



GODDARD SPACE FLIGHT CENTER WALLOPS FLIGHT FACILITY MAIN BASE WATERWORKS *2006 Water Quality Report*



June 2007

This Annual Drinking Water Quality Report for Calendar Year 2006 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 Environmental Protection Agency (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**

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. Substances (referred to as contaminants) in water sources may come from septic systems, discharges from domestic or industrial wastewater treatment facilities, or from agricultural and farming 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 are more vulnerable to contaminants in drinking water than the general population. Immuno-deficient persons, such as those undergoing chemotherapy or organ transplantation, persons with HIV/AIDS and other immune system disorders, as well as some elderly and infants, can be at risk for infections. These people should seek advice about local drinking water quality from health care providers in that community.

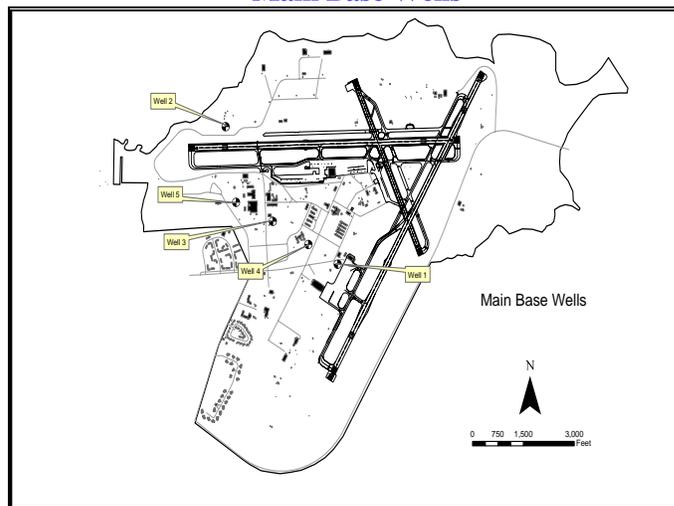
The EPA and the Centers for Disease Control and Prevention (CDCP) guidelines on appropriate means to lessen the risk of disease or infection by contaminants in drinking water are available from the **Safe Drinking Water Hotline at 1(800)-426-4791**.

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. Food and Drug Administration regulations establish limits for contaminants in bottled water that must provide the same protection for public health.

Main Base Wells



Sources and Treatment of Your Drinking Water

The sources of your drinking water are groundwater wells, as described below:

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

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

Well #2 – Between Bldg. D12 and runway. 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 the new Payload Processing Facility. 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. Much 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 1999 through December 2006.



Drinking Water Monitoring Results

Regulated Contaminants (Units)	MCLG	MCL	Level Found	Range of Results Obtained	Violation	Date of Sample	Likely Source
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 (ppm)	0	80	59		No	07/11/06	By-product of drinking water chlorination
HAA5 (ppm)	0	60	27		No	07/11/06	By-product of drinking water chlorination
Chlorine (ppm)	4 MRDL	4 MRDLG	0.42	0.01->2.2	No	CY 2006	Water additive to control microbes
Copper (ppm)	1.3	AL=1.3	0.618	(ND-1.4)*	No	10/19/06	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservative
Lead, Pb (ppb)	0	AL=15	48	(ND-193)**	Yes	10/19/06	Corrosion of household plumbing systems; Erosion of natural deposits

* 1 site out of 20 sampled were above the Copper Action Level.

**7 sites out of 20 sampled were above the Lead Action Level.

Note: The results for lead (Pb) exceeded the requirement of the Lead and Copper Rule during October 2006. WFF personnel issued a notice to inform the public that some faucets have elevated lead levels and placed filters on drinking water fountains and kitchen faucets to remove metals, including lead. Since August 2005, the WFF Facilities Management Branch 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.

DEFINITIONS

Action Level (AL) – The concentration of a contaminant that, if exceeded, triggers treatment or other requirements that a water system must follow.

HAA5 – Haloacetic Acids; The acronym for the sum of the five haloacetic acids that might be formed in drinking water by the addition of chlorine.

Contaminant - Any constituent in the water other than hydrogen and oxygen (H₂O) is considered a contaminant. Contaminants can be introduced into the water through natural means or through human introduction (anthropogenically). Regulatory agencies have established safe drinking water contaminant levels for most constituents.

Maximum Contaminant Level (MCL) – The highest level of a contaminant that is allowed in drinking water. MCL is set as close to the 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 health risk. MCLG allows for a margin of safety.

MRDL – Maximum Residual Disinfection Level.

MRDLG – Maximum Residual Disinfection Level Goal.

Non-detect (ND) – Lab analysis indicating that the contaminant is not present, “not detected.”

Parts per million (ppm) or Milligrams per liter (mg/l) – One part per million corresponds to one minute in two years, or a single penny in ten thousand dollars.

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 ten million dollars.

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

Treatment Technique (TT) – a process intended to reduce the level of a contaminant in drinking water.

TTHM – Total Trihalomethanes. The sum of the trihalomethane compounds (there are four) which might be formed during disinfection procedure with chlorine.

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.

Other Drinking Water Constituents of Interest:

The 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 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 a 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 WFF system is likely due to the addition of corrosion control chemicals.

Additional Health Information

Certain contaminants (such as *cryptosporidium*, radon, arsenic, nitrate, and lead), if present in your drinking water, may be of special concern to consumers.

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.

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.

This Drinking Water Quality Report was prepared by:

