



## 2023 Annual Drinking Water Quality Report (Consumer Confidence Report)

### MORÓN AIR BASE, SPAIN

This report contains important information about your drinking water. If you do not understand it, please have someone explain or translate it for you.

Este informe contiene información importante sobre su agua potable. Si no lo entiende, pídale a alguien que se lo explique o lo traduzca.

#### *Introduction*

The Bioenvironmental Engineering (BE) Flight is pleased to present this year's Annual Drinking Water Quality Report (Consumer Confidence Report – CCR) for Morón Air Base (AB) as required by the Final Governing Standards for Spain (FGS-S) and Department of the Air Force Instruction 48-144, *Drinking Water Surveillance Program*. This report provides an overview of the 2023 drinking water quality from 1 January 2023 through 31 December 2023 and details about where your water comes from, what it contains, and how it compares to standards set by regulatory agencies. Our goal is to provide you with a safe, quality, and reliable drinking water supply. We are committed to providing you with this information because informed customers are the best allies.

#### *Water Sources*

The 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 can pick up substances resulting from the presence of animals or from human activity. In order to ensure that tap water is safe to drink, the final governing standard for Spain, published in 2014, prescribes regulations which limit the number of certain contaminants in drinking water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

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 storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
  - Pesticides and Herbicides: which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
  - 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.
  - Radioactive Contaminants: which can be naturally occurring or be the result of oil and gas production and mining activities.
  - Per- and Polyfluoroalkyl Substances (PFAS): a group of thousands of man-made chemicals used in a variety of industries and consumer products around the globe since the 1940s.
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### *Where Do We Get Our Drinking Water?*

Morón AB receives its water supply from a shallow regional aquifer. Groundwater that is not under the influence of superficial waters is the primary source of the water system. Six well fields pump water through a water treatment plant to a comprehensive distribution system. The water is treated using reverse osmosis and granular activated carbon filters to remove contaminants prior to disinfection with chlorine. The water system supplies water to all facilities including the Youth Center, Military Family Housing, DoDEA School, dorms, dining facilities, clinic and most Spanish Air Force facilities.

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### *Drinking Water and Your Health*

All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information on contaminants and potential health effects can be obtained by calling BE at DSN 314-479-2220 (+49-6371-46-2220). Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised individuals such as those with cancer undergoing chemotherapy, those who have undergone organ transplants, those with HIV/AIDS or other immune system disorders, some elderly, and infants are at a higher risk of waterborne illness. These people should seek advice about drinking water from their health care providers. The Environmental Protection Agency (EPA) and Center for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

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### *Is there Lead in my Water?*

Although BE regularly tests lead levels in your drinking water, it is possible that lead and/or copper levels at your home are higher because of materials used in your plumbing. If present, elevated levels of lead can cause serious 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. Morón AB is responsible for providing high quality drinking water but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead and copper exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline at 1-800-426-4791 or <http://www.epa.gov/safewater/lead>.

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### *What is PFAS?*

#### **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 U.S., 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 such as aqueous film-forming foam, or AFFF, used for fighting petroleum fires at airfields and in industrial fire suppression processes. PFAS compounds 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?**

In May 2016, the EPA established a lifetime health advisory (LHA) level at 70 parts per trillion (ppt) for individual or combined concentrations of perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS). Both compounds are types of PFAS. On 10 April 2024, the EPA published new drinking water standards for certain PFAS under the Safe Drinking Water Act (SDWA). AF is reviewing the EPA's new rule now and will incorporate these standards into future sampling and analysis efforts.

Out of an abundance of caution, DoD pursued PFAS testing and response actions beyond EPA SDWA requirements. In 2020, the DoD established a policy to monitor drinking water for 17 PFAS compounds at all service owned and operated water systems. If results confirmed the drinking water contained PFOA and PFOS at individual or combined concentrations greater than 70 ppt, water systems quickly took action to reduce exposures. While not a SDWA requirement, in 2023, DoD improved upon its 2020 PFAS drinking water monitoring policy by expanding the list of PFAS compounds monitored to 29, implementing continued monitoring of systems with detectable PFAS, and requiring initial mitigation planning actions.

#### **Has Morón AB tested its water for PFAS?**

Yes, in December 2023 samples were collected at the entry to the distribution system.

#### **PFOA and/or PFOS detected above 70 ppt.**

We are informing you that 14 of the 29 PFAS compounds covered by the sampling method were detected above the Method Detection Limit (MDL), and PFOS and PFOA combined tested higher than 70 ppt on 12 December 2023. The results are provided in the table at the end of this report, and public notification of these sample results was initially provided on 12 March 2024 via the base website and paper notifications published at all major facilities and residents living on base. The 70 ppt for PFOS and PFOA is the concentration above which means action will be taken to reduce exposure to PFOA and PFOS. In accordance with the DoD policy, alternate water is provided, via bottled water, is provided until the drinking water is tested and is consistently below the 70 ppt. Morón AB is sampling semi-annually to monitor the situation, and periodic updates will be provided after samples are collected via the base website, <https://www.ramstein.af.mil>.

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### *A Final Word on Water Quality*

Your water quality team at Morón AB works around the clock to provide safe, dependable water at every tap. But they can only ensure the success of today's mission if everyone contributes. Tomorrow's success will depend on all of us, working together, to protect our vital water resources.

Remember, the water we use does not quickly return to the aquifer, but is, for the most part, "consumed" by our actions. Morón AB and many nearby villages draw water from the same aquifer. Conservation is therefore essential to protect our water supply.

You should also consider ways you can reduce your water consumption, i.e., don't let the water run while brushing your teeth, take a shower versus taking a bath. There are numerous ways to save our most valuable natural resource for us and the future of our children. If you have ideas to reduce usage and contamination of this valuable resource submit it to the Morón AB Drinking Water Quality Working Group via Morón AB Independent Duty Medical Technicians (IDMTs). These efforts will help protect the future water supply by reducing the overall consumptive use.

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### *Customer Reviews Welcome*

We are available to address any questions or concerns you may have. Housing residents should contact the Housing Office with any water concerns. Dorm residents should contact their building manager.

For more information on this report or base drinking water quality, please call BE at DSN 314-479-2220 (+49- 6371-462220), the 496 ABS CE Environmental Management Flight at DSN 314-722-8604, or 496 ABS IDMTs at 314-722-8069.

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### *About the Following Pages*

The tables below list all of the drinking water contaminants that we detected during the calendar year of this report. Although more than **80 contaminants** were tested, only those substances listed below were detected in our water. The FGS-S requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants do not vary significantly from year to year, or the system is not considered vulnerable to this type of contamination. If this changes, and levels are elevated, increased monitoring frequency will occur in accordance with the FGS-S.

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### *Definitions and Abbreviations*

**Action Level (AL):** the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

**Average:** regulatory compliance with some Maximum Contaminant Levels (MCLs) are based on running annual average of monthly samples.

**Haloacetic Acids (HAA5):** a type of disinfection byproduct when adding chlorine to the water as a treatment

method.

**Maximum Contaminant Level (MCL):** the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the Maximum Contaminant Level Goal (MCLG) 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.

**Maximum Residual Disinfectant Level (MRDL):** the highest level of disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

**Maximum Residual Disinfectant Level Goal (MRDLG):** 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 contamination.

**Milligrams per liter (mg/L):** unit of measurement for concentration by weight of a substance in the water.

**millirem per year (mrem/yr):** a measure of radiation absorbed by the body.

**Million Fibers per Liter (MFL):** a measure of the presence of asbestos fibers that are longer than 10 micrometers.

**Minimum Detection Limit (MDL):** a detection limit for the lab to be able to detect the chemical of concern in the water.

**Nephelometric Turbidity Units (NTU):** measurement of the clarity, or turbidity, of water.

**Non-Detect (N.D.):** a measurement used when the sample result was below the detection capabilities of the lab.

**Picocuries per Liter (pCi/L):** measurement of the natural rate of disintegration of radioactive contaminants in water.

**pH:** measurement of acidity/basicity with 7.0 being neutral.

**parts per trillion (ppt):** one part substance per trillion parts water, or nanograms per liter.

**Running Annual Average (RAA):** average results for the most recent four quarters.

**Secondary Maximum Contaminant Level (SMCL):** recommended level for a contaminant that is not regulated and has no MCL.

**Total Trihalomethanes (TTHM):** a set of chemicals that are disinfection byproducts.

**Treatment Technique:** a required process intended to reduce the level of a contaminant in drinking water.

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### *How to Read the Data Tables*

Starting with a substance, read across. The year sampled is 2023 (January through December). MCL shows the highest level of substance (contaminant) allowed. MCLG is the goal level for that substance (this may be lower than what is allowed). Average Amount Detected represents the measured amount (less is better). Range tells the highest and lowest amounts measured. A 'No' under Violation means the amount of the substance met government requirements. Typical Source tells where the substance usually originates. Unregulated substances are measured, but maximum allowed contaminant levels have not been established by the government.

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### *Water Quality Results*

<b>Contaminant</b>	<b>Unit of Measure</b>	<b>MCLG<sup>1</sup></b>	<b>MCL</b>	<b>Level Found</b>	<b>Violation</b>	<b>Typical Source</b>
Total Coliform	# of Positives	0	5% of Monthly Samples	0	No	Naturally present in the environment
E. Coli	# of Positives	0	Any Positive	0	No	Contamination from sewage or animal waste
Trichloroethene	mg/L	0.005	0.005	0.0002	No	Discharge from factories and dry cleaners
Chloroform (TTHM)	Sum, mg/L	0.07	-	N.D.	No	By-products of drinking water chlorination
Bromodichloromethane (TTHM)	Sum, mg/L	0	-	0.0010	No	By-products of drinking water chlorination
Dibromochloromethane (TTHM)	Sum, mg/L	0.06	-	0.00054	No	By-products of drinking water chlorination
Tribromomethane (TTHM)	Sum, mg/L	0	-	0.0030	No	By-products of drinking water chlorination
Total TTHMs	mg/L	N/A	0.08	0.004054	No	By-products of drinking water chlorination
Boron	mg/L	N/A	1	0.11	No	Naturally occurring in the environment
Sodium	mg/L	N/A	200	34.9	No	Naturally occurring in the environment
Chloride	mg/L	N/A	250	32	No	Natural minerals dissolving due to weathering
Sulfates	mg/L	N/A	250	50	No	Drainage from artificial fertilizers or dissolved minerals from weathering
Nitrate (as Nitrogen)	mg/L	10	10	6.0	No	Runoff from fertilizer use; leaking from septic tanks, sewage; erosion of natural deposits
Combined Radium	pCi/L	5.0	5.0	0.15	No	Naturally occurring radiation within the ground that seeps into groundwater

Contaminant	Unit of Measure	MCLG <sup>1</sup>	MCL	Level Found	Violation	Typical Source
Gross Alpha	pCi/L	2.7	2.7	0.5	No	Naturally occurring radiation within the ground that seeps into groundwater
Gross Beta	mrem/yr	4	4	0.9	No	Naturally occurring radiation within the ground that seeps into groundwater
Tritium	pCi/L	2702	2702	67	No	Byproduct of nuclear reactors, or after nuclear weapons explosion

**Notes:**

1: Each individual TTHM and HAA5 have an MCLG, but the MCL is for the sum of all TTHMs and HAA5s respectively. There is no violation for exceeding an MCLG.

Residual Disinfectants	Unit of Measure	MRDL	MRDLG	Average Level	Minimum Level	Maximum Level	Violation	Typical Source
Free Available Chlorine	ppb	4000	4000	1650	1300	2350	No	Water additives used to control microbes
Bromate	mg/L	0.010	<0.010	0.1065	0.093	0.12	Yes <sup>1</sup>	Disinfectant byproduct when treating the water

**Notes:**

1: See the violations section below for more details on the actions taken to mitigate the exceeded MCL.

Lead and Copper	Units	AL	AL Exceeded? <sup>1</sup>	90 <sup>th</sup> Percentile	# Sites Over AL	Violation	Typical Source
Lead	mg/L	0.010	Yes	0.012	5 <sup>2</sup>	Yes	Corrosion of household plumbing systems; erosion of natural deposits.
Copper	mg/L	1.3	No	0.24	0	No	Erosion of natural deposits; leaching from wood preservatives; corrosion of household plumbing systems.

**Notes:**

1: To exceed the AL with lead and copper, over 10% of the samples need to exceed the AL. BE collects 20 samples per event in accordance with the FGS-S in relation to the base population. Greater than 10% would be 3 samples per sampling event. If the AL of either lead or copper is exceeded, BE will need to collect confirmation samples within 24 hours to confirm the exceedance. If the confirmation results are below the AL, no action is needed. If the AL is exceeded with confirmation samples, it will be considered a violation and documented below.

2: The sites over the AL during the third quarter sampling event were Bldgs: 608 (0.012 mg/L), 610 (0.011 mg/L), 645 (0.014 mg/L), 664 (0.011 mg/L) and 684 (0.015 mg/L).

PFAS <sup>1</sup>	Unit of Measure	Level Found	Violation
Perfluorobutanesulfonic Acid (PFBS)	ppt	7.43	No

PFAS <sup>1</sup>	Unit of Measure	Level Found	Violation
Perfluorohexanoic Acid (PFHxA)	ppt	29.0	No
Perfluoroheptanoic Acid (PFHpA)	ppt	11.8	No
Perfluorohexanesulfonic Acid (PFHxS)	ppt	67.1	No
Perfluorooctanoic Acid (PFOA)	ppt	17.6	<b>Yes<sup>2</sup></b>
Perfluorononanoic Acid (PFNA)	ppt	1.61	No
Perfluorooctanesulfonic Acid (PFOS)	ppt	53.3	<b>Yes<sup>2</sup></b>
Fluorotelomer Sulphonic Acid 4:2 (4:2 FTS)	ppt	2.28	No
Fluorotelomer Sulphonic Acid 6:2 (6:2 FTS)	ppt	90.8	No
Fluorotelomer Sulphonic Acid 8:2 (8:2 FTS)	ppt	5.07	No
Perfluorobutanoic Acid (PFBA)	ppt	9.16	No
Perfluoropentanoic Acid (PFPeA)	ppt	26.5	No
Perfluoropentanesulfonic Acid (PFPeS)	ppt	7.48	No
Perfluoroheptanesulfonic Acid (PFHpS)	ppt	1.52	No

**Notes:**

**1:** The 70 ppt health advisory only applies to the combination of PFOS and PFOA.

**2:** The combined PFOS and PFOA was 70.9 ppt.

## *Violations*

### **Violation 1: Bromate MCL Exceedance**

A lifetime of drinking bromate at higher levels has an increased lifetime cancer risk of 2 in 10,000. Some people who ingested large amounts of bromate had gastrointestinal symptoms such as nausea, vomiting, diarrhea and abdominal pain. Some individuals who ingested very high concentrations of bromate also experienced adverse effects in kidney, nervous system, and hearing loss. However, the levels of bromate were low, but still slightly exceeding the MCL. The violation was detected and reported in accordance with the FGS-S. The MCL for bromate is a running annual average.

<b>Violation Type</b>	<b>Violation Begin</b>	<b>Violation End</b>	<b>Violation Explanation</b>
MCL	20 October 2023	TBD	<p>BE performs quarterly sampling of Bromate in Morón AB's drinking water system. During the third and fourth quarter sampling periods, it was identified that Morón AB's drinking water system had exceeded the MCL of 0.01 mg/L. The running annual average was 0.1065 mg/L.</p> <p>BE is working with Civil Engineering (CE) at Morón AB on reducing the levels of Bromate in the water. The filters are being replaced in response to the second violation below, but this may also resolve this violation.</p> <p>The new water treatment plant is expected to be finished with construction in 2024 and the filtration system within that plant should be sufficient on reducing the levels of Bromate in the drinking water. BE will continue to monitor Bromate in the drinking water quarterly.</p>

**Violation 2: PFAS Health Advisory Exceedance**

While an exceedance of the Health Advisory for PFAS is not technically a “violation” of the FGS-S or even EPA regulations, the Assistant Secretary of Defense Office published a DoD policy memorandum stating if the HA of 70 ppt is exceeded for PFOS and PFOA combined, the unit must provide an alternate drinking water source until sampling indicates the levels are below 70 ppt.

The science on PFAS is evolving. There is extensive research being done to determine where PFAS exist and what impact they have on human health and the environment. DoD continues to monitor research efforts and health risk information to better understand potential health effects of PFAS exposure. DoD is supporting scientific health research and has provided \$90 million to the Agency for Toxic Substances and Disease Registry (ATSDR <<https://www.atsdr.cdc.gov/pfas/>> ) to conduct a multi-site health study and exposure assessments in the communities around eight current and former military installations. <https://www.acq.osd.mil/eie/eer/ecc/pfas/index.html>

BE collects samples at the entry to the distribution system, therefore PFAS levels may be below the 70 ppt in your home, but there are common filters that can be purchased that can reduce the levels of PFAS within your home. These filters include activated carbon, ion exchange, and reverse osmosis. Do your research prior to purchasing to verify the filter is effective for PFAS in the drinking water. For more information on PFAS, please review the section directly addressing PFAS.

Violation Type	Violation Begin	Violation End	Violation Explanation
Health Advisory Exceedance	22 December 2023	TBD	<p>BE performed sampling in December 2023 for PFAS utilizing new EPA methods to ensure compliance with DoD guidance. The public notification informing the installation of the results was delayed due to some confusion with the DoD policy memorandum and which EPA method it applied to from the BE office. Once the confusion was discovered, a public notification was immediately published, and an alternate water source (bottled water) was established. The health risk of drinking slightly elevated levels of PFAS in the water for that extended period is low. The combined level of PFOS and PFOA was 70.9 ppt.</p> <p>BE is continually working with Civil Engineering (CE) at Morón AB to reduce the levels of PFAS within the water system. The first step is to replace the GAC filters at the treatment plant, and this is expected for early 2024.</p> <p>The new treatment plant is expected to be finished with construction in 2024 and the filtration system should be sufficient in reducing the levels of PFAS in the drinking water. BE will continue to monitor at least semiannually until PFAS levels are below 70 ppt.</p>

**Violation 3: Lead AL Exceedance**

The AL level for lead is not a standard for establishing a safe level of lead in the drinking water for consumers, but to measure the effectiveness of corrosion control treatment in the water systems. If the action level is exceeded, this will drive action on re-evaluating corrosion control measures to reduce corrosion. The goal is to reduce lead levels as low as possible and the AL allows BE to identify when corrosion control measures may be failing and need to be adjusted.

For more information on lead in the drinking water, please review the section above about lead in the water or the educational notice that was published in November 2023 on <https://www.ramstein.af.mil/>. Flushing for 30 seconds prior to consuming is always the best practice for reducing lead levels withing your home.

Violation Type	Violation Begin	Violation End	Violation Explanation
MCL	13 October 2023	23 October 2023	<p>BE performs semiannual sampling of lead in Morón AB’s drinking water system. During the third quarter sampling period, it was identified that Morón AB’s drinking water system had exceeded the AL of 0.01 mg/L for 5 locations. Due to Morón AB being a Geographically Separated Unit for Ramstein AB, the BE Flight was not able to accomplish confirmation sampling within the required 24-hour timeframe. Therefore, it was considered that the AL was exceeded, and a public notification regarding the AL exceedance was published on 20 October 2023 and the educational notice was published on 17 November 2023.</p> <p>BE is working with Civil Engineering (CE) at Morón AB on improving corrosion control measures. Base Flushing Plans are also being reviewed for adequacy. For future sampling events, BE will leave additional sample bottles with the on base Independent Duty Medical Technicians to collect confirmation sampling, if required. This could prevent violations in the future.</p> <p>The new water treatment plant is expected to be finished with construction in 2024 and the filtration system within that plant should reduce lead levels from the source water. BE will continue to monitor lead and copper semiannually.</p>