

# ANNUAL WATER QUALITY REPORT

WATER TESTING PERFORMED IN 2017



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

## Quality First

Once again, we are pleased to present our annual water quality report. 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 new regulations, source water protection, water conservation, and community outreach and education while continuing to serve the needs of our water users. Thank you for allowing us the opportunity to serve you and your family.

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. We encourage you to share your thoughts with us on the information contained in this report by contacting us at (305) 296-2454. After all, well-informed customers are our best allies.

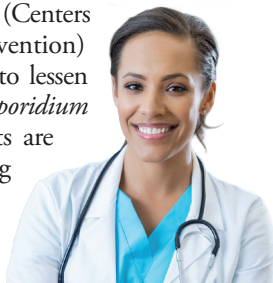
## Community Participation

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 FCAA's CodeRED Priority Alert System or find us on Facebook and Twitter. Links are available on our website at [www.FKAA.com](http://www.FKAA.com).



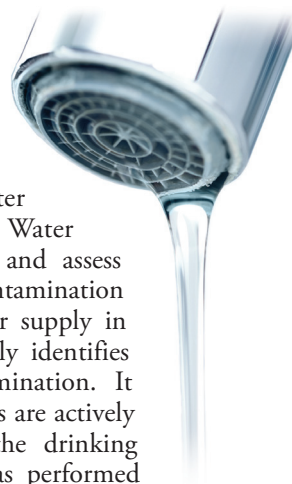
## Important Health Information

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>.



## Source Water Assessment Plan

In 2017, 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.



FCAA's injection well, used 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.

Petroleum storage tanks on the property at FCAA's WTP are all State of Florida registered tanks with no history of reported spills or compliance concerns.

The Source Water Assessment report for our system is available at the FDEP Source Water Assessment and Protection Program website at [www.dep.state.fl.us/swapp](http://www.dep.state.fl.us/swapp).





## 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.

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.

## 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 belowground limestone geological formation that produces high-quality freshwater. Our well field 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 ground water 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 our needs beyond these restrictions, the FKAA utilizes the Floridan Aquifer, a brackish ground water 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 well field 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 use 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 salt water.

## 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.



## Count on Us

Delivering high-quality drinking water to our customers involves far more than just pushing water through pipes. Water treatment is a complex, time-consuming process. Because tap water is highly regulated by state and federal laws, water treatment plant and system operators must be licensed and are required to commit to long-term, on-the-job training before becoming fully qualified. Our licensed water professionals have a comprehensive understanding of a wide range of subjects, including mathematics, biology, chemistry, and physics. Some of the tasks they complete on a regular basis include:

- Operating and maintaining equipment to purify and clarify water;
- Monitoring and inspecting machinery, meters, gauges, and operating conditions;
- Conducting tests and inspections on water and evaluating the results;
- Maintaining optimal water chemistry;
- Applying data to formulas that determine treatment requirements, flow levels, and concentration levels;
- Documenting and reporting test results and system operations to regulatory agencies; and
- Serving our community through customer support, education, and outreach.

So, the next time you turn on your faucet, think of the skilled professionals who stand behind each drop.

## What's a Cross-connection?

Cross-connections that contaminate drinking water distribution lines are a major concern. A cross-connection is formed at any point where a drinking water line connects to equipment (boilers), systems containing chemicals (air conditioning systems, fire sprinkler systems, irrigation systems), or water sources of questionable quality. Cross-connection contamination can occur when the pressure in the equipment or system is greater than the pressure inside the drinking water line (backpressure). Contamination can also occur when the pressure in the drinking water line drops due to fairly routine occurrences (main breaks, heavy water demand), causing contaminants to be sucked out from the equipment and into the drinking water line (backsiphonage).

Outside water taps and garden hoses tend to be the most common sources of cross-connection contamination at home. The garden hose creates a hazard when submerged in a swimming pool or when attached to a chemical sprayer for weed killing. Garden hoses that are left lying on the ground may be contaminated by fertilizers, cesspools, or garden chemicals. Improperly installed valves in your toilet could also be a source of cross-connection contamination.

Community water supplies are continuously jeopardized by cross-connections unless appropriate valves, known as backflow prevention devices, are installed and maintained. We have surveyed industrial, commercial, and institutional facilities in the service area to make sure that potential cross-connections are identified and eliminated or protected by a backflow preventer. We also inspect and test backflow preventers to make sure that they provide maximum protection.

For more information on backflow prevention, contact the 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).

## 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. Ground water extracted from the Biscayne Aquifer is the primary source water for this facility. A secondary ground water source, the Floridan Aquifer, is used 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 FKAA. The FKAA 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 calcium “hardness” 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.

To comply with Biscayne Aquifer withdrawal limitations, a Floridan well field 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 FKAA 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 FKAA 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 because of 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 of 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, or organic contaminants. The information in the data tables shows only those substances that were detected in 2017 or during previous sampling. Remember that many substances in the water are naturally occurring, and detecting a substance does not necessarily mean the water is unsafe to drink. As you will see, all of our results meet or surpass regulatory requirements. The State recommends monitoring for certain substances less 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.

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

#### 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
Alpha Emitters (pCi/L)	04/2017	No	1.8	NA	0	15	Erosion of natural deposits
Radium 226 + 228 [Combined Radium] (pCi/L)	04/2017	No	1.3	NA	0	5	Erosion of natural deposits

#### Inorganic Contaminants

Barium (ppm)	04/2017	No	0.0085	NA	2	2	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Cyanide (ppb)	04/2017	No	11.8	NA	200	200	Discharge from steel/metal factories; discharge from plastic and fertilizer factories
Fluoride (ppm)	04/2017	No	0.652	NA	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
Nitrate [as Nitrogen] (ppm)	04/2017	No	3.32	NA	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Sodium (ppm)	04/2017	No	21.6	NA	NA	160	Salt water intrusion, leaching from soil

### STAGE 1 DISINFECTANTS AND DISINFECTION BY-PRODUCTS

For bromate, chloramines, or chlorine, the level detected is the highest running annual average (RAA), computed quarterly, of monthly averages of all samples collected. The range of results is the range of results of all the individual samples collected during the past year.

DISINFECTANT OR CONTAMINANT AND UNIT OF MEASUREMENT	DATE OF SAMPLING (MO./YR.)	MCL OR MRDL VIOLATION (YES/NO)	LEVEL DETECTED	RANGE OF RESULTS	MCLG OR MRDLG	MCL OR MRDL	LIKELY SOURCE OF CONTAMINATION
Chlorine and Chloramines (ppm)	1/2017–12/2017	No	3.3	0.7–4.3	MRDLG = 4	MRDL = 4.0	Water additive used to control microbes

### 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
Haloacetic Acids (five) [HAA5] (ppb)	04/2017 & 11/2017	No	19.6	17.7–19.6	NA	60	By-product of drinking water disinfection
TTHM [Total trihalomethanes] (ppb)	04/2017 & 11/2017	No	30.0	24.4–30.0	NA	80	By-product of drinking water disinfection

## 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).

**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)	90TH PERCENTILE RESULT	NO. OF SAMPLING SITES EXCEEDING THE AL	MCLG	AL (ACTION LEVEL)	LIKELY SOURCE OF CONTAMINATION
Copper [tap water] (ppm)	08/2016	No	0.0343	0	1.3	1.3	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Lead [tap water] (ppb)	08/2016	No	4.2	1	0	15	Corrosion of household plumbing systems, erosion of natural deposits

**Microbiological Contaminants**

CONTAMINANT AND UNIT OF MEASUREMENT	DATE OF SAMPLING (MO/YR)	MCL VIOLATION Y/N	HIGHEST MONTHLY PERCENTAGE	MCLG	MCL	LIKELY SOURCE OF CONTAMINATION
Total Coliform Bacteria (% positive samples)	01/2017 - 12/2017	N	2.06% (97 samples)	0	> 5%	Naturally present in the environment