



**GODDARD SPACE FLIGHT CENTER  
WALLOPS FLIGHT FACILITY  
MAIN BASE WATERWORKS**



June 2008

# 2007 Drinking Water Quality Report

This Annual Drinking Water Quality Report for Calendar Year (CY) 2007 is designed to inform you, the consumer, about the quality of the drinking water on the Main Base of Wallops Flight Facility (WFF). Our goal is to provide you with a safe and dependable supply of drinking water, and to help you understand the efforts made to protect your water supply. The quality of your drinking water must meet Federal and State requirements as administered by the U.S. Environmental Protection Administration (EPA) and the Virginia Department of Health (VDH).

If you have questions about this report, wish to obtain additional information about any aspect of your drinking water, or would like to know how to participate in decisions that may affect the quality of your drinking water, please contact:

**Joshua Bundick of the Environmental Office at (757) 824-2319 or [Joshua.A.Bundick@nasa.gov](mailto:Joshua.A.Bundick@nasa.gov)**

## General Information

As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals, in some cases radioactive materials, and can pick up substances resulting from the presence of animals, or from human activities. All drinking water, including bottled drinking water, may reasonably be expected to contain very small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons with cancer undergoing chemotherapy, persons who gave undergone organ transplantation, persons 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. The EPA and the Centers for Disease Control and Prevention (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 at (800)-426-4791**.

The sources of all drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. Contaminants that may be present in source water include: (1) Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife. (2) Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming. (3) Pesticides and

herbicides, which may come from a variety of sources including agriculture, urban storm water runoff, and residential uses. (4) Organic chemical contaminants, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and also from fueling stations, urban storm water runoff, and septic systems. (5) Radioactive contaminants, which can be naturally occurring, or the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, EPA prescribes regulations that limit the amount of certain contaminants allowed in water provided by public water systems. The U.S. Food and Drug Administration regulations establish limits for contaminants in bottled water that must provide the same protection for public health.

## **Sources and Treatment of Your Drinking Water**

The sources of your drinking water are groundwater wells, as described and shown in the map below:

NASA Wallops Flight Facility Main Base receives its water from five wells. The wells are at the following locations:

**Well #1** – Between Buildings E134 and N159. This well is 260 feet deep.

**Well #2** – Between Bldg. D12 and runway 10-28. This well is 150 feet deep.

**Well #3** – Between Bldg. F157 and Storage Bldg. This well is 253 feet deep.

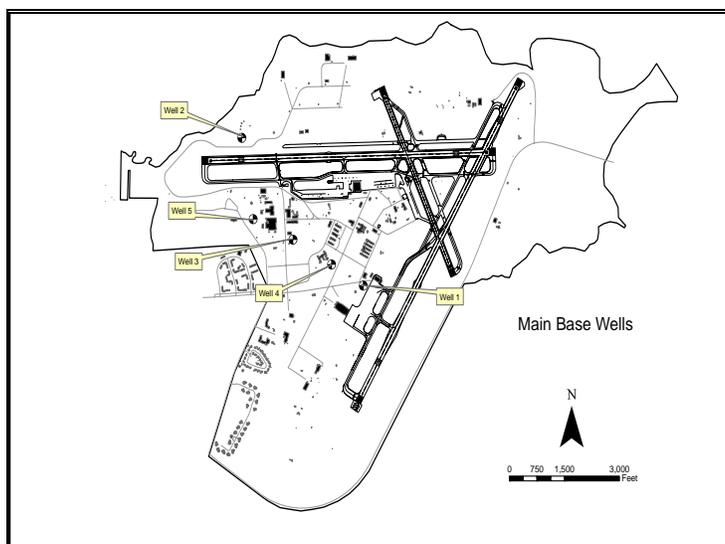
**Well #4** – Between Bldg. F160 and Tennis Court. This well is 265 feet deep.

**Well #5** – Between Bldg. F10 and H-100. This well is 260 feet deep.

## **How is our water treated?**

The groundwater sources are not required to be chlorinated unless there is a potential source of contamination, the water fails to meet the bacteriological quality standards, or the supply is under the direct influence of surface water.

WFF chooses to treat its groundwater supply by chlorination, although it is not required. However, since WFF chooses to treat by chlorination, the VDH recommends that it maintain a residual chlorine level between 0.1-0.5 mg/L throughout the distribution system.



## DRINKING WATER MONITORING

Your drinking water is routinely monitored in accordance with Federal and State regulations. The table lists only those contaminants that have had some level of detection within the past 5 years. Levels of many other contaminants have been analyzed, but they were either not present or were below the detection limits of the laboratory equipment. Contaminants below detection limits are not usually of concern.

State regulators allow WFF to monitor several contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of the data in the table is more than one year old, but is still considered accurate for these contaminants. The table to the right shows results of monitoring from December 2002 through December 2007.

### How to Read This Table

It's easy! Our water is tested to ensure it's safe and healthy. The column marked **GOAL** shows the Maximum Contaminant Level Goal or **MCLG**. This is 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.

The column marked **Maximum Allowed** is the Maximum Contaminant Level or **MCL**. This is 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.

**Maximum Residual Disinfectant Level (MRDL)** is the highest level of a residual disinfectant that is allowed in drinking water.

**Maximum Residual Disinfectant Level Goal (MRDLG)** is the level of residual disinfectant below which there is no known or expected risk to health. **MRDLGs** allow for a margin of safety.

**Non-detect (ND)** – lab analysis indicates the contaminant is not present.

**Parts per million (ppm) or Milligrams per liter (mg/L)** corresponds to one minute in two years or a single penny in \$10,000.

**Parts per billion (ppb) or Micrograms per liter** – One part per billion corresponds to one minute in 2,000 years, or a single penny in \$10,000,000.

**Picocuries per liter (pCi/L)** is a measure of the radioactivity in water.

**Total Trihalomethanes (TTHM)** – The sum of the trihalomethane compounds (there are four) are formed in drinking water by the addition of chlorine.

**Haloacetic Acid (HAA5)** – The sum of the five haloacetic acids are formed in drinking water by the addition of chlorine.

The column marked **DETECTED LEVEL** shows the results observed in our water during the most recent round of testing.

**SOURCE OF SUBSTANCE** provides an explanation of the typical natural or manmade origins of the contaminant.

**ACTION LEVEL (AL)** is the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

**TREATMENT TECHNIQUE (TT)** is a required process intended to reduce the level of a contaminant in drinking water.

## Summary of 2007 Water Quality Data

Contaminants Regulated (Units)	Goal (MCLG)	Max. Allowed (MCL)	Detected Level	Range of Levels Tested	Violation	Date of Sample	Sources of Substance
Gross Beta Radiation (pCi/l)	0	50	12.0		No	04/07/03	Decay of natural and man-made deposits
Radium-228 (pCi/L)	0	5	0.5		No	04/07/03	Erosion of natural deposits
Combined Radium (pCi/L)	0	5	2.0		No	04/07/03	Erosion of natural deposits
Arsenic (ppb)	0	10	2		No	12/21/06	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes
TTHM <sup>1</sup> (ppm)	0	80	80	79-81	No	11/29/07	By-product of drinking water chlorination
HAA5 <sup>2</sup> (ppm)	0	60	15	15	No	11/29/07	By-product of drinking water chlorination
Chlorine (ppm)	4 MRDL	4 MRDLG	0.21	ND-1.08	No	CY 2007	Water additive to control microbes
Copper <sup>3</sup> (ppm)	1.3	AL=1.3	0.495	ND-0.79	No	11/29/07	Corrosion of house-hold plumbing systems; Erosion of natural deposits; Leaching from wood preservatives
Lead, Pb <sup>4</sup> (ppb)	0	AL=15	54	ND-64.5	Yes	11/29/07	Corrosion of household plumbing systems; Erosion of natural deposits

### TABLE FOOTNOTES

<sup>1</sup> The Detected Level represents a running quarterly average. Although 1 sample (August 2007) was above the primary MCL, compliance was achieved as subsequent samples reduced the quarterly annual average.

<sup>2</sup> The Detected Level represents a running quarterly average. Both samples collected CY 2007 were 15 ppb.

<sup>3</sup> The Detected Level represents the 90th percentile value. None of the 20 samples tested for copper exceeded the current Action Level of 1.3 ppm.

<sup>4</sup> The Detected Level represents the 90th percentile value. Nine of the 20 samples tested for lead exceeded the current Action Level of 15 ppb.

***We are pleased to report to you that there were no detections of total coliforms or fecal coliforms in the monthly samples collected during calendar year 2007.***

**Note:** The results for lead (Pb) exceeded the action level for Lead and Copper Rule during November 2007. WFF issued a notice to inform the consumers that some taps have elevated lead levels and placed filters on drinking water fountains and kitchen faucets to remove metals, including lead. Since August 2005, the WFF waterworks has been adding small amounts of zinc orthophosphate to the water distribution system. Zinc orthophosphate works by forming a protective lining inside pipes and plumbing fixtures to prevent metals such as lead and copper from leaching into drinking water. It is VDH approved, recognized as safe by the Food and Drug Administration, and is certified for use in drinking water treatment by NSF International. Additional information regarding lead and zinc orthophosphate in WFF's drinking water has been distributed to all employees and the documents are also posted on bulletin boards in all WFF buildings. To receive additional copies contact **Joshua Bundick of the Environmental Office at (757) 824-2319 or Joshua.A.Bundick@nasa.gov**

#### Additional Information of Interest:

The Virginia Department of Health conducted a Source Water Assessment of the NASA Wallops Flight Facility Waterworks in 2002. Well #1, Well #2, Well #3, Well #4, and Well #5 were determined to be of low susceptibility to contamination using the criteria developed by the state in its approved Source Water Assessment Program. The assessment report consists of maps showing the Source Water Assessment area, an inventory of known Land Use Activity Sites in Zone 1, a Susceptibility Explanation Chart, and Definitions of Key Terms. The report is available by contacting **Joshua Bundick of the Environmental Office at (757) 824-2319 or Joshua.A.Bundick@nasa.gov**

#### Other drinking water constituents of interest are as follows:

The 2006 test for iron in the water indicated a level of 0.59 mg/L. The Secondary MCL for iron is 0.3 mg/l. Iron can be an objectionable constituent in water supplies for domestic or industrial use. Iron may impart brownish discolorations to laundered goods. The taste it imparts to water may be described as bitter or astringent, and may adversely affect the taste of other beverages. Human diets contain 7 to 35 milligrams of iron per day, and average 16 milligrams per day. The allowable amount of iron in drinking water constitutes only a small fraction of the amount normally consumed and does not have toxicological significance.

The 2006 test for zinc in the water indicated a level of 1.78 mg/L. The Secondary MCL for zinc is 5 mg/L. Zinc is an essential and beneficial element in human metabolism and levels in water below the SMCL do not cause serious health effects. Above the SMCL, it may produce taste in water that is described as bitter or astringent. Zinc is naturally occurring in the environment; however, the level of 1.78 mg/L reported for the subject system is likely due to the addition of a corrosion inhibitor.

#### Additional Health Information

Certain contaminants (such as Cryptosporidium, Radon, Arsenic, Nitrate, THM, and Lead), if present in your drinking water, may be of special concern to consumers.

#### **Trihalomethanes (THMs) are present.**

THMs are by-products of drinking water chlorination. **WFF is in compliance** with the primary MCL. However, it should be noted that some people who drink water containing THMs in excess of the MCL over many years may experience problems with their liver, kidneys, and have an increased risk of cancer.

#### **Lead (Pb) is present.**

Infants and children who drink water that contains lead (Pb) in excess of the action level could experience delays in their physical or mental development. Children may show slight deficits in attention span and learning abilities after exposure. Adults who drink this water over many years could develop kidney problems or high blood pressure.

**Note: WFF personnel have equipped all drinking water sources, including fountains and kitchen faucets, with filters that have been proven to capture lead. Please make use of potable water sources equipped with filters for drinking, cooking, etc.**



#### Water Conservation –

**Simple steps to save water and lower your bill:**

- Report leaks in faucets, toilets, and hoses by calling the WICC Help Desk @ extension 4357.
- Run your clothes washer and dishwasher only when full.
- Take shorter showers.
- Turn off the water while you brush your teeth, shave and shampoo your hair.

*Additional information on how you can help conserve water and protect your water supply can be found at the EPA's website <http://www.epa.gov/owm/water-efficiency/index.htm>.*

This Drinking Water Quality Report was prepared by:



***Our goal is to provide a safe and dependable supply of drinking water. We want you to understand the efforts we make to protect your water supply.***

