Spangdahlem Air Base, Germany

2019 Consumer Confidence Report (CCR)

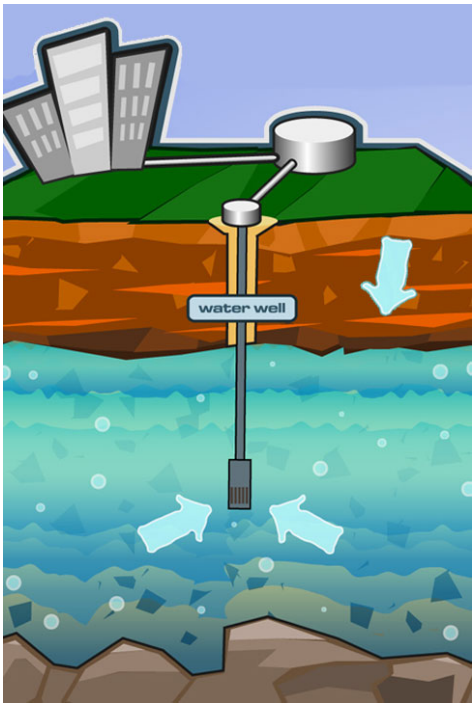
Drinking Water Quality

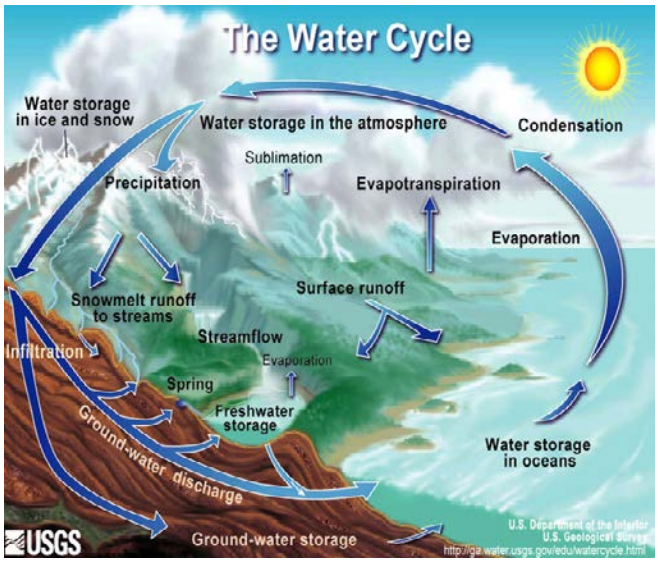
Special points of interest:

- Where our drinking water comes from
- Who ensures our drinking water is safe
- What standards are used for drinking water compliance
- Potential contamination sources
- The Earth's water cycle
- Contact names and numbers for questions or concerns

The Spangdahlem Air Base Drinking Water is Safe!

The 52d Aerospace Medicine Squadron, Bioenvironmental Engineering (BE) Flight, informs consumers annually about the quality of their drinking water from the previous year (2019). Spangdahlem AB has five groundwater wells, two water treatment plants, and four storage reservoirs which supply our potable water system. All five wells extract water from the same partially confined aquifer which meets the demand requirements for the entire installation. The water treatment plants use a filtration system followed by chlorination for disinfection. Fluoride is also added to the water during this process to help maintain healthy teeth. The water treatment plant personnel, along with the Bioenvironmental Engineering Flight, ensure compliance with Final Governing Standards for Germany (FGS-G). The FGS-G standards are a compilation of the most stringent standards published within the European Union, United States Environmental Protection Agency and the Safe Drinking Water Act.





The Water Cycle

For many of us, water is something we take for granted; we fail to realize how important water really is. It is the blood that must continually be moving to ensure our planet's survival. Water is constantly being cycled between the atmosphere, the ocean and the land. This cycling is a very important process that helps sustain life on Earth. As water evaporates, vapors rise and condense into clouds. The clouds move over the land and precipitation falls in the form of rain, ice or snow. Water fills streams and rivers, and eventually flows back into the oceans where evaporation starts the process again. Water states (solid, liquid or gas) are determined primarily by temperature. Although water continuously changes state from solid to liquid to gas, the amount of water on Earth remains constant. However, not all water can be treated to produce potable (drinkable) water. Good water conservation practices are key to conserving the treatment efforts and drinkable water that we have available. Therefore, consider reduction of daily water usage to a minimum amount needed.

What Constituents are Analyzed?

Contaminants that may be present in source water before we treat it 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, and mining or farming.
- *Pesticides and herbicides,* which may come from a variety of sources such as agricultural and residential uses.
- *Radioactive contaminants,* which are naturally occurring.
- *Organic chemical contaminants,* includes synthetic and volatile organic chemicals, are by-products of industrial work and petroleum production, also come from gas stations, urban storm water runoff, and septic systems.

Acronyms and Definitions Used in This Report

Max Contaminant Limit (MCL) - highest level of a contaminant that is allowed in drinking water.
Action Level (AL) - a set level requiring modifications to the water system if exceeded
Milligrams per Liter (mg/L) - amount of contaminant per liter of water.
Picocuries per Liter (pCi/L) - amount of contaminant per liter of water.
Micrograms per Liter (µg/L) - amount of contaminant per liter of water.

The tables below list all the drinking water contaminants that we sampled during the 2019 calendar year. The presence of these contaminants in the water does not necessarily indicate the water poses a health risk. Unless otherwise noted, the data presented in these tables are from testing done January 1 – December 31, 2019. The Environmental Protection Agency (EPA) requirement is to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year.

In 2018 the Bioenvironmental Engineering (BE) Flight submitted a reduction in water monitoring request for Volatile Organic Compounds (VOCs), Pesticides/PCBs, Nitrate (NO3), and Nitrite (NO2). Based on current and historical results, analysis for these chemicals met the reduction in sampling requirements as stated in the most current FGS. The request was submitted to and approved by USAFE MAJCOM BE on 30 April 2018. Sampling frequency for VOCs, Nitrate (NO3), and Nitrite (NO2) are now once a year; while Pesticides/PCBs are two quarters per year. The new sampling schedule is reflected on Spangdahlem AB's Sampling, Analysis, and Monitoring (SAM) Plan. For more information, please contact the BE Flight.

BE and Civil Engineering (CE) are working to conduct Legionella sampling during calendar year (CY) 2020. This sampling requirement is derived from the FGS-G, which establishes annual monitoring. Legionella bacteria can be found in both potable and non-portable water systems, but more specifically in facilities where warm water can be aerosolized, such as: Facilities with showers, pools, water-based saunas, hospitals, etc. A reduction in sampling exemption is available and can be requested once there is at least three (3) consecutive years of results showcasing legionella bacteria as not problematic within these facilities. For information regarding health effects of the legionella bacteria, contact BE or Spangdahlem AB's Public Health office.

Table 1: Microbiological Contaminants

Contaminant of Concern	Result	Max Contaminant Limit [MCL]	Within Regulatory limits?
Total Coliform Bacteria	Non-Detect	1/month	√

Note: Total Coliform Bacteria MCL: 3 positive monthly sample (in systems that collect <40 samples/month). Spangdahlem is required to take at least 10 samples a month according to the FGS-G. Spangdahlem collects 20 water samples every month.
Note: Coliforms are bacteria that are naturally present in the environment. Their presence in water can indicate the water supply may be vulnerable to contamination by more harmful pathogenic organisms (Disease Causing Organisms).
Note: Non-Detect means the water had been sampled and analyzed for these contaminants, and the contaminants have not been found. Contact Bioenvironmental Engineering for specific limits of detection for individual contaminants.

Table 2: Synthetic Organic Compounds - Other Organics

Contaminant of Concern	Result	Max Contaminant Limit [MCL]	Within Regulatory limits?
Di(2-ethylhexyl)adipate	Non-Detect	0.4 mg/L	√
Di(2-ethylhexyl)phthalate	Non-Detect	0.006 mg/L	√
Hexachlorobenzene	Non-Detect	0.001 mg/L	√
Hexachlorocyclopentadiene	Non-Detect	0.05 mg/L	√
PCB as Aroclor	Non-Detect	0.0005 mg/L	√
2,3,7,8-TetraCDD {2,3,7,8-TCDD}	Non-Detect	Not Regulated	N/A

Note: Synthetic Organic Compounds include chemicals that come from agriculture, urban storm water runoff, or industrial activities.
Note: Non-Detect means the water had been sampled and analyzed for these contaminants, and the contaminants have not been found. Contact Bioenvironmental Engineering for specific limits of detection for individual contaminants.

Table 3: Inorganic Chemicals (including Metals)

Contaminant of Concern	Result	Max Contaminant Limit [MCL]	Within Regulatory limits?
Aluminum	0.013 mg/L	0.2 mg/L	√
Ammonium as NH4+	Non-Detect	Not Regulated	N/A
Antimony	Non-Detect	0.006 mg/L	√
Arsenic	Non-Detect	0.01 mg/L	√
Asbestos	Non-Detect	Not Regulated	N/A
Barium	0.032 mg/L	2 mg/L	√
Beryllium	Non-Detect	0.004 mg/L	√
Cadmium	Non-Detect	0.005 mg/L	√
Chromium	Non-Detect	0.1 mg/L	√
Cyanide {CN}, free	Non-Detect	0.2 mg/L	√
Fluoride {F}	0.9 mg/L	4 mg/L	√
Mercury	Non-Detect	0.002 mg/L	√
Nickel	Non-Detect	0.1 mg/L	√
Selenium	Non-Detect	0.05 mg/L	√
Sodium	5.8 mg/L	Not Regulated	N/A
Thallium	Non-Detect	0.002 mg/L	√
Nitrate {NO3}, as N	0.8 mg/L	10 mg/L	√
Nitrite {NO2}, as N	Non-Detect	1 mg/L	√
Total Nitrate/Nitrite, as N	0.82 mg/L	10 mg/L	√

Note: Inorganic Compounds include salts and metals, occur naturally and from urban storm water runoff.
Note: Non-Detect means the water had been sampled and analyzed for these contaminants, and the contaminants have not been found. Contact Bioenvironmental Engineering for specific limits of detection for individual contaminants.

Table 4: Synthetic Organic Compounds - Polycyclic Aromatic Hydrocarbons (PAH)

Contaminant of Concern	Result	Max Contaminant Limit [MCL]	Within Regulatory limits?
Benz[a]anthracene	Non-Detect	0.0001	√
Benzo[a]pyrene	Non-Detect	0.0002	√
Benzo[b]fluoranthene	Non-Detect	0.0002	√
Benzo[g,h,i]perylene	Non-Detect	Not Regulated	N/A
Benzo[k]fluoranthene	Non-Detect	0.0002	√
Chrysene	Non-Detect	0.0002	√
Indeno[1,2,3-cd]pyrene	Non-Detect	0.0001	√

Note: PAHs are found naturally and also man-made. PAHs are created when products such as coal, oil, gas and garbage are burned but the burning process is not completed.
Note: Non-Detect means the water had been sampled and analyzed for these contaminants, and the contaminants have not been found. Contact Bioenvironmental Engineering for specific limits of detection for individual contaminants.

Table 5: Synthetic Organic Compounds – Pesticides and Herbicides

Contaminant of Concern	Result	Max Contaminant Limit [MCL]	Within Regulatory limits?
Aldicarb	Non-Detect	0.003 mg/L	√
Aldicarb sulfone	Non-Detect	0.003 mg/L	√
Aldicarb sulfoxide	Non-Detect	0.004 mg/L	√
Aldrin	Non-Detect	Not Regulated	N/A
Alachlor	Non-Detect	0.002 mg/L	√
Aminomethylphosphonic acid	Non-Detect	Not Regulated	N/A
Atrazine	Non-Detect	0.003 mg/L	√
Baygon (Propoxur)	Non-Detect	Not Regulated	N/A
Bentazon	Non-Detect	Not Regulated	N/A
Carbaryl	Non-Detect	Not Regulated	N/A
Carbofuran	Non-Detect	0.04 mg/L	√
Chlordane, technical	Non-Detect	0.002 mg/L	√
Dalapon	Non-Detect	0.2 mg/L	√
Dieldrin	Non-Detect	Not Regulated	N/A
Diquat	Non-Detect	Not Regulated	N/A
Dinoseb	Non-Detect	0.007 mg/L	√
1,2-Dibromoethane {Ethylene Dibromide [EDB]}	Non-Detect	0.00005 mg/L	√
1,2-Dibromo-3-chloropropane {DBCP}	Non-Detect	0.0002 mg/L	√
Endrin	Non-Detect	0.002 mg/L	√
Endothall	Non-Detect	0.1 mg/L	√
Glyphosate	Non-Detect	0.7 mg/L	√
Heptachlor	Non-Detect	0.0004 mg/L	√
Heptachlor epoxide	Non-Detect	0.0002 mg/L	√
gamma-BHC {Lindane}	Non-Detect	0.0002 mg/L	√
Methiocarb	Non-Detect	Not Regulated	N/A
Methomyl	Non-Detect	Not Regulated	N/A
3-Hydroxycarbofuran	Non-Detect	Not Regulated	N/A
Methoxychlor	Non-Detect	0.04 mg/L	√
Oxamyl {Vydate}	Non-Detect	0.2 mg/L	√
Paraquat	Non-Detect	Not Regulated	N/A
Picloram	Non-Detect	0.5 mg/L	√
Pentachlorophenol	Non-Detect	0.001 mg/L	√
Simazine	Non-Detect	0.004 mg/L	√
Toxaphene	Non-Detect	0.003 mg/L	√
2,4-D	Non-Detect	0.07 mg/L	√
2,4,5-TP {Silvex}	Non-Detect	0.05 mg/L	√

Note: Synthetic Organic Compounds include herbicides, pesticides, and other chemicals that come from agriculture, urban storm water runoff, or industrial activities.
Note: Non-Detect means the water had been sampled and analyzed for these contaminants, and the contaminants have not been found. Contact Bioenvironmental Engineering for specific limits of detection for individual contaminants.

Table 6: Disinfection Byproducts

Contaminant of Concern	Result	Max Contaminant Limit [MCL]	Within regulatory limits?
Bromochloroacetic acid	Non-Detect	Not Regulated	N/A
Dibromoacetic acid	Non-Detect	Not Regulated	N/A
Dichloroacetic acid	Non-Detect	Not Regulated	N/A
Monobromoacetic acid	Non-Detect	Not Regulated	N/A
Monochloroacetic acid	Non-Detect	Not Regulated	N/A
Trichloroacetic acid	Non-Detect	Not Regulated	N/A
Bromodichloromethane	0.0010 mg/L	0.8 mg/L	√
Bromoform	0.0017 mg/L	0.8 mg/L	√
Chloroform	0.0010 mg/L	0.8 mg/L	√
Dibromochloromethane	0.0017 mg/L	0.8 mg/L	√
Trihalomethanes, Total {TTHM}	0.08 mg/L	0.08 mg/L	√
Haloacetic Acids (HAA5)	Non-detect	Not Regulated	N/A

Note: Disinfection Byproducts are the reaction of chlorine with organic matter present in water that had been treated.
Note: Non-Detect means the water had been sampled and analyzed for these contaminants, and the contaminants have not been found. Contact Bioenvironmental Engineering for specific limits of detection for individual contaminants.

Table 7: Radiologicals (Results from 2016-2017)

Contaminant of Concern	Result	Max Contaminant Limit [MCL]	Within regulatory limits?
Gross Alpha Activity (total)	1.1 pCi/L	15 pCi/L	√
Gross Beta Activity (total)	2.4 pCi/L	Not Regulated	N/A
Radium-226 Activity	0.13 pCi/L	Not Regulated	N/A
Radium-228 Activity	1.100 pCi/L	Not Regulated	N/A
Uranium	Non-Detect	0.03 mg/L	√

Note: Radiological contaminants such as Uranium and Radium are naturally occurring
Note: Non-Detect means the water had been sampled and analyzed for these contaminants, and the contaminants have not been found. Contact Bioenvironmental Engineering for specific limits of detection for individual contaminants.
Note: Sampling frequency as established by the FGS-G for Radiologicals is four (4) consecutive quarters every four (4) years. Last sampling event for Radiologicals was completed in 2016-2017. Next scheduled sampling: 2020-2021.

Table 8: Lead (Results from 2017)

Contaminant of Concern	Result	Action Level [AL]	Within regulatory limits?
Lead	0.0076 mg/L	0.015 mg/L	√

Note: The 90th percentile sample is required by the EPA to be compared to the Action Level for Lead samples. This is within the FGS-G and EPA Lead and Copper Rule requirement that 90% of total samples for lead are below the Action Level
Note: Sampling frequency as established by the FGS-G for Lead is once every three (3) years. Last sampling event for Lead was completed in 2017. Next scheduled sampling: 2020.

Table 9: Total Organic Compounds [TOCs] – Pre Treated Water

Contaminant of Concern	Result	Max Contaminant Limit [MCL]	Within Regulatory limits?
TOC - Grosslittgen	1.6 mg/L	Not Regulated	N/A
TOC - Kailbach	1.2 mg/L	Not Regulated	N/A

Note: TOCs are defined as a measurement of the total amount of organic matter that is present in drinking water. It is also used as a measurement of water quality.
Note: Non-Detect means the water had been sampled and analyzed for these contaminants, and the contaminants have not been found. Contact Bioenvironmental Engineering for specific limits of detection for individual contaminants.

Table 10: Perfluorinated Compounds [PFCs]

Contaminant of Concern	Result	Max Contaminant Limit [MCL]	Within Regulatory limits?
Perfluorobutanesulfonic acid	Non-Detect	Not Regulated	N/A
Perfluoroheptanoic acid	Non-Detect	Not Regulated	N/A
Perfluorohexanesulfonic acid	Non-Detect	Not Regulated	N/A
Perfluorononaoic acid	Non-Detect	Not Regulated	N/A
Perfluorooctanoic acid	Non-Detect	Not Regulated	N/A
Perfluorooctanesulfonic acid	Non-Detect	Not Regulated	N/A
Perfluorodecanoic acid	Non-Detect	Not Regulated	N/A
Perfluorododecanoic acid	Non-Detect	Not Regulated	N/A
Perfluorohexanoic acid	Non-Detect	Not Regulated	N/A
Perfluorotetradecanoic acid	Non-Detect	Not Regulated	N/A
Perfluorotridecanoic acid	Non-Detect	Not Regulated	N/A
Perfluoroundecanoic acid	Non-Detect	Not Regulated	N/A

Note: PFCs are a broad range of compounds used in numerous applications including stain repellents for textiles, additive to paper products, and in aqueous film forming foams used to fight electrical fires.
Note: Non-Detect means the water had been sampled and analyzed for these contaminants, and the contaminants have not been found. Contact Bioenvironmental Engineering for specific limits of detection for individual contaminants.

Table 11: Volatile Organic Compounds

Contaminant of Concern	Result	Max Contaminant Limit [MCL]		Within Regulatory limits?
Benzene	Non-Detect	0.005	mg/L	√
Carbon tetrachloride	Non-Detect	0.005	mg/L	√
Chlorobenzene	Non-Detect	0.1	mg/L	√
1,2-Dichlorobenzene	Non-Detect	0.6	mg/L	√
1,4-Dichlorobenzene	Non-Detect	0.075	mg/L	√
1,2-Dichloroethane	Non-Detect	0.005	mg/L	√
1,1-Dichloroethene	Non-Detect	0.007	mg/L	√
cis-1,2-Dichloroethane	Non-Detect	0.07	mg/L	√
trans-1,2-Dichloroethane	Non-Detect	0.1	mg/L	√
1,2-Dichloropropane	Non-Detect	0.005	mg/L	√
Ethylbenzene	Non-Detect	0.7	mg/L	√
Methylene chloride	Non-Detect	0.005	mg/L	√
Styrene	Non-Detect	0.1	mg/L	√
Tetrachloroethene {PCE}	Non-Detect	0.005	mg/L	√
Toluene	Non-Detect	1	mg/L	√
1,2,4-Trichlorobenzene	Non-Detect	0.07	mg/L	√
1,1,1-Trichloroethane	Non-Detect	0.2	mg/L	√
1,1,2-Trichloroethane	Non-Detect	0.005	mg/L	√
Trichloroethene {TCE}	Non-Detect	0.005	mg/L	√
Vinyl chloride	Non-Detect	0.002	mg/L	√
Xylene, total	Non-Detect	10	mg/L	√

Note: Volatile Organic Compounds are those that can easily become vapors or gases
Note: Non-Detect means the water had been sampled and analyzed for these contaminants, and the contaminants have not been found. Contact Bioenvironmental Engineering for specific limits of detection for individual contaminants.

Lead and Legionella in Drinking Water

Lead levels on Spangdahlem are very low and cause no risk to health. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Spangdahlem is required, per FGS-G to use only lead-free solder, flux, and fittings in the installation or repair of water systems and plumbing systems for drinking water. Small traces of lead may still be present in the above mentioned components; therefore, lead samples are taken to ensure drinking water safety. Elevated levels of lead can cause health problems, especially for pregnant women and young children. Water that has been sitting in pipes for long periods can collect contaminants like lead; so, though this risk is already very small, you can further minimize the potential for lead exposure by running your tap for a few seconds before using water for drinking or cooking, and only utilizing cold water from your faucets.

Legionella is a type of bacterium found naturally in freshwater environments, like lakes and streams. It can become a health concern when it grows and spreads in human-made building water systems like showerheads and sink faucets, hot water tanks and heaters, large plumbing systems, etc. Susceptible individuals are exposed by breathing in small droplets of water in the air that contain the bacteria. In general, most healthy people exposed to Legionella do not get sick. Individuals at risk are those with immuno-compromised diseases/disorders. Bioenvironmental Engineering is overseeing the contractor that will be conducting an installation-wide sampling for Legionella during calendar year 2020.

SrA Kristopher Richardson from the Bioenvironmental Engineering Flight analyzing water quality standards.

Perfluorinated Compounds (PFCs)

Perfluoroalkyl and polyfluoroalkyl compounds (PFAS) are a large group of human-made chemicals that have been used in industry and consumer products world-wide. In military applications, these have been used in firefighting foam. Per the U.S. Environmental Protection Agency (EPA), these chemicals have been categorized as emerging contaminants. Although there are no FGS-G requirements to sample for PFCs in drinking water, Bioenvironmental Engineering (BE) in conjunction with Spangdahlem AB's Drinking Water Working Group, have established biennial monitoring for PFCs contaminants since 2016. All results to this date have been reported as 'negative' or as 'non-detect'. For more information regarding BE's PFC sampling methodology or overall questions about these chemical of concerns, please contact the BE Office.

Immuno-compromised persons

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised people, such as individuals with cancer undergoing chemotherapy, those who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk. The Environmental Final Governing Standards for Germany guidelines are designed to reduce the risk of infections by possible microbial contaminants. Bioenvironmental Engineering regularly tests for microbial contamination to ensure continuous water safety. Immune-compromised individuals with concerns should seek advice from their healthcare providers.

How can you help conserve water?

- Take shorter showers.
- Turn off the faucet in your bathroom while you brush your teeth.
- Don't let the water run constantly while you're washing or rinsing dishes.
- Fill a pitcher with tap water and put it in the fridge, rather than running the water every time you want a cold drink.
- Clean sidewalks and driveways with a broom—not the water hose.
- Water your lawn in the early morning to avoid rapid evaporation.
- Have dripping faucets repaired as soon as possible.

Contact information:

We are available to answer any questions or concerns you may have. If you would like additional copies of this report, please contact Bioenvironmental Engineering at DSN: 452-8348. We are located in Building 175, Third Floor (Office Hours: 0730-1630, Mon-Fri)

(Point of Contact: SSgt Grady Holmes or SrA Kevin Johnson)

Information in **deutscher** Sprache erhältlich bei der Umwelt-Abteilung. **Mr. Franz Steffes oder Mr. Christian Thurner** at Tel: 452-7257.