

ANNUAL WATER QUALITY REPORT

WATER TESTING
PERFORMED IN 2015

Presented By



Florida Keys
Aqueduct Authority

PWS ID#: 4134357, 5444047

Meeting the Challenge

Once again we are proud to present our annual drinking water report, covering all drinking water testing performed between January 1 and December 31, 2015. 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 your homes and businesses. 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 of our water users.

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

Important Health Information for Vulnerable Populations

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as those with cancer undergoing chemotherapy, those 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 fresh water. 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 900 to 1,200 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 Floridan Aquifer water 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.



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 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.

FCAA Has an Award-Winning Year

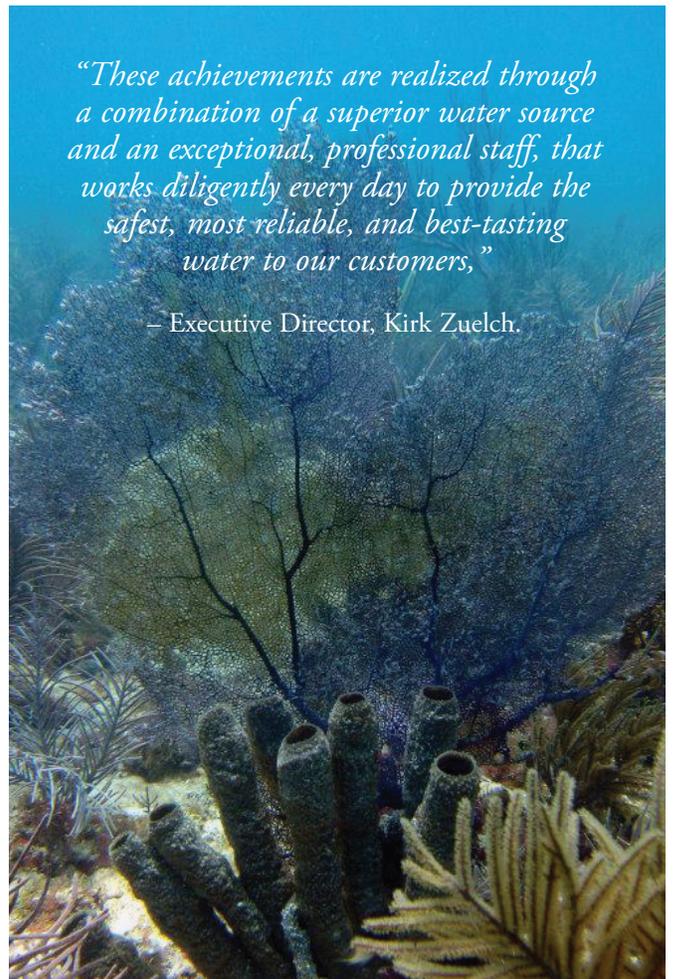
The Florida Keys Aqueduct Authority took home the top prize in the Florida Section of the American Water Works Association's Region 7 Best-Tasting Drinking Water Contest this year. This wasn't the first taste test award for the FCAA and is the third award bestowed on the utility in the past year.

The FCAA's J. Robert Dean Water Treatment Plant garnered the 2015 Large Community Water Plant Operations Excellence Award for the Florida Department of Environmental Protection's Southeast District. Each year, the FDEP presents awards to drinking water facilities that demonstrate excellence in operation, maintenance, innovative treatment, waste reduction, pollution prevention, recycling, or other special achievements.

The FCAA was also recognized by the Florida Engineering Society for managing one of the top ten Engineering Feats of the Century in Florida, pumping an average of 17 million gallons of water a day along the 130 mile island chain, crossing 43 bridges, all while working at pressures that can reach 250 pounds per square inch.

"These achievements are realized through a combination of a superior water source and an exceptional, professional staff, that works diligently every day to provide the safest, most reliable, and best-tasting water to our customers,"

— Executive Director, Kirk Zuelch.



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 or at www.epa.gov/lead.

Failure in Flint

The national news coverage of water conditions in Flint, Michigan, has garnered a great deal of attention over the past year. The water there has been described as being corrosive; images of corroded batteries and warning labels on bottles of acids come to mind. But is corrosive water necessarily bad?

Corrosive water can be defined as a condition of water quality that will dissolve metals (iron, lead, copper, etc.) from metallic plumbing at an excessive rate. There are a few contributing factors but, generally speaking, corrosive water has a pH of less than 7; the lower the pH, the more acidic, or corrosive, the water becomes. (By this definition, many natural waterways throughout the country can be described as corrosive.) While all plumbing will be somewhat affected over time by the water it carries, corrosive water will damage plumbing much more rapidly than water with low corrosivity.

Public water systems are required to maintain their water at optimal conditions to prevent it from reaching corrosive levels. To minimize any risk of lead exposure in the water supply, the Authority adheres to a strict water chemistry program, optimizing both pH and alkalinity in the drinking water to ensure that what happened in Flint never happens here. The Authority has remained well in compliance with our Lead and Copper Tap Sampling Program since its inception over 22 years ago. For more information on lead in drinking water, visit: http://www.fkaa.com/water_quality_lead.html.



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 for FCAA's CodeRED Priority Alert System or find us on Facebook and Twitter. Links are available on our website.

Source Water Assessment Plan

In 2015 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; a search of the data sources indicated one potential source (FCAA's injection well utilized for its disposal of concentrate from the RO water treatment plant) of contamination near our wells. FCAA's injection well is encased in steel to 2,674 ft, passing through multiple clay layers that serve as confining units. This source is categorized by the FDEP as being of low concern; 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.

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.



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, 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.

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 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 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 in order 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 tables below show 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 Web site, 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
Total Coliform Bacteria (% positive samples)	No	01/2015-12/2015	2.5	0		Presence of coliform bacteria in >5% of monthly samples Naturally present in the environment

Radioactive Contaminants

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
Alpha Emitters (pCi/L)	No	02/2015	1.8	NA	0	15	Erosion of natural deposits
Radium 226 + 228 or combined radium (pCi/L)	No	02/2015	1.3	NA	0	5	Erosion of natural deposits

Inorganic Contaminants

Barium (ppm)	No	02/2015	0.0078	NA	2	2	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Fluoride (ppm)	No	01/2015-12/2015	0.69**	0.30–1.06	4	4	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)	No	02/2015	2.62	NA	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Selenium (ppb)	No	02/2015	9.2	NA	50	50	Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines
Sodium (ppm)	No	02/2015	21.1	NA	NA	160	Salt water intrusion; leaching from soil

STAGE 2 DISINFECTANTS AND DISINFECTION BY-PRODUCTS

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
Haloacetic Acids (five) [HAA5] (ppb)	No	04/2015 & 10/2015	15.9	12.7–15.9	NA	60	By-product of drinking water disinfection
TTHM [Total trihalomethanes] (ppb)	No	04/2015 & 10/2015	35.4	20.4–35.4	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	MCLG	AL (ACTION LEVEL)	LIKELY SOURCE OF CONTAMINATION
Copper [tap water] (ppm)	No	08/2013	0.0306	0	1.3	1.3	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Lead [tap water] (ppb)	No	08/2013	3.0	2	0	15.0	Corrosion of household plumbing systems; erosion of natural deposits

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 that, if exceeded, triggers treatment or other requirements that a water system must follow.

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).

** Level Detected is the annual average of daily test results