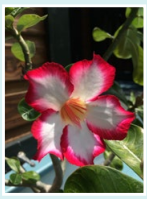
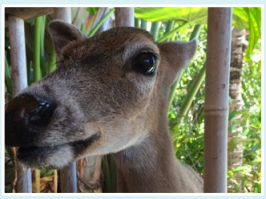
ANNUAL WATER QUALITY REPORT

REPORTING YEAR 2019

Presented By

Florida Keys Aqueduct Authority





PWS ID#: 4134357, 5444047

Our Mission Continues

We are once again pleased to present our annual water quality report covering all testing performed between January 1 and December 31, 2019. Over the years, we have dedicated ourselves to producing drinking water that meets all state and federal standards. We continually strive to adopt new methods for delivering the best-quality drinking water to you. As new challenges to drinking water safety emerge, we remain vigilant in meeting the goals of source water protection, water conservation, and community education while continuing to serve the needs of all our water users.

Please remember that we are always available should you ever have any questions or concerns about your water.

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 for more information on these meetings. To receive up-to-date safety alerts and information about your water system, sign up on our Web site for FKAA's CodeRED Priority Alert System or find us on Facebook and Twitter.

Source Water Assessment Plan

In 2019 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 (an 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.

Petroleum storage tanks on the property at FKAA's WTP are all State of Florida registered tanks with no history of reported spills or compliance concerns. They are steel, single wall tanks mounted on a raised concrete slab, within a concrete secondary containment structure, and housed under a steel roof.

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.

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 Joshua Peele, Water Quality and Environmental Manager, at (305) 809-2636.

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.

> We remain vigilant in delivering the best-quality drinking water

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 that 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 that 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 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 of the 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. In order 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 six 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 (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.

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 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 we 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 at (800) 426-4791 or at www.epa.gov/safewater/lead.

Test Results

Our water is monitored for many different kinds of substances on a very strict sampling schedule. Also, the water we deliver must meet specific health standards. Here, we show only those substances that were detected in our water. (A complete list of all our analytical results is available upon request.) Remember that detecting a substance does not mean the water is unsafe to drink; our goal is to keep all detects below their respective maximum allowed levels.

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.

We have been monitoring for unregulated contaminants (UCs) as part of a study to help the U.S. Environmental Protection Agency (U.S. EPA) determine the occurrence in drinking water of UCs and whether or not these contaminants need to be regulated. For example, we participated in the 4th stage of the U.S. EPA's Unregulated Contaminant Monitoring Rule (UCMR4) program by performing additional tests on our drinking water. At present, no health standards (e.g., maximum contaminant levels) have been established for UCs. If you would like more information on the U.S. EPA's Unregulated Contaminant Monitoring Rule, please call the Safe Drinking Water Hotline at (800) 426-4791.

RADIOACTIVE CONTAMINANTS

CONTAMINANT AND UNIT OF MEASUREMENT	DATES OF SAMPLING (MO./YR.)	MCL VIOLATION (YES/NO)	LEVEL DETECTED	RANGE OF RESULTS	MCLG	MCL	LIKELY SOURCE OF CONTAMINATION
Alpha Emitters (pCi/L)	04/2018	No	3.36	NA	0	15	Erosion of natural deposits
Radium 226 + 228 [Combined Radium] (pCi/L)	04/2018	No	0.898	NA	0	5	Erosion of natural deposits

Inorganic Contaminants

CONTAMINANT AND UNIT OF MEASUREMENT	DATES OF SAMPLING (MO./YR.)	MCL VIOLATION (YES/NO)	LEVEL DETECTED	RANGE OF RESULTS	MCLG	MCL	LIKELY SOURCE OF CONTAMINATION
Fluoride (ppm)	05/2019	No	0.58	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)	05/2019	No	2.9	NA	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Sodium (ppm)	05/2019	No	21.6	NA	NA	160	Saltwater intrusion; leaching from soil

STAGE 1 DISINFECTANTS AND DISINFECTION BY-PRODUCTS

CONTAMINANT AND UNIT OF MEASUREMENT	DATES OF SAMPLING (MO./YR.)	MCL VIOLATION (YES/NO)	LEVEL DETECTED	RANGE OF RESULTS	MRDLG	MRDL	LIKELY SOURCE OF CONTAMINATION
Chloramines (ppm)	1/2019-12/2019	No	3.4	3.2–3.7	4	4.0	Water additive used to control microbes

STAGE 2 DISINFECTANTS AND DISINFECTION BY-PRODUCTS

CONTAMINANT AND UNIT OF MEASUREMENT	DATES OF SAMPLING (MO./YR.)	MCL VIOLATION (YES/NO)	LEVEL DETECTED	RANGE OF RESULTS	MCLG	MCL	LIKELY SOURCE OF CONTAMINATION
Haloacetic Acids (five) [HAA5] (ppb)	05/2019 & 10/2019	No	25.1	24.9–25.2	NA	60	By-product of drinking water disinfection
TTHM [Total trihalomethanes] (ppb)	05/2019 & 10/2019	No	25.0	17.5–32.5	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	DATES 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)	08/2019	No	0.0258	0	1.3	1.3	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Lead [tap water] (ppb)	08/2019	No	1.0	1	0	15	Corrosion of household plumbing systems; erosion of natural deposits

SECONDARY CONTAMINANTS

CONTAMINANT AND UNIT OF MEASUREMENT	DATES OF SAMPLING (MO./YR.)	MCL VIOLATION (YES/NO)	HIGHEST RESULT	RANGE OF RESULTS	MCLG	MCL	LIKELY SOURCE OF CONTAMINATION
Chloride (ppm)	05/2019	No	49.7	NA	NA	250	Natural occurrence from soil leaching
Fluoride (ppm)	05/2019	No	0.58	NA	NA	2.0	Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories
Sulfate (ppm)	05/2019	No	40.7	NA	NA	250	Natural occurrence from soil leaching
Total Dissolved Solids (ppm)	05/2019	No	167	NA	NA	500	Natural occurrence from soil leaching

Definitions

90th %ile: The levels reported for lead and copper represent the 90th percentile of the total number of sites tested. The 90th percentile is equal to or greater than 90% of our lead and copper detections.

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

SMCL (Secondary Maximum Contaminant Level): These standards are developed to protect aesthetic qualities of drinking water and are not health based.

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

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 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.

In order 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 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 that 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 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 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.