

## ***Air Force Research Laboratory, Tyndall AFB 2009 Annual Drinking Water Quality Report***

This year's Annual Water Quality Report covering CY 2009 is provided to you by the Bioenvironmental Engineering Flight. This report is designed to inform you about the water quality and services that are delivered to you every day. This report was prepared and distributed in accordance with *Air Force Instruction 48-144, Safe Drinking Water Surveillance Program*. We are committed to ensuring the quality of your water.

The Air Force Research Laboratory water system is classified as non-transient non-community, which means that it is a public water system that regularly serves at least 25 of the same persons over six months per year. The drinking water source for the Air Force Research Laboratory is a well which draws from the Floridan Aquifer, a groundwater source. The well is located in Building 9705; access to this well is highly restricted, greatly reducing the risk of intentional contamination. Immediately upon being pumped from the aquifer, water is disinfected with chlorine to protect against microbial contamination.

On April 17, 2009 the Florida Department of Environmental Protection conducted an inspection of the Air Force Research Laboratory public water system. The purpose of this survey was to determine the system's capability to provide an adequate potable water supply that complies with the Florida Safe Drinking Water Act. The system was found to be in good operational order.

The 325 Bioenvironmental Engineering Flight routinely monitors for contaminants in your drinking water according to Federal and State laws, rules, and regulations. Except where indicated otherwise, this report is based on the results of our monitoring for the period of January 1 to December 31, 2009. Data obtained before January 1, 2009, and presented in this report are from the most recent testing done in accordance with the laws, rules, and regulations.

This report shows our water quality results and what they mean. If you have any questions about this report or concerning your water utility, please contact the 325 Bioenvironmental Engineering Flight at 850-283-7139. We encourage our valued customers to be informed about their water utility.

The following tables list monitoring frequency for contaminants and applicable test results for the 2009 calendar year. We constantly monitor for various contaminants in the water supply to meet all regulatory requirements. The tables list only those contaminants that had some level of detection. Many other contaminants have been analyzed, but were not present or were below the detection limits of the lab equipment. Detection does not necessarily mean that the contaminant exceeded its MCL or that its presence in the drinking water poses a health risk. The state allows us to monitor for certain contaminants less than once per year because the concentration of these contaminants do not change frequently. The inclusion of this data is required in water quality reports until more current sampling is requested and analyzed. As shown by the dates of sampling, some of our data, though representative of the water quality, is more than one year old.

In the tables below, you may find unfamiliar terms and abbreviations. To help you better understand these terms we've provided the following definitions:

**Maximum Contaminant Level or MCL:** 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 Contaminant Level Goal or MCLG:** 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.

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

**Initial Distribution System Evaluation (IDSE):** An important part of the Stage 2 Disinfection Byproducts Rule (DBPR). The IDSE is a one-time study conducted by water systems to identify distribution system locations with high concentrations of trihalomethanes (THMs) and haloacetic acids (HAAs). Water systems will use results from the IDSE, in conjunction with their Stage 1 DBPR compliance monitoring data, to select compliance monitoring locations for the Stage 2 DBPR.

**Maximum residual disinfectant level or MRDL:** 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.

**Maximum residual disinfectant level goal or MRDLG:** 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.

**Nephelometric Turbidity Unit (NTU)** - measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

“ND” means not detected and indicates that the substance was not found by laboratory analysis.

**Parts per billion (ppb) or Micrograms per liter ( $\mu\text{g}/\text{l}$ )** – one part by weight of analyte to 1 billion parts by weight of the water sample.

**Parts per million (ppm) or Milligrams per liter ( $\text{mg}/\text{l}$ )** – one part by weight of analyte to 1 million parts by weight of the water sample.

**Picocurie per liter ( $\text{pCi}/\text{L}$ )** - measure of the radioactivity in water.

**Treatment Technique (TT):** A required process intended to reduce the level of a contaminant in drinking water.

## **Analyte Groups and Monitoring Frequency Table**

Analyte/Contaminant Group	Monitoring Frequency
Biological Contaminants	Monthly
Nitrate & Nitrite	Annually
Inorganic	Every 3 years (Due in 2010)
Volatile Organics	Every 3 years (Due in 2010)
Synthetic Organic Contaminants	Every 3 years (Due in 2010)
Trihalomethanes and Haloacetic Acids	Every 3 years (Due in 2010)
Lead and Copper	Every 3 years - 5 samples (Due in 2012)
Radiochemical	No longer required

## 2009 Contaminant Tables

Test Results for Inorganic Compounds						
Contaminant and Unit of Measurement	Sampling Date	MCL Violation Y/N	Level Detected	MCLG	MCL	Likely Source of Contamination
Barium (mg/l)	07/11/07	N	0.013	2	2	Erosion of natural deposits
Sodium (mg/l) (Inorganic Analyte)	07/11/07	N	51	N/A	160	Salt water intrusion, leaching from soil
Fluoride (mg/l)	7/11/07	N	5.3*	4	4	Erosion of natural deposits
Nitrate (mg/l)	11/30/09	N	0.1	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Nitrite (mg/l)	11/30/09	N	0.1	1	1	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits

\* Due to historical Fluoride results, the FDEP requires the use of Reverse Osmosis units for potability use. Please see notes on Fluoride Sampling discussion below.

Test Results for Disinfectant/Disinfection By-Product (D/DBP) Parameters (2)						
Contaminant and Unit of Measurement	Sampling Date	MCL Violation Y/N	Level Detected	MCLG	MCL	Likely Source of Contamination
Chlorine (ppm)	Jan – Dec 09	N	0.2 - 2.0	4	4	Water additive used to control microbes
Haloacetic Acids (five) (HAA5) (ug/l)	7/11/07	N	9.4	N/A	60	By-product of drinking water disinfection
	8/22/07	N	9.9*			
TTHM (Total trihalomethanes) (ug/l)	7/11/07	N	25.4	N/A	80	By-product of drinking water disinfection
	8/22/07	N	25.6*			

\* Denotes the average of three samples taken on the same day. All three samples were below the MCL for applicable contaminants.

Test Results for Radiochemical Contaminants						
Contaminant and Unit of Measurement	Sampling Date	MCL Violation Y/N	Level Detected	MCLG	MCL	Likely Source of Contamination
Gross Alpha (pCi/L)	6/19/98	N	2.3	N/A	15	Erosion of natural deposits

## Test Results for Lead and Copper

Contaminant and Unit of Measurement	Sampling Date	AL Violation Y/N	90th Percentile Result	# of Samples Exceeding MCL	MCLG	AL	Likely Source of Contamination
Lead (mg/l)	8/26/09	N	0.002	0 of 5	0.015	0.015	Corrosion of household plumbing systems; erosion of natural deposits
Copper (mg/l)	8/26/09	N	0.59	0 of 5	1.36	1.3	Corrosion of household plumbing systems, erosion of natural deposits

### **Bacteriological Sampling at Air Force Research Laboratory**

The base Bioenvironmental Engineering Flight conducts monthly microbiological sampling at a variety of points at the Air Force Research Laboratory. During 2009, zero samples tested positive for bacteriological contamination.

### **Fluoride Sampling at Air Force Research Laboratory**

Fluoride is a Florida Department of Environmental Protection secondary drinking standard whose level is set at 4.0 mg/l. High levels of fluoride are caused by Erosion of natural deposits in ground water. Past Inorganic Compounds testing results show high levels of fluoride in the Air Force Research Laboratory area. To minimize these levels, AFRL is required to use Reverse Osmosis Units for any potable water requirements. The Bioenvironmental Engineering Flight performs periodic fluoride sampling on these RO units to ensure that they are operating adequately.

### **Health Effects of Detected Contaminants**

Barium - Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.

Fluoride - Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums.

Sodium - The State of Florida Department of Environmental Protection (DEP) has set the drinking water standard for sodium at 160.0 parts per million (ppm) to protect individuals that are susceptible to sodium sensitive hypertension or diseases that cause difficulty in regulating body fluid volume. Sodium is monitored so that individuals who have been placed on sodium (salt) restricted diets may take the sodium in their water into account. Sodium naturally occurs in food and drinking water. Food is the common source of sodium. Drinking water contributes only a small fraction (less than 10 percent) to the overall sodium intake. Sodium levels in drinking water can be increased by ion-exchange softeners at water treatment facilities or some point-of-use treatment devices.

Haloacetic Acids (HAA) - Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.

Nitrate - Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.

Nitrite - Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.

TTHMs (Total Trihalomethanes) - Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.

Alpha emitters - Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.

Radium - Some people who drink water containing radium 226 or 228 in excess of the MCL over many years have an increased risk of getting cancer.

Lead - Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.

Copper - Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level for many years could suffer liver or kidney damage. People with Wilson's disease should consult their personal doctor.

The 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:

- (A) Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- (B) 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.

- (C) Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
- (D) Organic chemical 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.
- (E) Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

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

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 the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Bioenvironmental Engineering Flight at 850-283-7139 or the Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791.

**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. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbiological contaminants are available from the Safe Drinking Water Hotline (800-426-4791).**

## ***2009 Annual Drinking Water Quality Report Ammo Area, Tyndall AFB***

This year's Annual Water Quality Report covering CY 2009 is provided to you by the Bioenvironmental Engineering Flight. This report is designed to inform you about the water quality and services that are delivered to you every day. This report was prepared and distributed in accordance with *Air Force Instruction 48-144, Safe Drinking Water Surveillance Program*. We are committed to ensuring the quality of your water.

The Ammo Area water system is classified as non-transient non-community, which means that it is a public water system that regularly serves at least 25 of the same persons over six months per year. The drinking water source for the Ammo Area is a well which draws from the Floridan Aquifer, a groundwater source. The well is located in Building 7001 in the weapons storage area and services the 325th Logistics Group Munitions Flight and the 83rd Missile Maintenance Flight. Access to this well is highly restricted, greatly reducing the risk of intentional contamination. Immediately upon

being pumped from the aquifer, water is disinfected with chlorine to protect against microbial contamination.

On September 8, 2008, the 325 MDG/CC declared the Ammo Area water system to be non-potable. This was due to its poor aesthetic qualities including taste, odor and turbidity. The Florida Department of Environmental Protection still enforces drinking water standards for this system.

On April 17, 2009 the Florida Department of Environmental Protection conducted an inspection of the Ammo Area public water system. The purpose of this survey was to determine the system's capability to provide an adequate potable water supply that complies with the Florida Safe Drinking Water Act. The system was found to be in good operational order.

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This report shows our water quality results and what they mean. If you have any questions about this report or concerning your water utility, please contact the 325 Bioenvironmental Engineering Flight at 850-283-7139. We encourage our valued customers to be informed about their water utility.

The following tables list monitoring frequency for contaminants and applicable test results for the 2009 calendar year. We constantly monitor for various contaminants in the water supply to meet all regulatory requirements. The tables list only those contaminants that had some level of detection. Many other contaminants have been analyzed, but were not present or were below the detection limits of the lab equipment. Detection does not necessarily mean that the contaminant exceeded its MCL or that its presence in the drinking water poses a health risk. The state allows us to monitor for certain contaminants less than once per year because the concentration of these contaminants do not change frequently. The inclusion of this data is required in water quality reports until more current sampling is requested and analyzed. As shown by the dates of sampling, some of our data, though representative of the water quality, is more than one year old.

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

Initial Distribution System Evaluation (IDSE): An important part of the Stage 2 Disinfection Byproducts Rule (DBPR). The IDSE is a one-time study conducted by water systems to identify distribution system locations with high concentrations of trihalomethanes (THMs) and haloacetic acids (HAAs). Water systems will use results from the IDSE, in conjunction with their Stage 1 DBPR compliance monitoring data, to select compliance monitoring locations for the Stage 2 DBPR.

Maximum residual disinfectant level or MRDL: 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.

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Picocurie per liter ( $\text{pCi/L}$ ) - measure of the radioactivity in water.

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

### **Analyte Groups and Monitoring Frequency Table**

<b>Analyte/Contaminant Group</b>	<b>Monitoring Frequency</b>
Biological Contaminants	Monthly
Nitrate & Nitrite	Annually
Inorganic	Every 3 years (Due in 2010)
Volatile Organics	Every 3 years (Due in 2010)
Synthetic Organic Contaminants	Every 3 years (Due in 2010)
Trihalomethanes and Haloacetic Acids	Annually
Asbestos	Every 9 years (Due in 2013)
Lead and Copper	Every 3 years - 10 samples (Due in 2010)
Radiochemical	No longer required



## 2009 Contaminant Tables

Test Results for Inorganic Compounds						
Contaminant and Unit of Measurement	Sampling Date	MCL Violation Y/N	Level Detected	MCLG	MCL	Likely Source of Contamination
Barium (mg/l)	07/12/07	N	0.046	2	2	Erosion of natural deposits
Fluoride (mg/l) (Inorganic Analyte)	07/12/07	N	2.9	4	4	Erosion of natural deposits
Sodium (mg/l) (Inorganic Analyte)	11/14/07	N	132	N/A	160	Salt water intrusion, leaching from soil
	2/27/08	N	138	N/A		
	5/14/08	N	145	N/A		
	8/26/08	N	141	N/A		
Nitrate (mg/l)	12/30/09	N	0.1	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Nitrite (mg/l)	12/30/09	N	0.1	1	1	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits

Test Results for Disinfectant/Disinfection By-Product (D/DBP) Parameters (2)						
Contaminant and Unit of Measurement	Sampling Date	MCL Violation Y/N	Level Detected	MCLG	MCL	Likely Source of Contamination
Chlorine (ppm)	Jan – Dec 09	N	0.2 – 3.1	4	4	Water additive used to control microbes
Haloacetic Acids (five) (HAA5) (ug/l)	11/18/08	N	8.9	NA	60	By-product of drinking water disinfection
	2/19/09	N	3.2	NA		
	5/13/09	N	5.1	NA		
	8/20/09	N	4.37	NA		
Total Trihalomethanes (TTHM) (ug/l)	11/18/08	Y	130.2	NA	80	By-product of drinking water disinfection
	2/19/09	N	4.6	NA		
	5/13/09	N	10.1	NA		
	8/20/09	N	3.8	NA		

HAA5 and TTHM results are part of the four quarter consecutive sampling required. See note below for D/DBP.

Test Results for Radiochemical Contaminants						
Contaminant and Unit of Measurement	Sampling Date	MCL Violation Y/N	Level Detected	MCLG	MCL	Likely Source of Contamination
Gross Alpha (pCi/L)	11/02/00	N	8.3	N/A	15	Erosion of natural deposits
Radium 226 (pCi/L)	11/02/00	N	2.8	N/A	20	Erosion of natural deposits
Radium 228 (pCi/L)	11/02/00	N	0.3	N/A	20	Erosion of natural deposits

## Test Results for Lead and Copper

Contaminant and Unit of Measurement	Sampling Date	AL Violation Y/N	90th Percentile Result	# of Samples Exceeding MCL	MCLG	AL	Likely Source of Contamination
Lead (mg/l)	2/27/08	Y	0.004	2/10	0.015	0.015	Corrosion of household plumbing systems; erosion of natural deposits
Copper (mg/l)	2/27/08	Y	0.48	4/10	1.36	1.3	Corrosion of household plumbing systems, erosion of natural deposits

### **Bacteriological Sampling at Ammo Area**

The base Bioenvironmental Engineering Flight conducts monthly microbiological sampling at a variety of points in the Ammo area. During 2009, four samples tested positive for bacteriological contamination at the Ammo Area well. This was a result of well pump scheduled maintenance performed on November 2009. Subsequently, 21 consecutive samples were taken on the well water which resulted in the Ammo Area system cleared by the FDEP.

### **Disinfectant/Disinfection By products (D/DBP)**

Disinfectant and disinfection by products are produced as a consequence of drinking water chlorination and disinfection. Both total trihalomethanes and haloacetic acids are FDEP primary drinking standards whose suggested level is set at 80 mg/l and 60 mg/l respectively. The Bioenvironmental Engineering Flight sampled four consecutive quarters in order to comply with established regulations. The average result for the four quarters at the Ammo Area showed levels below the FDEP's maximum contaminant level. As a result, we will continue monitoring at the recommended schedule - annually during the warmest water temperature (July-September). The next required sampling event will be between July and September 2010.

### **Health Effects of Detected Contaminants**

Barium - Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.

Fluoride - Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums.

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## ***2009 Annual Drinking Water Quality Report Full Scale Drone, Tyndall AFB***

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**Maximum Contaminant Level Goal or MCLG:** 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.

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

Initial Distribution System Evaluation (IDSE): An important part of the Stage 2 Disinfection Byproducts Rule (DBPR). The IDSE is a one-time study conducted by water systems to identify distribution system locations with high concentrations of trihalomethanes (THMs) and haloacetic acids (HAAs). Water systems will use results from the IDSE, in conjunction with their Stage 1 DBPR compliance monitoring data, to select compliance monitoring locations for the Stage 2 DBPR.

Maximum residual disinfectant level or MRDL: 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.

Maximum residual disinfectant level goal or MRDLG: 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.

Nephelometric Turbidity Unit (NTU) - measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

“ND” means not detected and indicates that the substance was not found by laboratory analysis.

Parts per billion (ppb) or Micrograms per liter ( $\mu\text{g/l}$ ) – one part by weight of analyte to 1 billion parts by weight of the water sample.

Parts per million (ppm) or Milligrams per liter (mg/l) – one part by weight of analyte to 1 million parts by weight of the water sample.

Picocurie per liter (pCi/L) - measure of the radioactivity in water.

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

### Analyte Groups and Monitoring Frequency Table

Analyte/Contaminant Group	Monitoring Frequency
Biological Contaminants	Monthly
Nitrate & Nitrite	Annually
Inorganic	Every 3 years (Due in 2010)
Volatile Organics	Every 3 years (Due in 2010)
Synthetic Organic Contaminants	Every 3 years (Due in 2010)
Trihalomethanes and Haloacetic Acids	Every 3 years (Due in 2010)
Lead and Copper	Every 3 years - 5 samples (Due in 2012)
Radiochemical	No longer required

### 2009 Contaminant Tables

Test Results for Inorganic Compounds						
Contaminant and Unit of Measurement	Sampling Date	MCL Violation Y/N	Level Detected	MCLG	MCL	Likely Source of Contamination
Barium (mg/l)	07/11/07	N	0.037	2	2	Erosion of natural deposits
Fluoride (mg/l) (Inorganic Analyte)	07/11/07	N	2.6	4	4	Erosion of natural deposits
Sodium (mg/l) (Inorganic Analyte)	07/11/07	N	126	N/A	160	Salt water intrusion, leaching from soil
Nitrate (mg/l)	11/30/09	N	0.1	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Nitrite (mg/l)	11/30/09	N	0.1	1	1	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits

Test Results for Disinfectant/Disinfection By-Product (D/DBP) Parameters (2)						
Contaminant and Unit of Measurement	Sampling Date	MCL Violation Y/N	Level Detected	MCLG	MCL	Likely Source of Contamination
Chlorine (ppm)	Jan – Dec 09	Y	0.2 - 2.7	4	4	Water additive used to control microbes
Haloacetic Acids (five) (HAA5) (ug/l)	7/11/07	N	24	NA	60	By-product of drinking water disinfection
TTHM (Total trihalomethanes) (ug/l)	7/11/07	N	1.0	NA	80	By-product of drinking water disinfection

Test Results for Radiochemical Contaminants						
Contaminant and Unit of Measurement	Sampling Date	MCL Violation Y/N	Level Detected	MCLG	MCL	Likely Source of Contamination
Gross Alpha (pCi/L)	4/7/98	N	5.3	N/A	15	Erosion of natural deposits

Test Results for Lead and Copper							
Contaminant and Unit of Measurement	Sampling Date	AL Violation Y/N	90th Percentile Result	# of Samples Exceeding MCL	MCLG	AL	Likely Source of Contamination
Lead (mg/l)	8/26/08	N	0.005	0/5	0.015	0.015	Corrosion of household plumbing systems; erosion of natural deposits
Copper (mg/l)	8/26/08	N	0.745	0/5	1.36	1.3	Corrosion of household plumbing systems, erosion of natural deposits

## **Bacteriological Sampling at Full Scale Drone**

The base Bioenvironmental Engineering Flight conducts monthly microbiological sampling at a variety of points at Full Scale Drone. During 2009, zero samples tested positive for bacteriological contamination.

## **Health Effects of Detected Contaminants**

**Barium** - Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.

**Fluoride** - Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums.

**Sodium** - The State of Florida Department of Environmental Protection (DEP) has set the drinking water standard for sodium at 160.0 parts per million (ppm) to protect individuals that are susceptible to sodium sensitive hypertension or diseases that cause difficulty in regulating body fluid volume. Sodium is monitored so that individuals who have been placed on sodium (salt) restricted diets may take the sodium in their water into account. Sodium naturally occurs in food and drinking water. Food is the common source of sodium. Drinking water contributes only a small fraction (less than 10 percent) to the overall sodium intake. Sodium levels in drinking water can be increased by ion-exchange softeners at water treatment facilities or some point-of-use treatment devices.

**Haloacetic Acids (HAA)** - Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.

**Nitrate** - Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.

**Nitrite** - Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.

**TTHMs (Total Trihalomethanes)** - Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.

**Alpha emitters** - Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha



emitters in excess of the MCL over many years may have an increased risk of getting cancer.

Radium - Some people who drink water containing radium 226 or 228 in excess of the MCL over many years have an increased risk of getting cancer.

Lead - Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.

Copper - Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level for many years could suffer liver or kidney damage. People with Wilson's disease should consult their personal doctor.

The 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:

- (A) Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- (B) 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, mining, or farming.
- (C) Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- (D) Organic chemical 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 stormwater runoff, and septic systems.
- (E) Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

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

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 the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Bioenvironmental Engineering Flight at 850-283-7139 or the Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791.

**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. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbiological contaminants are available from the Safe Drinking Water Hotline (800-426-4791).**

## ***2009 Annual Drinking Water Quality Report Tyndall AFB***

We are pleased to present to you this year's Annual Water Quality Report. This report is designed to inform you about the quality water and services that are delivered to you every day. We are committed to ensuring the quality of your water. The water source for Tyndall AFB main base area is surface water drawn from Deer Point Reservoir.

In 2009 the Department of Environmental Protection performed a Source Water Assessment on our system. The assessment was conducted to provide information about any potential sources of contamination in the vicinity of our surface water intakes. The surface water system is considered to be at high risk because of the many potential sources of contamination present in the assessment area. The assessment results are available on the FDEP Source Water Assessment and Protection Program website at [www.dep.state.fl.us/swapp](http://www.dep.state.fl.us/swapp) or they can be obtained from Bay County Utility Services by calling 872-4785.

The Bay County Water Treatment Plant uses a conventional treatment process consisting of coagulation, flocculation, sedimentation, filtration, pH adjustment, disinfection, fluoridation, and corrosion control. The treatment process includes adding lime occasionally to provide additional alkalinity to the raw water so that it can react with the primary coagulating chemical, ferric sulfate, which is added to remove particles and organics. Polymer is also added to assist in the coagulation process. Sodium Hypochlorite is added to maintain disinfection in the distribution system. The addition of zinc orthophosphate reduces the corrosiveness of the water. Fluoride, in the form of hydrofluosilicic acid, is added as a supplement to prevent tooth decay. Lime is also added at the end of the process to increase the pH. These processes are needed to meet the drinking water standards as set by the United States Environmental Protection Agency (EPA) and the Florida Department of Environmental Protection (FDEP).

This report shows Bay County Utility Service's water quality results and additional monitoring by the 325 Bioenvironmental Engineering Flight. We encourage water customers to be informed about Bay County Utility Services. If you want to learn more, please attend any of the regularly scheduled Bay County Commission meetings. The

meetings are scheduled the first and third Tuesday of each month. Public notices of the meetings are announced regularly publicizing the date, time, and location. If you have any questions about this report or concerning your water, please contact the 325 Bioenvironmental Engineering Flight at 850-283-7139.

Bay County Utility Services routinely monitors for contaminants in your drinking water according to Federal and State laws, rules, and regulations. The 325 Bioenvironmental Engineering Flight (BEF) conducts additional monitoring to comply with Air Force instructions. Except where indicated otherwise, this report is based on the results of our monitoring for the period of January 1 to December 31, 2009. Data obtained before January 1, 2009, and presented in this report are from the most recent testing done in accordance with the laws, rules, and regulations.

In the table below, you may find unfamiliar terms and abbreviations. To help you better understand these terms we've provided the following definitions:

**Maximum Contaminant Level or MCL:** 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 Contaminant Level Goal or MCLG:** 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.

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

**Initial Distribution System Evaluation (IDSE):** An important part of the Stage 2 Disinfection Byproducts Rule (DBPR). The IDSE is a one-time study conducted by water systems to identify distribution system locations with high concentrations of trihalomethanes (THMs) and haloacetic acids (HAAs). Water systems will use results from the IDSE, in conjunction with their Stage 1 DBPR compliance monitoring data, to select compliance monitoring locations for the Stage 2 DBPR.

**Maximum residual disinfectant level or MRDL:** 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.

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**Nephelometric Turbidity Unit (NTU)** - measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

“ND” means not detected and indicates that the substance was not found by laboratory analysis.

Parts per billion (ppb) or Micrograms per liter ( $\mu\text{g/l}$ ) – one part by weight of analyte to 1 billion parts by weight of the water sample.

Parts per million (ppm) or Milligrams per liter ( $\text{mg/l}$ ) – one part by weight of analyte to 1 million parts by weight of the water sample.

Picocurie per liter ( $\text{pCi/L}$ ) - measure of the radioactivity in water.

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

# 2009 Annual Drinking Water Quality Report Air Force Research Laboratory, Tyndall AFB

## 2009 Contaminants Table

Microbiological Contaminants							
Contaminant and Unit of Measurement	Dates of sampling (mo/yr)	MCL Violation Y/N	Highest Monthly Percentage/ Number	MCLG	MCL		Likely Source of Contamination
Total Coliform Bacteria	Jan-Dec 09	N	1	0	For systems collecting fewer than 40 samples per month: presence of coliform bacteria in 1 sample collected during a month.		Naturally present in the environment
Contaminant and Unit of Measurement	Dates of sampling (mo/yr)	MCL Violation Y/N	The Highest Single Measurement	The Lowest Monthly Percentage of Samples Meeting Regulatory Limits	MCLG	MCL	Likely Source of Contamination
Turbidity (NTU)	Jan – Dec 09	N	1.0	96.6%	N/A	TT	Soil runoff
Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of the effectiveness of our filtration system. High turbidity can hinder the effectiveness of disinfectants. *The Treatment Technique standard requires that 95% of the turbidity readings be at 0.3 NTU or less.							

Contaminant and Unit of Measurement	Dates of sampling (mo/yr)	MCL Violation Y/N	Level Detected	Range of Results	MCLG	MCL	Likely Source of Contamination
Radiological Contaminants							
Radium 226 + 228 or combined radium (pCi/L)	Apr-08	N	0.2	N/A	0	5	Erosion of natural deposits
Inorganic Contaminants							
Arsenic (ppb)	June-09	N	0.8	N/A	N/A	10	Erosion of natural deposits; runoff from orchards; runoff from glass and electronics production wastes
Barium (ppm)	June-09	N	0.0057	N/A	2	2	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Beryllium (ppb)	June - 09	N	0.2	N/A	4	4	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries
Fluoride (ppm) <small>*Result from Source Water Prior to Fluoride Supplement.</small>	June-09	N	1.3	N/A	4	4	Erosion of natural deposits; discharge from fertilizer and aluminum factories. Water additive which promotes strong teeth when at optimum levels between 0.7 and 1.3 ppm
Nickel (ppb)	June-09	N	1	N/A	N/A	100	Pollution from mining and refining operations. Natural occurrence in soil.
Sodium (ppm)	June-09	N	6	N/A	N/A	160	Salt water intrusion, leaching from soil
Thallium (ppb)	June-09	N	0.7	N/A	0.5	2	Leaching from ore-processing sites; discharge from electronics, glass, and drug factories
Synthetic Organic Contaminants including Pesticides and Herbicides							
Dalapon (ppb)	Jan – Dec 09	N	0.74	ND – 1.7	200	200	Runoff from herbicide used on rights of way

### Stage 1 Disinfectants and Disinfection By-Products

Disinfectant or Contaminant and Unit of Measurement	Dates of sampling (mo/yr)	MCL or MRDL Violation Y/N	Level Detected	Range of Results	MCLG or MRDLG	MCL or MRDL	Likely Source of Contamination
Chlorine (ppm) *Bay County Utilities Monitoring	Jan – Dec 09	N	1.0	0.7 – 1.5	MRDLG = 4	MRDL = 4.0	Water additive used to control microbes
Chlorine (ppm) *Base BEF Monitoring	Jan – Dec 09	N/A	Variable	0.0* – 1.89	MRDLG = 4	MRDL = 4.0	*Chlorine <b>not</b> added by Tyndall AFB.
Haloacetic Acids (five) (HAA5) (ppb)	Jan – Dec 09	N	49.1	13.53-139	NA	MCL = 60	By-product of drinking water disinfection
TTHM [Total trihalomethanes] (ppb)	Jan – Dec 09	N	59.6	17.7-158	NA	MCL = 80	By-product of drinking water disinfection

\*Levels were detected below minimum requirement of 0.2 ppm; 325 CES was notified, flushing of stagnant water was conducted bringing chlorine levels up to at least minimum requirement.

Contaminant and Unit of Measurement	Dates of sampling (mo/yr)	TT Violation Y/N	Lowest Running Annual Average, Computed Quarterly, of Monthly Removal Ratios	Range of Monthly Removal Ratios	MCLG	MCL	Likely Source of Contamination
Total organic carbon	Jan – Dec 09	N	1.16	0.96 – 1.98	N/A	TT	Naturally present in the environment

  

Contaminant and Unit of Measurement	Dates of sampling (mo/yr)	AL Violation Y/N	90th Percentile Result	No. of sampling sites exceeding the AL	MCLG	AL (Action Level)	Likely Source of Contamination
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### Lead and Copper (Tap Water)

Copper (ppm) Bay County Utilities Monitoring	Jan 08 – Dec 08	N	0.92	0 of 21	1.3	1.3	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Copper (mg/l) Base BEF Monitoring	7/22/09	N	0.25	0 of 8	1.36	1.3	
Lead (mg/l) Base BEF Monitoring	7/22/09	N	0.002	0 of 8	0.015	0.015	Corrosion of household plumbing systems; erosion of natural deposits

### Bacteriological Sampling at Tyndall AFB

The base Bioenvironmental Engineering Flight conducts monthly microbiological sampling at a variety of points around Tyndall AFB. During 2009, zero samples tested positive for bacteriological contamination.

### Additional information from Bay County Utility Services

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Bay County Utility Services is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at <http://www.epa.gov/safewater/lead>.

The 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:

- (A) Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- (B) 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.
- (C) Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
- (D) Organic chemical 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.
- (E) Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

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

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 the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Bioenvironmental Engineering Flight at 850-283-7139 or the Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791.

**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. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbiological contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

## ***2009 Annual Drinking Water Quality Report Silver Flag, Tyndall AFB***

This year's Annual Water Quality Report covering CY 2009 is provided to you by the Bioenvironmental Engineering Flight. This report is designed to inform you about the water quality and services that are delivered to you every day. This report was prepared and distributed in accordance with *Air Force Instruction 48-144, Safe Drinking Water Surveillance Program*. We are committed to ensuring the quality of your water.

The Silver Flag water system is classified as non-transient non-community, which means that it is a public water system that regularly serves at least 25 of the same persons over six months per year. The drinking water source for Silver Flag is a well which draws from the Floridan Aquifer, a groundwater source. The well is located in Building 9439 in the Red Horse Training Compound; access to this well is highly restricted, greatly reducing the risk of intentional contamination. Immediately upon being pumped from the aquifer, water is disinfected with chlorine to protect against microbial contamination.

On April 17, 2009 the Florida Department of Environmental Protection conducted an inspection of the Silver Flag public water system. The purpose of this survey was to determine the system's capability to provide an adequate potable water supply that complies with the Florida Safe Drinking Water Act. The system was found to be in good operational order.

The 325 Bioenvironmental Engineering Flight routinely monitors for contaminants in your drinking water according to Federal and State laws, rules, and regulations. Except where indicated otherwise, this report is based on the results of our monitoring for the period of January 1 to December 31, 2009. Data obtained before January 1, 2009, and presented in this report are from the most recent testing done in accordance with the laws, rules, and regulations.

This report shows our water quality results and what they mean. If you have any questions about this report or concerning your water utility, please contact the 325 Bioenvironmental Engineering Flight at 850-283-7139. We encourage our valued customers to be informed about their water utility.

The following tables list monitoring frequency for contaminants and applicable test results for the 2009 calendar year. We constantly monitor for various contaminants in the water supply to meet all regulatory requirements. The tables list only those contaminants that had some level of detection. Many other contaminants have been analyzed, but were not present or were below the detection limits of the lab equipment. Detection does not necessarily mean that the contaminant exceeded its MCL or that its presence in the drinking water poses a health risk. The state allows us to monitor for certain contaminants less than once per year because the concentration of these contaminants do not change frequently. The inclusion of this data is



required in water quality reports until more current sampling is requested and analyzed. As shown by the dates of sampling, some of our data, though representative of the water quality, is more than one year old.

In the tables below, you may find unfamiliar terms and abbreviations. To help you better understand these terms we've provided the following definitions:

**Maximum Contaminant Level or MCL:** 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 Contaminant Level Goal or MCLG:** 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.

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

**Initial Distribution System Evaluation (IDSE):** An important part of the Stage 2 Disinfection Byproducts Rule (DBPR). The IDSE is a one-time study conducted by water systems to identify distribution system locations with high concentrations of trihalomethanes (THMs) and haloacetic acids (HAAs). Water systems will use results from the IDSE, in conjunction with their Stage 1 DBPR compliance monitoring data, to select compliance monitoring locations for the Stage 2 DBPR.

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**Nephelometric Turbidity Unit (NTU) -** measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

“ND” means not detected and indicates that the substance was not found by laboratory analysis.

**Parts per billion (ppb) or Micrograms per liter ( $\mu\text{g}/\text{l}$ )** – one part by weight of analyte to 1 billion parts by weight of the water sample.

**Parts per million (ppm) or Milligrams per liter ( $\text{mg}/\text{l}$ )** – one part by weight of analyte to 1 million parts by weight of the water sample.

Picocurie per liter (pCi/L) - measure of the radioactivity in water.

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

### Analyte Groups and Monitoring Frequency Table

Analyte/Contaminant Group	Monitoring Frequency
Biological Contaminants	Monthly
Nitrate & Nitrite	Annually
Inorganic	Every 3 years (Due in 2010)
Volatile Organics	Every 3 years (Due in 2010)
Synthetic Organic Contaminants	Every 3 years (Due in 2010)
Trihalomethanes and Haloacetic Acids	Every 3 years (Due in 2010)
Lead and Copper	Every 3 years - 5 samples (Due in 2012)
Radiochemical	No longer required

### 2009 Contaminant Tables

Test Results for Inorganic Compounds						
Contaminant and Unit of Measurement	Sampling Date	MCL Violation Y/N	Level Detected	MCLG	MCL	Likely Source of Contamination
Barium (mg/l)	7/12/07	N	0.016	2	2	Erosion of natural deposits
Sodium (mg/l) (Inorganic Analyte)	7/12/07	N	69	N/A	160	Salt water intrusion, leaching from soil
Fluoride (mg/l)	7/12/07	N	3.5*	4	4	Erosion of natural deposits
Nitrate (mg/l)	11/30/09	N	0.1	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Nitrite (mg/l)	11/30/09	N	0.1	1	1	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits

\* Due to historical Fluoride results, the FDEP requires the use of Reverse Osmosis units for potability use. Please see notes on Fluoride Sampling discussion below.

Test Results for Disinfectant/Disinfection By-Product (D/DBP) Parameters (2)						
Contaminant and Unit of Measurement	Sampling Date	MCL Violation Y/N	Level Detected	MCLG	MCL	Likely Source of Contamination
Chlorine (ppm)	Jan – Dec 09	N	0.2 - 2.9	4	4	Water additive used to control microbes
Haloacetic Acids (five) (HAA5) (ug/l)	7/12/07	N	7.5	NA	60	By-product of drinking water disinfection
TTHM (Total trihalomethanes) (ug/l)	7/12/07	N	31.5	NA	80	By-product of drinking water disinfection

Test Results for Radiochemical Contaminants						
Contaminant and Unit of Measurement	Sampling Date	MCL Violation Y/N	Level Detected	MCLG	MCL	Likely Source of Contamination
Gross Alpha (pCi/L)	6/16/98	N	4.1	N/A	15	Erosion of natural deposits
Radium 226 (pCi/L)	6/16/98	N	1.2	N/A	20	Erosion of natural deposits
Radium 228 (pCi/L)	6/16/98	N	0.1	N/A	20	Erosion of natural deposits

Test Results for Lead and Copper							
Contaminant and Unit of Measurement	Sampling Date	AL Violation Y/N	90th Percentile Result	# of Samples Exceeding MCL	MCLG	AL	Likely Source of Contamination
Lead (mg/l)	8/26/09	N	0.01	1 of 5	0.015	0.015	Corrosion of household plumbing systems; erosion of natural deposits
Copper (mg/l)	8/26/09	N	1.215	0 of 5	1.36	1.3	Corrosion of household plumbing systems, erosion of natural deposits

### Bacteriological Sampling at Silver Flag

The base Bioenvironmental Engineering Flight conducts monthly microbiological sampling at a variety of points at Silver Flag. During 2009, zero samples tested positive for bacteriological contamination.

### Fluoride Sampling at Silver Flag

Fluoride is a Florida Department of Environmental Protection secondary drinking standard whose level is set at 4.0 mg/l. High levels of fluoride are caused by Erosion of natural deposits in ground water. Past Inorganic Compounds testing results show high levels of fluoride in the Silver Flag area. To minimize these levels, Silver Flag is required to use Reverse Osmosis Units for any potable water requirements. The Bioenvironmental Engineering Flight performs periodic fluoride sampling on these RO units to ensure that they are operating adequately.

### Lead Sampling at Silver Flag

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Tyndall AFB Utility Services is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at <http://www.epa.gov/safewater/lead>.

### Health Effects of Detected Contaminants

Barium - Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.

Fluoride - Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums.

Sodium - The State of Florida Department of Environmental Protection (DEP) has set the drinking water standard for sodium at 160.0 parts per million (ppm) to protect individuals that are susceptible to sodium sensitive hypertension or diseases that cause difficulty in regulating body fluid volume. Sodium is monitored so that individuals who have been placed on sodium (salt) restricted diets may take the sodium in their water into account. Sodium naturally occurs in food and drinking water. Food is the common source of sodium. Drinking water contributes only a small fraction (less than 10 percent) to the overall sodium intake. Sodium levels in drinking water can be increased by ion-exchange softeners at water treatment facilities or some point-of-use treatment devices.

Haloacetic Acids (HAA) - Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.

Nitrate - Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.

Nitrite - Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.

TTHMs (Total Trihalomethanes) - Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.

Alpha emitters - Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.

Radium - Some people who drink water containing radium 226 or 228 in excess of the MCL over many years have an increased risk of getting cancer.

Lead - Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show

slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.

**Copper** - Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level for many years could suffer liver or kidney damage. People with Wilson's disease should consult their personal doctor.

The 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:

- (A) Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- (B) 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.
- (C) Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
- (D) Organic chemical 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.
- (E) Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

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

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 the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Bioenvironmental Engineering Flight at 850-283-7139 or the Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791.

**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. EPA/CDC guidelines on appropriate means to**

**lessen the risk of infection by Cryptosporidium and other microbiological contaminants are available from the Safe Drinking Water Hotline (800-426-4791).**