currently NSA Bahrain BANZ Area has no treatment facility. The compliance of water at this facility is listed below:

| Location | Compliance status |
|-----------|---|
| BANZ Area | Remains Fit for hand washing and showering purpose only |

Water Quality Data Table – BANZ Area

Table 3 below lists all of the water contaminants and relevant sampling data collected during the 2020 calendar year. Unless otherwise noted, 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 BANZ Area Tank water are below the Maximum Contaminant Levels (MCLs) allowed by FGS, DoD, and EPA applicable requirements.

Table 3

| Contaminants | MCLG or MRDLG | MCL, TT, or MRDL | Your Water | Units | Sample Date | Violation | Typical Source |
|-----------------------------|---------------|------------------|------------|-------|-------------|-----------|---|
| Inorganic Components | | | | | | | |
| Sodium | N/A | N/A | 8.5 | mg/L | 27-Dec-2020 | NO | Erosion of natural deposits; Leaching |
| Chlorides | N/A | N/A | 13 | mg/L | 28-Oct-2020 | NO | Erosion of natural deposits; Leaching |
| Silica | N/A | N/A | 0.14 | mg/L | 28-Oct-2020 | NO | Erosion of natural deposits; Leaching |
| Calcium | N/A | N/A | 41 | mg/L | 27-Dec-2020 | NO | Erosion of natural deposits; Leaching |
| Magnesium | N/A | N/A | 1.0 | mg/L | 27-Dec-2020 | NO | Erosion of natural deposits; Leaching |
| Sulfate | 250 | N/A | 1.9 | mg/L | 27-Dec-2020 | NO | Runoff/leaching from natural deposits |
| Potassium | N/A | N/A | 0.33 | mg/L | 28-Oct-2020 | NO | Erosion of natural deposits; Leaching |
| Iron | N/A | 0.3 | 0.02 | mg/L | 28-Oct-2020 | NO | Occurs naturally in the soil, sediments and ground water and some rocks |
| Copper | 1.3 | 1.3 | N/D | mg/L | 05-Jul-2020 | NO | Corrosion of household |

| Contaminants | MCLG or MRDLG | MCL, TT, or MRDL | Your Water | Units | Sample Date | Violation | Typical Source |
|---|---------------|------------------|------------|-------|-------------|-----------|---|
| Inorganic Components | | | | | | | |
| | | | | | | | plumbing systems; erosion of natural deposits |
| Nitrates | N/A | 10 | N/D | mg/L | 05-Jul-2020 | NO | Runoff/leaching from natural deposits |
| Total Nitrite and Nitrate | N/A | 10 | N/D | mg/L | 05-Jul-2020 | NO | Byproduct of drinking water disinfection |
| Note: All other Inorganic Compounds, Organic Compounds, Pesticides, PCBs, Radionuclides, and Total Coliforms were not detected. | | | | | | | |

N/D= Not Detected, *e.g.*, below PQL
PQL= Practical Quantitation Limit of the best method

Reason for Non Potability of BANZ Area Water and Mitigation Measures:

The source of water at the BANZ Area is the Host Nation municipal water system. Despite presumption that the water in the Host Nation system has been treated and is potable, the water is by military Navy overseas drinking water policy considered non-potable until approved for use. The Host Nation water may be contaminated after it has been treated through broken water lines or cross-connections in the storage and distribution systems that are not readily visible. Since the City source water is not further treated at the BANZ Area, it is classified as fit for hand washing and showering purpose only.

As a risk mitigation measure, personnel at the BANZ area are advised to purchase bottled water from local water bottling companies that have been certified by the US Army Veterinarian to meet US guidelines.

| 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. |
| 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 or exceedances during the year 2020 for any tested parameters at NSA I, NSAIII (AV Unit), and BANZ.

However, this section also provides the Tier 3 notification requirements in accordance with Navy policy and USEPA 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 NSAI, AV Unit, and BANZ, 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 US DoD 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 NSAI, BANZ, and AV Unit tested its water for PFAS?

Yes. In Oct 2020 samples were collected from NSAI, BANZ, and AV Unit

Below MRL

We are pleased to report that drinking water testing results (Table 4) were below the Method Reporting Limit (MRL) 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 4

| Per- and polyfluoroalkyl substances (PFAS) | | | | | | | |
|--|------|--------------------------|-----|----------------------|-----|----------------------------|-----|
| Client Sample ID Number from PFAS Reports | | NSAI BAHRAIN-NSA1-Sample | | BANZ BAH-BANZ-Sample | | AV UNIT BAH-Av-Unit-Sample | |
| Analyte | Unit | Result | RL | Result | RL | Result | RL |
| Perfluorohexanoic acid | ng/L | <1.8 | 1.8 | <1.8 | 1.8 | <1.8 | 1.8 |
| Perfluoroheptanoic acid | ng/L | <1.8 | 1.8 | <1.8 | 1.8 | <1.8 | 1.8 |
| Perfluorooctanoic acid | ng/L | <1.8 | 1.8 | <1.8 | 1.8 | <1.8 | 1.8 |
| Perfluorononanoic acid | ng/L | <1.8 | 1.8 | <1.8 | 1.8 | <1.8 | 1.8 |
| Perfluorodecanoic acid | ng/L | <1.8 | 1.8 | <1.8 | 1.8 | <1.8 | 1.8 |
| Perfluorotridecanoic acid | ng/L | <1.8 | 1.8 | <1.8 | 1.8 | <1.8 | 1.8 |
| Perfluorotetradecanoic acid | ng/L | <1.8 | 1.8 | <1.8 | 1.8 | <1.8 | 1.8 |
| Perfluorobutanesulfonic acid | ng/L | <1.8 | 1.8 | <1.8 | 1.8 | <1.8 | 1.8 |
| Perfluorohexanesulfonic acid | ng/L | <1.8 | 1.8 | <1.8 | 1.8 | <1.8 | 1.8 |
| Perfluorooctanesulfonic acid | ng/L | <1.8 | 1.8 | <1.8 | 1.8 | <1.8 | 1.8 |
| NEtFOSAA | ng/L | <1.8 | 1.8 | <1.8 | 1.8 | <1.8 | 1.8 |
| NMeFOSAA | ng/L | <1.8 | 1.8 | <1.8 | 1.8 | <1.8 | 1.8 |
| Perfluoroundecanoic acid | ng/L | <1.8 | 1.8 | <1.8 | 1.8 | <1.8 | 1.8 |

| | | | | | | | |
|--------------------------|------|------|-----|------|-----|------|-----|
| Perfluorododecanoic acid | ng/L | <1.8 | 1.8 | <1.8 | 1.8 | <1.8 | 1.8 |
| HFPODA | ng/L | <1.8 | 1.8 | <1.8 | 1.8 | <1.8 | 1.8 |
| 9CI-PF3ONS | ng/L | <1.8 | 1.8 | <1.8 | 1.8 | <1.8 | 1.8 |
| 11CI-PF3OUdS | ng/L | <1.8 | 1.8 | <1.8 | 1.8 | <1.8 | 1.8 |
| DONA | ng/L | <1.8 | 1.8 | <1.8 | 1.8 | <1.8 | 1.8 |
| 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:

Patrick Smith

**Installation Environmental Program Director
Coordinator, Installation Water Quality Board**

Phone: +973-17-85-4603

Email: Patrick.g.smith@me.navy.mil