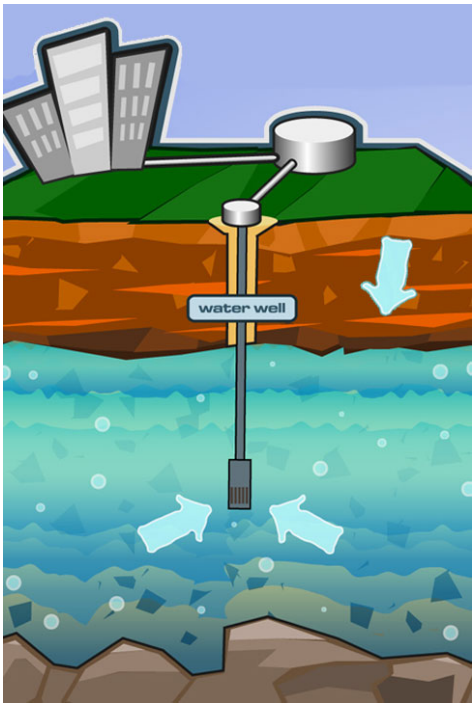
Spangdahlem Air Base, Germany

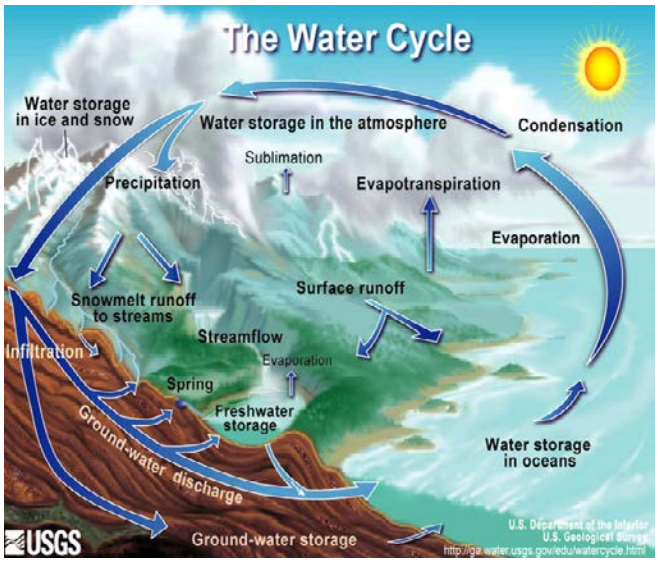
# 2015 Drinking Water Quality Report

**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 52d Aerospace Medicine Squadron (AMDS), Bioenvironmental Engineering Flight, informs consumers annually about the quality of their drinking water from the previous year (2015). 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 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.

# 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 stormwater 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 stormwater 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.
Picograms per Liter (pg/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 2015 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, 2015. 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.

**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: 1 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 to include locations at Bitburg.
**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? |
|---|---|---|---|
| Antimony | Non-Detect | 0.006 mg/L | √ |
| Arsenic | Non-Detect | 0.01 mg/L | √ |
| Barium | 0.07 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} | 0.8 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 | 62 mg/L | Not Regulated | √ |
| Thallium | 0.0007 mg/L | 0.002 mg/L | √ |
| Nitrate {NO3}, as N | Non-Detect | 10 mg/L | √ |
| Nitrite {NO2}, as N | Non-Detect | 1 mg/L | √ |
| Total Nitrate/Nitrite, as N | 0.2 mg/L | 10 mg/L | √ |

**Note:** Inorganic Compounds includes 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? |
|---|---|---|---|
| Acenaphthene | Non-Detect | Not Regulated | N/A |
| Acenaphthylene | Non-Detect | Not Regulated | N/A |
| Anthracene | Non-Detect | Not Regulated | N/A |
| Benz[a]anthracene | Non-Detect | Not Regulated | N/A |
| Benzo[a]pyrene | Non-Detect | 0.0002 mg/L | √ |
| Benzo[b]fluoranthene | Non-Detect | Not Regulated | N/A |
| Benzo[g,h,i]perylene | Non-Detect | Not Regulated | N/A |
| Benzo[k]fluoranthene | Non-Detect | Not Regulated | N/A |
| Chrysene | Non-Detect | Not Regulated | N/A |
| Dibenz[a,h]anthracene | Non-Detect | Not Regulated | N/A |
| Fluoranthene | Non-Detect | Not Regulated | N/A |
| Fluorene | Non-Detect | Not Regulated | N/A |
| Naphthalene | Non-Detect | Not Regulated | N/A |
| Phenanthrene | Non-Detect | Not Regulated | N/A |
| Indeno[1,2,3-cd]pyrene | Non-Detect | Not Regulated | N/A |

**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 | √ |
| Alachlor | Non-Detect | 0.002 mg/L | √ |
| Atrazine | Non-Detect | 0.003 mg/L | √ |
| Carbofuran | Non-Detect | 0.04 mg/L | √ |
| Chlordane, technical | Non-Detect | 0.002 mg/L | √ |
| Dalapon | Non-Detect | 0.2 mg/L | √ |
| 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 | √ |
| Diquat | Non-Detect | 0.02 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 | √ |
| Methoxychlor | Non-Detect | 0.04 mg/L | √ |
| Oxamyl {Vydate} | Non-Detect | 0.2 mg/L | √ |
| 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? |
|---|---|---|---|
| Trihalomethanes, Total {TTHM} | Non-Detect | 0.08 mg/L | √ |
| Haloacetic Acids (HAA5) | 0.00903 mg/L | 0.06 mg/L | √ |

**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: Lead**

| Contaminant of Concern | Result | Action Level [AL] | Within regulatory limits? |
|---|---|---|---|
| Lead | 0.007 mg/L | 0.015 mg/L | √ |

**Note:** Thirty (30) samples were performed at a high interest facility, the Child Development Center, building 457. This facility is on the main Spangdahlem water line.
**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.

## Lead 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.

SrA Bruce Moore from Bioenvironmental Engineering analyzes a bacteriological water sample.

## How you can help conserve water

- Turn off the faucet in your bathroom while you brush your teeth.
- Take shorter showers.
- 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.
- Repair dripping faucets.
- Place a layer of mulch around trees and plants to retain water.

## Immuno-compromised persons

Some people 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. The German Environmental Final Governing Standards guidelines are designed to reduce the risk of infections by possible microbial contaminants. 52 MDG Bioenvironmental Engineering regularly tests for microbial contamination to ensure continuous water safety. Immune-compromised individuals with concerns should seek advice from their healthcare providers.

## 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
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Information in deutscher Sprache erhältlich bei der Umwelt-Abteilung.
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