



*Annual* WATER  
QUALITY  
REPORT

*Reporting Year 2011*



*Presented By* \_\_\_\_\_  
Florida Keys Aqueduct Authority

## Meeting the Challenge

Once again we are proud to present our annual water quality report, covering all testing performed between January 1 and December 31, 2011. As in years past, we are committed to delivering the best-quality drinking water possible. To that end, we remain vigilant in meeting the challenges of source water protection, distribution and transmission system protection, and water conservation.

Through proactive efforts, the Florida Keys Aqueduct Authority (FKAA) is continually monitoring, assessing, and working to eliminate potential hazards to our water source, including inappropriate aquifer utilization, unsuitable land uses, and the potential for saltwater intrusion. Progressive planning, such as construction of our new reverse osmosis plant, the strategic installation of additional monitoring wells, and the implementation of alternative water supplies and advanced conservation strategies, will continually be used to protect our resource. Additionally, we persist in our efforts to manage the impacts to our transmission and distribution lines from ongoing outside utility construction and harsh environmental conditions. Throughout these challenges, we maintain our high standards in an effort to continue delivering the best-quality drinking water possible. There may be other hurdles in the future, but please know that we will always stand by you and the exceptional drinking water we work diligently to provide. We encourage you to share your thoughts with us on the information contained in this report. Should you ever have any questions or concerns, we are always available to assist you.

## Where Does My Water Come From?

### **J. Robert Dean Water Treatment Facility (PWS ID#: FL4134357)**

The freshwater Biscayne Aquifer is the primary water supply for the Florida Keys Aqueduct Authority. Our well field is located within an environmentally protected pine rockland forest west of Florida City on the mainland. The location of the well field near Everglades National Park, along with restrictions enforced by state and local regulatory agencies, contributes to the unusually high-quality raw water. The FKAA wells contain some of the highest quality groundwater in the state, meeting all regulatory standards prior to treatment.

Included in the regulations mentioned above are restrictions which limit the amount of water that can be extracted from the Biscayne Aquifer. In order to abide by the regulations, the FKAA utilizes the Floridan Aquifer, a brackish groundwater source located approximately 800 to 1,000 feet below the surface, to supplement the Biscayne Aquifer supply. The Floridan Aquifer is the source employed by the FKAA's new low pressure reverse osmosis (LPRO) water treatment plant located at our Florida City well field. The new LPRO facility was completed in the fall of 2009 and can contribute up to an additional six million gallons a day to our water supply. During emergency situations, the FKAA may also directly blend the Floridan Aquifer with the Biscayne Aquifer to supplement approximately 4 percent of the water supply.

### **Kermit H. Lewin Reverse Osmosis & Marathon Reverse Osmosis Facilities (PWS ID#: FL5444047)**

During an emergency situation, the FKAA may utilize the emergency Reverse Osmosis Water Treatment Plants (WTPs) located in Stock Island (Kermit Lewin Reverse Osmosis Facility) and Marathon to supplement the water supply and increase emergency storage capacity. The RO WTPs withdraw from seawater wells to produce potable water from saltwater.

## Award Winning Water!

For two consecutive years, the Aqueduct has taken home top honors at the Florida Section American Water Works Association's Region VII, Best Tasting Drinking Water Contest. The highly competitive event is the largest Best Tasting Drinking Water Contest in Florida and provides the Aqueduct an opportunity to demonstrate that our high-quality drinking water tastes good too!



## Community Participation

You are invited to participate in regularly scheduled board meetings and voice your concerns about your drinking water. Call the executive office at (305) 296-2454 or visit our Web site at [www.fkaa.com](http://www.fkaa.com) for more information on these meetings.

## Source Water Assessment Plan

The Florida Department of Environmental Protection (FDEP) is conducting a statewide source water assessment project. This project will result in Source Water Assessment reports that will identify and assess any potential sources of contamination in the vicinity of each water supply in the state. The FDEP has performed a source water assessment on our shallow aquifer system in Florida City, and a search of the data sources indicated two potential sources (injection well and petroleum storage tank) of contamination near our wells. The Source Water Assessment report for our system is available at the FDEP Source Water Assessment and Protection Program Web site at [www.dep.state.fl.us/swapp](http://www.dep.state.fl.us/swapp). The Source Water Assessment for the RO facility water supply system has not yet been evaluated.



## How Is My Water Treated and Purified?

### **J. Robert Dean Water Treatment Facility (PWS ID#: FL4134357)**

The water treatment plant is an integrated source facility staffed by state-licensed personnel. Groundwater extracted from the Biscayne Aquifer is the primary source water for this facility. A secondary groundwater source, the Floridan Aquifer, is utilized to a much lesser extent. The Biscayne groundwater is classified as very hard due to the high concentration of calcium in the water. A process called lime softening is used to reduce calcium hardness. Lime softening is achieved by the addition of excess calcium under high pH conditions. This allows the water to become supersaturated with calcium, thereby causing the calcium to sink to the bottom of the lime softening treatment unit, leaving less hard (softened) water for use by FCAA. The FCAA product water is considered moderately hard.

The softened water is then piped to dual-media filters, which are made up of layers of anthracite and fine sand, for additional removal of particles (calcium) and further purification. Chlorine and ammonia are injected into the water to form chloramines, which provide long-lasting disinfectant protection without the objectionable taste and odor of regular chlorine. Fluoride, which is recommended for drinking water by the American Dental Association to prevent cavities and strengthen bones, is also added.

In order to comply with Biscayne Aquifer withdrawal limitations, a new Floridan well field and low pressure reverse osmosis (LPRO) water treatment plant were constructed. Operational since the fall of 2009, the LPRO water treatment plant treats the brackish water of the Floridan Aquifer. The Floridan raw water contains approximately 4,000 to 5,000 parts per million of salt. This concentration is significantly lower than the 35,000 ppm typically found in seawater. This LPRO system utilizes very fine membrane elements mounted on LPRO system skids. The water is pressurized to approximately 250 pounds per square inch (psi), rejecting the salt while allowing the passage of the pure finished water. The LPRO water is disinfected in the same manner as the Biscayne lime-softened water. Finished water from the LPRO WTP is blended with water treated from the Biscayne Aquifer.

The FCAA treated water is pumped 130 miles from Florida City to Key West, supplying water to the entire Florida Keys. The water provided to customers in the Florida Keys is continuously monitored and tested to ensure the water quality is consistent, safe, and meets all federal and state drinking water standards. The FCAA operates two state-certified laboratories, located in Florida City and Stock Island, to perform many daily water quality analyses.

### **Kermit H. Lewin Reverse Osmosis & Marathon Reverse Osmosis Water Treatment Facilities (PWS ID#: FL5444047)**

Through a process called Reverse Osmosis (RO), the Kermit H. Lewin and Marathon RO water treatment facilities desalinate saltwater, producing potable water. The saltwater from seawater wells first enters the cartridge filter to remove particulate matter. From the filters, the water is pressurized up to 900 psi. These pressures are significantly higher than those required at the Florida City LPRO due to the significantly higher salt content of the seawater. The high pressure forces some of the water in through the RO membranes (that water is then commonly referred to as permeate); the remainder of water is rejected as brine and disposed in an underground injection well. The permeate flows into a degasifier and clear well, where hydrogen sulfide and carbon dioxide are removed. Next, sodium hydroxide is added to raise the pH and a corrosion inhibitor may be added to provide corrosion control. In the final treatment stage, the permeate is disinfected with chloramines and the finished product is transferred to the storage tank for distribution.

## How Often Is My Water Tested?

In accordance with state and federal regulations and as part of the FCAA's Water Quality Program, the FCAA conducts over 95,000 water quality tests every year. Your water is sampled and analyzed by skilled and certified technicians, operators, and laboratories. Your water is analyzed 24 hours a day, 7 days a week, at various locations, including at the underground source, at the water treatment plants, and at hundreds of points throughout the distribution system.



## Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised 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 may be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The U.S. EPA/CDC (Centers for Disease Control and Prevention) 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 or <http://water.epa.gov/drink/hotline>.

## QUESTIONS?

For more information about this report, or for any questions relating to your drinking water, please call Julie Cheon, Water Quality and Environmental Manager, at (305) 295-2150.

## Q&A

**I moved into a new home and I am not sure about the building's plumbing. Is there a way I can tell if the water quality at my faucet is as high-quality as the water provided by the FKA to the meter?**

Any customer concerned about the water quality at their home can request a Water Quality Analysis. This Customer Water Quality Testing Program is provided by the Aqueduct free of charge. A water quality technician will come to your home and obtain a sample from your faucet. This sample will be tested for Total Chlorine, Hardness, Turbidity, Alkalinity, Total Dissolved Solids (TDS), and Iron. The analysis will determine if the sample is outside of the acceptable range and will also allow a comparison between the water provided to the meter by the FKA and the water at your faucet.

If you have any questions about this program, or would like to schedule an appointment, please contact Julie Cheon, Water Quality and Environmental Manager, at (305) 295-2150 or [jcheon@fka.com](mailto:jcheon@fka.com).

**What does it mean to have "air in the line"?**

The water in the pipes coming into your home or business is under pressure, so gasses (the air) are dissolved and trapped in the pressurized water as it flows into your glass. Occasionally tiny air bubbles form, causing the water to look cloudy. As the air bubbles rise in the glass, they break free at the surface, thus clearing up the water. Although the milky appearance might be disconcerting, the air bubbles won't affect the quality or taste of the water. If you see that your water has a cloudy appearance, let the water stand for a few minutes. If the cloudy appearance dissipates, it is simply tiny air bubbles in the water which have now escaped back to the atmosphere. Running the tap for a few minutes should remove the air. If a residue accumulates at the bottom of the glass, there may be sediment in the line. Occasionally, routine cleaning of pipes can stir up the material that has accumulated at the bottom of the pipe. This may also be removed by running the largest faucet for several minutes. If you have sediment in the line and running the tap does not resolve the problem, please contact the Aqueduct's Water Quality Division at (305) 295-2146.

**What makes ice cubes cloudy?**

As the water freezes, air is trapped in the ice. Light rays are distorted by the crystals and air, giving home-frozen ice a cloudy appearance. This does not occur in most commercially produced ice, as it is stirred as it is being frozen. This mixing reduces the crystallization and trapping of air.

**Is it safe to drink from my garden hose?**

No. The chemicals in a standard garden hose may leach into the water. It is also important that water left in the hose does not inadvertently, through backpressure or backsiphonage, return into a house fixture such as the kitchen faucet. The installation of an inexpensive hose bib vacuum breaker will protect against backsiphonage. Hose bib vacuum breakers can be purchased at your local hardware or plumbing supply store. The most foolproof way to avoid backflow from the hose is to disconnect the hose from the house when not in use. Food-grade plastic hoses are available and often used in recreational vehicles or boats.



## Water Main Flushing

**D**istribution mains (pipes) convey water to homes, businesses, and hydrants in your neighborhood. The water entering distribution mains is of very high quality; however, over time sediment can settle at the bottom of the main. Water main flushing is the process of cleaning the interior of water distribution mains by sending a rapid flow of water through the mains.

Flushing maintains water quality in several ways. For example, flushing removes sediments like iron and manganese. Although iron and manganese do not pose health concerns, they can affect the taste, clarity, and color of the water. Additionally, sediments can shield microorganisms from the disinfecting power of chloramines, contributing to the growth of microorganisms within distribution mains. Flushing helps remove stale water in dead-end mains and ensures the presence of fresh water with sufficient dissolved oxygen, disinfectant levels, and an acceptable taste and smell.

During flushing operations in your neighborhood, some short-term aesthetic changes are possible. If you notice changes in the appearance of your water, allow your cold water to run for a few minutes at full velocity before use and avoid using hot water, to prevent sediment accumulation in your hot water tank. Please contact us if you have any questions or if you would like more information on our water main flushing schedule.

## Substances That Could Be in Water

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:

**Microbial Contaminants**, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

**Inorganic Contaminants**, such as salts and metals, which can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

**Pesticides and Herbicides**, which may come from a variety of sources, such as agriculture, urban stormwater runoff, and residential uses.

**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.

**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 U.S. EPA prescribes regulations, which limit the amount of certain contaminants in water provided by public water systems. 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 Environmental Protection Agency's Safe Drinking Water Hotline at (800) 426-4791.

## Lead in Home Plumbing

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. We are 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 [www.epa.gov/safewater/lead](http://www.epa.gov/safewater/lead).



## Sampling Results

The following tables detail the concentrations of water quality parameters detected in the FKAA finished (treated) water, unless otherwise noted. The data presented in this table are from the most recent testing done in accordance with regulations. The U.S. EPA requires monitoring of more than 80 drinking water contaminants. Every primary regulated contaminant that was detected in the FKAA finished water, even in the minutest traces, is listed here. The tables contain the name of each substance, the highest level allowed by regulation (the MCL), the ideal goals for public health, the amount detected, the usual sources of contamination, definitions, and a key for units of measurement. This report is based on the results of our monitoring for the period of January 1 to December 31, 2011. A complete listing of all contaminants that are monitored is available upon request.

The state requires the FKAA to monitor for certain substances less often than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data are included, along with the year in which the sample was taken.

### PRIMARY REGULATED CONTAMINANTS

#### Microbiological Contaminants

CONTAMINANT AND UNIT OF MEASUREMENT	MCL VIOLATION (YES/NO)	DATE OF SAMPLING (MO./YR.)	HIGHEST MONTHLY PERCENTAGE/NUMBER	MCLG	MCL	LIKELY SOURCE OF CONTAMINATION
<b>Total Coliform Bacteria</b> (% positive samples)	No	1/1/11–12/31/11	2.9	0		Naturally present in the environment

#### Inorganic Contaminants<sup>1</sup>

CONTAMINANT AND UNIT OF MEASUREMENT	MCL VIOLATION (YES/NO)	DATE OF SAMPLING (MO./YR.)	LEVEL DETECTED	RANGE OF RESULTS	MCLG	MCL	LIKELY SOURCE OF CONTAMINATION
<b>Barium</b> (ppm)	No	08/2011	0.012	NA	2	2	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
<b>Fluoride</b> (ppm) <sup>2</sup>	No	01/01/11–12/31/11	0.83	0.1–1.01	4	4.0	Erosion of natural deposits; discharge from fertilizer and aluminum factories; water additive that promotes strong teeth when at optimum levels between 0.7 and 1.3 ppm
<b>Nitrate [as Nitrogen]</b> (ppm)	No	08/2011	2.8	NA	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
<b>Sodium</b> (ppm)	No	08/2011	17.6	NA	NA	160	Saltwater intrusion; leaching from soil

#### Stage 1 Disinfectants and Disinfection By-products<sup>3</sup>

CONTAMINANT AND UNIT OF MEASUREMENT	MCL VIOLATION (YES/NO)	DATE OF SAMPLING (MO./YR.)	LEVEL DETECTED	RANGE OF RESULTS	MCLG OR [MRDLG]	MCL OR [MRDL]	LIKELY SOURCE OF CONTAMINATION
<b>Chloramines</b> (ppm)	No	01/01/11–12/31/11	3.87	1.0–4.6	[4]	[4.0]	Water additive used to control microbes
<b>Haloacetic Acids (five) [HAA5]</b> (ppb)	No	08/2011	6.9	NA	NA	60	By-product of drinking water disinfection
<b>TTHM [Total trihalomethanes]</b> (ppb)	No	08/2011	4.8	NA	NA	80	By-product of drinking water disinfection

#### Lead and Copper (Tap water samples were collected from sites throughout the community)

CONTAMINANT AND UNIT OF MEASUREMENT	AL EXCEEDANCE (YES/NO)	DATE OF SAMPLING (MO./YR.)	90TH PERCENTILE RESULT	NO. OF SAMPLING SITES EXCEEDING THE AL	AL (ACTION LEVEL)	LIKELY SOURCE OF CONTAMINATION
<b>Copper [tap water]</b> (ppm)	No	09/2011	0.0351	0	1.3	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
<b>Lead [tap water]</b> (ppb)	No	9/2011	2.69	0	15	Corrosion of household plumbing systems; erosion of natural deposits

<sup>1</sup> Results in the Level Detected column for radioactive contaminants, inorganic contaminants, and synthetic organic contaminants including pesticides and herbicides are the highest average at any of the sampling points or the highest detected level at any sampling point, depending on the sampling frequency.

<sup>2</sup> Level detected is the annual average.

<sup>3</sup> For chloramines, the level detected is the highest running annual average (RAA), computed quarterly, of monthly averages of all samples collected. For haloacetic acids or TTHM, the level detected is the highest RAA, computed quarterly, of quarterly averages of all samples collected if the system is monitoring quarterly or is the average of all samples taken during the year if the system monitors less frequently than quarterly. Range of Results is the range of individual sample results (lowest to highest) for all monitoring locations, including Initial Distribution System Evaluation (IDSE) results as well as Stage 1 compliance results.

## Definitions

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

**IDSE (Initial Distribution System Evaluation):** An important part of the Stage 2 Disinfection By-products 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.

**MCL (Maximum Contaminant Level):** The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

**MCLG (Maximum Contaminant Level Goal):** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

**MRDL (Maximum Residual Disinfectant Level):** The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

**MRDLG (Maximum Residual Disinfectant Level Goal):** The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

**NA:** Not applicable.

**ppb (parts per billion):** One part substance per billion parts water (or micrograms per liter).

**ppm (parts per million):** One part substance per million parts water (or milligrams per liter).