



*Presented By*  
**Florida Keys  
Aqueduct Authority**

# ANNUAL WATER QUALITY REPORT

WATER TESTING PERFORMED IN 2016

PWS ID#:  
4134357,  
5444047

## Our Mission Continues

Providing you with safe, high-quality drinking water is our number one priority. A team of dedicated and highly qualified employees works 24 hours a day, seven days a week, to continually monitor, assess, and eliminate any potential threats to your drinking water. As a result, we are pleased to let you know that, once again, your drinking water met or surpassed all regulated water quality standards in 2016.



Please take this opportunity to learn more about where your drinking water comes from and our efforts to protect and provide the highest water quality possible. If you have any questions, concerns, or suggestions, please contact us at (305) 296-2454.

## 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/lead](http://www.epa.gov/lead).

## 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>.



## Where Does My Water Come From?

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

The FKAA's primary drinking water supply originates from the Biscayne Aquifer, a below ground limestone geological formation that produces high-quality freshwater. Our wellfield is located within an environmentally protected pine rockland forest west of Florida City on the mainland. The location of the wellfield near Everglades National Park, along with restrictions enforced by State and Local regulatory agencies, contributes to the remarkably high-quality source 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 that limit the amount of water that can be extracted from the Biscayne Aquifer. To meet these regulations, the FKAA utilizes the Floridan Aquifer, a brackish groundwater source located approximately 880 to 1,270 feet below the surface, to supplement and protect our primary Biscayne supply. The FKAA constructed a low-pressure reverse osmosis (LPRO) water treatment plant at our Florida City Wellfield in 2009 to utilize the Floridan Aquifer and contribute up to an additional 6 million gallons per day to our 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 (RO 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.

## Safeguarding the Water Supply

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. 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 Environmental Protection Agency's Safe Drinking Water Hotline at (800) 426-4791.



## What is the Value of Water?

Essential. Reliable. Invaluable. Water — It keeps our communities healthy, our cities running, and our economies growing. Water is a cup of coffee, the produce aisle, better production, increased exports, and greater strength. While essential, water infrastructure is largely invisible. Few people realize what it takes to treat and deliver drinking water every day. The high quality of life we enjoy would not be possible without water and the infrastructure that fuels it.

While conservation is critical, we also need innovative water management strategies to respond to the unprecedented water challenges facing communities all across the country. Investments can support a wide range of innovations including resource recovery, reuse, and diversification of local water supplies. Our investments now will allow us to face long-term challenges such as water supply protection and short-term challenges, such as hurricane recovery, for decades to come. Please know that you and your investments are critical to the future of our water supply.

## QUESTIONS?

For more information about this report, or for any questions relating to your drinking water, please call Shelli Johnson, Water Quality and Environmental Manager, at (305) 295-2219.

## Source Water Assessment Plan

In 2016 the Florida Department of Environmental Protection (FDEP) performed a Source Water Assessment on our system as part of their statewide source water assessment project. Source Water Assessment reports identify and assess any potential sources of contamination in the vicinity of each water supply in the state. This inventory only identifies potential sources of contamination. It does not mean that these sites are actively causing contamination of the drinking water source. 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 of contamination near our wells (injection well and petroleum storage tanks). Both are categorized by the FDEP as being of low concern.

FKAA's injection well, utilized for its disposal of concentrate from the RO water treatment plant, is encased in steel to 2,674 ft, passing through multiple clay layers that serve as confining units. The potential contaminant is chloride from the Floridan Aquifer.

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).



## How Often Is My Water Tested?

In accordance with state and federal regulations and as part of the FKAA's Water Quality Program, the FKAA 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 the underground source, the water treatment plants, and at hundreds of points throughout the distribution system.

## 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 website at [www.fkaa.com](http://www.fkaa.com) for more information on these meetings. To receive up-to-date safety alerts and information about your water system, sign up for FKAA's CodeRED Priority Alert System or find us on Facebook and Twitter. Links are available on our website.

## 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 ground water source, the Floridan Aquifer, is utilized to a much lesser extent. The Biscayne source water 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 finished 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, is also added at very low dosage.

To comply with Biscayne Aquifer withdrawal limitations, a Floridan wellfield and low-pressure reverse osmosis (LPRO) water treatment plant were constructed. Operational since the summer 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 (ppm) of salt. This concentration is significantly lower than the 35,000 ppm typically found in seawater, but higher than the 200 ppm found in the Biscayne Aquifer. This LPRO system utilizes very fine membrane elements. 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 emergency water treatment facilities desalinate saltwater to produce 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 and is 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.



## Sampling Results

During the past year we have taken thousands of water samples to determine the presence of any radioactive, biological, inorganic, volatile organic, or synthetic organic contaminants. The State requires us 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 sampling data are included, along with the year the sample was taken. The table below shows only those contaminants that were detected in the water.

If you would like to see a list of all regulated contaminants, please go to our Drinking Water Standards Report on our website, [www.FKAA.com](http://www.FKAA.com), or contact Shelli Johnson at (305) 295-2219.

### PRIMARY REGULATED CONTAMINANTS

#### Microbiological Contaminants

CONTAMINANT AND UNIT OF MEASUREMENT	MCL VIOLATION (YES/NO)	DATE OF SAMPLING (MO./YR.)	HIGHEST MONTHLY PERCENTAGE	MCLG	MCL	LIKELY SOURCE OF CONTAMINATION
<b>Total Coliform Bacteria</b> (% positive samples through March 31, 2016)	No	01/2016-03/2016	1.0	0	> 1 Sample per Month	Naturally present in the environment
<b>Total Coliform Bacteria</b> (% positive samples beginning April 1, 2016)	No	04/2016-12/2016	1.0	0	> 1 Sample per Month	Naturally present in the environment

#### Radioactive Contaminants

CONTAMINANT AND UNIT OF MEASUREMENT	DATE OF SAMPLING (MO./YR.)	MCL VIOLATION (YES/NO)	LEVEL DETECTED	RANGE OF RESULTS	MCLG	MCL	LIKELY SOURCE OF CONTAMINATION
<b>Alpha Emitters</b> (pCi/L)	02/2015	No	1.8	NA	0	15	Erosion of natural deposits
<b>Radium 226 + 228 [Combined Radium]</b> (pCi/L)	02/2015	No	1.3	NA	0	5	Erosion of natural deposits

#### Inorganic Contaminants

<b>Barium</b> (ppm)	02/2015	No	0.008	NA	2	2	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
<b>Fluoride</b> <sup>1</sup> (ppm)	01/2016-12/2016	No	0.59	0.26–0.80	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> <sup>2</sup> (ppm)	01/2016-12/2016	No	3.38	2.41–4.02	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
<b>Selenium</b> (ppb)	02/2015	No	9.2	NA	50	50	Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines
<b>Sodium</b> (ppm)	02/2015	No	21.1	NA	NA	160	Salt water intrusion, leaching from soil

### STAGE 2 DISINFECTANTS / DISINFECTION BY-PRODUCTS

CONTAMINANT AND UNIT OF MEASUREMENT	DATE OF SAMPLING (MO./YR.)	MCL VIOLATION (YES/NO)	LEVEL DETECTED	RANGE OF RESULTS	MCLG	MCL	LIKELY SOURCE OF CONTAMINATION
<b>Haloacetic Acids (five) [HAA5]</b> (ppb)	04/2016 & 10/2016	No	14.7	13.2–14.7	NA	60	By-product of drinking water disinfection
<b>TTHM [Total trihalomethanes]</b> (ppb)	04/2016 & 10/2016	No	30.5	26.0–30.5	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	DATE OF SAMPLING (MO./YR.)	AL EXCEEDANCE (YES/NO) <sup>4</sup>	90TH PERCENTILE RESULT	NO. OF SAMPLING SITES EXCEEDING THE AL	MCLG	AL (ACTION LEVEL)	LIKELY SOURCE OF CONTAMINATION
<b>Copper [tap water]</b> (ppm)	08/2016	No	0.0343	0	1.3	1.3	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
<b>Lead [tap water]</b> (ppb)	08/2016	No	4.2	1	0	15	Corrosion of household plumbing systems, erosion of natural deposits

<sup>1</sup> Level detected is the annual average of daily test results.

<sup>2</sup> Level detected is the average of monthly production well composites.

<sup>3</sup> Though the amount measured when analyzing for total chromium is the sum of chromium in all of its valence states, the MCL for EPA's current total chromium regulation was determined based upon the health effects of chromium-6.

<sup>4</sup> AL exceedance refers to the 90th percentile result.

## Definitions

**90th Percentile Result:** 90% or 9 out of 10 samples were at or below this level.

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

**LRAA (Locational Running Annual Average):** The average of sample analytical results for samples taken at a particular monitoring location during the previous four calendar quarters.

**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

**pCi/L (picocuries per liter):** A measure of radioactivity.

**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).