

2015 Water Quality Report

Annual Consumer Confidence Report on the Quality of Drinking Water at Tinker AFB for the Year 2014 (Water System ID Number OK2005508)

This year's Annual Water Quality Consumer Confidence Report is designed to inform you about the quality of water on base, to advance your understanding of drinking water and heighten awareness of the need to protect our precious water resources. Tinker AFB issues this annual report to meet requirements set under the "Consumer Confidence Reporting Rule" of the Safe Drinking Water Act.

Bioenvironmental Engineering constantly monitors the system to meet all regulatory requirements. Our staff collects water samples from the water distribution system. These samples are then shipped to certified laboratories where all of the required water quality analyses are performed.

Bottom Line:

Tinker's drinking water is safe and meets all federal and state requirements. No monitoring violations occurred during 2014. All detected analytes were at or below the Maximum Contaminant Level.

Where does our water come from?

The Tinker AFB water system is primarily supplied by a system of wells ranging in depth from approximately 400 to 800 feet, drawing from the Garber-Wellington mudstone/sandstone aquifer. Water from the wells is chlorinated before entering the distribution system. Fluoride is added to the system on the west side of the base only, serving our non-industrial consumers. Tinker AFB can also use the Oklahoma City Stanley Draper water system as a secondary source of water. These connections are occasionally opened in the summer and during other peak demand periods. The water supplied by Oklahoma City is produced at the Lake Stanley Draper Drinking Water Plant, where it is treated to meet SDWA standards. The Stanley Draper system is the source of water for the Tinker Aerospace Complex. Individuals with questions regarding the water quality at TAC can go to the following website for 2014 OKC CCR: http://www.okc.gov/ccr_2014.pdf

How do contaminants get into drinking water?

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. 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.

- *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 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.

See Water page 16.



Water Quality Data Table

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of contaminants in water provided by public water systems. The table below lists all of the drinking water contaminants that were detected during 2014. Although many more contaminants were tested, only those substances listed below were found in your water. Some water quality parameters do not require annual testing. If the parameter was not tested in 2014, the sampling year is noted below. Terms used in the table are explained in the definitions below the table. In addition, Tinker AFB was selected by the EPA to be part of a drinking water study of Unregulated Contaminants. Unregulated contaminants are those for which EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist EPA in determining the occurrence of unregulated contaminants in drinking water and whether future regulation is warranted. These results are listed in a separate table on page 17.

Coliform Bacteria

| Maximum Contaminant Level Goal | Total Coliform Maximum Contaminant Level | Highest No. of Positive | Fecal Coliform or E. Coli Maximum Contaminant Level | Total No. of Positive E. Coli or Fecal Coliform Samples | Violation | Likely Source of Contamination |
|--------------------------------|--|-------------------------|--|---|-----------|--------------------------------------|
| 0 | 1 positive monthly sample | 1 | No more than 5.0% samples total coliform-positive (TC-positive) in a month | 0 | N | Naturally present in the environment |

Lead and Copper

Definitions:

Action Level Goal (ALG): The level of a contaminant in drinking water below which there is no known or expected risk to health. ALGs allow for a margin of safety.

Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

| Lead and Copper | Date Sampled | MCLG | Action Level (AL) | 90th Percentile | # Sites Over AL | Units | Violation | Likely Source of Contamination |
|-----------------|--------------|------|-------------------|-----------------|-----------------|-------|-----------|---|
| Copper | 2013 | 1.3 | 1.3 | 0.113 | 0 | ppm | N | Erosion of natural deposits; Leaching from wood preservatives; Corrosion of household plumbing systems. |

Regulated Contaminants

| Disinfectants and Disinfection | Collection Date | Highest Level Detected | Range of Levels Detected | MCLG | MCL | Units | Violation | Likely Source of Contamination |
|---|-----------------|------------------------|--------------------------|-----------------------|----------|-------|-----------|--|
| Chlorine | 2014 | 1 | 0 - 1 | MRDLG = 4 | MRDL = 4 | ppm | N | Water additive used to control microbes. |
| Total Trihalomethanes (TTHM) | 2014 | 1 | 0 - 4.9 | No goal for the total | 80 | ppb | N | By-product of drinking water disinfection. |
| Inorganic Contaminants | Collection Date | Highest Level Detected | Range of Levels Detected | MCLG | MCL | Units | Violation | Likely Source of Contamination |
| Arsenic | 2014 | 2.1 | 0 - 2.1 | 0 | 10 | ppb | N | Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics. |
| Barium | 2014 | 0.64 | 0.33 - 0.64 | 2 | 2 | ppm | N | Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits. |
| Chromium | 2014 | 6.3 | 0 - 6.3 | 100 | 100 | ppb | N | Discharge from steel and pulp mills; Erosion of natural deposits. |
| Nitrate [measured as Nitrogen] | 2014 | 1.31 | 0 - 1.31 | 10 | 10 | ppm | N | Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits. |
| Radioactive Contaminants | Collection Date | Highest Level Detected | Range of Levels Detected | MCLG | MCL | Units | Violation | Likely Source of Contamination |
| Beta/Photon emitters | 2014 | 3.25 | 2.3 - 3.25 | 0 | 50 | pCi/L | N | Decay of natural and man-made deposits. |
| Combined Radium 226/228 | 2013 | 1.87 | 0 - 1.87 | 0 | 5 | pCi/L | N | Erosion of natural deposits. |
| Gross alpha excluding radon and uranium | 2014 | 5.85 | 3.19 - 5.85 | 0 | 15 | pCi/L | N | Erosion of natural deposits. |
| Uranium | 2014 | 1.2 | 0 - 1.2 | 0 | 30 | ug/l | N | Erosion of natural deposits. |
| Volatile Organic Contaminants | Collection Date | Highest Level Detected | Range of Levels Detected | MCLG | MCL | Units | Violation | Likely Source of Contamination |
| Trichloroethylene | 2013 | 0.9 | 0 - 0.9 | 0 | 5 | ppb | N | Discharge from metal degreasing sites and other factories. |

Unit Descriptions

| Term | Definition |
|-------|---|
| ppm | parts per million, or milligrams per liter (mg/L) |
| ppb | parts per billion, or micrograms per liter (µg/L) |
| pCi/L | picocuries per liter (a measure of radioactivity) |
| NA | not applicable |
| ND | Not detected |

Important Drinking Water Definitions

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.

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.

MPL: State Assigned Maximum Permissible Level

ALG: Action Level Goal — The level of a contaminant in drinking water below which there is no known or expected risk to health. ALGs allow for a margin of safety.

AL: Action Level — The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

Water

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- *Radioactive materials*, which can be naturally occurring or the result of oil and gas production and mining activities.

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 water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's (EPA) Safe Drinking Water Hotline (800-426-4791).

Source Water Assessment and Wellhead Protection Programs

The Oklahoma Department of Environmental Quality conducted a contamination susceptibility assessment of Tinker's water system in 2003, under the Source Water Assessment and Protection Program. The overall contamination susceptibility was rated as "Low." The Tinker AFB Wellhead Protection Plan, written in April 2004, is used to protect the underground source of Tinker's drinking water. For more information on the Source Water Assessment and Wellhead Protection Programs contact the base Civil Engineering Restoration Division at 736-4348.

Who needs to take special precautions?

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 from infections. These people should seek advice about drinking water from their health care providers.

Additional Water Quality Information for residents in Tinker family housing

PUBLIC WATER SYSTEM ID NUMBER OK8005550

Tinker Family Housing is pleased to report that your drinking water is safe! Your drinking water is purchased from Tinker, Public Water System ID Number OK2005508. See the Annual Consumer Confidence Report on the Quality of Drinking Water, Tinker, for the Year 2014, for information on the quality of drinking water provided to base housing in 2014. Tinker Family Housing is also required by the Oklahoma Department of Environmental Quality to collect additional drinking water samples in the base housing area for lead, copper, Disinfection-By-Product 2 and bacteriological. All of these samples, shown in the table below, met federal and state requirements for drinking water. If you have any questions regarding the drinking water supplied to your base home, call Timothy Heath at Tinker Family Housing at 732-3324.

Coliform Bacteria

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| 0 | 1 positive monthly sample | 1 | | 0 | N | Naturally present in the environment |

Lead and Copper

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Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

| Lead and Copper | Date Sampled | MCLG | Action Level (AL) | 90th Percentile | # Sites Over AL | Units | Violation | Likely Source of Contamination |
|-----------------|--------------|------|-------------------|-----------------|-----------------|-------|-----------|---|
| Copper | 06/27/2012 | 1.3 | 1.3 | 0.096 | 0 | ppm | N | Erosion of natural deposits; Leaching from wood preservatives; Corrosion of household plumbing systems. |
| Lead | 06/27/2012 | 0 | 15 | 5.4 | 0 | ppb | N | Corrosion of household plumbing systems; Erosion of natural deposits. |

EPA/Centers for Disease Control guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791)

Want additional information?

If you have any questions about this Water Quality Report or other Tinker drinking water quality issues,

contact Douglas Woods at the Bioenvironmental Engineering Flight at 734-7844. Additional information on drinking water quality may be obtained from the Oklahoma DEQ 702-8100 and the EPA Safe Drinking Water Hotline (800) 426-4791.

This water quality report is also available on line at: <https://cs3.eis.af.mil/sites/OO-SE-MC-14/Drinking%20Water/Forms/AllItems.aspx> or <http://www.tinker.af.mil/library/environment/index.asp>

Unregulated Contaminant Monitoring Rule (UCMR) 2014

UCMR 3 List 1 Contaminants Assessment Monitoring

| Contaminant s | Average for the year | Limit of detections | Likely Source of Contamination |
|---|----------------------|---------------------|--|
| Seven Volatile Organic Compounds by EPA Method 524.3 | | | |
| 1,2,3-trichloropropane | ND | 0.03 µg/L | Halogenated alkane; used as an ingredient in paint, varnish remover, solvents and degreasing agents |
| 1,3-butadiene | ND | 0.1 µg/L | Alkene; used in rubber manufacturing and occurs as a gas |
| chloromethane (methyl chloride) | ND | 0.2 µg/L | Halogenated alkane; used as foaming agent, in production of other substances, and by-product that can form when chlorine used to disinfect drinking water |
| 1,1-dichloroethane | ND | 0.03 µg/L | Halogenated alkane; used as a solvent |
| bromomethane (methyl bromide) | ND | 0.2 µg/L | Halogenated alkane; occurs as a gas, and used as a fumigant on soil before planting, on crops after harvest, on vehicles and buildings, and for other specialized purposes |
| chlorodifluoromethane (HCFC-22) | ND | 0.08 µg/L | Chlorofluorocarbon; occurs as a gas, and used as a refrigerant, as a low-temperature solvent, and in fluorocarbon resins, especially tetrafluoroethylene polymers |
| bromochloromethane (halon 1011) | ND | 0.06 µg/L | Used as a fire-extinguishing fluid, an explosive suppressant, and as a solvent in the manufacturing of pesticides |

One Synthetic Organic Compounds, by EPA Method 522

| | | | |
|-------------|----|-----------|--|
| 1,4-dioxane | ND | 0.07 µg/L | Cyclic aliphatic ether; used as a solvent or solvent stabilizer in manufacture and processing of paper, cotton, textile products, automotive coolant, cosmetics and shampoos |
|-------------|----|-----------|--|

Six Metals, by EPA EPA 200.8 Rev 5.4, ASTM D5673-10, Standard Methods 3125 (1997) (excluding chromium-6)

| | | | |
|------------|-----------|------------------|--|
| vanadium | 4.47 µg/L | 4.16 – 16.7 µg/L | Naturally-occurring elemental metal; used as vanadium pentoxide which is a chemical intermediate and a catalyst |
| molybdenum | ND | NA | Naturally-occurring element found in ores and present in plants, animals and bacteria; commonly used form molybdenum trioxide used as a chemical reagent |
| cobalt | ND | NA | Naturally-occurring element found in the earth's crust and at low concentrations in seawater, and in some surface and ground water; cobaltous chloride was formerly used in medicine and as a germicide |
| strontium | 179 µg/L | 117-268 µg/L | Naturally-occurring element; historically, commercial use of strontium has been in the faceplate glass of cathode-ray tube televisions to block x-ray emissions |
| chromium | 5.18 µg/L | 1.97-9.23 µg/L | See chromium-6 for use or source information; though the amount measured when analyzing for "total chromium" is the sum of chromium in all of its valence states, the MCL for EPA's current total chromium regulation was determined based upon the health effects of chromium-6 |
| chromium-6 | 2.43 µg/L | 1.25-3.60 µg/L | Naturally-occurring element; used in making steel and other alloys; chromium-3 or -6 forms are used for chrome plating, dyes and pigments, leather tanning, and wood preservation |

UCMR 3 List 1 Contaminants

| Contaminants | Average for the year | Limit of detections | Likely Source of Contamination |
|---|----------------------|---------------------|---|
| One Oxyhalide Anion, by EPA Method 300.1, ASTM D6581-08, Standard Methods 4110D (1997) | | | |
| chlorate | ND | 20µg/L | Agricultural defoliant or desiccant; disinfection byproduct; and used in production of chlorine dioxide |

Six Perfluorinated Compounds, by EPA Method 537 Rev 1.1

| | | | |
|--------------------------------------|----|-----------|---|
| perfluorooctanesulfonic acid (PFOS) | ND | 0.04 µg/L | Surfactant or emulsifier; used in fire-fighting foam, circuit board etching acids, alkaline cleaners, floor polish, and as a pesticide active ingredient for insect bait traps; U.S. manufacture of PFOS phased out in 2002; however, PFOS still generated incidentally |
| perfluorooctanoic acid (PFOA) | ND | 0.02 µg/L | Perfluorinated aliphatic carboxylic acid; used for its emulsifier and surfactant properties in or as fluoropolymers (such as Teflon), fire-fighting foams, cleaners, cosmetics, greases and lubricants, paints, polishes, adhesives and photographic films |
| perfluorononanoic acid (PFNA) | ND | 0.2 µg/L | Manmade chemical; used in products to make them stain, grease, heat and water resistant |
| perfluorohexanesulfonic acid (PFHxS) | ND | 0.03 µg/L | Manmade chemical; used in products to make them stain, grease, heat and water resistant |
| perfluoroheptanoic acid (PFHpA) | ND | 0.01 µg/L | Manmade chemical; used in products to make them stain, grease, heat and water resistant |
| perfluorobutanesulfonic acid (PFBS) | ND | 0.09 µg/L | Manmade chemical; used in products to make them stain, grease, heat and water resistant |

UCMR 3 List 2 Contaminants Screening Survey

Seven Hormones by EPA 539

| | | | |
|---|----|-------------|---|
| 17-β-estradiol | ND | 0.0004 µg/L | Estrogenic hormone naturally produced in the human body; and used in pharmaceuticals |
| 17-α-ethynylestradiol (ethinyl estradiol) | ND | 0.0009 µg/L | Synthetic steroid; prepared from estrone |
| 16-α-hydroxyestradiol (estriol) | ND | 0.0008 µg/L | Estrogenic hormone naturally produced in the human body; and used in veterinary and human pharmaceuticals |
| equilin | ND | 0.004 µg/L | Manmade chemical; used in products to make them stain, grease, heat and water resistant |
| estrone | ND | 0.002 µg/L | Manmade chemical; used in products to make them stain, grease, heat and water resistant |
| testosterone | ND | 0.0001 µg/L | Manmade chemical; used in products to make them stain, grease, heat and water resistant |
| 4-androstene-3,17-dione | ND | 0.0003 µg/L | Manmade chemical; used in products to make them stain, grease, heat and water resistant |

UCMR 3 List 3 Contaminants Pre-Screen Testing

Two Viruses by EPA 1615

| | | | |
|---------------|----|-----|---|
| enteroviruses | ND | N/A | Exposure to fecally-contaminated water or consumption of food exposed to the contaminated water |
| noroviruses | ND | N/A | Exposure to fecally-contaminated water or consumption of food exposed to the contaminated water |