

***Association of Metropolitan Water
Agencies
2019 Sustainable Water Utility
Management Award***



Part I. Utility Profile

1. **Does your utility provide drinking water only or water/wastewater?** The City of Boca Raton (COBR) Utility Services Department (USD) provides potable water, wastewater, and reclaimed water services to its customers.
2. **What are your water sources, i.e., groundwater, surface water, desalination, etc.?** The Biscayne Aquifer (groundwater) is the sole water source.
3. **Characterize your climate, i.e., arid, tropic, etc.** The COBR, with its large seasonal population, enjoys a tropical climate.
4. **Does your utility have watershed management responsibilities?** No; watershed management is the responsibility of the State of Florida and the South Florida Water Management District.
5. **Is your utility a wholesaler, retailer or combination?** COBR is a retailer.
6. **Are you a stand-alone utility or part of a municipal organization?** Municipal organization
7. **What is your governance structure?** City Council-City Manager
8. **What is your population served?** Approximately 130,000
9. **What is your annual budget?** The approved budget for 2018-2019 budget is summarized below:

Utility Services Department Approved Budget 2018-19	
Administration	\$ 20,872,900
Water	\$ 11,181,600
Wastewater	\$ 9,264,500
Customer Service	\$ 1,995,600
W/S Renewal & Replacement	\$ 10,315,000
Water Impact	\$ 6,830,000
Capital Projects/Transfers	\$ 47,010,300
Reserves	\$ 56,396,600
TOTAL	\$ 163,866,500

10. **Other relevant profile information?** The COBR's USD is one of eight departments in the COBR's organizational structure. The USD is comprised of the following divisions: Finance, Engineering, Capital Improvement Projects, Quality Control, Treatment Operations, Operations and Environmental Compliance, and Utilities Facility Maintenance. The USD strives to sustain excellence by balancing regulatory mandate requirements, benchmarking our established levels of service, achieving financial stability and ensuring environmental sustainability.

The COBR is a community along the southeastern coast of Florida. The USD serves over 130,000 customers each day with potable water, wastewater, and reclaimed water services. The USD has standard of excellence in delivering these services to all customers and continues to meet and exceed customer's expectations while protecting and sustaining our natural resources. The COBR received the 2014 AMWA Sustainability Award, the 2010 Platinum Award for Utility Excellence and in 2002 received the Gold Award for Exceptional Utility Performance.

Part II. Sustainability Mission/Policy Statement



The City of Boca Raton's Utility Services Mission:

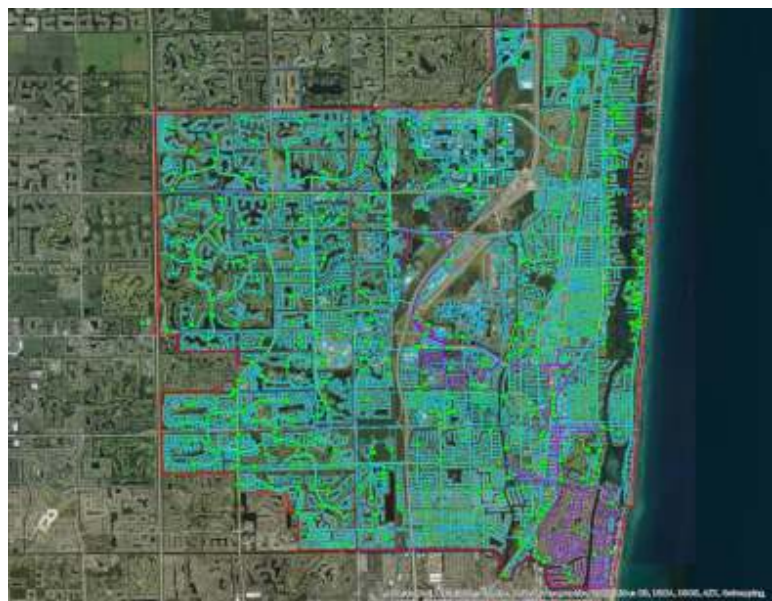
The Mission of the COBR USD is to protect the health and welfare of the COBR and adjacent customers, protect the environment, and provide an exceptional level of service to our customers. Through environmentally-sound treatment, distribution and storage of high-quality potable water as well as utilizing sustainable operation and best management practices, the USD continues to meet and exceed local, state, and federal standards.

The USD mission statement has not changed since we received the AMWA Sustainability Award in 2014. While we continue to work year-round to provide quality, essential services to the community, the USD is also investigating the best alternatives and options to address future needs and potential impacts. While utilities across the country are dealing with failing infrastructure, aging work forces, and reduction in available revenues for re-investment, COBR is setting the standard for utility services.

During the next five years, we will invest over \$160 million dollars in infrastructure upgrades by using cutting-edge technology and by creating redundancy in our systems to continuously meet and exceed our service levels. We actively recruit young professionals and provide ongoing, advanced training opportunities for all of our staff. These investments, along with our commitment to providing world class superior services, has created a sustainable water and wastewater utility for both the near and distant future.

The City of Boca Raton Utility Services Infrastructure

- **Potable water distribution system** - approximately **700 miles** of pipelines
- **Wastewater collection system** - **242** pump stations; approximately **112 miles** force mains
- **Reclaimed water distribution system** - **43 miles** of pipelines



Part III. Financial management

Strategic Plan

In 2018, the COBR finalized a strategic plan for 2018-2019. This plan was finalized with extensive participation from City Council, City Management, staff members and other key stakeholders in the community. The Strategic Plan established several City-wide goals with individual goals for each department. The City-wide long-term/master goals are as follows:

- Financially Sound City
- World Class Municipal Services
- Strong Partnership with the Community
- Vibrant and Sustainable City

The development of measurable goals is instrumental to the successful implementation of the City Strategic Plan. The USD has put forth these efforts to meet the City's Plan:

iSIP

In 2016-2018 USD contracted the services of an engineering consultant to analyze the existing water and wastewater pipeline infrastructure. The analysis consisted of determining and prioritizing the risk and consequence for pipeline failures in the City's system and help prioritize them for renewal and/or replacement projects. The project employed state-of-the art software and the City's Geographic Information System (GIS) to assist in processing the large amounts of data, which are inherent in a system of this size. At the conclusion of the study USD was provided guidance for planning for their future underground infrastructure Capital Improvement Program (CIP) projects, this included prioritized projects to be initiated within 5 years based on the study and coordinated with other upcoming municipal stormwater and street projects. The USD has prioritized six (6) neighborhood project areas based on this information and the USD has commenced work on these project areas. The USD plans to invest \$160 million dollars to design and commence construction on all these projects within the next 5 years. By addressing the highest ranked pipelines by risk and consequence of failure, the City is addressing their long-term renewal needs and will maintain the current low pipeline failure rate and level of service.

Rate Structure

The COBR, through the Long-Range Financial Planning process, has developed and maintained a utility rate structure that is effective and comprehensive and has allowed the USD to assure a competitive status. This rate structure is one of the lowest in Florida and because of this it continues to attract businesses to our community. The COBR has over 50% of the commercial properties (for Palm Beach County) located within our service area limits. In addition, to ensure our rates reflect current economic status, the City adopted an ordinance for increasing rates annually based on the consumer price index (CPI) for the Miami-Ft. Lauderdale area. Because of the effectiveness on investing properly, planning appropriately and implementation of these programs, USD achieved AAA Bond ratings from three Rating Agencies: Moody's Investor Service, Standard & Poors, and Fitch Ratings, Ltd.

Each year, the operation and maintenance expenses associated with operating the USD increase. However, the USD continues to modify its business model to provide a high-level of service, meet all regulatory requirements, and sustain its utility without making dramatic increases to the utility rates.

Water and Sewer Rate Comparison



Succession Planning and Management

The USD actively recruits young professionals and provides ongoing, advanced training opportunities for all team members. The USD also has two active internship programs, one that is for plant mechanics, plant operators and electricians to receive apprenticeship hours and invaluable institutional knowledge. The other city-wide program is for college students, USD typically has engineers for the CIP and science-major interns for the laboratory. To continue to maintain a high-quality workforce as well as ensure succession longevity and operational flexibility the City approved an incentivized pay structure for plant and field operators which encourages employees to obtain and maintain advance licensure through the State of Florida. In FY 2018, USD staff completed approximately 1,700 hours of training.

Performance Improvement

Since receiving the 2014 award, USD has implemented the computerized maintenance management system called MAXIMO. MAXIMO Asset Management and Maintenance Program is a powerful software tool that automates all aspects of assets and maintenance operations, including equipment history, scheduling, preventative maintenance, work orders, labor and expense tracking, procurement, and reporting. The software is compatible with the RCM (Reliability Centered Maintenance) data previously discussed in the 2014 Award application. The MAXIMO database is constantly growing as preventive and corrective work orders are being performed. Technicians completing corrective work orders are required to identify the failure codes and write a description of the problem. The MAXIMO system allows you to view corrective work orders or failures for a particular asset. This is of great benefit for future RCM analysis as we can see times between failures of a specific item allowing the USD to now

implement predictive maintenance instead of corrective maintenance. The MAXIMO system automatically generates routine and preventative or predictive work orders for specified assets. This ensures that components of our system are maintained. RCM, Predictive Maintenance and MAXIMO work together to reduce equipment downtime, closely control and track maintenance expenses as well as improve safety, reduce spare parts inventories and costs. By using this system, the USD can effectively utilize our assets, personnel and other resources.

The USD measures and improves performance through RCM, Predictive Maintenance, Maximo, employment input and customer feedback. Some examples of long-term/master objectives that USD tracks are the following:

Objective	Strategic Initiative	FY 2016-2017 Goal	FY 2016-2017 Actual	FY 2017-2018 Goal	FY 2017-2018 Actual	FY 2018-2019 Target
Percentage of raw waste water flowing into treatment facility	World Class Municipal Services	100%	100%	100%	100%	100%
Percentage of time drinking water surpasses state/federal standards	World Class Municipal Services	100%	100%	100%	100%	100%
Percentage of water service calls responded to within 2 hours	Strong Partnership with the Community	100%	100%	100%	100%	100%
Percentage of one-pump lift stations	Financially Sound City	9%	9%	5%	5%	<5%
Continue maintaining/rehabilitating distribution and collection systems	Vibrant and Sustainable City		Completed critical infrastructure assessment, developing list of prioritized projects	Completed critical infrastructure assessment, developing list of prioritized projects	Developed, bid, and awarded pressure pipe and sewer rehabilitation contracts	Begin work on pressure pipe and sewer rehabilitation contracts

These objectives are created to ensure consistency and currency with the City's overall strategic plan.

Capital Improvements Program

The USD, as well as the other departments in the City, continue to execute an active Capital Improvements Program (CIP) to maintain long-term fiscal viability. The CIP is reviewed, revised, and updated each year by the USD to ensure that sustainability is integrated into the planned projects and purchases. The USD's CIP is also reviewed by various departments within the City, specifically Budget and Finance, to ensure that the financial impacts of the plan consider the City's sustainability goals, budget, and long-range planning. Since winning the Sustainability Award in

2014, the CIP approved 2018 budget has doubled to approximately \$47,000,000 which accounts for 28% of the total budget. The goal of the CIP allows the USD to maintain the existing infrastructure and equipment as well as plan for future improvements. The CIP is critical to incorporating sustainability into long-term financial viability because it allows the USD to integrate modern and efficient technologies into infrastructure that, in some instances, is original to the utility. CIP projects currently under construction that highlight sustainability are detailed below.

There are currently 31 CIP projects in planning, design, bidding, or construction phases that will allow USD to maintain a world-class level of service and ensure continued safe and sustainable infrastructure. Below the projects are listed, described and are categorized by sustainability effort(s).

Project Name	Project Description	Project Phase	LED Lighting	Water Use Reduction	Energy Reduction/Efficiency	Building Hardening	Operational Efficiency/Maintenance Reduction	Reclaimed Expansion	Septic Tank Elimination
Hydropneumatic Tank Removal & Related Reuse System Improvements	Utility Services Reclaimed Water Plant: removal of hydropneumatic tank and various electrical upgrades.	Bidding							
Water and Wastewater Treatment Facility Laboratory Fume Hood Replacement	Utility Services: replacement of existing laboratory fume hoods.	Bidding							
Glades Road Water Treatment Plant Residuals System & Ancillary Improvements Project	Utility Services Water Treatment Plant: lime residuals and electrical systems upgrades.	Const.							
Utility Services Building 1B Renovations	Utility Services: field operations building renovations.	Const.							
Rehabilitation of the Membrane Pretreatment Pressure Filters	Utility Services Water Treatment Plant: pressure filter rehabilitation.	Const.							
LLPS Modifications and Electrical Improvements	Utility Services Wastewater Treatment Plant: low lift pump addition and various electrical upgrades.	Const.							
Wastewater Treatment Plant Headworks Building Rehabilitation	Utility Services Wastewater Treatment Plant: construction of new electrical building and rehabilitation to headworks treatment process.	Const.							
Hurricane Hardening for Buildings 25, 33 & 52 Hardening	Utility Services Wastewater Treatment Plant: hurricane hardening.	Const.							
Water and Wastewater Telemetry Reliability Upgrade	Utility Services City-wide: conversion of telemetry system from radio communication to cell communication.	Const.							
Replacement of the Carbon Dioxide System	Utility Services Water Treatment Plant: replacement of one (1) 50 ton carbon dioxide system with two (2) 16-ton units.	Const.							

Project Name	Project Description	Project Phase	LED Lighting	Water Use Reduction	Energy Reduction/Efficiency	Building Hardening	Operational Efficiency/Maintenance Reduction	Reclaimed Expansion	Septic Tank Elimination
WWTP Drying Bed Relocation	Utility Services Wastewater Treatment Plant: construction of an upgraded solids drying bed and extension of existing generator storage slab.	Const.							
Raw Water Transmission System Flushing Connection	Utility Services Wellfield: addition of flushing connection for northeastern raw water wells.	Const.							
Wastewater Treatment Plant Primary Clarifier Rehabilitation	Utility Services Wastewater Treatment Plant: rehabilitation to primary clarifiers and scum systems, and improvements to aeration basins.	Design							
Intermittent Filter Backwash Upgrades	Utility Services Reclaimed Water Plant: conversion of backwash system from continuous operation to intermittent operation to conserve water.	Design							
Dixie Highway Reclaimed Water Main Extension	Extension of reclaimed water service along Dixie Highway.	Design							
University Woodlands Park Sewer Improvements	Utility Services: Addition of central sewer at University Woodlands Park.	Design							
Water Treatment Plant Washwater Recovery Upgrades	Utility Services Water Treatment Plant: construction of new washwater recovery basin.	Design							
Water Treatment Plant Gravity Filter System Rehabilitation	Utility Services Water Treatment Plant: rehabilitation of gravity filters.	Design							
Chatham Hills Infrastructure Improvements (iSIP)	Chatham Hills Neighborhood: Infrastructure upgrades including relocation of rear water services to rights-of-way (front of property).	Design							
Country Club Village Infrastructure Improvements (iSIP)	Country Club Village Neighborhood: infrastructure upgrades including relocation of rear water services to rights-of-way (front of property).	Design							
Utility Services Buildings 27 and 48 Renovations	Utility Services Wastewater Treatment Plant: maintenance building and sludge treatment building renovation.	Design							

Project Name	Project Description	Project Phase	LED Lighting	Water Use Reduction	Energy Reduction/Efficiency	Building Hardening	Operational Efficiency/Maintenance Reduction	Reclaimed Expansion	Septic Tank Elimination
Utility Services Building 63 Warehouse Replacement- incl solar panels	Utility Services: construction of new, upgraded warehouse for all inventoried items.	Design							
Sewer Manhole Relocations	Relocation of sewer system components.	Design							
Wells 35W, 36W, and 37W Upgrades	Utility Services Wellfield: rehabilitation/upgrade to three (3) raw water wells.	Design							
Reuse Disinfection and Compliance Upgrades- incl solar panels	Utility Services Reclaimed Water Plant: reconstruction of compliance sampling station and improvements to chlorine contact basin.	Design							
Lime Treatment Unit Rehabilitation	Utility Services Water Treatment Plant: rehabilitation to Lime Treatment Units 2 and 3.	Design							
Pressure Filter Expansion	Utility Services Water Treatment Plant: Addition of two (2) pretreatment pressure filters.	Design							
Lake Floresta Park/Tunison Palms/ Old Floresta (iSIP)	Floresta/Tunison Neighborhood: infrastructure upgrades including relocation of rear water services to rights-of-way (front of property).	Design							
Boca Raton Villas Infrastructure Upgrades (iSIP)	Boca Villas Neighborhood: infrastructure upgrades including relocation of rear water services to rights-of-way (front of property).	Design							
Hurricane Hardening for Buildings 3, 4, 5, 6, 7, and 62 Design	Utility Services: Structural design to improve buildings for hurricane-loads.	Design							
AIA Area Wastewater Infrastructure Upgrades Project	Central sewer addition and water main improvements.	Hold							

Part IV. Environmental Stewardship

Water and Wastewater Plant Operation

The operation of the water, wastewater and reclaimed water treatment plants is regulated through several permits issued to the USD by local, state and/or federal agencies such as the Department of Health (DOH), Florida Department of Environmental Protection (FDEP), South Florida Water Management District (SFWMD), and/or the Environmental Protection Agency (EPA). The environmental policies behind the contents of these permits drive the USD to employ sustainability in various plant operations. Below are details on specific measures that demonstrate how the USD approaches sustainable environmental policy.

Wastewater and Reclaimed Water Treatment

At the USD, green is purple. In the drinking and wastewater industries, purple (piping, hose bibs, sprinkler heads, etc.) represents reclaimed water. As the population in South Florida continues to grow, the demand for water increases, however, through time, the amount of water available remains unchanged. Instead of wasting valuable drinking water to irrigate green spaces, the USD was one of the first departments in southeast Florida to develop a Reclaimed Water System. Reclaimed water is recycled wastewater that has been highly treated, filtered, and disinfected and reused for non-potable uses such as for the irrigation of landscaped areas and golf courses. Reclaimed water is a sustainable and renewable water resource.

Since the early 1990's, IRIS (In-City Reclamation Irrigation System) water has been "reclaimed" at the City's Glades Road Utility Services Complex. This award-winning treatment facility uses a multi-stage treatment process. USD employees monitor the reclaimed water quality twenty-four hours a day, seven days a week to be certain that it meets strict quality and safety standards. IRIS water is pumped from the treatment facility to golf courses, medians and other irrigated areas through pipes that are completely separate from the City's drinking water system. Currently the City's IRIS reclamation facility produces 11 to 12 million gallons of reclaimed water per day. This means that the City preserves over 4.1 billion gallons of fresh water every year!

The USD has expanded the IRIS plant production capacity to 17.5 million gallons per day, extended the reclaimed distribution system, as of 2015 the wastewater treatment plant (WWTP) received designation from the Florida Department Environmental Protection (FDEP) as a 100% reuse facility.



Reclaimed Water Use

There are several areas within the wastewater treatment plant (WWTP) that require the use of process water. In lieu of utilizing potable water for certain operations, and where appropriate, the USD uses reclaimed water. Some examples include site irrigation throughout the entire complex,

delivery of sodium hypochlorite for WWTP disinfection via eductor systems, pump packing glands, wash down of treatment processes in the WWTP, and in the biosolids thickening and dewatering.



Concentrate Re-Use

To reduce waste, the concentrate stream from our membrane facility is blended at a 1:4 ratio without high quality reclaimed water and is used for irrigation purposes. This maximizes the use of a potable water by-product, optimizes the use of reclaimed water as an alternative water source, and eliminates ocean outfall discharge.



Biosolids

The wastewater biosolids produced as a result of digestion in the wastewater treatment process have valuable and sustainable reuse potentials when appropriately treated and re-used.

Wastewater biosolids are an inevitable by-product of wastewater treatment. The ability to incorporate their use into the community after additional treatment is a highly-sustainable practice that few utilities in South Florida utilize. The USD produces Class B biosolids (as defined by the FDEP) on-site. There are certain restrictions on the re-use of this category of biosolids based on its treatment characteristics. In an effort to expand the ability to re-use the biosolids, after Class B treatment, the USD sends the material to a drying facility where they are treated to Class AA biosolids. Once they meet this quality requirement, they meet the standards which allow them to be sold and marketed as fertilizer. Formerly, the biosolids were spread on land application sites which have become increasingly regulated over time due to nutrient loading restrictions.



Methane Re-use for Digester Heating

The wastewater digestion process has three (3) key variables that when operated in appropriate ranges, result in ideal digestion. These variables are mixing, loading rate, and temperature. Mixing and load rate are controlled by pump operation whereas temperature is controlled through an external heating system.

A by-product of wastewater digestion is methane gas. The methane gas produced at the USD is re-used in the digester's heating system to control the temperature which makes a portion of the digestion operation sustainable. By using the sustainable methane gas for temperature control, the USD is able to eliminate a demand on an outside fuel source for heating.

Potable Water Treatment



Dewatered Lime Re-Use for Construction Fill

Lime (calcium oxide) is used in the lime softening water treatment process for the removal of minerals and organics. It's delivered to the site in a dry, pebbled form and then saturated with potable water. Once the lime slurry is formed, it is added to the lime softening treatment units as the first treatment step. After the lime has performed its necessary treatment and is no longer capable of removing additional minerals and organics, it is removed from the treatment process. The water treatment steps that follow include gravity filtration and disinfection. This spent lime is now suspended in water and requires dewatering in a separate process. Once the lime has been dewatered, a dry clay-like material remains that has a high content of minerals and organics. This material is re-used for construction fill.

The construction industry is able to reduce their demand on non-sustainable fill products by using this spent lime which will always be available as long as the USD treats the raw water with lime. The USD does not have any plans to discontinue the use of lime softening treatment because the final product is blended with membrane softened water which is further discussed in this section.



Water from Dewatered Lime for Re-treatment and Filter Backwashing

The water that is removed from the saturated lime, as discussed in the previous subsection, is also reused. A portion of the water undergoes re-treatment and a portion is used for backwashing of the gravity filters. There is very little water that is lost in the lime softening process and the re-treated water helps keep the lime softening treatment recovery rate at almost 100%. The water that is used in filter backwashing allows the USD to clean the gravity filters without using additional potable water.



Lime Softened Water Blending with Membrane Softened Water

One of the drawbacks of typical membrane softening water treatment is that the water is often over softened by excessive hardness removal and can become corrosive, which can result in violations of the Lead and Copper Rule. The relative hardness of water is a characteristic recognized by nearly all water users. To meet our water quality objective of a stable finish water hardness in the 60-90 mg/l range, reduce disinfection by-products and have an apparent color of less than 8 color units, the USD chose a customized membrane. This particular membrane created a dramatic enhancement and allows the USD to blend lime softened water with membrane softened water and still obtain the desired objectives, providing a level service to our customers that meets or exceeds their expectations for both hardness and color.

This blending is cost effective as well, allowing the continued use of the lime softening facility and its reduced operating costs. An additional benefit of this membrane is that it requires no pre-treatment chemicals such as sulfuric acid and anti-scalants, which is a significant cost savings and hazard reduction to employees and the community. The membranes installed initially exceeded the expected seven (7) year life cycle and were replaced after 11.5 years. The membranes are cleaned using citric acid, which is safe for the employees and may also aid in the longevity of the membranes. Not only is the USD able to eliminate the need for additional chemicals, but the continued use of the low energy lime softening process to balance the water quality and demand has defrayed costs and environmental impacts.



On-site Generation of Sodium Hypochlorite

The USD formerly used elemental chlorine for disinfection in both the water and wastewater treatment processes. Elemental liquid chlorine is an excellent disinfectant but is highly hazardous substance and requires risk management planning and extreme care when being handled. The USD determined that an alternative to storing and using this elemental chlorine was to generate an equally suitable disinfectant on-site. The USD now has an on-site sodium hypochlorite generation (OSHG) system to produce a 0.8% solution at both the water and wastewater plants. The systems are also designed so bulk sodium hypochlorite 12.5% solution can be purchased for added reliability thus creating dual solutions for disinfection requirements.

These OSHG systems are much safer and more sustainable than purchasing elemental chlorine. The only additional material that needs to be purchased to generate sodium hypochlorite is salt. One precaution that the water plant OSHG takes is that it uses low-bromide chemical grade salt whereas the wastewater plant uses solar salt to generate the sodium hypochlorite. Sodium hypochlorite is made by making a saltwater solution and passing this mixture through electrolytic cells which causes electrolysis to occur. Through this process, a 0.8% sodium hypochlorite solution is created with hydrogen gas as a by-product. The system vents off hydrogen gas into the atmosphere. By generating sodium hypochlorite on-site, the USD is able to further its sustainable operations.

Ocean Outfall Program

On June 30, 2008, the Leah Schad Memorial Ocean Outfall Program (Program) was signed into law by the Governor of the State of Florida. Five (5) utilities (including the COBR) which manage six (6) existing ocean outfalls were impacted. This Program significantly reduces the use of the ocean outfalls with the intent to eliminate ocean discharge of approximately 300 MGD of treated domestic wastewater. The COBR was actively involved in the progression of the Program and contributed comments throughout the lawmaking process. The Program contains specific milestones and regulatory requirements the impacted utilities must follow. In 2015, the COBR USD met all the milestones and regulatory requirements in a sustainable manner. By meeting

and exceeding the Ocean Outfall Program milestones and regulatory requirements, the USD has saved on average 1.5 billion gallons annually since the reclaimed water plant went on-line ensuring the viability and sustainability of our drinking water source. The details of how each milestone was met were discussed in the previous award application. **As of 2015, the WWTP received designation from the FDEP as a 100% reuse facility and completed the four milestones ten years ahead of schedule!**

iSIP



**INNOVATIVE SUSTAINABLE
INFRASTRUCTURE PROGRAM**

Innovative, proactive and collaborative program utilizing **technology to assess and rehabilitate** infrastructure around the City to ensure continued **safe, resilient and sustainable** utility services for the future.

Across the country, underground utility pipelines (water and wastewater) are reaching the end of their useful life. Utility reports have suggested that greater than \$2 trillion dollars are needed in the United States, over the next 25 years, to maintain current levels of service. Many utility systems are experiencing underground infrastructure failures due to pipe materials and age. The USD is cognizant of this national trend and is fortunate to not experience these types of failures. As mentioned in the Part III in 2016-2018 the USD contracted the services of an engineering consultant to analyze the existing water and wastewater pipeline infrastructure. At the conclusion of the study USD was provided guidance for planning for their



Cost benefit – hire one contractor to complete both utility and municipal projects together



Impact – minimize disturbances to residents by reducing number of individual projects



Enhanced neighborhoods – new roads, sidewalks and improved stormwater systems



Quality of life – enhanced level of service and ensuring the delivery of superior City water



Sustainability & Resiliency – providing the most safe and sustainable infrastructure for day-to-day needs

future underground infrastructure Capital Improvement Program (CIP) projects. The USD has prioritized six (6) neighborhood project areas based on the study and has commenced work on these project areas. These neighborhood projects include but are not limited to replacement of aged water and sewer mains, elimination of rear water service, asbestos pipes, and roadway and sidewalks improvements. The USD plans to complete these projects within the next 5 years. By addressing the highest ranked pipelines by risk and by pipeline material, the City is addressing their long-term renewal needs and will likely maintain the current low pipeline failure rate and level of service. The cost for iSIP over the next 20 year is estimated at 600-750 million dollars. The program will be funded through reserves, bonds and rates.

Part V. Social Responsibility

Reclaimed Water

The USD promotes the use of reclaimed water for irrigation within the community and makes it available, accessible, and affordable for its customers in defined service areas. Reclaimed water is a sustainable resource that reduces the amount of potable water (and groundwater) used for irrigation and allows the USD to promote green practices within the community. The use of reclaimed water also allows for groundwater recharge. Reclaimed water is used by residential, commercial, municipal, and academic customers. The USD has developed an attractive reclaimed water rate structure which incentivizes customers to use reclaimed water at a lower cost than potable water.

One of those most notable uses of reclaimed water in the COBR is by golf courses. Previously, these courses used water from the Biscayne Aquifer or surrounding canal systems to fill their on-site lakes. Now, these lakes are filled with reclaimed water produced by the USD. Drought no longer has an impact on the golf course lake water levels or their irrigation practices as the reclaimed water irrigation restrictions are less stringent than those for potable and groundwater. Additionally, the reduction in pumping from the Biscayne Aquifer from the eastern golf courses has shown dramatic reductions in the potential for saltwater intrusion. Saltwater intrusion is a major concern in eastern communities such as the COBR. The USD has taken a proactive approach to minimize the potential for saltwater intrusion with the reclaimed water program.

The USD's largest reclaimed water customer is Florida Atlantic University (FAU). FAU is located directly adjacent to the USD complex and enrolls over 30,000 students across nearly a 1,000 acre campus. The campus includes a football stadium, soccer fields, baseball fields, practice fields, extensive green areas, and an ecological site. In addition to being able to effectively use the reclaimed water, our future generation (students), learn about the use and benefits of reclaimed water on their campus.

The average day reclaimed water demand for the previous 12 months was approximately 10.0 MGD and many days the demand exceeded the supply. This 10.0 MGD use of reclaimed water allowed a reduction in pumping from the Biscayne Aquifer and surrounding canal systems which

not only conserves natural resources but also recharges groundwater and reduces operational costs associated with producing potable water.

During their cross-connection inspections, reclaimed water customers are provided with educational information and literature on the proper and effective use of reclaimed water. These inspections occur when the customer connects to the reclaimed water system or periodically after connection. The purpose of these inspections is three-fold: to confirm that there are no cross-connections between the potable and reclaimed water systems, to confirm that the appropriate backflow protection is installed, and to educate/re-educate the customer on reclaimed water use. These inspections also provide another opportunity for the USD to interact with the community on the sustainable use of reclaimed water.

To further encourage the use of reclaimed water, the USD developed a mandatory reclaimed water zone (MRWZ). The MRWZ promotes the reuse of reclaimed water, protects the environment, conserves the COBR's potable water supply and reduces the amount of wastewater discharged. The MRWZ is contained within COBR's entire utility service area and requires golf courses located within the MRWZ to connect to the reclaimed water system and use reclaimed water within 90 days of service availability. The creation of the MRWZ further allows the USD to coordinate with the SFWMD to increase the amount of reclaimed water used within the COBR's utility service area. The SFWMD requires the use of reclaimed water for affected consumptive use permit holders located within the MRWZ.

Interconnects

The USD continues to maintain eight (8) potable water interconnects with four (4) nearby utilities. These interconnects help maintain positive and sustainable community relations with the nearby utilities and the USD customers. If there's ever an emergency or need to open one or more interconnect, the USD can receive water thus having the ability to provide continuous potable water service to its customers without major water and/or pressure interruptions. Also, the interconnected utilities have the opportunity to receive water from the USD if needed. The USD and the interconnected utilities have agreements that stipulate the requirements prior to opening one of the interconnections to ensure that both parties are prepared and able to supply the needed potable water.

Community Re-use of Treatment By-Products

As discussed in Section IV, the USD tries to operate the utility plants as sustainably as possible. Two of the sustainable treatment by-products that involve the community are used lime and wastewater biosolids. The specific use of each is described below.

Lime

As discussed previously, lime is used in the water treatment plant for the removal of minerals and organics as the first treatment step in the lime softening process. Once the lime performs its

necessary treatment, it does not remain in the finished water and is removed before the water undergoes filtration and disinfection. This used lime is a liquid which undergoes dewatering in a separate process. Once the lime has been dewatered, it's made available for construction fill.

The community is involved in and utilizes this sustainable resource as the USD has a contract for used lime hauling to construction sites. Depending on the construction fill market, which changes frequently, the USD often does not have to pay for the lime to be hauled off-site. The construction industry is able to reduce their demand on non-sustainable fill products by using this spent lime which will always be available as long as the USD treats the raw water with lime. The USD does not have any plans to discontinue the use of lime-softening treatment because the final product is blended with membrane softened water as discussed previously.

Biosolids

Wastewater biosolids are an inevitable by-product of wastewater treatment. The ability to incorporate their use into the community after additional treatment is a highly-sustainable practice that few utilities in South Florida utilize. The Class B (as defined by the FDEP) biosolids produced at the USD are sent to a drying facility where they are transformed to Class AA biosolids. Once they meet this quality requirement, they are sold and marketed as fertilizer. Formerly, the biosolids were land applied on application sites that have become limited with time due to nutrient loading capacity.

Public Outreach

The USD has an active public outreach program which includes the Utility Services Public Outreach and Sustainability Team that reaches out to the utility's community and surrounding areas. Public outreach activities include participation at community events, career day presentations at local schools, and ongoing tours of the water, wastewater, and reclaimed water treatment plants. The presentations include a discussion on water conservation, information about the USD's sustainable operations, and the water and wastewater treatment processes. The USD generates literature on water treatment, water conservation and reclaimed water use to distribute as well as distributes material produced by the local water management district. In the past 12 months, nearly **20,000** children and adults in the community participated in the USD's public outreach program!

MARS

The City's innovative water wagon, Mobile Aqua Refreshing Station or MARS, built by the Utility Services Department, is the first proto-type for the City and provides a cost-effective and sustainable solution for City event attendees to enjoy chilled City tap water in their own refillable water bottles. The MARS unit is all stainless steel, includes an insulated enclosure, and has three hundred feet of 7/8" copper coils that maintain a water temperature of about 45 degrees over an eight-hour period. The MARS unit also has four spigots and a water fountain faucet, requires no electric power, has provisions for connecting to a hose bibb, and can provide a continuous cold

glass of superior quality water for up to 24 hours. One spigot accessible for children and the water fountain faucet was designed for ADA accessibility.

The MARS has a positive impact the City's environmental resources and efforts because it encourages event attendees to think sustainably. Residents are encouraged to "go green and bring their canteen" to City events where the MARS station is available for free. By using the MARS, there is a reduction in the purchase of bottled water and the likelihood of plastic water bottles ending up in our waterways. We have received great feedback from residents and visitors and to date ~2,100 bottles of water have been replaced by the MARS unit.

Potable Water Demand

Over the past 10 years, the combined efforts of Public Outreach and the increased reclaimed water use have led to almost a 20% decrease in per capita use rate for the City of Boca Raton! The USD has recently set a goal of reducing the per capita use rate by another 5% by 2025 and plan to achieve this goal by increasing public outreach particularly on the topic of landscape irrigation.

Contact Information and Application Checklist

Association of Metropolitan Water Agencies

2019 Sustainable Water Utility Management Award

Application Checklist

Complete and Return with Application

X Application contact

Name Kara Mills

Title Utility Services Program Policy Coordinator

Organization City of Boca Raton Utility Services Department

Phone 561-338-7306

E-mail kmills@myboca.us

X E-mail the completed application in pdf format to peterson@amwa.net.

X E-mail a 300-word summary of the main achievements described in the application (in a .doc file) to peterson@amwa.net.

X Press contact name Christopher R. Helfrich, P.E., Utility Services Director

Phone 561-338-7303

E-mail CHelfrich@myboca.us

X E-mail a high-resolution head and shoulders color photograph of the utility executive to be featured with the award, identified with name and title.*

X E-mail two or three high-resolution, color photographs of activities, personnel or facilities related to the main achievements, with descriptive captions.*

* Please send high-resolution, 300 dpi photos in jpg format to peterson@amwa.net. Please **do not** embed photos in word or pdf files. Contact Carolyn Peterson (202-331-2820, peterson@amwa.net) if you have questions.